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Leviathan Drift and Sticky Fiscal Floors: Why Government Expenditure Stays High after Recessions

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Abstract

This paper uses a panel of all OECD economies over the past five decades to study whether democratic fiscal systems are biased toward higher expenditure and deficit financing. It suggests a mechanism of "sticky fiscal floor", the tendency of the expenditure-to-GDP ratio to remain elevated long after crises. The results of the paper imply that deviations of the ratio from country means have a half-life of about 4.3 years. The floor differs from the traditional ratchet explanation as cyclical asymmetry is significant only in some periods, and deviations above the long-run level disappear faster than deviations below it. Local projections up to ten years after the beginning of a recession show where the floor comes from. Real GDP per capita stabilises 3 to 4% below its pre-recession path, while real expenditure stays close to its own pre-recession path. This means that the expenditure ratio remains about 1 pp of GDP higher for at least six years. The floor is formed by real expenditure commitments that are not adjusted to permanent output losses, rather than discretionary spending increases. Recurring recessions mean that these floors cumulate into a Leviathan drift, a slow stepwise growth of government relative to the economy, largely financed by deficit spending. The paper finds no support for the fiscal illusion prediction that deficit financing slows the reversal of expenditure. Reversion is faster when deficits are larger, consistent with a fiscal reaction to imbalances. Strong independent fiscal institutions are associated with a more countercyclical recession response, whereas supranational rules show no significant moderation.

Keywords: Government expenditure, Leviathan, sticky fiscal floor, ratchet effect, permanent output losses, fiscal illusion, fiscal rules, independent fiscal institutions

JEL-classification: H50, H62, H63, E32, E62, D72

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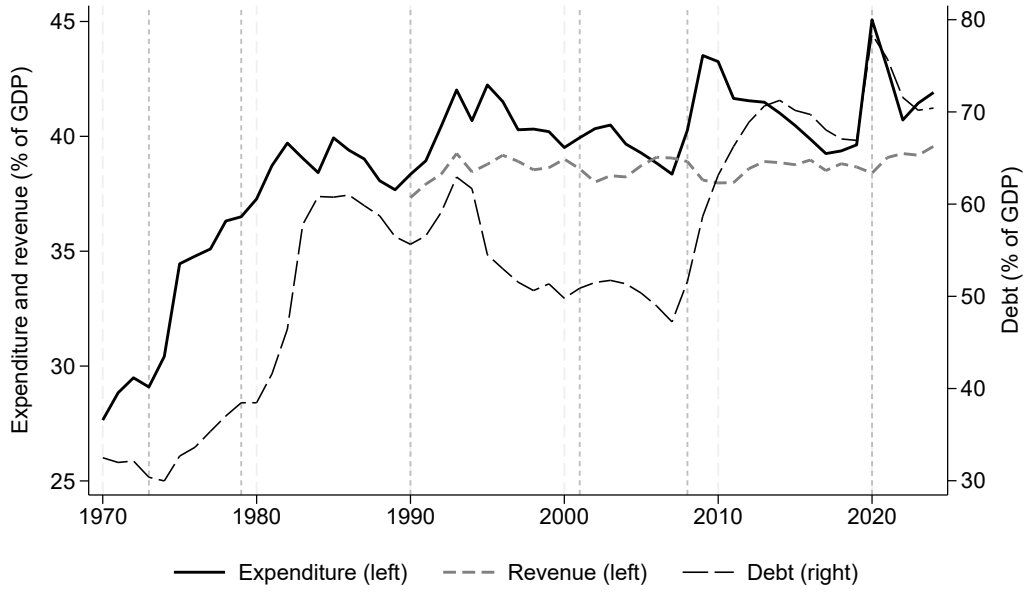
1 Introduction

It has been nearly fifty years since Buchanan and Wagner (1977) published *Democracy in Deficit*. Their argument was that democratic political systems face an asymmetry between the political benefits of public spending and the costs of taxation. Deficit financing can strengthen this asymmetry when voters do not fully account for future tax liabilities. One implication is that fiscal expansions may be easier to sustain than subsequent consolidations, particularly after large shocks. This raises a broader question of whether the persistent growth of government expenditure relative to GDP require governments to make successive decisions to expand spending, or can it emerge from the way expenditure and output adjust after large shocks?

Figure 1 shows the aggregate pattern. The mean expenditure ratio across OECD economies rose from about 28% of GDP in 1970 to over 40% by the early 1990s and has remained at higher levels, with sharp increases in the global financial crisis (GFC) and the pandemic that were only partially reversed. The mean debt ratio more than doubled over the sample, from about 30% to over 70% of GDP. It has risen in large steps in the early 1980s, after the GFC and in the pandemic and with only minor lowering episodes between the crises. General government revenue has been comparatively stable at about 38 to 40% of GDP. Mean expenditure has exceeded mean revenue throughout this period, by a wide margin during the GFC and the pandemic. These patterns are consistent with a persistent fiscal ratchet, but they can also reflect changes in preferences, demographics, macroeconomic conditions, or institutional arrangements.

Figure 1: Mean general government expenditure, revenue and debt (% of GDP), OECD countries.



Notes: Cross-country means over an unbalanced panel. Expenditure and revenue on the left axis, debt on the right axis. Revenue is only broadly available from the early 1990s. Dashed vertical lines: 1973, 1979, 1990, 2001, 2008, 2020 (episodes of quick expenditure growth).

This paper refers to this pattern as the Leviathan drift: a slow accumulation of government expenditure relative to the economy, financed partly by deficits and accompanied by a gradual, stepwise increase in government debt. The term is based on the Leviathan model of Brennan and Buchanan (1980), in which an unconstrained government grows as time passes. The question the paper asks is whether such drift requires a Leviathan at all. Government can also grow relative to the economy without deliberate decisions on expanding if expenditure that rises during crises is not subsequently brought back to its previous relationship with output.

The main element of the analysis is what the paper refers to as the "sticky fiscal floor". This is the tendency of the expenditure ratio to remain above its pre-crisis level long after a crisis has passed. This means that floors cumulate into drift after successive crises. The paper distinguishes three mechanisms that can generate such a floor. The first is an asymmetric ratchet, in which expenditure responds more strongly to downturns than to subsequent upturns. The second is a level shift in the sense of Peacock and Wiseman (1961), where crises permanently raise real expenditure above the path it would otherwise have followed. The third operates through the denominator. If real expenditure commitments are set relative to the income path expected before a crisis and are not revised when output turns out to be permanently lower, the expenditure ratio can rise and remain higher without a corresponding permanent increase in real expenditure. The three mechanisms

have different implications for fiscal frameworks, and they can be distinguished empirically by studying both real expenditure and real GDP after recessions.

This distinction matters because the mechanism studied here is not the ratchet effect in its conventional sense. The ratchet literature asks whether expenditure responds more strongly to recessions than to subsequent expansions, so that cyclical asymmetry produces a persistent upward shift in the expenditure ratio. This paper studies how quickly expenditure-ratio deviations revert once they have occurred. Sufficiently slow error correction can leave the expenditure ratio elevated for many years, even if the response to downturns and upturns is symmetric. In the data, the conventional ratchet pattern is not robust in the full sample, while expenditure-ratio deviations have a half-life of about 4.3 years and the post-recession increase in the ratio is driven primarily by persistent output losses rather than by a permanent increase in real expenditure. The paper therefore treats the fiscal floor primarily as an aspect of persistence and unadjusted expenditure paths.

The paper also studies whether the fiscal floor is related to the two further elements of the Buchanan argument. Specifically, it examines whether expenditure reverts more slowly when it is financed by borrowing (as a fiscal illusion mechanism would predict) or whether larger deficits and higher debt instead generate stronger fiscal responses. It then examines whether fiscal rules and independent fiscal institutions (IFIs) are associated with a different cyclical response of expenditure.

The results imply that persistence is the most robust result. Deviations of the expenditure ratio from country means have a half-life of about 4.3 years, which is most likely a lower bound. The classic ratchet pattern can be observed, but the difference between recession-year and expansion-year responses is only significant in some periods, and deviations above a country's long-run level are reversed faster than deviations below it. Local projections up to ten years after recession support the third mechanism and provide only limited support for a permanent real-expenditure level shift. Real GDP per capita stabilises 3 to 4% below its pre-recession path and does not recover within ten years, while real expenditure per capita remains close to its own pre-recession path. As a result, the expenditure ratio is about 1 pp of GDP higher for at least six years after a recession begins. The sticky fiscal floor is therefore associated primarily with real expenditure paths that are not adjusted in proportion to permanently lower output. A recession in a typical OECD country is observed every eight years, so these floors are large enough to account for roughly a third of the rise in the mean expenditure ratio since 1970 and for most of the increase since 1990. This is a form of Leviathan drift without a Leviathan. Larger deficits and high debt are associated with faster reversion, which is more consistent with a fiscal reaction to imbalances (Bohn, 1998) than with weakened consolidation pressure. The fiscal illusion interpretation receives almost no support. The institutional results are mixed. Strong IFIs are associated with a more countercyclical recession response. This result is robust to controlling for the size of government. Supranational rules show no significant moderation and the potential complementarity between

rules and IFIs is not found in the data.

The paper contributes to the literature by identifying persistent error correction in government expenditure ratios as a distinct source of fiscal drift and by separating this persistence from cyclical asymmetry and permanent real-expenditure level shifts in a long OECD panel. It shows that the expenditure floor after recessions arises mainly from persistent output losses combined with relatively unadjusted real expenditure paths. The paper then shows how recurring floors can cumulate into a slow drift in the size of government and in debt. This connects the expenditure-ratchet literature to evidence on the persistent output costs of recessions (Cerra and Saxena, 2008; Ball, 2014; Blanchard et al., 2015). The paper also tests the fiscal illusion mechanism against a fiscal reaction alternative using the general government deficit, conditional-persistence regressions, local projections and an interest-rate salience test. Finally, the paper relates fiscal rules and IFIs (including mandate strength and the timing of adoption) to the cyclical response of expenditure. The results imply that fiscal frameworks based on expenditure ceilings and medium-term plans may not (by themselves) correct an expenditure level that has become high relative to a downward-revised path for potential output.

Section 2 reviews the literature and Section 3 sets out the conceptual framework. Section 4 describes the data, Section 5 the empirical methodology and Section 6 the results, including the long-horizon analysis of the fiscal floor and its cumulation into the Leviathan drift. Section 7 concludes.

2 Literature Review

2.1 Political Economy Foundations

The modern political economy of fiscal policy emphasises that democratic decision-making can generate systematic biases in public finance outcomes. Buchanan and Wagner (1977) argued that politicians face asymmetric incentives, as public spending yields visible benefits while taxation imposes visible costs. Combined with fiscal illusion, i.e. the tendency of voters to underestimate the cost of debt-financed expenditure, this creates a bias toward deficits and government expansion. Governments that would prefer to commit to long-run balance repeatedly find that short-run political incentives favour present spending over future consolidation, generating the deficit bias documented in the literature (Alesina and Tabellini, 1990; Persson and Tabellini, 2002; Yared, 2019).

This builds on earlier work by Peacock and Wiseman (1961), who argue that crises can raise the socially acceptable burden of taxation, enabling discrete upward shifts in expenditure that are not fully reversed once the crisis subsides. Buchanan and Wagner (1977) extended this logic to a continuous political process in which deficit financing becomes a systematic feature of democratic governance. Brennan and Buchanan (1980)

developed the Leviathan model, in which unconstrained governments maximise revenues subject to political feasibility, and the growth of government is intentional. These theories predict that expenditure will drift upward as commitments accumulate and the political cost of reversal rises.

2.2 Expenditure Dynamics: Wagner's Law and the Ratchet Effect

Empirical work on government expenditure has traditionally focused on two frameworks. Wagner's Law suggests that public spending rises with income, with Lamartina and Zaghini (2011) finding long-run elasticities exceeding unity across OECD countries. Durevall and Henrekson (2011) show that this relationship weakens in the post-1970 period, suggesting that income growth alone cannot explain recent expenditure dynamics.

An alternative explanation is the ratchet or displacement effect. Hercowitz and Strawczynski (2004) find that the government spending-to-GDP ratio increases during recessions and is only partially reduced during expansions, implying a cumulative upward drift. Similar patterns are documented in developing economies by Akitoby et al. (2006). On the other hand, Jaén-García (2021) finds stronger support for displacement than ratcheting in historical data, and Durevall and Henrekson (2011) find limited evidence of a general ratchet effect across countries. A related literature studies the cyclicality of fiscal policy more broadly (Lane, 2003).

A limitation of the ratchet literature is its focus on asymmetric cyclical sensitivity, i.e. whether spending responds more strongly to downturns than to upturns. Even symmetric responses can generate long periods of elevated expenditure when deviations decay slowly. This paper studies persistence alongside asymmetry, and also tests whether reversion itself is asymmetric, i.e. whether increases are reversed more slowly than decreases.

2.3 Fiscal Illusion and the Fiscal Reaction Alternative

The fiscal illusion hypothesis provides a behavioural foundation for persistent deficits. Oates (1988) surveys early empirical work suggesting that fiscal complexity may obscure the true cost of government, Dollery and Worthington (1996) review evidence on the role of tax structure in shaping voter perceptions, and Prado and da Silva (2020) find patterns consistent with fiscal illusion in specific institutional contexts. Fiscal illusion is closely linked to the time inconsistency problem in fiscal policy (Alesina and Tabellini, 1990). Governments face weaker political constraints on deficit spending if voters cannot perceive the intertemporal cost of current borrowing.

Studying the level of fiscal illusion is challenging as deficits can arise from many sources, and voter misperception is hard to distinguish from tax smoothing (Barro, 1979), deliberate inter-generational redistribution, political commitment problems, or failures of Ricardian equivalence. This paper uses a conditional-persistence

test where fiscal illusion is studied through expenditure deviations, which should be reversed more slowly when spending is financed by borrowing. The fiscal reaction literature provides an alternative prediction (Bohn, 1998). Governments respond to larger imbalances with stronger consolidation, which would produce faster reversion when deficits or debt are high. The two hypotheses have opposite predictions for the same conditional coefficient.

2.4 Fiscal Institutions and Constraints

A growing literature examines whether institutional constraints can mitigate political biases. Early evidence suggests that fiscal rules and formal constraints, such as balanced-budget requirements, can influence fiscal outcomes (Poterba, 1994). Fiscal rules are now used in most advanced and many developing economies, and the evidence suggests they are often associated with improved fiscal performance, although effects are highly contingent on design and enforcement (Brändle and Elsener, 2024; Alonso-Albarran et al., 2025; Lehtimäki, 2026).

