Fiscal discipline under scarring: do grand spending plans lift growth and curb debt?

Peter Claeys

Abstract

Concerns about faltering productivity have led to calls for grand fiscal strategies to ignite economic growth. Targeted spending sprees are believed to be lifting economies out of stagnation. This policies shift stands in stark contrast to the type of fiscal restraint (austerity) advocated after the Global Financial Crisis. This paper examines whether fiscal policy can lift economic growth after recessions characterised by prolonged economic stagnation – also known as scarring- while keeping debt under control. I find the odds of such an expansionary debt-reducing fiscal policy are limited due to a typical deficit bias in the short term – a combination of much lower tax revenues and reduced government spending – and the use of tax-based consolidations in the longer run. Higher taxes even push governments to raise spending to higher levels a decade after the recession. The combination of procyclical fiscal policy in the short term, with distortionary tax increases in the long term is unlikely to lift productivity growth.

JEL Classification: E32, E62, E65, H11.

Keywords: fiscal policy, recession, scarring, debt, growth.

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* Financial support by the Universidad Pontificia Comillas is gratefully acknowledged. I thank Juliana Fernandes Leao for excellent research assistance on this project. The usual disclaimer applies.

1. Introduction

A lack of economic growth due to faltering productivity is center stage in policy debates across the globe since the Global Financial Crisis and the Covid-19 Pandemic left a lasting impact on output with a very slow recovery (Ball, 2014; Agénor, 2017). The US is fearing a decline in key industries and suffers the consequences of economic autarky. China seems to have reached a limit to its capacity to grow at a rate that exceeds its insertion of labour, and may fall in a middle-economic trap. Nowhere is the discussion stronger than in the EU, where declining productivity growth is seen as a principal threat to competitiveness and long-term prosperity of EU Member States (Draghi, 2024). Since 1995, the EU's productivity gap with the US has widened, with GDP per hour worked in the EU falling to less than 80 per cent of US levels. Italy, Germany and the UK are experiencing a decades-long stagnation (Codogno and Galli, 2022). The Draghi report attributes much of this divergence to a structural innovation deficit, notably in digital and advanced technologies, where EU firms invest €270 billion less annually in R&D than US counterparts. Europe lacks the scale and dynamism to commercialize innovation, with fragmented markets and underdeveloped capital markets impeding firm growth. The Letta report underlines persistent fragmentation in key network sectors—finance, energy, digital—hindering the scale economies and cross-border integration necessary for productivity-enhancing investments.

Underlying this view is that recessions over the last two decades have not just been cyclical, but also had permanently negative effects on economic growth. This scarring of the economy with prolonged periods of stagnant growth has budgetary consequences. The sustainability of public debt depends on the real interest rate on government debt (r) and the economy's growth rate (g), with productivity growth serving as the principal determinant of g. High productivity growth lifts the underlying growth rate of output, expanding tax bases and facilitating the servicing and gradual reduction of public debt relative to GDP—even when initial debt levels are high. Conversely, persistently weak productivity growth compresses future revenue streams, raising the risk that debt expands faster than the economy can support, especially if $r>g$.

In addition, trouble might also occur on the spending side. On the one hand, episodes of high productivity growth are often seen as an opportunity for governments to raise spending levels. Several studies find spending to be procyclical, even in industrialised economies (Larch *et al.*, 2019; Gootjes and de Haan, 2022). Economic booms with

buoyant economic growth are not often seen as a chance to bring public debt down to sustainable levels. On the other hand, episodes of low economic growth are not characterised by spending restraint either. Stagnant productivity growth might call for additional public spending as political pressures for increased assistance to unemployed or low-paid workers might be hard to resist over longer periods of time (Ghosh *et al.*, 2013). But prolonged crises also lead to calls for public investment strategies to lift productivity. Additional public spending with a grand fiscal strategies to ignite economic growth is believed to be lifting economies out of stagnation. In contrast to the policy recommendations on fiscal austerity popular in the period after the Global Financial Crisis, policy thinking on fiscal sustainability has shifted remarkably. This shift is in part due to a growing attention to the role public investment programmes have played historically (Ciaffi *et al.*, 2024).[1] It is also in part due to the mixed results of austerity programmes in some countries, and some have argued that consolidation programmes have been self-defeating (Piergallini, 2021; Heimberger, 2025) or even contributed to secular stagnation (Cerra *et al.*, 2023).

As a consequence, governments have become keen to invest in grand fiscal strategies or targeted spending sprees on programmes that should focus on innovation and productivity in strategic industries. In the US, Biden's Inflation Reduction Act has given a boost to green and digital investment The Draghi and Letta reports call for a wide set of reforms including strengthening the Single Market, improving skills acquisition, harmonizing regulatory frameworks, and mobilizing private capital but also for scaling EU-level public investment in innovative industries. China has started to focus on innovation in key sectors to boost domestic growth.

The implicit aim in these spending strategies is to grow out of the budgetary deficit such additional spending programmes inevitably create, and hence avoid debt sustainability issues in the longer term by giving a boost to productivity. The April 2024 reform of the Stability and Growth Pact (SGP) has precisely incorporated such a goal. While respecting the Treaty's 3 per cent deficit and 60 per cent public debt reference values, the focus on a net expenditure path in the medium-term shifts attention to the longer-term trajectory of public finances, but with a stronger emphasis on fiscal sustainability by safeguarding public investment for the green, digital, and defence transitions EU countries face. By rewarding pre-agreed reform-investment packages with extra time for governments to

[1] Reference is often made to historical examples, such as the New Deal or the Autobahn program in Nazi Germany (Ritschl, 2002; Fishback, 2017).

bring deficits under control, the Pact links fiscal space to structural productivity gains, echoing a golden-rule logic without explicitly separating capital and current budgets.