This paper studies supranational fiscal rules, proxied by membership in the European Union (EU), capturing the Stability and Growth Pact (SGP), and Economic and Monetary Union (EMU), capturing additional convergence criteria. Almost all advanced economies have also implemented national fiscal rules (Lehtimäki, 2025). Supranational rules differ from national constitutional rules or expenditure ceilings as they are externally imposed, involve political negotiation over compliance, and have been subject to repeated reform and de facto suspension.

IFIs have emerged as a complementary institutional innovation, and their number has grown substantially since the GFC. Nerlich and Reuter (2013) and Fall et al. (2015) suggest that IFIs may enhance the effectiveness of fiscal rules by improving transparency and accountability, while Debrun and Kinda (2017) show that well-designed institutions are associated with improved forecast accuracy and compliance. Weaker advisory bodies appear to have limited impact, which is consistent with the constitutional argument of Brennan and Buchanan (1980) that institutions without real enforcement capability cannot constrain government.

2.5 Persistence and Debt Dynamics

Most of the previous literature has focused on cyclical asymmetry or institutional constraints, and less attention has been given to persistence as a mechanism of fiscal expansion with cumulative debt implications. The idea that temporary shocks can have long-lasting effects is well established in macroeconomics through the concept of hysteresis (Blanchard and Summers, 1986). Applied to fiscal policy, slow adjustment means that expenditure increases during downturns remain in place for long periods. They also add to the stock

of public debt if financed by borrowing, and slow reversion can contribute to a stepwise rise in debt if new shocks happen before earlier deviations have been addressed.

A separate literature documents that recessions and financial crises are followed by persistent and often permanent losses in the level of output (Cerra and Saxena, 2008; Ball, 2014; Blanchard et al., 2015). This matters for fiscal ratio variables as expenditure is planned in real terms on the basis of the pre-recession income path. A permanent output loss raises the expenditure ratio even when real spending is unchanged. In fiscal surveillance such effects appear as revisions of potential output, but they have received little attention in the literature on the expenditure ratchet, which typically studies the ratio without separating its numerator from its denominator.

3 Conceptual Framework

3.1 The Democratic Fiscal Bias

Let government expenditure in period t be G_t and tax revenue be T_t, with the deficit $D_t = G_t - T_t$ financed by debt B_t. Following Buchanan and Wagner (1977), the politician maximises electoral support

$$V = V(G_t, -T_t) \tag{1}$$

with $\partial V/\partial G_t > 0$ and $\partial V/\partial T_t < 0$. The full cost of spending G_t is current taxes plus the deferred tax implied by borrowing, $T_t + D_t$. Under fiscal illusion, voters discount the deferred component:

$$\widetilde{C}_t = T_t + (1-\phi)D_t = G_t - \phi D_t, \quad 0 < \phi < 1 \tag{2}$$

where $\widetilde{C}_t$ is the perceived cost of government and ϕ captures the degree of fiscal illusion. When $\phi > 0$, any given spending level appears cheaper when it is financed by borrowing than when it is financed by taxes, which tilts political incentives toward higher G_t and D_t. The framework is reduced-form and it motivates the empirical predictions.

The framework suggests that expenditure deviations should be reversed more slowly when the borrowing-financed share D_t is large, because that is when the wedge between $\widetilde{C}_t$ and G_t is largest. A fiscal reaction mechanism predicts the opposite as governments respond to larger deficits or debt with consolidation.

3.2 The Sticky Fiscal Floor

The ratchet argument implies that political economy forces make it difficult to return to its prior level once the expenditure ratio has risen following a shock. The first mechanism which drive such downward stickiness is the entitlement lock-in, where spending programmes create organised constituencies who mobilise to defend them (Peacock and Wiseman, 1961; Pierson, 1996). Many commitments, such as pensions, benefits and public-sector pay, are set or indexed in real terms. The second is bureaucratic inertia (Niskanen, 1971), where departments that absorbed additional resources during a crisis resist returning to pre-crisis budgets. The third one is informational, where the complexity of government budgets makes it difficult for voters to assess whether current spending levels represent efficient provision (Oates, 1988), and under fiscal illusion they underestimate the carrying cost of elevated expenditure when it is deficit-financed.

These mechanisms can produce a floor in the expenditure ratio in different ways. Let $g_t = G_t/Y_t$, and let G^*_{t+h} and Y^*_{t+h} denote the paths that real expenditure and real output would have followed without a recession that starts in t. To a first approximation,

$$g_{t+h} - g^*_{t+h} \approx \bar{g}\left[\left(\ln G_{t+h} - \ln G^*_{t+h}\right) - \left(\ln Y_{t+h} - \ln Y^*_{t+h}\right)\right], \tag{3}$$

so a persistent increase in the ratio can come from the numerator, the denominator, or both. The paper distinguishes three versions of the sticky fiscal floor.

The first is an asymmetric ratchet. Let $\bar{g}$ denote the long-run level of the ratio:

$$\Delta g_t = \alpha + \beta^- (g_{t-1} - \bar{g})^- + \beta^+ (g_{t-1} - \bar{g})^+ + \varepsilon_t \tag{4}$$

where $(x)^- = \min(x, 0)$ and $(x)^+ = \max(x, 0)$. A strict floor implies $|\beta^+| < |\beta^-|$, i.e. deviations above the long-run level are reversed more slowly than deviations below it. The second is a level shift in the sense of Peacock and Wiseman (1961), where real expenditure moves permanently above its counterfactual path, $\ln G_{t+h} - \ln G^*_{t+h} > 0$ at long horizons. The third is a floor in unadjusted commitments. Real expenditure stays on its counterfactual path, $\ln G_{t+h} \approx \ln G^*_{t+h}$, while output settles permanently below its path, $\ln Y_{t+h} < \ln Y^*_{t+h}$. This version requires no decision to spend more, only the absence of a decision to adjust commitments to a lower income level. It is consistent with entitlement lock-in, and also with governments that treat permanent output losses as temporary. Under high persistence both gaps in equation (3) eventually close and the ratio returns only slowly to its counterfactual path.

3.3 From Floors to Leviathan Drift

A single floor is a temporary phenomenon if it eventually closes, and a permanent one if it does not. In either case, recurring recessions cumulate. Let recessions start with frequency π per year and leave a long-run increase θ^{∞} in the expenditure ratio. Then the contribution of recessions to the change in the ratio over T years is approximately

$$\Delta g_T^{\text{rec}} \approx \pi \, T \, \theta^{\infty}, \tag{5}$$

which accumulates in steps but at a roughly constant average rate. This is the Leviathan drift, where no single episode raises expenditure by a large amount, and each increase is defensible at the time. In the unadjusted-commitments version of the floor, the drift arises in the ratio rather than in real expenditure. Government becomes larger relative to the economy because the economy is smaller than the path on which commitments were planned.

The debt implications follow from the budget constraint. Ignoring stock-flow adjustments, and writing $b_t = B_t/Y_t$, τ_t for the revenue ratio and γ_t for nominal GDP growth, the debt ratio evolves as

$$\Delta b_t = (g_t - \tau_t) - \frac{\gamma_t}{1+\gamma_t} \, b_{t-1} \tag{6}$$

where g_t includes interest payments. A temporary increase in g_t that is not matched by τ_t raises the debt ratio while the deviation lasts, and the cumulative increase is larger the slower the deviation closes. A persistent wedge $g - \tau = d$ moves the debt ratio toward $d(1+\gamma)/\gamma$ rather than raising it without bound, so a rising debt ratio over decades requires either repeated shocks or a widening wedge. Leviathan drift supplies both. Each floor that is not matched by revenue widens the wedge for several years, and a given wedge stabilises debt at a higher level when nominal growth is slower. The result is a slow, stepwise growth of debt rather than an explosive path.

3.4 Institutional Constraints

The constitutional approach of Buchanan and Wagner (1977) and Brennan and Buchanan (1980) argues that the only effective counter to democratic fiscal bias is an institutional constraint that binds both the executive and the legislature. Rules without enforcement can be circumvented through optimistic forecasts and creative accounting, while IFIs without rules can identify fiscal risks but cannot enforce consolidation. Let institutional coverage combine supranational rule intensity $R_{it} \in \{0, 1, 2\}$ and IFI status $C_{it} \in \{0, 1, 2\}$ (none, weak, strong). If the ratchet arises from a larger expenditure response to downturns than to upturns, an institution that constrains it should bring the recession-year and expansion-year responses closer together.

The constitutional argument predicts that (i) strong IFIs reduce this cyclical asymmetry more than weak IFIs, (ii) supranational rules alone have limited effects, and (iii) rules and IFIs are complements, so that the reduction in asymmetry exceeds the sum of the individual effects when both are present.

4 Data

The dataset is compiled from the public databases of international organisations (IMF, OECD, World Bank) and covers the 38 OECD countries over 1970–2024. All the variables and their descriptive statistics are presented in Table 1 and series definitions in Appendix A. The main variable of interest, government expenditure, is measured by total general government expenditure as a percentage of GDP, which includes government final consumption, gross fixed capital formation, transfers, subsidies, and interest payments. This broad measure is aligned with Buchanan's framework, in which all categories of spending contribute to the political economy of fiscal expansion.

Expenditure and revenue are on a general government basis, which makes the deficit directly comparable to the Maastricht reference value. All tests that use revenue or the deficit are based on a shorter period beginning from the early 1990's. Other variables are real GDP per capita growth, an unemployment gap (actual minus structural unemployment, with structural unemployment proxied by OECD NAIRU estimates or a 10-year backward rolling mean of unemployment described in Appendix B), government debt, inflation, long-term interest rates, the old-age dependency ratio, trade openness and the cyclically adjusted primary balance. Supranational fiscal rules are proxied by EU and EMU membership. IFIs are coded from establishment dates in Davoodi et al. (2022) and classified by mandate strength (Appendix C).

Table 1: Summary Statistics (baseline estimation sample)

Variable	Obs	Mean	SD	Min	Max
Government expenditure (% GDP)	1529	41.64	10.41	12.31	69.40
Δ Government expenditure (pp)	1529	0.13	2.59	−19.97	23.53
Real GDP per capita growth (%)	1529	2.04	3.14	−14.64	23.45
Recession dummy	1529	0.19	0.39	0	1
Unemployment gap (pp)	1529	0.45	2.07	−7.23	11.32
Government debt (% GDP)	1529	58.94	37.40	3.90	258.37
Inflation (%)	1529	4.82	6.66	−11.08	100.58
Old-age dependency ratio	1529	22.25	6.61	6.92	50.66
Trade openness (% GDP)	1529	82.29	51.55	10.76	412.18
General government revenue (% GDP)	1207	39.24	10.49	10.29	63.00
Deficit (expenditure − revenue, % GDP)	1207	2.29	4.12	−25.45	32.14
Supranational fiscal rules index (0–2)	1529	0.66	0.85	0	2
IFI present	1529	0.33	0.47	0	1
Strong IFI	1529	0.16	0.37	0	1

Notes: Observations used in the baseline model, 38 countries, 1970–2024. Supranational fiscal rules index: 0 = no EU/EMU membership, 1 = EU only, 2 = EU + EMU.

5 Empirical Methodology

The baseline model is

$$\Delta g_{it} = \alpha_i + \lambda_t + \delta\,(g_{i,t-1} - \bar{g}_i) + \beta_2\, gdp^{-}_{it} + \beta_3\, gdp^{+}_{it} + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it} \tag{7}$$

where Δg_{it} is the annual change in total government expenditure as a share of GDP, α_i and λ_t are country and year fixed effects, $gdp^{-}_{it} = gdp_growth_{it} \times recession_{it}$ and $gdp^{+}_{it} = gdp_growth_{it} \times (1 - recession_{it})$, and $\mathbf{X}_{it}$ contains the unemployment gap, lagged inflation, lagged debt, the old-age dependency ratio and trade openness. A recession year is a year of negative real GDP per capita growth. The ratchet hypothesis is tested by $H_0 : \beta_2 = \beta_3$. The error correction term is the lagged deviation of the expenditure ratio from its country mean $\bar{g}_i$. With country fixed effects this is numerically equivalent to the lagged level, and the half-life of a deviation is $\log(0.5)/\log(1 + \hat{\delta})$. The asymmetric version splits the error correction term into positive and negative deviations, as in equation (4).

These definitions matter for the interpretation as the dependent variable is a ratio, so its response to real GDP growth contains a mechanical denominator effect. If real expenditure did not respond to the cycle at all, the coefficient on growth would be close to $-\bar{g} \approx -0.42$ at the sample mean, so coefficients smaller than this in absolute value indicate that real expenditure rises with GDP. Appendix D presents a model for real expenditure growth. The year fixed effects absorb movements common to all countries, so the regressions identify country-specific dynamics around the common trend. It is also worth noting that the model includes a lagged dependent variable together with country fixed effects, so the persistence estimate is subject to Nickell (1981) bias. With about 40 observations per country, the bias in the autoregressive coefficient is of order $-(1+\rho)/(T-1) \approx -0.05$. It biases the estimated reversion speed upward, so the half-life result should be interpreted as a lower bound.

To test the fiscal illusion mechanism, the error correction coefficient is allowed to vary with the fiscal financing regime:

$$\Delta g_{it} = \alpha_i + \lambda_t + \delta^{\text{above}} (g_{i,t-1} - \bar{g}_i) \cdot \mathbf{1}[d_{i,t-1} > 3] + \delta^{\text{below}} (g_{i,t-1} - \bar{g}_i) \cdot \mathbf{1}[d_{i,t-1} \leq 3] + \theta \, \mathbf{1}[d_{i,t-1} > 3] + \mathbf{X}'_{it}\boldsymbol{\gamma} + \varepsilon_{it} \tag{8}$$

where $d_{i,t-1}$ is the lagged general government deficit in % of GDP and the 3% threshold is the Maastricht reference value. Since the δ coefficients are negative, fiscal illusion predicts $\delta^{\text{above}} > \delta^{\text{below}}$ (closer to zero), i.e. slower reversion when a larger share of spending is borrowing-financed. A fiscal reaction predicts the opposite. The same partition is applied at the 60% debt threshold. A continuous specification interacts the error correction term with the lagged deficit, $\ldots + \delta (g_{i,t-1} - \bar{g}_i) + \varphi (g_{i,t-1} - \bar{g}_i) d_{i,t-1} + \kappa \, d_{i,t-1} + \ldots$, so that the reversion coefficient at deficit x is $\delta + \varphi x$. Fiscal illusion predicts $\varphi > 0$. A fiscal reaction predicts $\varphi < 0$. A salient reference value could make deficit financing more visible and strengthen consolidation pressure, so the threshold specification is not a clean test of illusion on its own, and the continuous specification is the more informative of the two.