The remarkable shift in thinking about the growth effects of policy, and in particular that spending policies are able to lift productivity growth in such a way that public debt will remain sustainable, is a major policy question to be tested. This paper therefore tests whether an expansionary debt-reducing fiscal policy is feasible.

In contrast to the literature on successful fiscal consolidations with non-Keynesian effects, I focus on recessions with prolonged economic stagnation – also known as scarring – and test whether fiscal policy can lift economic growth in the short and long-term while keeping debt under control.

I follow standard practices in the field to identify scarring periods in a sample of 26 OECD economies since the seventies. To analyse the budgetary consequences of these scarring episodes I use local projection methods to disentangle the response of public spending and tax revenues, as well as public debt, up to ten years after the onset of a recession. As spending or taxes could feed back into economic growth, I control for endogeneity of the fiscal responses.

The main finding is that the odds of an expansionary debt-reducing fiscal policy are limited. Scarring episodes raise public debt both in the short and in the long term. In the short-term, governments display the typical deficit bias. While they let tax revenues move with the cycle – and the resulting increase in the deficit would be a logical consequence of governments pursuing tax smoothing over the cycle – government spending moves in a procyclical way. Moreover, in the longer term, governments fail to consolidate public debt sufficiently, and choose a strategy of tax increases, rather than spending cutbacks in order to keep debt under control. Such a strategy need not be problematic for sustainability if additional spending would lift the economy out of recession. However, we find that controlling for the feedback effects on the economic cycle, the impact of spending is limited and debt control strategies are mostly focused on tax increases.

The policy implications of these results are that governments pursue a mix of spending and tax policies that only partially favour economic growth. The benign short-term effects of tax smoothing in the short term, are offset by the increase of distortionary taxes in the longer term. Moreover, spending moves in a procyclical way in the short-term and is not found to have expansionary effect in the longer term. It therefore seems unlikely that keeping public spending at high levels and relying on tax rises to keep public debt under control is a strategy that can lift productivity growth in the longer run.

The paper is structured as follows. Section 2 provides a discussion of the literature on the budgetary consequences of scarring, and the possible feedback effects of fiscal policy on scarring. Section 3 discusses the dataset and the empirical methodology, while section 4 provides the main results and a series of robustness checks. Policy implications are discussed in the conclusion.

2. Literature review

Conventional economic models consider recessions as temporary deviations in output from an underlying longer growth trend, but hardly study both jointly. The Global Financial Crisis and the Covid-19 Pandemic both led to slow recoveries and had lasting effects on economic growth, that revived interest in hysteresis i.e. recessions that would lead to prolonged lower economic growth. Interest in these permanent scars is intimately linked to the debate on secular stagnation. Evidence from a broad cross-section of countries and crisis types demonstrates that scarring is actually a pervasive phenomenon (Ball, 2014; Cerra *et al.*, 2017; Blanchard *et al.*, 2015; Dovern and Zuber, 2020).

Permanent output losses that result from temporary shocks are hard to justify in a conventional neoclassical perspective with cyclical fluctuations around a stable trend. Scars therefore require a mechanism that can cause a prolonged stagnation in output following temporary demand shocks. A detailed overview of models of scarring is provided in Cerra *et al.* (2023), so I discuss mostly the relation between scarring and fiscal policy.

Models of scarring fall into three different categories. In a first set of models of endogenous growth, in which output is driven by capital accumulation (Reifschneider *et al.*, 2015), learning-by-doing, or R&D (Comin and Gertler, 2006), a temporary fluctuation in GDP modify the conditions for further investment in labour upskilling or capital investment (Engler and Tervala, 2018; Anozategui *et al.*, 2019). This loss is not easily reversed, as skill atrophy, diminished labour force attachment or lost technological innovations induce lasting effects on individual productivity and aggregate output.

Financial crises can be particularly harmful in this respect as financial frictions let firms forego credit to finance R&D or investment more generally (Guerron-Quintana and Jinnai, 2014). Economic shocks that weaken corporate balance sheets or elevate uncertainty typically induce firms to postpone or scale back investment, especially in R&D. This contraction in capital accumulation and innovation activity slows total factor

productivity growth, thereby reducing the economy's potential output over the long run. The feedback loop between subdued demand, reduced investment, and slower productivity growth serves to amplify and entrench scarring effects, making recovery to the pre-crisis trend increasingly elusive. As a result, subpar investment keeps the economy for long periods on a low growth path.

In a second set of scarring models, it is self-fulfilling expectations that can steer the economy towards a prolonged phase of boom or stagnation. Expectations of future developments lead to multiple equilibria. The source of shocks that push economies into a low-growth state can be multiple, from confidence shocks over debt sustainability constraints. Without a self-correcting mechanism or a policy instrument that unlocks these expectations, the economy remains in a low-growth steady state.

A final set of models has a boundary condition that keeps the economy in a low-growth trap. Shocks that push the economy out of equilibrium but in which key prices cannot adjust, like downward wage rigidity, a zero lower bound on interest rates, …, can hamper capital accumulation and curb growth rates.

Unlike a classical cyclical recession, the welfare costs of business cycles are not trivial under hysteresis (Lucas, 1987; Engler and Tervala, 2018). The excessive welfare cost of prolonged recessions might therefore call for active demand management by policymakers. A more forceful implementation of stabilisation policies would not just reduce the volatility of business cycles, but also permanently raise the level of output (Cerra *et al.*, 2023). Both monetary policy and fiscal policy may be required to become more aggressive towards countering negative economic shocks in this case (Blanchard *et al.*, 2015; Fatás and Summers, 2018).[2] Using cross-country panel data, Cerra *et al.* (2013) or Reifschneider *et al.* (2015) demonstrate that countries which implemented larger and more sustained fiscal responses during crises experienced more rapid recoveries and less persistent deviations from pre-crisis output trends. Strong fiscal stimulus helps in shaping post-crisis trajectories on a positive path.