To relax the geometric-decay restriction, the paper also estimates Jordà (2005) local projections:

$$g_{i,t+h} - g_{i,t-1} = \alpha_i^h + \lambda_t^h + \beta^h_{\text{above}} \, d_{i,t-1} \cdot \mathbf{1}[d_{i,t-1} > 3] + \beta^h_{\text{below}} \, d_{i,t-1} \cdot \mathbf{1}[d_{i,t-1} \leq 3] + \mathbf{X}'_{it}\boldsymbol{\gamma}^h + \varepsilon^h_{it} \tag{9}$$

for $h = 0, \ldots, 6$, where $\mathbf{X}_{it}$ contains the baseline controls, two lags of Δg_{it} and the second lag of the deficit. The pooled version uses a single coefficient on $d_{i,t-1}$. The coefficients describe how expenditure evolves after a year with a 1 pp larger deficit. They are conditional dynamics rather than responses to an identified exogenous shock. Under fiscal illusion, expenditure should remain more elevated after larger deficits, particularly in the above-threshold regime at horizons of two to four years.

To test the versions of the fiscal floor in Section 3, the paper estimates local projections of outcomes up to ten years after the beginning of a recession:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \lambda_t^h + \theta^h \, onset_{it} + \sum_{k=1}^{3} \rho_k^h \, \Delta y_{i,t-k} + \sum_{k=1}^{2} \pi_k^h \, gdp_growth_{i,t-k} + \psi^h \, \overline{\Delta y}_{i,t-1} + \varepsilon_{it}^h \quad (10)$$

for $h = 0, \ldots, 10$, where $onset_{it}$ equals one in the first year of negative real GDP per capita growth after a non-recession year (231 observations), and $\overline{\Delta y}_{i,t-1}$ is the country's average annual change in y over the five years before t. The coefficients θ^h measure deviations from the path implied by each country's pre-recession dynamics. The outcomes are the expenditure ratio (real expenditure per capita and real GDP per capita), which correspond to the three terms of equation (3). A retention ratio compares the long-run with the impact response of the expenditure ratio, $R = \bar{\theta}^{8-10}/\bar{\theta}^{1-2}$. A floor implies $R \approx 1$ and full reversion $R \approx 0$. Persistence at the baseline reversion speed implies $R \approx (1 + \hat{\delta})^{7.5} \approx 0.30$. Robustness checks drop the year fixed effects in favour of leave-one-out OECD growth and a linear trend (since the year effects absorb common recessions such as the GFC), restrict the shock to deep recessions with growth below -2% (108 observations), and use a fixed sample of recession beginnings for which the full ten-year horizon is observed.

Finally, an interest-rate salience test interacts the continuous error-correction–deficit term with an indicator for observations in which the absolute annual change in the long-term interest rate is above its sample median. Any illusion-type gradient should be stronger if fiscal illusion is weaker when market signals make fiscal imbalances visible, i.e. more positive, when rate movements are small.

All specifications use two-way fixed effects with standard errors clustered at the country level. The Mundlak–Chamberlain test rejects random effects ($\chi^2(8) = 68.1$, $p < 0.001$). The Pesaran CD test indicates cross-sectional dependence ($CD = -3.67$, $p < 0.001$), which the year fixed effects address only partially. Driscoll–Kraay standard errors are reported as a robustness check to address the potential cross-sectional dependence.

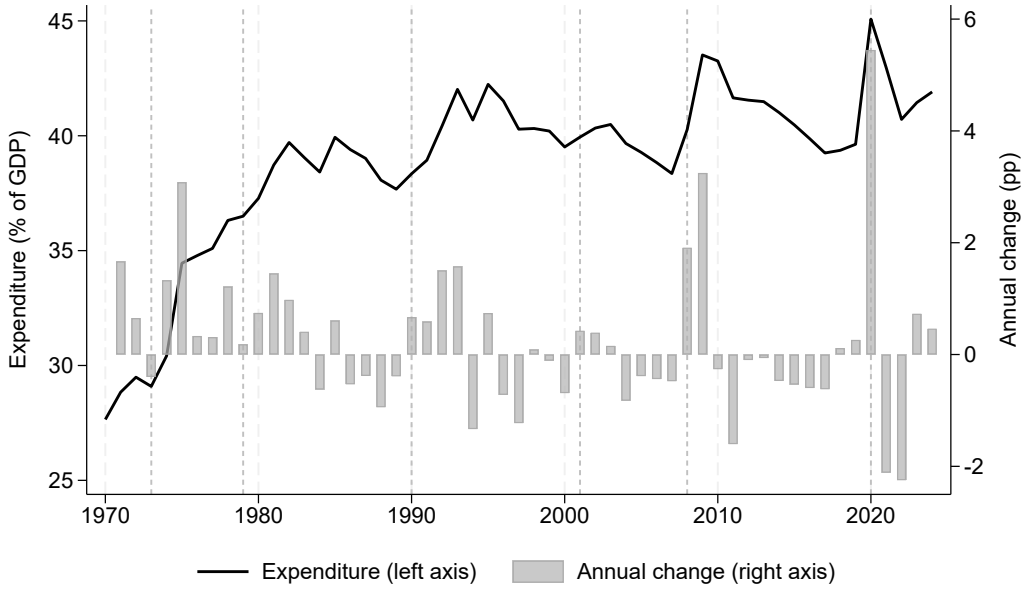
6 Results

6.1 Descriptive Evidence

The mean expenditure ratio rises from about 28% to over 42% of GDP across the sample (Figure 2). Most of the increase occurs before the early 1990s. Since then, the series has moved in a band of about 38 to 45% of GDP. It jumps in the early-1990's recession, the GFC and the pandemic, and declines in the subsequent recoveries. After the GFC it returns close to its pre-crisis level only by the late 2010s, and after the pandemic it remains above its 2019 level at the end of the sample. The mean annual changes are mostly within ± 2 pp,

with the largest increases concentrated in recession years. This incomplete reversal after crises is the pattern of the sticky fiscal floor. Section 6.4 studies where it arises from.

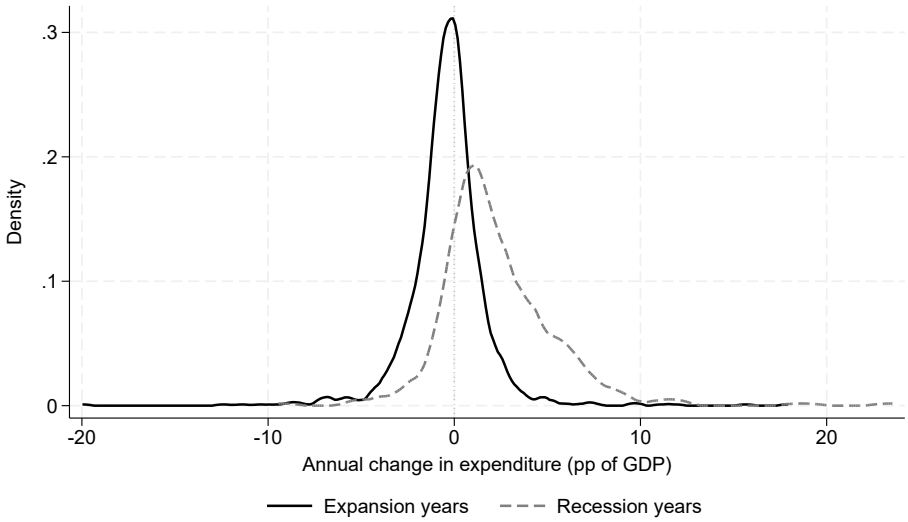
Figure 2: Mean total government expenditure (% GDP) and mean annual changes, OECD countries.



Notes: Line: mean expenditure ratio (left axis). Bars: mean annual change in percentage points (right axis). Dashed vertical lines: 1973, 1979, 1990, 2001, 2008, 2020. Means are taken over an unbalanced panel.

Figure 3 shows the distribution of annual changes. In expansion years the distribution is tightly concentrated around zero with a modest left tail. Declines in the expenditure ratio are common but typically small. In recession years the distribution shifts right and has a much fatter right tail, so large increases are concentrated in downturns. Across all available observations, the mean annual change is -0.22 pp in expansion years and $+2.05$ pp in recession years.

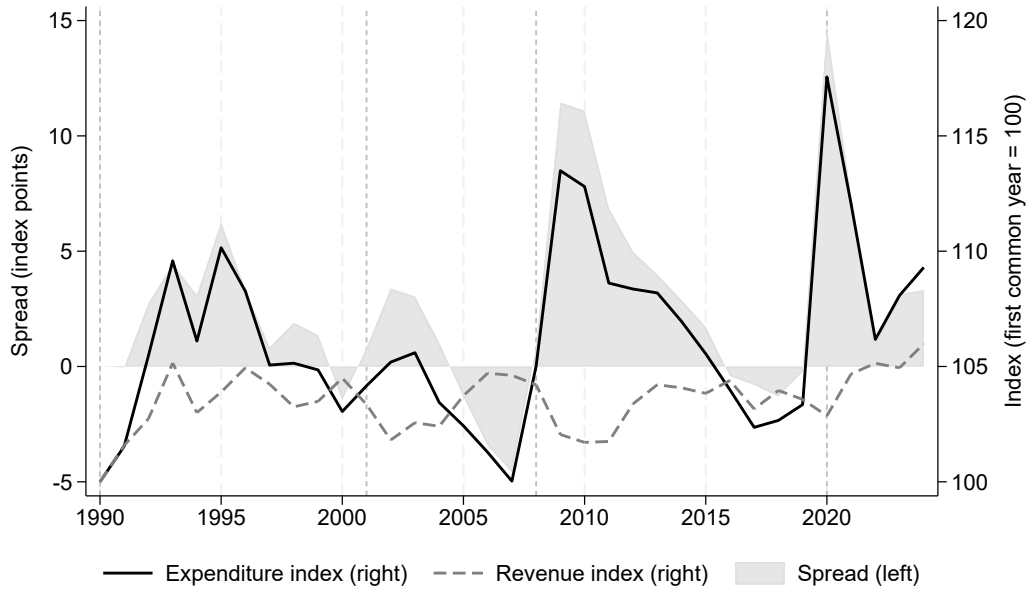
Figure 3: Distribution of annual changes in total government expenditure (pp of GDP): recession vs expansion years.



Notes: Kernel densities, baseline estimation sample.

Figure 4 compares the growth of mean expenditure and revenue ratios over the years in which both are available. The spread between the two indices widens in the early-1990s recession and sharply in the GFC and the pandemic (to about 11 and 13 index points), and narrows in the recoveries that follow. It is negative in the years before the GFC and in the late 2010s, and at the end of the sample it is about 4 index points. Over this period, the divergence between expenditure and revenue is cyclical. The cyclical pattern is consistent both with tax smoothing (Barro, 1979) and with the fiscal illusion argument.

Figure 4: Indexed mean government expenditure and revenue (% GDP), first common year = 100, and the spread between the two indices.



Notes: Years in which both series are available. Lines: indices (right axis). Shaded area: expenditure index minus revenue index (left axis).

6.2 Main Results

Table 2 reports the baseline results. In column (1), the coefficient on real GDP growth is −0.260. This means that a one percentage point increase in growth reduces the expenditure ratio by about 0.26 pp. The expenditure ratio is countercyclical, but less so than the mechanical benchmark of about −0.42, which implies that real expenditure rises with GDP. A direct estimate confirms this (Appendix Table A.4). Real expenditure growth has an elasticity of about 0.34 with respect to growth in expansion years ($p < 0.01$). In recession years the elasticity is about 0.23 and insignificant, so real expenditure is roughly acyclical in downturns.

Table 2: Government Expenditure Dynamics, OECD countries, 1970–2024

	(1) Symmetric FE	(2) ECM	(3) Asymmetric ECM
GDP growth	−0.260***		
	(0.040)		
gdp^- (growth × recession)		−0.365***	−0.373***
		(0.094)	(0.091)
gdp^+ (growth × expansion)		−0.214***	−0.212***
		(0.037)	(0.041)
Expenditure(-1)	−0.151***		
	(0.016)		
Error correction term		−0.150***	
		(0.016)	
ECM: deviation above mean			−0.243***
			(0.036)
ECM: deviation below mean			−0.047
			(0.031)
Unemployment gap	−0.034	−0.035	−0.029
	(0.028)	(0.028)	(0.027)
Inflation(-1)	−0.019***	−0.018***	−0.017***
	(0.006)	(0.006)	(0.006)
Debt(-1)	−0.000	−0.001	0.002
	(0.004)	(0.004)	(0.004)
Old-age dependency ratio	0.030	0.034	0.016
	(0.027)	(0.027)	(0.029)
Trade openness	−0.012**	−0.012**	−0.013***
	(0.004)	(0.005)	(0.004)
Observations	1529	1529	1529
within R^2	0.417	0.419	0.431
Wald p: $gdp^- = gdp^+$		0.121	0.096
Wald p: above = below			0.003
Half-life (years)		4.3	

Notes: Dependent variable: Δ total government expenditure (% GDP). Country and year FE in all models; standard errors clustered at the country level in parentheses. Error correction term: lagged deviation of the expenditure ratio from its country mean; with country FE it is numerically equivalent to the lagged level. Col. (3) splits the term into positive and negative deviations. $^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Column (2) splits the growth effect by cyclical state. The recession-year coefficient (-0.365) is larger in absolute value than the expansion-year coefficient (-0.214). This is the classic ratchet pattern, where expenditure is maintained in downturns and grows with income in upturns. The difference is not statistically significant in the baseline ($p = 0.121$). It is significant when Ireland is excluded or the dependent variable is winsorised as well as in some sub-periods (Section 6.3).

The error correction coefficient in column (2) is -0.150, which implies a half-life of about 4.3 years. This means that a deviation of one percentage point from the country mean is still about 0.5 pp slightly over four years later, conditional on the cyclical controls. As an example, the pandemic raised mean OECD expenditure by roughly 5 pp of GDP in 2020. At the estimated rate, a little under half of such a deviation would remain after five years, which is broadly in line with Figure 13. Slow reversion also implies a cumulative addition to debt over the adjustment period (equation 6) when elevated expenditure is not matched by higher revenue.

Column (3) tests the strict floor hypothesis by splitting the error correction term. The result do not support the hypothesis. Deviations above the country mean revert quickly (-0.243, half-life about 2.5 years), while deviations below the mean revert slowly and insignificantly (-0.047). The difference is significant. There is no evidence that increases are reversed more slowly than decreases. The persistence in the pooled estimate can be described as a slow, roughly symmetric reversion around a moving level. Section 6.4 studies whether the floor reflects a shift in the numerator or the denominator of the ratio after recessions.

Among the controls, lagged inflation is a significant negative predictor. Higher inflation reduces the real value of nominally fixed commitments relative to nominal GDP. The old-age dependency ratio has the expected positive sign but is insignificant[1]. The unemployment gap is small and insignificant, as its cyclical effect is potentially absorbed by the GDP growth terms.

[1]Population ageing generally raises government debt, but the effect is gradual unless there is a substantial acceleration in ageing (Kotamäki and Lehtimäki, 2025).

6.3 Robustness

Table 3: Robustness Checks

	(1) Alt. Recession	(2) CAPB Outcome	(3) Pre-COVID
gdp_2^- (2-yr recession)	-0.234^{**}		
	(0.102)		
gdp_2^+ (2-yr expansion)	-0.264^{***}		
	(0.037)		
gdp^-		-0.162^{**}	-0.297^{***}
		(0.068)	(0.107)
gdp^+		-0.018	-0.254^{***}
		(0.054)	(0.036)
CAPB(-1)	-0.150^{***}	-0.348^{***}	-0.145^{***}
	(0.016)	(0.050)	(0.019)
Unemployment gap	-0.033	0.065^{*}	-0.029
	(0.027)	(0.036)	(0.032)
Inflation(-1)	-0.019^{***}	-0.018	-0.022^{***}
	(0.006)	(0.012)	(0.004)
Debt(-1)	-0.000	0.018^{***}	-0.004
	(0.004)	(0.004)	(0.004)
OADR	0.030	0.011	0.047^{*}
	(0.027)	(0.032)	(0.028)
Trade openness	-0.012^{***}		-0.013^{***}
	(0.004)		(0.004)
Observations	1529	1048	1339
R^2 within	0.417	0.412	0.344
Wald p: asymmetry	0.747	0.112	0.683

Notes: Country and year FE. Standard errors clustered. Col. (1): recession = two consecutive years of negative growth; gdp_2^-/gdp_2^+ defined accordingly. Col. (2): dependent variable is ΔCAPB (cyclically adjusted primary balance); lagged dependent is L.CAPB; trade openness not included. Col. (3): sample excludes 2020–2024. Wald p tests $H_0 : \beta(gdp^-) = \beta(gdp^+)$. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table 3 reports the main robustness checks. Column (1) uses a stricter recession definition (two consecutive years of negative growth). The point estimates are close to each other and symmetry is not rejected.

Column (2) uses the change in the cyclically adjusted primary balance (CAPB) to focus on discretionary policy. The CAPB is a balance, so a discretionary loosening in recessions would appear as a positive coefficient on gdp^{-}. The estimated coefficient is negative (-0.162), so deeper recessions are associated with a small improvement in the CAPB. The expansion-year coefficient is close to zero, and the asymmetry test does not reject equality. The CAPB results provide no evidence of discretionary loosening in downturns that is left unreversed in recoveries. The cyclical pattern in total expenditure appears to operate mainly through automatic components and the GDP denominator. The negative recession coefficient may also partly reflect known difficulties in cyclically adjusting balances during deep recessions. The positive coefficient on lagged debt indicates that higher debt is followed by structural consolidation, which is consistent with a fiscal reaction function (Bohn, 1998).

Column (3) excludes 2020–2024. The recession coefficient falls from -0.365 to -0.297 and the asymmetry test moves further from rejection, so part of the baseline asymmetry comes from the pandemic years.

Appendix D reports further checks. The persistence estimate is stable with Driscoll–Kraay standard errors in a subsample of 29 countries with at least 45 annual observations, where the Nickell bias is smaller, when Ireland is excluded, and with a winsorised dependent variable (-0.119, half-life 5.5 years). Relative to a backward-looking 10-year rolling mean, reversion is slower still (-0.092, half-life about 7.2 years). Appendix G estimates the cyclical coefficients separately for five sub-periods. Symmetry is rejected jointly across periods, with significant asymmetry in 1980–1992 and 2020–2024.

6.4 The Fiscal Floor at Long Horizons

Table 4: Long-Horizon Responses to Recession Onset

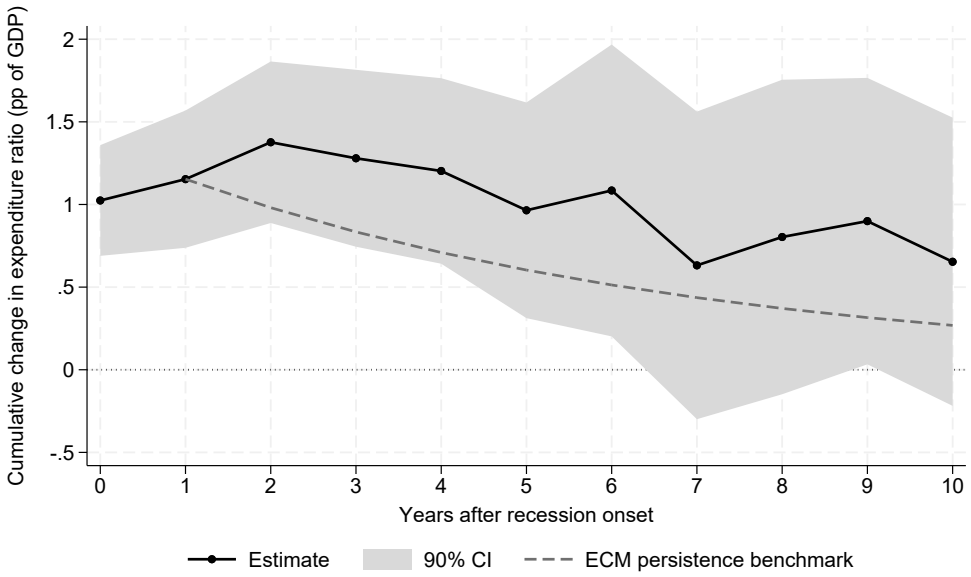
	Expenditure ratio (pp of GDP)			Real expenditure	Real GDP	
	(1) Main	(2) No year FE	(3) Deep	(4) per capita (%)	(5) per capita (%)	N
Panel A: Cumulative response θ^h after h years						
$h = 0$	1.024^{***}	1.340^{***}	1.368^{***}	-0.505	-3.237^{***}	1621
	(0.204)	(0.201)	(0.309)	(0.491)	(0.309)	
$h = 2$	1.377^{***}	1.416^{***}	2.298^{***}	0.178	-4.313^{***}	1544
	(0.297)	(0.303)	(0.544)	(0.992)	(0.426)	
$h = 4$	1.203^{***}	1.177^{***}	1.664^{***}	-0.231	-3.983^{***}	1470
	(0.341)	(0.351)	(0.406)	(1.082)	(0.372)	
$h = 6$	1.085^{*}	0.933^{*}	1.151^{**}	-1.115	-4.082^{***}	1394
	(0.537)	(0.492)	(0.502)	(1.706)	(0.532)	
$h = 8$	0.803	0.866^{*}	0.909	-1.391	-3.633^{***}	1318
	(0.578)	(0.465)	(0.649)	(1.847)	(0.642)	
$h = 10$	0.654	0.653	0.115	-1.325	-3.322^{***}	1242
	(0.530)	(0.446)	(0.672)	(1.697)	(0.645)	

Panel B: Retention of the expenditure-ratio response, col. (1)	
Impact response ($\bar{\theta}^{1-2}$)	1.220
Long-run response ($\bar{\theta}^{8-10}$)	0.750
Retention ratio R (SE)	0.614 (0.360)
p-value, H_0: $R = 1$ (full floor)	0.277
p-value, H_0: $R = 0.297$ (ECM persistence)	0.407
p-value, H_0: long-run response $= 0$	0.141

Notes: Local projections of $y_{i,t+h} - y_{i,t-1}$ on recession onset in t (equation 10). Col. (1): country and year FE, three lags of Δy, two lags of real GDP growth and the average annual change in y over the five years before onset. Col. (2): as col. (1) without year FE, with leave-one-out OECD growth (t, $t-1$) and a linear trend. Col. (3): deep recessions (growth below -2% in the onset year or the next). Cols. (4)–(5): $100 \times \ln$ real expenditure per capita and real GDP per capita, specification as in col. (1). N: observations in col. (1). Panel B: retention ratio from the mean responses at $h = 1$–2 and $h = 8$–10, estimated jointly (seemingly unrelated estimation, delta method); the ECM benchmark is $(1 + \hat{\delta})^{7.5}$ with $\hat{\delta}$ from Table 2. Standard errors clustered at country level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table 4 and Figures 5 and 6 present the response of expenditure and output for ten years after the beginning of a recession. In the main specification the expenditure ratio rises by about 1.0 pp of GDP in the first year and peaks at 1.4 pp after two years. It remains about 1.0 to 1.2 pp higher for six years, with the 90% confidence band above zero, and is 0.6 to 0.9 pp higher at horizons of seven to ten years, where the estimates are less significant. At every horizon the estimated path lies above the path implied by the baseline reversion speed (Figure 5). The retention ratio is 0.61. This means that about 60% of the impact response is still present after eight to ten years, which is about double the 0.30 implied by the ECM. The estimate is insignificant, so it does not reject a full floor ($p = 0.28$), the ECM benchmark ($p = 0.41$) or full reversion ($p = 0.14$). The long-horizon evidence points to more persistence than the ECM implies, but it cannot separate the competing hypotheses.

Figure 5: Expenditure ratio after recession

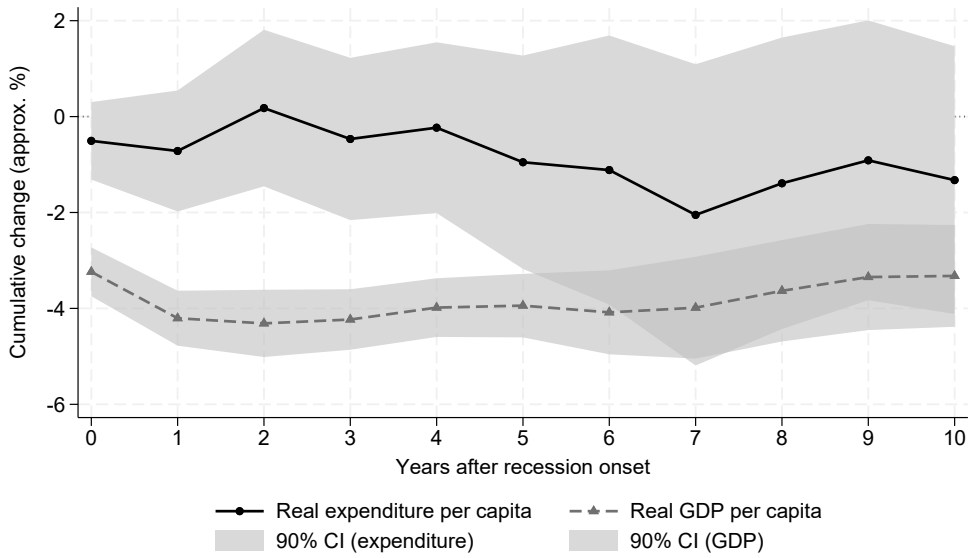


Notes: Cumulative change in the expenditure ratio (pp of GDP) relative to $t-1$, Table 4, col. (1), with 90% confidence intervals. Dashed line: path implied by the baseline ECM reversion speed, anchored at the estimated response in $h = 1$.

The decomposition in columns (4) and (5) shows where the floor comes from. Real GDP per capita falls about 3% below its pre-recession path in the onset year and 4.3% by the second year. It then remains 3.3 to 4.1% below that path for the rest of the decade, with every estimate significant at the 1% level. This is a pattern of permanent output losses after recessions (Cerra and Saxena, 2008; Ball, 2014). Real expenditure per capita stays close to its own pre-recession path. The estimates are between −0.7% and +0.2% in the first four years and lower to between −1.0% and −2.0% later, but none of them are significant. An average expenditure ratio of about 42% and equation (3) imply a ratio increase of about 1.9 pp after two years and 0.8 pp after

ten, compared with estimated increases of 1.4 and 0.65 pp. The persistent increase in the expenditure ratio after recessions is almost entirely a denominator effect. Governments do not raise real expenditure above its pre-recession path, which rejects the level-shift version of the floor. They also do adjust real expenditure to the permanently lower output path, at least during the first five to six years, which supports the version based on unadjusted commitments.

Figure 6: Real expenditure and real GDP per capita after recession onset



Notes: Cumulative change in $100 \times$ ln real expenditure per capita and real GDP per capita relative to $t-1$, Table 4, cols. (4)–(5), with 90% confidence intervals.

The pattern is robust. Column (2) brings the common recessions of the GFC and the pandemic into the identifying variation by leaving year fixed effects out, and the response is very similar. The same holds in a fixed sample of recessions for which the full horizon is observed. Deep recessions raise the ratio more, by 2.3 pp after two years. This response is fully reversed after ten years. This is consistent with the evidence in Section 6.6 where larger imbalances trigger stronger consolidation. Recessions are not predicted by past expenditure changes, which suggests that the responses are not driven by expansions that preceded the downturn.

From the theoretical analysis of Section 3, the sticky fiscal floor is a floor in real commitments rather than a ratchet. The mechanisms that make expenditure hard to cut do not need to produce higher real spending after crises. However, they are sufficient to prevent real spending from adjusting to a permanently lower income level. It is also possible that permanent output losses are recognised only gradually, through successive revisions of potential output. This would mean that expenditure plans anchored to pre-crisis projections

remain in place for several years. The burden of government relative to the economy rises permanently without any specific decision to expand it. This gap is financed by borrowing unless closed by higher revenue.

It is worth noting that the confidence bands for real expenditure widen at long horizons, so partial adjustment of real spending after the sixth year cannot be ruled out. The evidence is strongest for the first five to six years. Recessions are also not exogenous, and the estimates are conditional responses rather than causal effects of an exogenous output shock.