Fiscal policy can actually do even more than reacting in a countercyclical way by also considering the composition of a fiscal expansion. The precise policy prescriptions to escape hysteresis vary of course according to the model. If endogenous growth mechanisms are behind low growth, then it would be sufficient for fiscal policy to

[2] We leave aside the discussion what optimal countercyclical policy should do when recessions are perceived in real time with error, and whether the response should be equally aggressive towards positive shocks, or let a high pressure economy reap the benefits of high growth.

incentivise capital accumulation, boost R&D, or train workers for new jobs. Public investment not only raises the potential growth of an economy, but investment in infrastructure can set off a virtuous loop of higher growth that also spurs private investment. If deployed promptly during crises. fiscal support facilitated the maintenance of productive relationships om labour market and the conservation of firm-specific capital (Watson and Tervala, 2022). DSGE simulations by Ganelli and Tervala (2020) shows that the welfare effect of public infrastructure investment is positive only if infrastructure is sufficiently effective. Larch *et al.* (2024) examine the role of fiscal policy in the context of the EU's response to the COVID-19 pandemic. Their results indicate that automatic stabilisers, as well as discretionary fiscal measures, especially those aimed at supporting investment, played a significant role in limiting the extent of economic scarring.

These suggestions for an active use of fiscal policy ignores the fiscal space under which governments operate. Economic scarring has implications for budget deficits, and hence the sustainability of public debt. Persistently weak productivity growth compresses future revenue streams, raising the risk that debt expands faster than the economy can support, especially if r>g. At the same time, expenditures, especially those tied to social protection and the crisis response, often remain sticky or even increase. In fact, spending often responds in an asymmetric way to the cycle, and a scarring episode only exacerbates the resulting deficit bias. I.e. episodes of high productivity growth are often seen as an opportunity for governments to raise spending levels, rather than a chance to bring public debt down to sustainable levels; yet episodes of low economic growth are not characterised by spending restraint either. Stagnant productivity growth might call for additional public spending as political pressures for increased assistance to unemployed or low-paid workers might be hard to resist over longer periods of time (Ghosh *et al.*, 2013). Several studies therefore find spending to be procyclical with a deficit bias due to the asymmetric spending response (Larch *et al.*, 2019; Gootjes and de Haan, 2022). The result is a structurally higher budget deficit. Debt dynamic creates a direct link between scarring and fiscal sustainability, as the public debt ratio remains higher relative to the pre-crisis trajectory. Limited fiscal space might require future spending cuts or tax rises that will feed back into fiscal policy decisions.

Economic crises that lead to debt problems would call for fiscal austerity. Some researchers have argued that spending cuts implemented after a recession would just exacerbate the scars, and might even undermine the very purpose of the consolidation. Fatás and Summers (2018) or Gechert *et al.* (2019) provide empirical evidence on the

lasting impact of large fiscal consolidations on economic growth after the Global Financial Crisis, resulting in self-defeating austerity (a period of low growth and high debt). Piergallini (2021) formalises this idea by constructing an endogenous growth model in which government has to cut back spending if an upper limit on debt is reached. By making productivity depend on the public capital stock, spending cuts only initially reduce the debt ratio, but undermine growth in the longer term. As a result, due to self-fulfilling expectations of policy reversals, the economy can get stuck in a low-growth/high-debt state. Fiscal adjustments that force spending cuts to keep debt under control only further protract the scarring.[3]

The policy advice in such a situation is often interpreted as an argument to reverse spending cuts. However, a policy of boosting spending in a low growth/high debt economy could actually promote fiscal consolidation. Interestingly, Piergallini (2021) argues that once fiscal policymakers are sufficiently concerned about low economic growth to give a fiscal boost, even if the announcement of an initial spending boost is insufficient itself to set of growth directly, the expectations of positive growth rates in the future would lift the economy out of the bad state and make fiscal expansions self-sustaining.[4] A fiscal stabilisation policy can then push the economy to a unique 'good' equilibrium with an expansionary debt-reducing fiscal policy. It is not hard to see that the feeble growth rates over the last decade have shifted the policy discussion, and lead to calls for grand public investment strategies to lift productivity.

The main problem with these arguments is that spending programmes overlook the financing of larger deficits through taxation. Growth models that incorporate various distortionary tax changes on capital or labour, as well as non-productive government spending, on the said mechanisms – as in Turnovsky (2000) or Jones and Manuelli (2005) – typically result in negative dynamic scoring effects that push the economy in a low-growth high-debt situation. Expectations that deficit-financed spending might require future distortionary tax rises (very similar to Ricardian Equivalence) would be sufficient

[3] Note there is also a literature on the impact of high debt on economic growth. This discussion has been dominated by the debate on existence of a growth-inhibiting threshold of public debt, beyond which the marginal cost of debt accelerates, and growth deteriorates sharply (Reinhart and Rogoff, 2014). Empirical evidence is not so clear-cut, and much of the effect of public debt on growth is context-specific, mediated by the composition of debt (domestic vs. external), macroeconomic environment, institutional quality, and the interest-growth rate differential (Heimberger, 2023).

[4] A specific situation under which expansionary fiscal policy can generate multipliers greater than one occurs when the economy is operating below potential, and if monetary policy is constrained by the effective lower bound (Benigno and Fornaro, 2018).

to curb the positive growth effects as expectations of a necessary policy reversal kick in (Trabandt and Uhlig, 2011).

A specific subfield of the literature on fiscal consolidation comes to very similar conclusions. It is often found that 'successful' consolidations – those that manage to curb public debt and spur economic growth – are those that ignite the growth machine by cutting spending and taxes thanks to positive supply side effects (Giudice *et al.*, 2007; Alesina *et al.*, 2017). Faster and more decisive cuts in current expenditure trigger stronger supply effects. These effects tend to be stronger when consolidation is not skewed towards public investment or accompanied by structural reforms (Chrysanthakopoulos *et al.*, 2025). Supply side interventions of this kind would then have an important demand component too.