6.5 Leviathan Drift: Cumulating the Floors

This section studies how much of the long-run growth of government can be explained by recurring floors. Equation (5) and the 231 recessions in the sample imply one recession every eight years in a typical country. A long-run increase in the expenditure ratio of 0.65 to 0.75 pp per recession (Table 4, $h = 10$ and the mean over $h = 8$–10), so recessions add about 0.8 to 0.9 pp of GDP to the expenditure ratio per decade. Over 1970–2024 this amounts to about 4 to 5 pp, which is about a third of the increase in the mean ratio. Most of the earlier increase is due to the expansion of welfare states before the 1990's. Since 1990, the implied contribution of about 3 pp is of the same order as the increase in the mean ratio. Over the last three decades the growth of government relative to the economy in the OECD might be largely a cumulation of crisis floors.

The same arithmetic applies to debt. The general government revenue ratio has been broadly stable at 38 to 40% of GDP since the early 1990's (Figure 1). If revenue moves in proportion to output after a recession, the floor in the expenditure ratio moves completely into the deficit. A floor of about 1 pp of GDP lasting six years then adds roughly 6 pp of GDP to debt per recession (before interest). A recession occurs every eight years on average, so this corresponds to about 0.75 pp of GDP of additional borrowing per year. This is about a third of the mean deficit of 2.3% of GDP in the sample. This is an upper bound, since the revenue ratio also rises somewhat in recessions (Table 7). Equation (6) shows why the resulting debt dynamics are slow rather than quickly increasing. A persistent deficit of 2.3% of GDP stabilises debt at about 48% of GDP with nominal growth of 5%, at 60% with nominal growth of 4%, and at 79% with nominal growth of 3%. Drift in expenditure combined with slower nominal growth produces the gradual, stepwise rise in debt ratios visible in Figure 1, from about 30% to over 70% of GDP.

The calculations show that floors of the size estimated in Section 6.4 are large enough to generate a drift. This phenomenon requires no Leviathan in the sense of Brennan and Buchanan (1980), and no fiscal illusion in the sense of Buchanan and Wagner (1977). Section 6.6 shows that deficit financing does not slow the reversal of expenditure. It requires only that real expenditure commitments are not adjusted when output turns out to be permanently lower.

6.6 Fiscal Illusion: Conditional Persistence Tests

The co-movement of expenditure and deficits in Figure 4 is compatible with fiscal illusion but does not identify it, since it is equally consistent with tax smoothing, deliberate inter-generational redistribution, or political commitment problems. Voter misperception cannot be observed in aggregate fiscal data. The data can show the predicted fiscal footprint, and expenditure deviations should be reversed more slowly when a larger share of spending is financed by borrowing if fiscal illusion exists. Deviations should be reversed faster when deficits or debt are high if governments respond to imbalances with consolidation.

Table 5: Fiscal Illusion and Conditional Expenditure Persistence

	(1) 3% Deficit	(2) 60% Debt	(3) Continuous	(4) Non-EU obs.	(5) EU obs.
ECM × deficit > 3%	−0.255***			−0.283***	−0.283***
	(0.041)			(0.083)	(0.039)
ECM × deficit ≤ 3%	−0.200***			−0.204***	−0.230***
	(0.035)			(0.042)	(0.073)
ECM × debt > 60%		−0.176***			
		(0.023)			
ECM × debt ≤ 60%		−0.135***			
		(0.020)			
ECM term (δ)			−0.125**		
			(0.055)		
ECM × Deficit(-1) (φ)			−0.010**		
			(0.004)		
gdp^-	−0.348***	−0.368***	−0.355***	−0.182	−0.401***
	(0.093)	(0.092)	(0.090)	(0.202)	(0.077)
gdp^+	−0.211***	−0.215***	−0.219***	−0.149*	−0.249***
	(0.050)	(0.038)	(0.052)	(0.074)	(0.069)
Observations	1182	1529	1182	554	628
Countries	38	38	38	37	23
within R^2	0.452	0.421	0.471	0.407	0.550
Wald p	0.151	0.160	0.018	0.213	0.374

Notes: Dependent variable: annual change in total government expenditure (% GDP). Country + year FE and baseline controls. Standard errors clustered at country level. ECM term: lagged deviation of the expenditure ratio from its country mean. Deficit: lagged general government deficit. Cols. (1), (4), (5): ECM partitioned at the 3% deficit threshold; col. (2): at the 60% debt threshold; regime indicators included as main effects. Col. (3): ECM interacted with the lagged deficit, which is included as a main effect; the reversion coefficient at deficit x is $\delta + \varphi x$, so $\varphi < 0$ means faster reversion as the deficit widens. Cols. (4) and (5): observations outside and under EU membership. Fiscal illusion predicts slower reversion (coefficients closer to zero) above the thresholds and $\varphi > 0$. Wald p: equality of the two regime coefficients (cols. 1, 2, 4, 5); $\varphi = 0$ (col. 3). $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table 5 reports the results for the fiscal illusion and conditional expenditure persistence. Every specification points in the same direction, and that direction is the opposite of the fiscal illusion prediction.

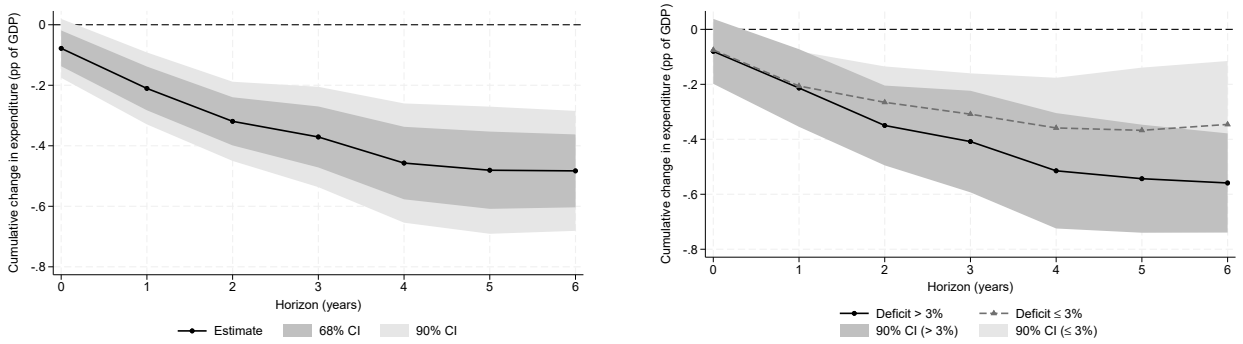
At the 3% threshold (column 1), reversion is faster above the threshold (-0.255 against -0.200, half-lives of about 2.4 and 3.1 years), although the difference is not significant ($p = 0.151$). At the 60% debt threshold (column 2), reversion is likewise faster above the threshold (-0.176 against -0.135, half-lives of 3.6 and 4.8 years; $p = 0.160$). The continuous specification in column (3) does not depend on a threshold and is the most statistically significant result. The interaction is negative and significant ($\hat{\varphi} = -0.010$, $p = 0.018$). The implied reversion coefficient is -0.125 at a balanced budget, -0.155 at a 3% deficit and -0.185 at a 6% deficit, corresponding to half-lives of about 5.2, 4.1 and 3.4 years. The same ordering appears in observations outside and under EU membership (columns 4 and 5).

Larger fiscal imbalances (either through the current deficit or the accumulated debt stock) are associated with faster lowering of expenditure deviations. This is consistent with a fiscal reaction in which consolidation pressure rises with imbalances (Bohn, 1998). It is not consistent with weakened consolidation pressure under deficit financing.

Local Projection Evidence

Figure 7 presents local projections based on equation (9). Panel A shows that a 1 pp larger deficit in $t-1$ is followed by a gradual and significant decline in the expenditure ratio. The cumulative response is about -0.3 pp after two years and about -0.5 pp after five years, and the 90% confidence band lies below zero from the first year onward. Panel B splits the response by regime. The two paths are virtually identical for the first two years. From the third year onward, the decline is larger above the 3% threshold (about -0.51 pp after four years and -0.56 pp after six) than below it (about -0.36 pp). The difference is significant at horizons four to six and insignificant at shorter horizons. The local projections confirm the conditional-persistence results without imposing geometric decay. Larger deficits are followed by partial expenditure consolidation, most strongly when the deficit exceeds the Maastricht reference value. There is no divergence in the direction that fiscal illusion predicts.

Figure 7: Local projections: cumulative change in the expenditure ratio following a 1 pp larger lagged deficit



(a) Pooled

(b) Above vs below the 3% deficit threshold

Notes: Coefficients $\hat{\beta}^h$ from equation (9); a negative value means that expenditure at horizon h is lower than in $t-1$. Panel (a): 68% and 90% confidence intervals. Panel (b): 90% confidence intervals. Country + year FE; baseline controls, two lags of Δg and the second lag of the deficit; Standard errors clustered at country level.

Interest-Rate Salience

Table 6 examines whether the deficit gradient differs with the visibility of fiscal pressure in financial markets. The gradient remains negative with interest-rate controls (column 2), so it is not driven by contemporaneous rate movements. In the salience split (column 3), the gradient is negative and significant in low-salience observations (-0.010, $p < 0.05$) and smaller and insignificant when rate movements are large. The difference between the two is not significant. Fiscal illusion predicts a weaker or positive gradient when market signals are absent, but such effects cannot be observed from the results of this paper.

The conditional-persistence tests do not support the fiscal illusion prediction that borrowing-financed expenditure is lowered more slowly. These tests do not rule out fiscal illusion as a contributor to the level of deficits. They show that the dynamics of expenditure are better described by a fiscal reaction to imbalances than by weakened consolidation pressure once a deviation has occurred. Appendix H reports a complementary test from the revenue side. Expenditure changes co-move with revenue changes. The coefficient on revenue shortfalls is somewhat smaller than on windfalls, as illusion would predict, but the difference is not significant.

Table 6: Fiscal Illusion: Interest-Rate Salience

	(1) Baseline	(2) Rate controls	(3) Salience split
ECM term	-0.125^{**}	-0.154^{**}	-0.158^{**}
	(0.055)	(0.063)	(0.062)
ECM × deficit (φ)	-0.010^{**}	-0.009^{*}	
	(0.004)	(0.005)	
ECM × deficit × low salience			-0.010^{**}
			(0.004)
ECM × deficit × high salience			-0.005
			(0.007)
gdp^{-}	-0.355^{***}	-0.310^{***}	-0.313^{***}
	(0.090)	(0.102)	(0.103)
gdp^{+}	-0.219^{***}	-0.251^{***}	-0.252^{***}
	(0.052)	(0.050)	(0.051)
Observations	1182	1111	1111
Countries	38	38	38
within R^2	0.471	0.484	0.485
Wald p: equal salience gradient			0.352

Notes: Dependent variable: annual change in total government expenditure (% GDP). Country + year FE and baseline controls. Standard errors clustered at country level. Lagged deficit included as a main effect. Col. (1) replicates Table 5, col. (3). Col. (2) adds the lagged long-term interest rate and its annual change. Col. (3): same controls as col. (2) plus a high-salience indicator. The ECM × deficit interaction is split by whether the absolute annual change in the long-term interest rate is above (high salience) or below (low salience) its sample median. $\varphi < 0$ indicates faster reversion as the deficit widens. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

6.7 Expenditure Decomposition: Revenue and Deficit

Table 7 decomposes the annual change in the expenditure ratio into the change in the revenue ratio and the change in the deficit, which sum to the total. Columns (1) and (2) are estimated on a common sample, which is restricted to the years in which revenue is available. The decomposition is an accounting split.

Table 7: Expenditure Decomposition and Debt Dynamics

	(1)	(2)	(3)	(4)
	Δ Revenue	Δ Deficit	Δ Debt	Δ Debt
gdp^-	−0.166**	−0.159**	−0.758***	−0.654**
	(0.064)	(0.076)	(0.213)	(0.261)
gdp^+	−0.062	−0.132***	−0.714***	−0.639***
	(0.052)	(0.048)	(0.144)	(0.141)
Dependent variable(-1)	−0.208***	−0.150***		
	(0.055)	(0.048)		
Δ Deficit(-1)				0.304***
				(0.077)
Debt(-1)	−0.002	−0.026***	−0.035***	−0.058***
	(0.003)	(0.004)	(0.012)	(0.010)
Unemployment gap	0.032	−0.084***	0.376***	0.405***
	(0.028)	(0.024)	(0.084)	(0.088)
Inflation(-1)	0.028*	−0.007	−0.124***	0.028
	(0.016)	(0.019)	(0.023)	(0.039)
OADR	0.038	0.050*	0.032	0.006
	(0.028)	(0.029)	(0.100)	(0.092)
Trade openness	−0.001	−0.009***	−0.033**	−0.037***
	(0.003)	(0.003)	(0.014)	(0.012)
Observations	1146	1146	1556	1146
within R^2	0.121	0.451	0.477	0.507
Wald p: $gdp^- = gdp^+$	0.205	0.786	0.857	0.955

Notes: Country + year FE. Standard errors clustered. Col. (1): Δ general government revenue (% GDP). Col. (2): Δ deficit. Cols. (1)–(2) are estimated on a common sample. Col. (3): Δ government debt (% GDP), full sample. Col. (4): adds the lagged change in the deficit, on the sample for which it is available. Cols. (3)–(4) exclude lagged expenditure. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

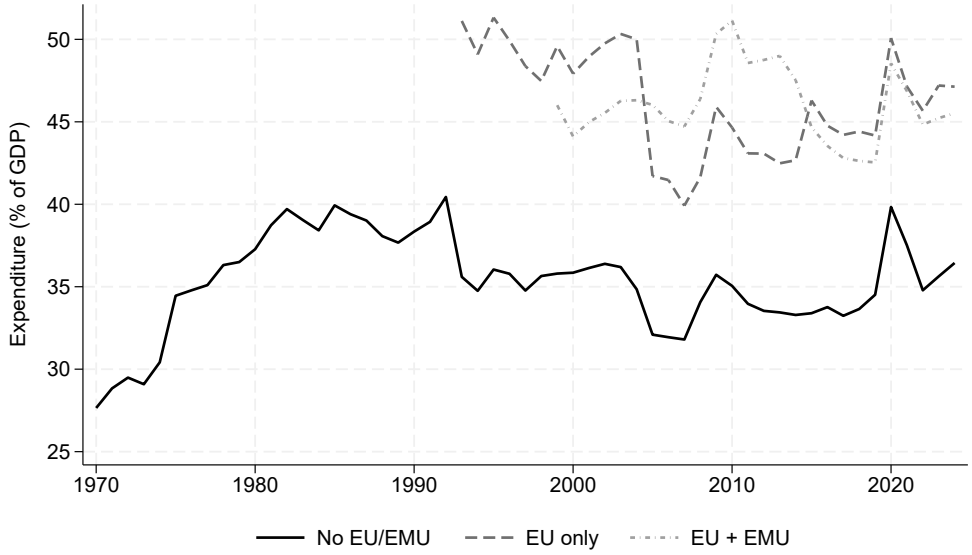
In recession years, the increase in the expenditure ratio as growth falls is split roughly evenly between a higher revenue ratio (-0.166) and a higher deficit (-0.159). The revenue ratio rises because revenue falls less than GDP. In expansion years, most of the decline in the expenditure ratio is matched by a lower deficit (-0.132), while the revenue ratio is insignificant and almost unchanged. Neither component responds asymmetrically to the cycle. The deficit response also shows clear mean reversion, where the lagged change is negative, and higher debt is followed by a lower deficit. A substantial part of cyclical expenditure movements is absorbed by borrowing, but they do not show that deficits opened in recessions are systematically left open in recoveries.

Columns (3) and (4) relate the change in the debt ratio to growth. Faster growth reduces the debt ratio by similar amounts in both cyclical states. The mechanical denominator effect of 1 pp of real growth is roughly the lagged debt ratio, about -0.6 pp at the sample mean, and the estimated coefficients are somewhat larger. A widening of the deficit is followed by additional debt accumulation in the following year, and the negative coefficient on lagged debt indicates a modest debt-stabilising response.

6.8 Institutional Moderation

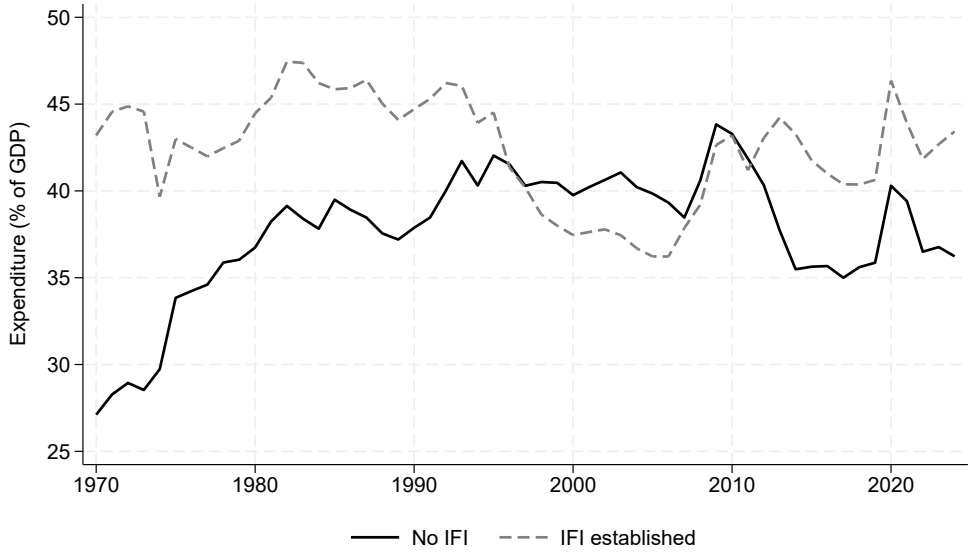
Figures 8 and 9 show expenditure levels by institutional status. EU and EMU countries spend more than countries outside the EU. These supranational institutions are concentrated among European welfare states that were already high spenders. Country-years with an IFI show higher mean expenditure before the mid-1990s and after about 2012, and lower mean expenditure between about 1997 and 2008. Group composition changes as countries join the EU and establish IFIs, so these series do not imply institutional effects, and Table 8 uses within-country variation instead.

Figure 8: Mean government expenditure by supranational fiscal rules group.



Notes: Cross-country means by group; group composition changes as countries join the EU and EMU.

Figure 9: Mean government expenditure by IFI status.



Notes: Country-years before and after the establishment of an IFI (Appendix C); group composition changes over time.

A more negative gdp^{-} coefficient can reflect either a stronger stabilising response in downturns or a stronger ratchet, so the institutional interactions are interpreted here in terms of the gap between the recession-year and expansion-year responses. An institution that constrains the ratchet should narrow this gap.

	(1) Fiscal Rules	(2) IFI	(3) Joint	(4) IFI Timing	(5) IFI Strength	(6) Complementarity
gdp^-	-0.243	-0.331^{***}	-0.223	-0.335^{***}	-0.329^{***}	-0.162
	(0.157)	(0.095)	(0.148)	(0.095)	(0.096)	(0.148)
gdp^+	-0.212^{***}	-0.200^{***}	-0.212^{***}	-0.195^{***}	-0.198^{***}	-0.206^{***}
	(0.038)	(0.036)	(0.038)	(0.036)	(0.037)	(0.042)
$gdp^-\times$ fiscal rules	-0.123		-0.119			-0.194^{**}
	(0.079)		(0.080)			(0.081)
$gdp^+\times$ fiscal rules	-0.005		0.020			-0.006
	(0.035)		(0.037)			(0.047)
$gdp^-\times$ IFI		-0.202	-0.163			-0.409^{*}
		(0.121)	(0.126)			(0.208)
$gdp^+\times$ IFI		-0.085	-0.102			-0.175
		(0.054)	(0.063)			(0.116)
$gdp^-\times$ post-IFI				-0.200		
				(0.124)		
$gdp^+\times$ post-IFI				-0.091		
				(0.057)		
$gdp^-\times$ strong IFI					-0.393^{**}	
					(0.171)	
$gdp^+\times$ strong IFI					-0.067	
					(0.056)	
$gdp^-\times$ weak IFI					-0.109	
					(0.121)	
$gdp^+\times$ weak IFI					-0.075	
					(0.087)	
$gdp^-\times$ fiscal rules $\times$ IFI						0.224^{*}
						(0.123)
$gdp^+\times$ fiscal rules $\times$ IFI						0.069
						(0.076)
Observations	1529	1529	1529	1479	1529	1529
Countries	38	38	38	37	38	38
R^2 within	0.423	0.424	0.427	0.421	0.427	0.431
Wald p: asymmetry	0.122	0.094		0.101		

Notes: Dependent variable: Δ total government expenditure (% GDP). All columns include country and year FE, g_{t-1}, unemployment gap, lagged inflation, lagged debt, old-age dependency ratio, trade openness, and the main effects of the institutional indicators (not shown). Standard errors clustered at country level. Fiscal rules: supranational index (0 = no EU/EMU; 1 = EU; 2 = EU + EMU). IFI: equal to one from the year an IFI is established (Appendix C). Col. (4): within-country timing, excluding the Netherlands, whose IFI predates the sample. In col. (6) the triple interaction uses fiscal rules $\times$ IFI, so it scales with the rules index. Wald p: total recession-year and expansion-year coefficients are equal

Column (1) shows that the interactions with the supranational rules index are not significant. This is consistent with the limited enforcement of the SGP, which has been breached repeatedly without sanctions.

Columns (2) to (4) relate the cyclical response to the presence of an IFI. Both interactions are negative but individually insignificant in column (2): -0.202 in recessions and -0.085 in expansions. For IFI country-years, the total recession-year response is about -0.53 and the expansion-year response about -0.29. The difference between them is significant, although only at the 10% level. This means that IFI presence is associated with a wider gap. Column (4) uses only within-country timing, excluding the Netherlands, and gives almost identical estimates. Figure 10 adds a maturity specification. The recession-year interaction becomes more negative with the number of years since adoption (-0.032 per year, $p < 0.01$), starting from about zero in the adoption year (0.025). The expansion-year interaction does not change with maturity. Ten years after adoption, the implied recession-year response is therefore about 0.3 more negative than before adoption. This again points to a more pronounced countercyclical response rather than a narrowing of the cyclical gap.

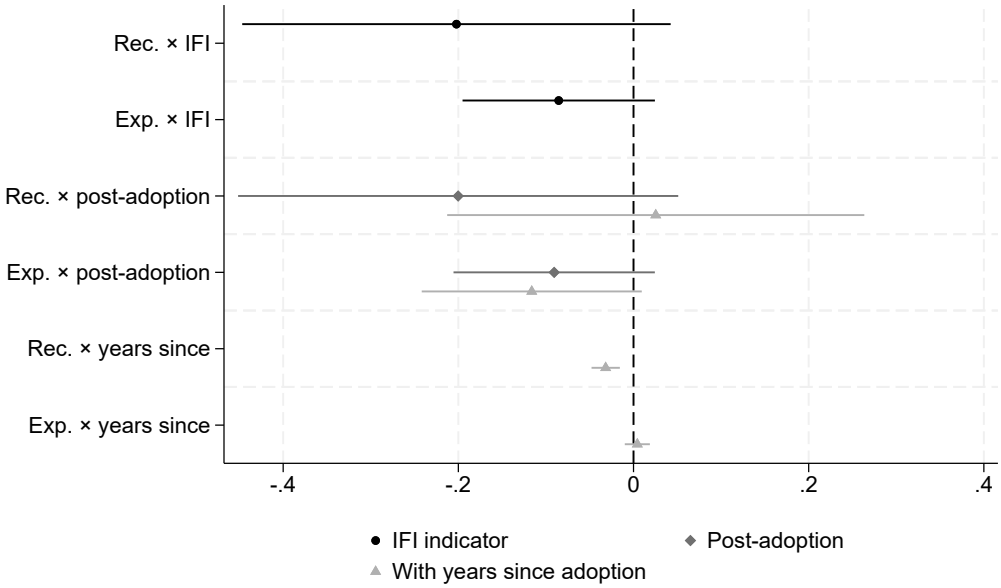


Figure 10: IFI interactions: baseline indicator, within-country post-adoption timing, and years since adoption. Coefficients from Table 8, cols. (2) and (4), and from a model that adds interactions with years since adoption, with 95% confidence intervals.

Column (5) separates strong and weak IFIs. The recession-year interaction is large and significant for strong IFIs and small and insignificant for weak IFIs. In strong-IFI country-years, the recession-year response (-0.72) exceeds the mechanical denominator benchmark, implying that real expenditure rises when GDP falls, while the expansion-year response (-0.27) is close to the baseline. This result survives controlling for the size of government, which itself affects the ratio-based coefficients (Appendix F, Table A.6). The general IFI

interaction and the rules interactions shrink and remain insignificant under that control. Mandate strength matters for the cyclical profile of expenditure, but in the direction of a more pronounced countercyclical response in downturns rather than a tighter constraint on expenditure.

Column (6) tests the complementarity prediction. Taken individually, both the rules interaction (-0.194) and the IFI interaction (-0.409) make the recession-year response more negative relative to the expansion-year response. The positive triple interaction is significant at the 10% level and partially counters this. For an EU member with an IFI, the implied recession-year and expansion-year responses are about -0.54 and -0.32, compared with -0.16 and -0.21 in the baseline group, so the gap is wider when both institutions are present. None of these interactions is significant once the size-of-government control is added. The prediction that the combination of rules and IFIs narrows the cyclical asymmetry by more than the sum of the individual effects is therefore not supported.

These associations should not be taken as causal estimates. IFI adoption is concentrated in the years after the GFC, when many countries were consolidating.

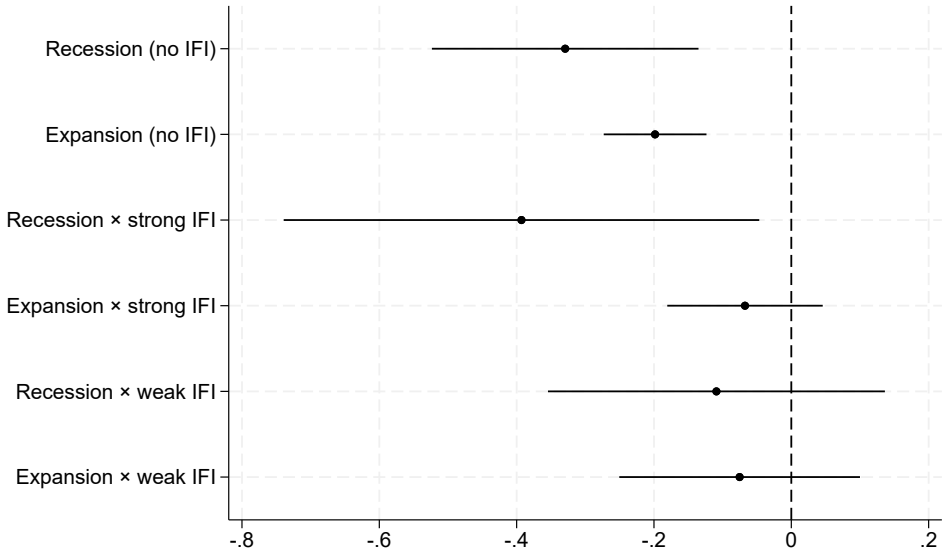


Figure 11: Strong vs weak IFIs: coefficients from Table 8, col. (5), with 95% confidence intervals.

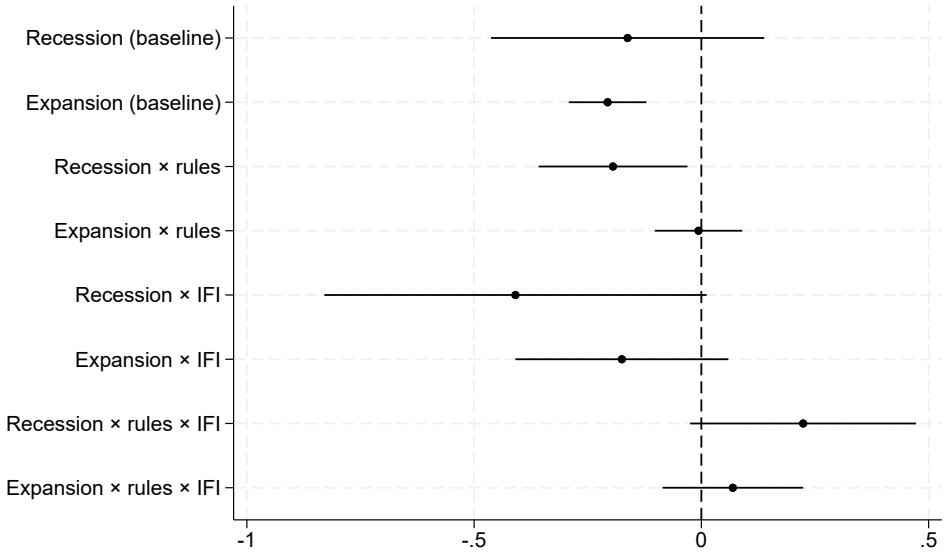


Figure 12: Rules and IFIs: coefficients from Table 8, col. (6), with 95% confidence intervals. The triple interaction enters in addition to the two individual interactions.