Policy advice on how to use fiscal policy optimally in response to scarring is likely going beyond the use of countercyclical policy, and might require a mix of targeted spending on growth-intensive areas as well as a cut in distortionary taxes.

Empirical work in this area is limited to the mentioned studies that examine the impact of spending or taxes on levels of scarring with scant attention on the longer term impact on public debt. This paper describes how fiscal policy has typically behaved in response to periods of scarring, and what impact the policy mix in taxes and spending has had on public debt.

3. Methodology

3.1 Economic downturns and scarring

In a first step, I need to identify recession episodes. Most papers in the empirical literature on scarring focus on large crises (Cerra and Saxena, 2008; Ball, 2014; Reinhart and Rogoff, 2014; Blanchard *et al.*, 2015).[5] As in Larch et al (2024), I use annual real GDP growth in 26 OECD economies starting in 1970 and up to 2022,[6] and apply three alternative methods for identifying deep economic recessions:

[5] Some papers alternatively identify temporary shocks with a lasting impact on GDP, or on indicators of the labour market, R&D or financing (Benati and Lubik, 2022).

[6] Data source is OECD Economic Outlook 116.

- the Harding and Pagan (2002) dating algorithm, which adapts the original method developed by Bry and Boschan (1971) to annual data with a window of 1 year, a minimum phase length of one year, and minimum cycle length of two years;[7]
- a year with negative real GDP growth in excess of one standard deviation of the country's sample growth rate;
- a year in which of the output gap – as measured by the OECD - falls below – one per cent of GDP.

Note that most studies have used quarterly series to provide a precise date of the start of the recession, but as I analyse fiscal policy data, and these have been collected at most since 2010 on a quarterly basis in most OECD economies, I follow Larch et al (2024) in using annual data.

By definition, the Harding-Pagan algorithm considers recessions to be cyclical phenomena, so two or more consecutive years cannot be the start of a prolonged recession. However, both the real growth rate or output gap measure could indicate prolonged recessions in two or more consecutive years. We exclude consecutive years in this case, and consider the recession as one long period of low growth. Albeit the parameters on the three dating methods are somewhat arbitrary, they are similar to what other studies have used (Blanchard *et al.*, 2015; IMF, 2021; Larch *et al.*, 2024), and lead to rather similar economic downturns by country and year as in other studies.

The three procedures identify major economic recessions, that are rather similar across the procedures (Table 1). The results of the three methods are reported in the Appendix. The output gap measure indicates close to 160 major recessions out of around 1,300 observations in our sample, i.e. some 12 per cent of all country-years. The Harding and Pagan (2002) or standard deviation measure identify a similarly large number of recessions episodes (close to ten per cent of all country-years).

3.2 Local projections

The local projections (LP) technique introduced by Jordà (2005) estimates impulse-response functions by directly regressing the endogenous variable on a contemporaneous shock and suitable controls for different forecast horizons. Specifically, for horizon h, the following model is estimated

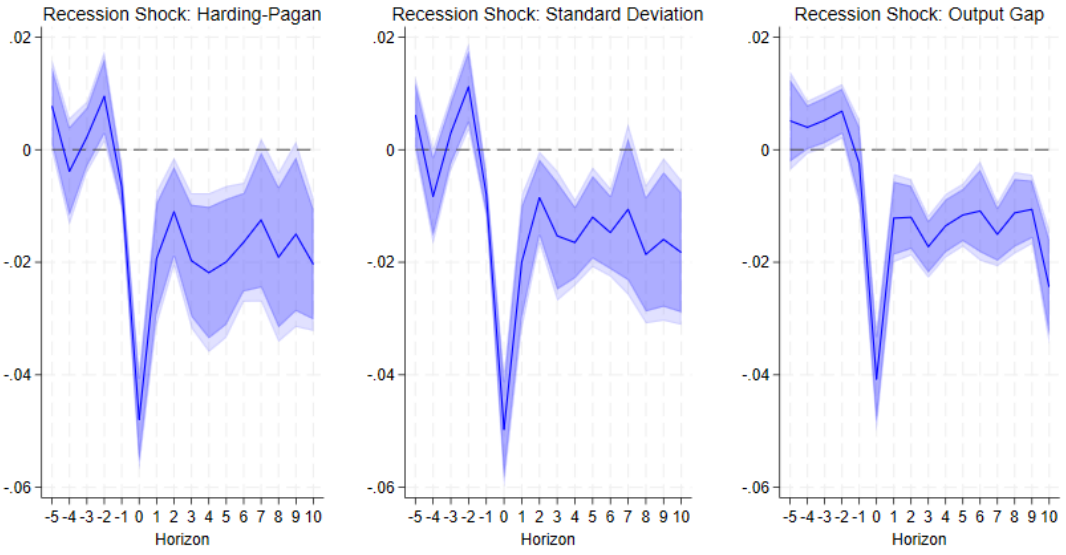
[7] These parameter choices closely follow the ones used in Chapter 2 of the IMF's April 2021 World Economic Outlook

$$Y_{t+h} = \alpha_h + \beta_h X_t + \theta_h Z_t + \varepsilon_t, \quad (1)$$

Where X_t is the shock, which in our case is the onset of the deep recession, Z_t includes lags of Y_t and X_t (and any additional covariates), and β_h is the impulse response. Repeating this regression for all time horizons $h=0,\ldots,H$ traces a dynamic path of the response of the variable. LP is a flexible alternative to VAR models since it does not impose dynamic restrictions. Because each horizon is estimated separately, LPs are robust to misspecification, accommodate non-linearities or alternative estimation techniques. The LP method can therefore easily be adjusted to a panel setting. I trace the effect of a major recession on budgetary variables, and public debt, on a panel of 26 OECD economies using as the shock variable the start of the recession. The panel LP conditions on fixed effects.

In order to understand the behaviour of GDP after the onset of a crisis, I first estimate the impact of a recession on GDP growth rates over a horizon of ten years after the recessionary shock. The shaded area on Figure 1 shows both the 90 and 95 per cent confidence intervals around the LP estimates. Standard errors have been made robust to clustering. I also show the evolution of GDP prior to the recession, up to five years prior to the onset of a recession.

Figure 1. Impulse responses of local projection estimates of recession on GDP.



Notes: Impulse responses of local projection estimates of the effect of recessions on economic growth in $t = 1, \ldots, 10$. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses; the dark shaded areas display the 90% SCC error bands; the light shaded areas display the 95% SCC error bands.

As the downturns have been identified as being followed by a recession, it is no surprise if GDP growth declines in the year(s) that follow. Recession are on average characterised by a V-shaped recovery: after a deep trough, output stabilises. However, this rebound is fairly contained and as documented in other studies, GDP growth rates stay at a permanently lower level. This scarring effect is significant and remains so for the entire time horizon. The results differ just slightly across the three identification methods. Economic growth never overshoots the rates recorded prior to the recession. The result is a downward shift in economic activity at the time of the recession and while real GDP resumes an upward trend afterwards, it stays below the one recorded prior to the recession. These findings are very much in line with earlier studies on the medium or long-term effects of economic downturns or economic crisis such as Ball (2014), Blanchard *et al.* (2015) and Martin *et al.* (2015).

4. Budgetary consequences

4.1 Impact of scarring on fiscal responses

Let us now turn to the effect of scarring on fiscal variables, and use the basic LP model to trace out the effects of an economic scarring episode on public spending and tax revenues.[8] Data are annual and I measure spending as the annual growth rate of real total spending, [9] and revenues as the annual growth rate of real total revenues. I again trace out the effect over a forecast horizon of ten years. LP estimates in Figures 2 to 4 show the annual growth rates of spending versus revenues over the forecast horizon, and the 95 per cent error bands. I compare the outcomes under the three types of recession indicator.

Figure 2 shows a couple of interesting facts on fiscal policy behaviour around recessions with scarring. First, and not surprisingly, at the start of the recession, tax revenues decrease in line with GDP growth. This drop in tax revenues is in line with the impact of the tax stabilisers built in most tax systems of OECD economies. More surprising is that governments also cut spending significantly at the same time. One would expect that spending does not move very much with the cycle, as it mostly concerns unemployment benefits that are a small part of the overall budget (OECD, 2005). This cutback in spending is not as strong as the fall in tax revenues, hence the budget deficit rises.

[8] Data from OECD Economic Outlook 116 include general government total outlays, and general government total tax and non-tax receipts. Public debt is general government gross financial liabilities.

[9] Total disbursements of general government; The used Price deflator is the one for gross domestic product

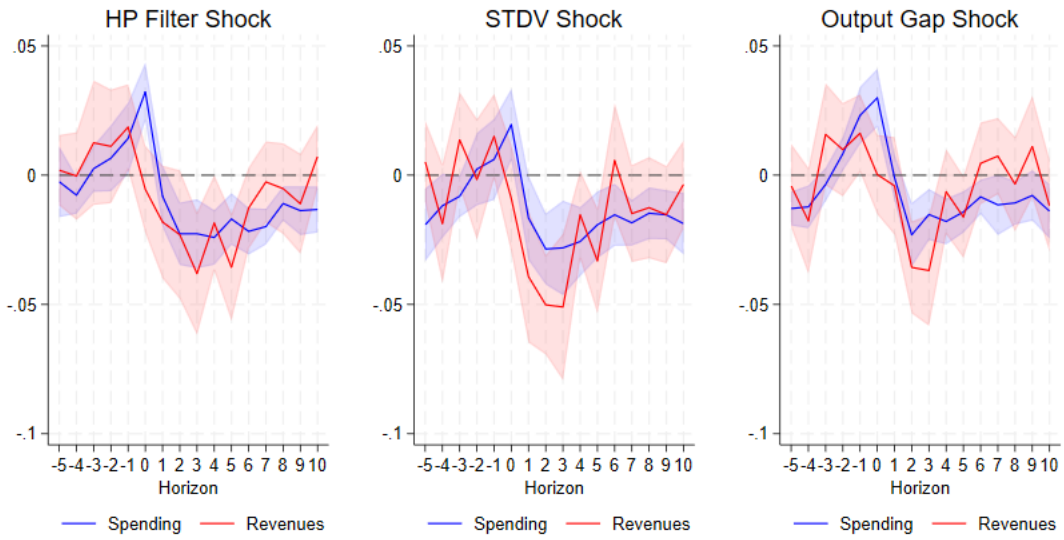
Second, it is also interesting to observe what happens just prior to the recession. We observe precisely the opposite behaviour as in the recession. In the economic boom preceding the recession, tax revenues go up in line with economic activity. However, governments also raise spending strongly. In this case, the rise in spending is larger than the rise in tax revenues, hence the budget deficit also rises

The period just before and after a recession period are thus characterised by cyclical tax policies that are in line with what an optimal tax-smoothing policy would look like. Instead, spending behaves in a procyclical way. As most spending categories are acyclical, it seems governments actively pursue a procyclical policy. Evidence on the cyclical responses of spending in studies using fiscal rules often come to similar conclusions (Larch *et al.*, 2019; Gootjes and de Haan, 2022). These studies have also argued that there is an inherent deficit bias in fiscal policy due to the asymmetry in the fiscal response to the cycle – with the spending upswing in booms not being covered by sufficient tax revenues, while recessions see limited spending reductions with large drops in tax revenues. I confirm this evidence by distinguishing the fiscal reaction before and after a deep recession.[10]

A third major finding that had not been documented by other studies is that a few years after the recession, spending starts to rise again. Nevertheless, it never turns back to the level prior to the recession, and even ten years after the recession growth in spending remains significantly below prior levels. At the same time, tax revenues grow back to the previous level, and after six years have been increased to the same level as before the recession. In EU or euro area countries, the reversal is actually faster and after about eight years, spending grows at a similar rate as before the recession. Tax revenues are back at levels prior to the recession five to six years later. Given that economic growth remains subdued (as shown in Figure 1), this must imply that governments have raised taxes sufficiently to exceed previous tax levels, in spite of the lasting economic scar.