6.9 The Pandemic Episode

Figure 13: Net change in total government expenditure (pp of GDP), 2019–2024.

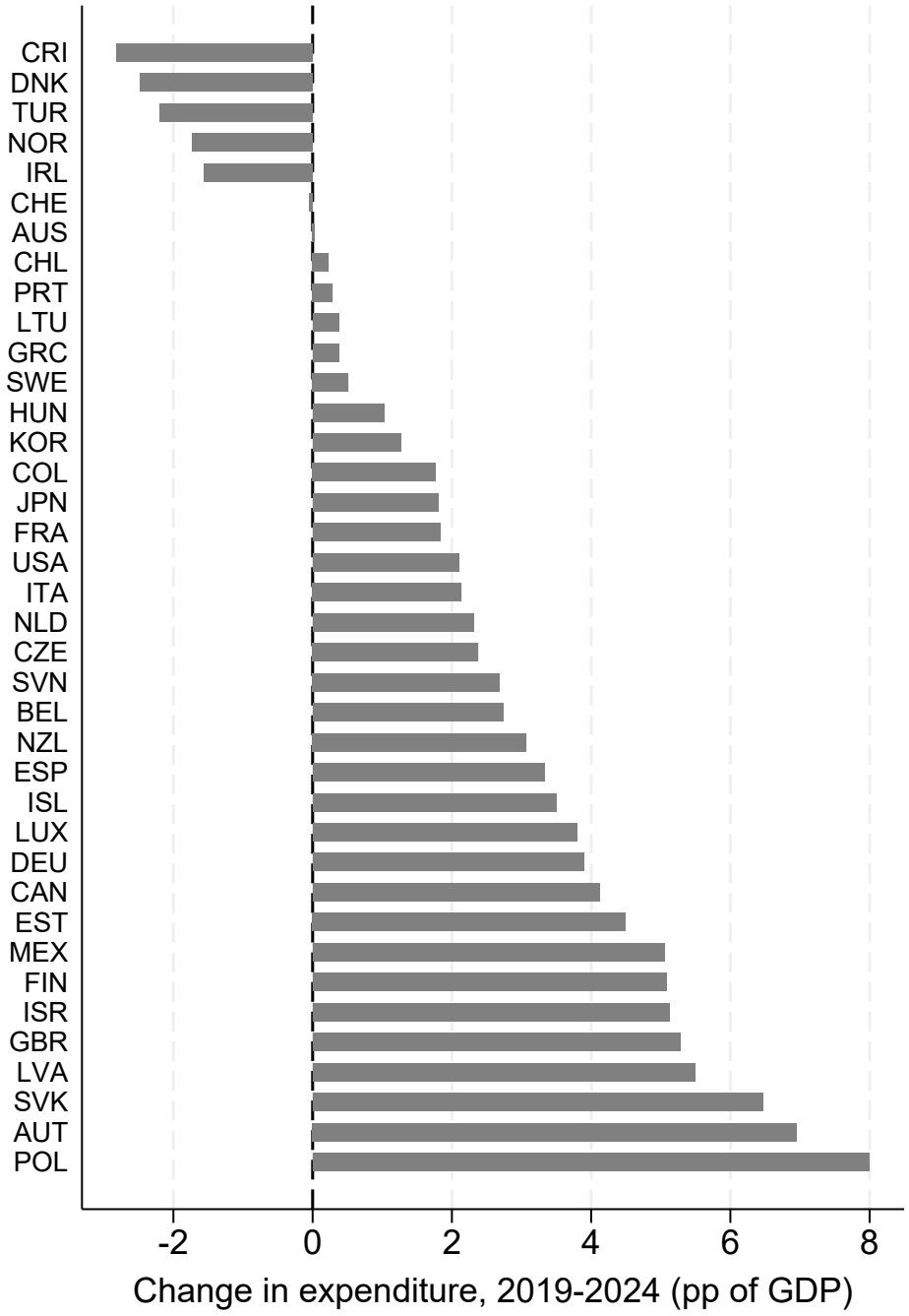


Figure 13 sorts countries by the change in their expenditure ratio between 2019 and 2024. 32 of the 38 countries remain above their 2019 level (two-sided binomial $p < 0.001$). Costa Rica, Denmark, Turkey, Norway and Ireland are clearly below it, Switzerland is marginally below, and Australia is essentially unchanged.

In Ireland and Norway the decline partly reflects strong nominal GDP growth (multinational profits and energy prices) rather than lower expenditure. All countries experienced the same shock, and the estimated half-life implies that just under half of a 2020 deviation would remain after five years even with complete eventual reversion. The share of countries above baseline is descriptive evidence of slow reversion. The 2024 levels also include the early stages of increased defence spending in several countries, but it should be noted that the effects are very similar compared to 2023. The long-horizon evidence in Section 6.4 suggests that whether the post-pandemic elevation persists will depend mainly on whether the pandemic's output losses prove permanent, rather than on further increases in real expenditure.

7 Conclusion

This paper discusses the fiscal incentives created by democratic government using a half-century of OECD data. The study is organised around the concept of a sticky fiscal floor, i.e. the tendency of the expenditure ratio to remain elevated long after crises. The floor can be observed from the data and deviations of the expenditure ratio from country means have a half-life of about 4.3 years in the baseline, which is likely a lower bound. After a recession the ratio remains about 1 pp of GDP higher for at least six years. It is not a ratchet in the usual sense. Cyclical asymmetry is only significant in some periods, and deviations above a country's long-run level are reversed faster than deviations below it.

The long-horizon evidence shows where the floor is formed. After a recession, real GDP per capita settles 3 to 4% below its pre-recession path and does not recover within a decade, while real expenditure per capita stays close to its own pre-recession path. Governments do not raise real spending after crises, but neither do they adjust it to the permanently lower level of income. Therefore, the sticky fiscal floor is a floor in real expenditure commitments, consistent with entitlement lock-in and with the gradual recognition of permanent output losses.

Recessions take place regularly, so these floors cumulate into what the paper calls the Leviathan drift, which is a slow, stepwise growth of government relative to the economy, financed partly by deficits and accompanied by a slow rise in debt. The results suggest that recurring floors can account for roughly a third of the increase in the mean expenditure ratio since 1970 and for most of the increase since 1990, and for a meaningful share of average deficits. The drift does not require a Leviathan that deliberately maximises its size, or voters who misperceive the cost of borrowing. It arises from the absence of adjustment rather than from decisions to expand.

The evidence does not support the specific fiscal illusion prediction that borrowing-financed expenditure is lowered more slowly. Reversion is faster when the deficit is larger and when debt exceeds 60% of GDP. Local

projections show that larger deficits are followed by partial expenditure consolidation. These dynamics are more consistent with a fiscal reaction to imbalances than with weakened consolidation pressure. The results do not conclusively rule out fiscal illusion as a contributor to the level of deficits.

The decomposition shows that cyclical movements in the expenditure ratio are absorbed partly by borrowing and partly by a counter-cyclical revenue ratio, without significant asymmetry in either component. Faster growth lowers the debt ratio by slightly more than the mechanical denominator effect. Combined with slow reversion of expenditure, borrowing-financed responses to recurring shocks can accumulate into higher debt when new shocks arrive before earlier deviations have closed.

The associations between fiscal institutions and the cyclical response of expenditure are mixed. Supranational rules show no significant moderation. Strong IFIs are associated with a more countercyclical response in recessions, a result that is robust to controlling for the size of government. The combination of rules and IFIs does not narrow the gap between recession-year and expansion-year responses, contrary to the complementarity prediction.

The results of the empirical study show is that the expenditure ratio rises after crises mainly because output falls permanently while real commitments do not, that downturns are partly financed by borrowing, and that larger imbalances are followed by faster rather than slower adjustment. Aggregate data cannot conclusively identify whether unadjusted commitments reflect entitlement lock-in, political commitment problems, changing preferences, or a slow recognition of permanent output losses.

The results have implications for fiscal frameworks. Rules built only around annual deficit outcomes do not address persistence in the level of expenditure, which makes expenditure ceilings and medium-term frameworks a natural complement to deficit limits. Additionally, the long-horizon evidence identifies a specific weakness of such frameworks. Expenditure ceilings and medium-term plans that are set in real terms and anchored to pre-crisis estimates of potential output will lock in a higher expenditure ratio once potential output is revised down after a recession. Frameworks that update expenditure paths to revised estimates of potential output (supported by IFI assessment of the revisions) are relevant for addressing the challenge. The question of level-targeting versus deficit-targeting depends on whether the underlying problem in a given country is political incentives, poor information, or a commitment problem.

Data availability

All data are taken from publicly available databases of the IMF, the OECD and the World Bank. Variable definitions are listed in Appendix A.

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A Variable Definitions

Table A.1: Variable Definitions

Variable	Definition
Government expenditure	Total general government expenditure, % of GDP, including interest payments
General government revenue	Expenditure plus general government net lending, % of GDP
Deficit	Expenditure minus revenue (minus net lending), % of GDP
Government debt	General government gross debt, % of GDP
Real GDP per capita growth	Annual % change in real GDP per capita
Recession	Year with negative real GDP per capita growth
Recession onset	First recession year after a non-recession year
Real expenditure per capita	Expenditure ratio × real GDP per capita (deflated by the GDP deflator)
Unemployment gap	Unemployment rate minus OECD NAIRU estimate; where unavailable, minus the 10-year backward rolling mean of unemployment
Inflation	Annual inflation rate, %
Long-term interest rate	Long-term government bond yield, %
Old-age dependency ratio	Population aged 65 and over relative to population aged 15–64, %
Trade openness	Exports plus imports, % of GDP
CAPB	Cyclically adjusted primary balance, % of potential GDP
Supranational fiscal rules index	0 = no EU/EMU membership, 1 = EU member, 2 = EU and EMU member
IFI	Equal to one from the year an independent fiscal institution is established (Appendix C)
Strong IFI	IFI with independent forecasting capacity and a public assessment role

B NAIRU Measurement Robustness

The OECD provides NAIRU estimates for 30 of the sample countries. For the remaining countries, a 10-year backward rolling mean of the actual unemployment rate is used. Columns (2) and (3) of Table A.2 are very close. Column (1) uses a smaller sample of 30 countries, in which the expansion-year coefficient and the reversion coefficient are larger in absolute value (implied half-life of about 3.1 years) and the asymmetry test is further from rejection.

Table A.2: NAIRU Measurement Robustness

	(1) Original	(2) Rolling Mean	(3) Synthetic
gdp^-	-0.365^{**}	-0.355^{***}	-0.365^{***}
	(0.148)	(0.095)	(0.094)
gdp^+	-0.288^{***}	-0.205^{***}	-0.214^{***}
	(0.042)	(0.036)	(0.037)
Expenditure(-1)	-0.200^{***}	-0.152^{***}	-0.150^{***}
	(0.029)	(0.016)	(0.016)
Unemployment gap	0.006	0.011	-0.035
	(0.037)	(0.027)	(0.028)
Inflation(-1)	-0.022	-0.018^{***}	-0.018^{***}
	(0.032)	(0.006)	(0.006)
Debt(-1)	0.005	-0.002	-0.001
	(0.005)	(0.004)	(0.004)
OADR	0.006	0.040	0.034
	(0.037)	(0.029)	(0.027)
Trade openness	-0.013^{*}	-0.012^{**}	-0.012^{**}
	(0.007)	(0.005)	(0.005)
Observations	1096	1529	1529
Countries	30	38	38
R^2 within	0.445	0.419	0.419
Wald p: $\beta(gdp^-) = \beta(gdp^+)$	0.600	0.128	0.121

Notes: Col. (1): unemployment gap based on OECD NAIRU estimates only. Col. (2): gap relative to a 10-year backward rolling mean of unemployment for all countries. Col. (3): OECD NAIRU where available, rolling mean otherwise (baseline). Country + year FE. Standard errors clustered. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

C IFI Classification

Table A.3: Independent Fiscal Institution Classification

Country	Institution	Establishment	Classification
AUS	Parliamentary Budget Office (PBO)	1998	Strong
AUT	Austrian Fiscal Advisory Council	2013	Weak
BEL	High Finance Council	2014	Weak
CAN	Parliamentary Budget Office (PBO)	2008	Strong
CZE	Fiscal Council	2008	Weak
DEU	Advisory Board (Federal Ministry)	2010	Weak
DNK	Economic Council (fiscal mandate)	2012	Weak
ESP	AIReF	2013	Weak
EST	State Budget Council	2014	Weak
FIN	Economic Policy Council	2013	Weak
FRA	Haut Conseil des Finances Publiques	2013	Weak
GBR	Office for Budget Responsibility (OBR)	2010	Strong
HUN	Fiscal Council	2009	Weak
IRL	Irish Fiscal Advisory Council (IFAC)	2012	Strong
ISR	State Revenue Administration	2003	Weak
JPN	Council on Economic and Fiscal Policy	2014	Weak
KOR	National Assembly Budget Office	2003	Strong
LTU	National Audit Office (fiscal mandate)	2015	Weak
LUX	Conseil National des Finances Publiques	2014	Weak
LVA	Fiscal Discipline Council	2014	Weak
MEX	CEFP	2013	Weak
NLD	Central Planning Bureau (CPB)	1945	Strong
NOR	Fiscal Policy Committee	2015	Weak
NZL	Treasury Act Fiscal Framework	1994	Strong
POL	Fiscal Council	2015	Weak
PRT	CFP	2012	Weak
SVK	Council for Budget Responsibility	2012	Weak
SVN	Fiscal Council	2012	Weak
SWE	Fiscal Policy Council	2007	Strong
USA	Congressional Budget Office (CBO)	1974	Strong

Sources: Davoodi et al. (2022); OECD Network of Parliamentary Budget Officials. Strong: independent forecasting capacity and a public assessment role. Weak: other institutions with a fiscal monitoring mandate. The IFI indicator equals one from the establishment year onward.