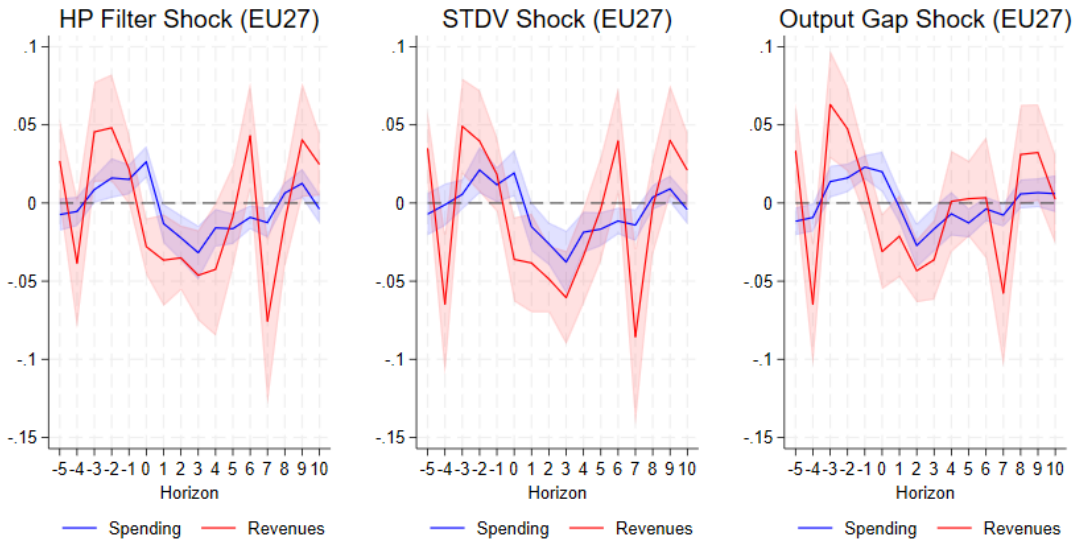
[10] Some studies have argued that EU Member States or euro area countries would display stronger procyclical spending behaviour. Figures 3 and 4 show the local projection estimates for each panel, but the differences with the full sample of OECD economies is not generally large.

Figure 2. Impulse responses of local projection estimates of recession on spending and revenues (full sample of 26 OECD economies).



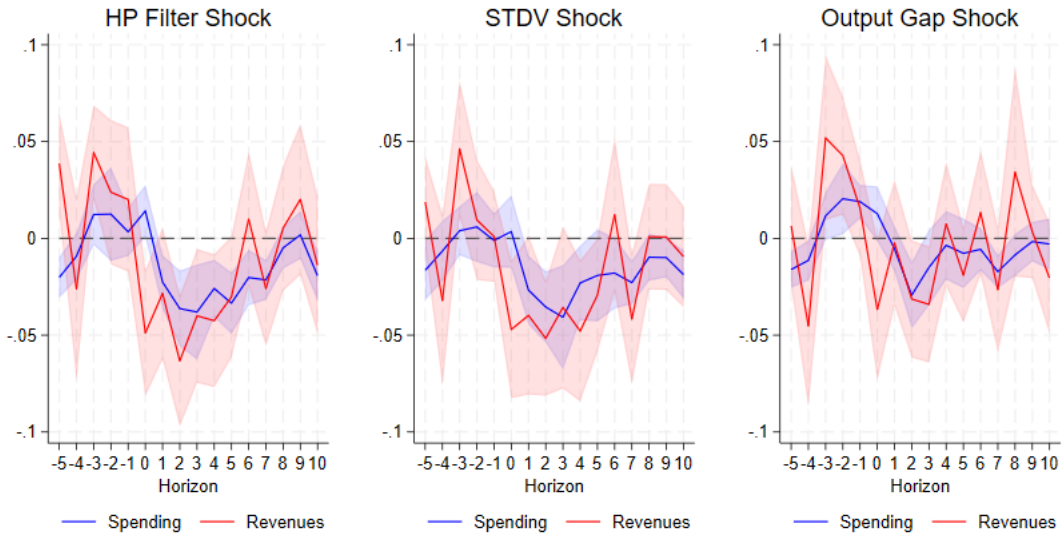
Notes: Impulse responses of local projection estimates of the effect of recessions on (the growth rate of) total spending and tax revenues in $t = 1, \ldots, 10$. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

Figure 3. Impulse responses of local projection estimates of recession on spending and revenues (sample of EU Member States).



Notes: Impulse responses of local projection estimates of the effect of recessions on (the growth rate of) total spending and tax revenues in $t = 1, \ldots, 10$, for a sample of EU Member States. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

Figure 4. Impulse responses of local projection estimates of recession on spending and revenues (euro area versus full sample).



Notes: Impulse responses of local projection estimates of the effect of recessions on (the growth rate of) total spending and tax revenues in $t = 1, \ldots, 10$, for a sample of euro area countries. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

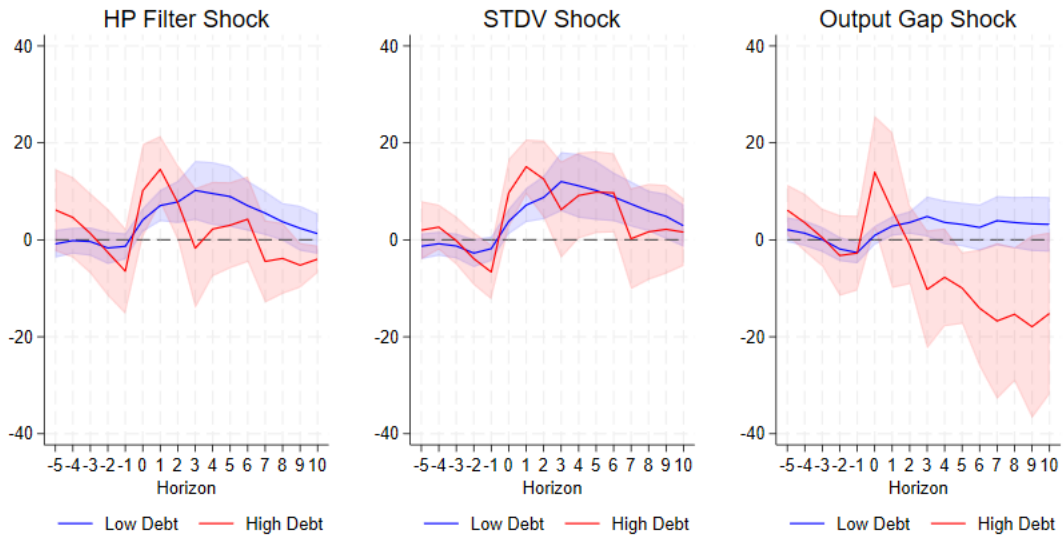
4.2 Impact of scarring on the sustainability of public debt

Given the deficit bias around the recession, and the gradual increase in taxes over time, we can expect to see an in initial increase in public debt around the recession and a gradual consolidation over time. Figure 5 shows the impact for two groups of countries: those with a low debt ratio, and those with a debt ratio above 90 per cent. The reason for choosing this threshold is related to the literature that has established this as the boundary after which negative growth effects occur (Reinhard and Rogoff, 2014). Recent research casts in doubt the specific threshold value (Heimberger, 2023), yet I keep it as a rough limit to separate two groups.

Given the asymmetric cyclical response of spending and revenues, and the deficit bias it implies, the LP estimates unsurprisingly show that higher deficits turn into higher debt (Figure 5). In countries with low debt, the peak response is reached after three years, after which a gradual slowdown in the increase of public debt takes place. High debt countries experience a faster reduction of public debt, but the rates never turn significantly negative so debt is kept under control but never really consolidated.[11]

[11] The only case where there is a negative response occurs in recessions identified by the output gap and only in high debt countries, but even in this case, the response is not significant.

Figure 5. Impulse responses of local projection estimates of recession on public debt (high versus low debt, threshold at 90 per cent public debt ratio).



Notes: Impulse responses of local projection estimates of the effect of recessions on (the growth rate of) public debt in $t = 1, \ldots, 10$, for a group of countries with low or high debt. The threshold value for high debt is fixed at 90% GDP. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

3.4 Accounting for endogeneity: is austerity self-defeating?

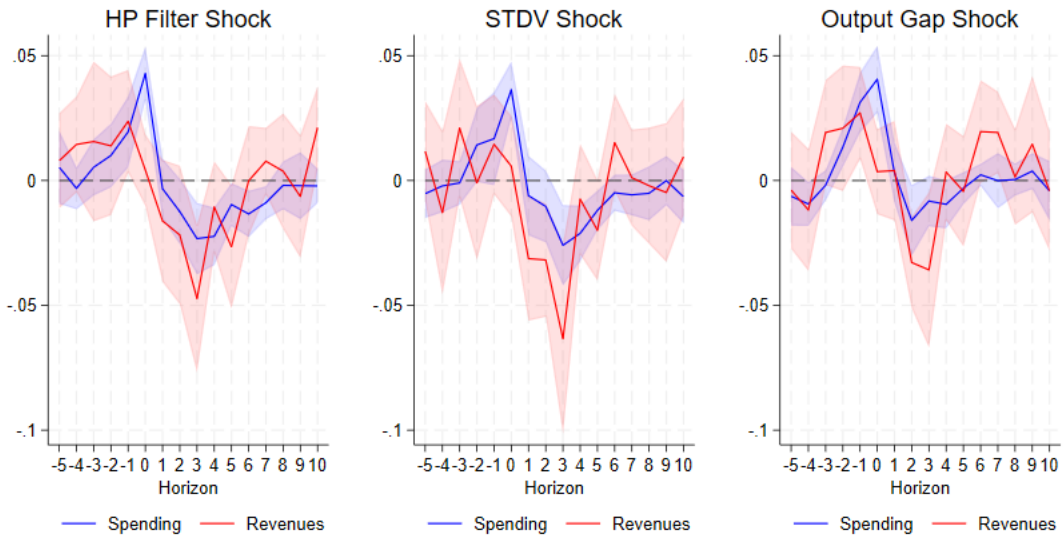
Scarring is affected by the way fiscal policy will react to the downturn. An aggressive stabilisation policy that cuts taxes and raises spending has the potential to stabilise the cycle (Engler and Tervala, 2018; Cerra *et al.*, 2013); or austerity might induce further output declines with a negative impact on the public debt ratio, self-defeating the purpose of the fiscal consolidation (Fatás and Summers, 2018). I address a possible concern of endogeneity in output to fiscal policy in two ways.