D Additional Robustness

Table A.4: Additional Robustness: Real Expenditure Growth, Inference, Sample

	(1)	(2)	(3)	(4)	(5)
	Real exp. growth	Driscoll–Kraay	Long-Term	Excl. Ireland	Winsorised
gdp^-	0.227	-0.365^{***}	-0.389^{***}	-0.371^{***}	-0.333^{***}
	(0.178)	(0.123)	(0.134)	(0.096)	(0.076)
gdp^+	0.339^{***}	-0.214^{***}	-0.213^{***}	-0.187^{***}	-0.206^{***}
	(0.113)	(0.040)	(0.040)	(0.034)	(0.030)
Expenditure(-1)	-0.378^{***}				
	(0.044)				
Error correction term		-0.150^{***}	-0.138^{***}	-0.150^{***}	-0.119^{***}
		(0.026)	(0.016)	(0.018)	(0.016)
Unemployment gap	-0.004	-0.035	-0.017	-0.037	-0.032
	(0.086)	(0.036)	(0.032)	(0.029)	(0.024)
Inflation(-1)	-0.032	-0.018^{***}	-0.018^{***}	-0.018^{***}	-0.011^{*}
	(0.024)	(0.006)	(0.006)	(0.006)	(0.005)
Debt(-1)	0.001	-0.001	-0.002	-0.000	-0.004
	(0.009)	(0.004)	(0.004)	(0.004)	(0.004)
OADR	0.042	0.034	0.038	0.030	0.036
	(0.065)	(0.022)	(0.026)	(0.026)	(0.025)
Trade openness	-0.027^{**}	-0.012^{***}	-0.020^{***}	-0.009^{**}	-0.012^{***}
	(0.013)	(0.003)	(0.005)	(0.004)	(0.004)
Observations	1529	1529	1271	1487	1529
Countries	38	38	29	37	38
Wald p: $gdp^- = gdp^+$	0.596	0.309	0.203	0.059	0.084

Notes: Country + year FE in all models. Col. (1): dependent variable = $100 \times \Delta \ln$(real government expenditure per capita), where real expenditure is the expenditure ratio times real GDP per capita; coefficients are elasticities with respect to real GDP growth. Col. (2): Driscoll–Kraay standard errors (lag 3). Col. (3): countries with at least 45 annual observations. Col. (4): excluding Ireland. Col. (5): dependent variable winsorised at the 1st and 99th percentiles. Other columns: Standard errors clustered at country level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table A.5 replaces the deviation from the full-sample country mean with the deviation of lagged expenditure from its own mean over the preceding ten years. This reference level does not use future observations and moves with each country's trend. Reversion is slower than in the baseline (-0.092, half-life about 7.2 years). In the asymmetric version, deviations above the rolling mean revert faster than deviations below it, as in Table 2, but the difference is not significant.

Table A.5: Error Correction Relative to a Backward 10-Year Rolling Mean

	(1) Symmetric	(2) Asymmetric
gdp^-	-0.376^{***}	-0.377^{***}
	(0.102)	(0.101)
gdp^+	-0.214^{***}	-0.210^{***}
	(0.036)	(0.035)
Deviation from rolling mean	-0.092^{***}	
	(0.021)	
Deviation above rolling mean		-0.121^{***}
		(0.041)
Deviation below rolling mean		-0.040
		(0.029)
Unemployment gap	-0.047	-0.039
	(0.048)	(0.050)
Inflation(-1)	-0.016^{**}	-0.015^{*}
	(0.007)	(0.008)
Debt(-1)	-0.020^{***}	-0.019^{***}
	(0.004)	(0.004)
OADR	0.073^{*}	0.070
	(0.042)	(0.042)
Trade openness	-0.012^{**}	-0.011^{**}
	(0.005)	(0.005)
Observations	1429	1429
Countries	38	38
R^2 within	0.393	0.395
Wald p: $gdp^- = gdp^+$	0.136	0.111
Wald p: above = below		0.212

Notes: Deviation of lagged expenditure from its mean over $t-2$ to $t-11$ (at least five observations). Country + year FE. Standard errors clustered. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

E Recession Episodes

Recession episodes are identified as runs of consecutive years with negative real GDP per capita growth. For each episode, mean expenditure in the three years after the first recovery year is compared with mean expenditure in the three years before the recession. Of 199 episodes with complete data, 156 (78%) show post-recovery expenditure above the pre-recession baseline (binomial $p < 0.001$). The median shift across all episodes is 2.5 percentage points of GDP, and the mean shift in the episodes with an increase is 4.1 percentage points. The mean expenditure ratio rose by about 0.25 pp per year over the sample, and the pre- and post-recession windows are typically several years apart, so part of each shift reflects the trend. The post-recovery ratio is also measured on a GDP level that is lower than it would have been without the recession. In addition, episodes within the same global downturn are not independent. The episode evidence is consistent with incomplete reversal, although it does not separate it from the secular trend.

F Institutional Models with Size-of-Government Controls

The cyclical coefficients of a ratio scale with its level, and institutional indicators are correlated with the size of government. Table A.6 therefore adds interactions of the cyclical terms with the lagged expenditure ratio. The expansion-year interaction with size is negative and significant, as expected from the denominator effect. The strong-IFI recession interaction remains large and significant. The general IFI, rules and complementarity interactions are smaller and insignificant.

Table A.6: Institutional Models with Size-of-Government Interactions

	(1) IFI	(2) IFI Strength	(3) Complementarity
gdp^-	0.091	0.113	0.124
	(0.291)	(0.288)	(0.275)
gdp^+	0.009	0.004	0.000
	(0.102)	(0.117)	(0.102)
$gdp^-\times$ Expenditure(-1)	−0.011	−0.012	−0.009
	(0.009)	(0.009)	(0.011)
$gdp^+\times$ Expenditure(-1)	−0.006**	−0.006*	−0.006**
	(0.003)	(0.003)	(0.003)
$gdp^-\times$ IFI	−0.154		−0.375
	(0.127)		(0.227)
$gdp^+\times$ IFI	−0.077		−0.141
	(0.060)		(0.111)
$gdp^-\times$ strong IFI		−0.362**	
		(0.172)	
$gdp^+\times$ strong IFI		−0.079	
		(0.059)	
$gdp^-\times$ weak IFI		−0.055	
		(0.126)	
$gdp^+\times$ weak IFI		−0.039	
		(0.091)	
$gdp^-\times$ fiscal rules			−0.140
			(0.150)
$gdp^+\times$ fiscal rules			0.023
			(0.054)
$gdp^-\times$ fiscal rules × IFI			0.217
			(0.139)
$gdp^+\times$ fiscal rules × IFI			0.034
			(0.076)
Observations	1529	1529	1529
Countries	38	38	38
R^2 within	0.433	0.436	0.437

Notes: As Table 8, cols. (2), (5) and (6), with the cyclical terms also interacted with the lagged expenditure ratio. Main effects of the institutional indicators and baseline controls included. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

G Period-Specific Asymmetry

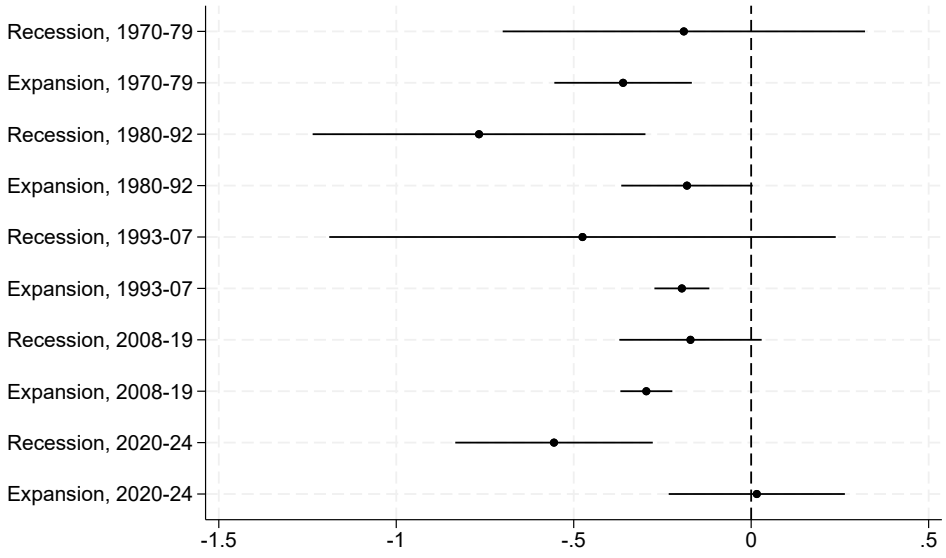

Figure A.1: Recession-year and expansion-year coefficients by sub-period, with 95% confidence intervals.

Figure A.1 presents the interacted period model. The recession-year coefficient is negative in all periods. It is largest in absolute value in 1980–1992 and 2020–2024, and insignificant in 1970–1979, 1993–2007 and 2008–2019, when the confidence intervals include zero. The expansion-year coefficient is between about -0.18 and -0.36 in the first four periods and close to zero in 2020–2024. Symmetry is rejected in 1980–1992 and 2020–2024, and jointly across all periods, but not in 1970–1979, 1993–2007 or 2008–2019. In 1970–1979 and 2008–2019 the expansion-year coefficient is the larger of the two. The cyclical asymmetry is episodic.

H Revenue Pass-Through

Table A.7 tests the fiscal illusion mechanism from the revenue side. If governments use revenue windfalls to finance spending increases more readily than they cut spending in response to shortfalls, the coefficient on revenue shortfalls should be closer to zero than the coefficient on windfalls. Expenditure changes co-move strongly with revenue changes (0.520 in column 1). The shortfall coefficient (0.437) is smaller than the windfall coefficient (0.578), in the direction illusion predicts, but the difference is far from significant ($p = 0.474$). Outside EU membership the ordering is reversed. Fiscal rules, strong IFIs and high debt do not significantly condition the pass-through. Because both ratios share the GDP denominator, part of the co-movement is mechanical, which the cyclical controls address only partly.

Table A.7: Revenue Pass-Through: Windfalls and Shortfalls

	(1) Symmetric	(2) Asymmetric	(3) Rules	(4) Strong IFI	(5) Debt	(6) Non-EU obs.
Δ revenue	0.520^{***}					
	(0.089)					
Windfall (Δrev > 0)		0.578^{***}	0.458^{**}	0.576^{***}	0.673^{***}	0.303^{*}
		(0.154)	(0.184)	(0.154)	(0.179)	(0.172)
Shortfall (Δrev ≤ 0)		0.437^{***}	0.413^{***}	0.449^{***}	0.426^{***}	0.408^{***}
		(0.078)	(0.092)	(0.080)	(0.123)	(0.072)
Windfall $\times$ conditioning var.			0.184	-0.239	-0.313	
			(0.177)	(0.333)	(0.191)	
Shortfall $\times$ conditioning var.			0.048	-0.085	0.040	
			(0.069)	(0.196)	(0.141)	
gdp^{-}	-0.270^{***}	-0.270^{***}	-0.253^{***}	-0.260^{***}	-0.272^{***}	-0.184
	(0.077)	(0.077)	(0.083)	(0.078)	(0.079)	(0.186)
gdp^{+}	-0.182^{***}	-0.183^{***}	-0.175^{***}	-0.185^{***}	-0.183^{***}	-0.191^{**}
	(0.038)	(0.039)	(0.040)	(0.042)	(0.037)	(0.083)
Expenditure(-1)	-0.164^{***}	-0.163^{***}	-0.162^{***}	-0.175^{***}	-0.162^{***}	-0.217^{***}
	(0.028)	(0.028)	(0.026)	(0.028)	(0.029)	(0.053)
Observations	1182	1182	1182	1182	1182	554
Countries	38	38	38	38	38	37
R^2 within	0.536	0.537	0.541	0.542	0.541	0.450
Wald p	0.000	0.474	0.523	0.682	0.185	0.528

Notes: Dependent variable: annual change in total government expenditure (% GDP). Revenue: general government revenue (% GDP). Conditioning variables: supranational rules index (col. 3), strong IFI (col. 4), lagged debt $\geq 60\%$ (col. 5); main effects included but not shown. Col. (6): observations outside EU membership. Controls: unemployment gap, lagged inflation, lagged debt, old-age dependency ratio (trade openness not included). Wald p: col. (1) revenue coefficient $= 0$; cols. (2) and (6) windfall = shortfall; cols. (3)–(5) windfall interaction = shortfall interaction. Country + year FE. Standard errors clustered. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

I Heterogeneity: Debt Stress and Inflation

Table A.8 studies whether the cyclical response differs when lagged debt exceeds 60% of GDP or lagged inflation exceeds 5%. The debt interactions are small and insignificant ($p = 0.477$ for equal interactions). In high-inflation environments, both cyclical coefficients are significantly closer to zero (interactions of 0.320 in recessions and 0.136 in expansions). The implied responses are -0.22 and -0.15, and the asymmetry is not significant in that regime ($p = 0.535$). This is consistent with nominal effects. When inflation is high, nominal GDP growth erodes nominally fixed commitments relative to GDP regardless of real growth, which weakens the link between real growth and the expenditure ratio. There is no evidence that the ratchet intensifies under fiscal stress or high inflation.

Table A.8: Heterogeneity: Debt Stress and Inflation

	(1) Debt > 60%	(2) Inflation > 5%
gdp^-	-0.325^{***}	-0.538^{***}
	(0.096)	(0.100)
gdp^+	-0.226^{***}	-0.282^{***}
	(0.039)	(0.041)
$gdp^-\times$ high debt	-0.105	
	(0.139)	
$gdp^+\times$ high debt	0.023	
	(0.075)	
High debt	0.063	
	(0.301)	
$gdp^-\times$ high inflation		0.320^{***}
		(0.115)
$gdp^+\times$ high inflation		0.136^{**}
		(0.054)
High inflation		-0.258
		(0.252)
Expenditure(-1)	-0.151^{***}	-0.153^{***}
	(0.016)	(0.016)
Unemployment gap	-0.034	-0.030
	(0.028)	(0.029)
Inflation(-1)	-0.018^{***}	-0.019^{***}
	(0.006)	(0.006)
Debt(-1)	-0.003	-0.001
	(0.004)	(0.004)
OADR	0.039	0.037
	(0.028)	(0.027)
Trade openness	-0.012^{**}	-0.011^{***}
	(0.004)	(0.004)
Observations	1529	1529
Countries	38	38
R^2 within	0.420	0.431
Wald p: asymmetry in high regime	0.204	0.535
Wald p: equal interactions	0.477	0.118

Notes: Country + year FE. Standard errors clustered. High debt: lagged debt > 60% of GDP. High inflation: lagged inflation > 5%. Wald p (asymmetry in high regime): total recession-year = total expansion-year coefficient when the indicator equals one. Wald p (equal interactions): the conditioning variable does not change the asymmetry. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.