First, I measure the impact of the recession on cyclically adjusted fiscal variables.[12] Figure 6 reports the LP estimates. We observe a similar procyclical pattern in spending and a countercyclical one in tax revenues around the start of the recession, just as in Figure 2. Moreover, there is a clear deficit bias, as the swing in tax revenues is not compensated by a similar change in spending. In contrast to the earlier findings, we observe that in the longer term, spending gradually moves back to the same level as before the recession, in spite of the lower GDP growth rates. In Figure 2, we inferred from the scars on GDP that governments must have raised taxes a few years after the recession, as tax revenues moved to higher levels. We can show this effect more clearly now by accounting for the

[12] Annual data for cyclically adjusted current disbursements and cyclically adjusted current receipts come from OECD Economic Outlook 116.

endogenous response of tax revenues. The impulse responses show that cyclically adjusted tax revenues – after about five years – move upwards (albeit the impact is not significant at standard levels). This implies that economic recovery is not responsible for the increase in tax revenues observed in Figure 2, but it indeed involves discretionary tax rises.

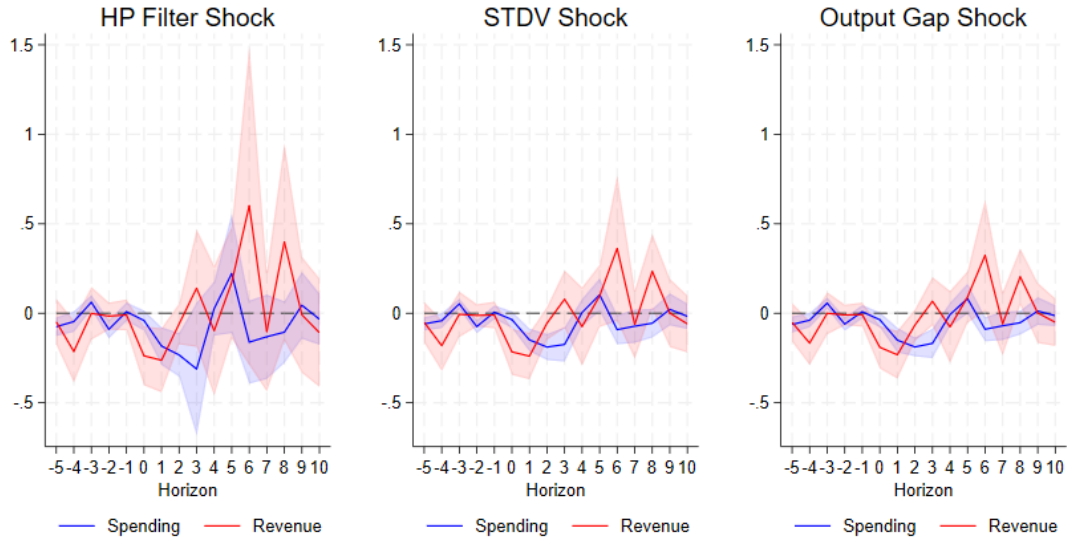
Figure 6. Impulse responses of local projection estimates of recession on cyclically adjusted spending and revenues.



Notes: Impulse responses of local projection estimates of the effect of recessions on (the growth rate of) cyclically adjusted total spending and tax revenues in $t = 1, \ldots, 10$. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

A shortcoming of the cyclical adjustment procedures applied to fiscal variables is that it only in part responds to the problem of endogeneity. In fact, due to scarring, filtering procedures – like HP filters or similar – cannot capture the permanent level change in the economic variables that occur after a recession. As a result, potential output measures move in a procyclical way and the output gap measures may incorrectly suggest a negative gap while in fact the economy may be on a lower growth path (Martin *et al.*, 2015; Dovern and Zuber, 2020). Policymakers might then view a recession as a temporary deviation from trend, when in fact the fiscal position has permanently shifted.

Figure 7. Impulse responses of local projection IV-estimates of recession on spending and revenues.



Notes: Impulse responses of local projection IV estimates of the effect of recessions on (the growth rate of) total spending and tax revenues in $t = 1, \ldots, 10$. The recession starts at $t = 0$. The solid line in the figure plots the impulse responses for each variable; the shaded areas display the 95% SCC error bands.

In a second correction for endogeneity, I therefore estimate (1) with an instrumental variable estimator. An LP panel model can be easily accommodated for the use of IVs. The chosen instrument is a common external shock – oil prices – that affects OECD countries' GDP but with no (major) effect on spending or tax revenues.[13]

Figure 7 shows a couple of new findings. The first one is that procyclical spending behaviour is now only visible after the recession (but not prior to it). Tax revenues do not move in a clear countercyclical pattern, except for the period when the recession starts. In the longer term, we do observe the same pattern though: the level of spending rebounds after around five years, while tax rises let total revenues increase again. The patter is similar across the different measures of recession. The results confirm the procyclical spending bias, and the longer term consolidation with increases in distortionary taxation.

5. Conclusions

Recessions that leave long lasting scars on the economy have consequences for the sustainability of public debt. The main finding of this paper is that scarring episodes raise public debt both in the short and in the long term. While the short-term response of governments is suboptimal - due to a combination of a procyclical cut in spending and

[13] The oil price is the annual change in the spot crude oil price (West Texas Intermediate) from the FRED database.

lower tax revenues – the long-term response fails to consolidate public debt sufficiently. In particular, governments choose a strategy of tax increases, rather than spending cutbacks in order to keep debt under control, and the joint impact has been negative for longer term economic growth.

This paper is a warning regarding the view that currently permeates large public spending programmes that they could boost the economy both in the short and long term without creating problems for the sustainability of public debt. Results show that an expansionary consolidation is unlikely to work.

Lavish spending on AI in the US, EV industries in China, or reforms proposed in the Draghi and Letta report all aim to relaunch productivity growth and enable digital and green transitions under constrained fiscal space. The political message is that without decisive action, countries risk secular stagnation and economic marginalization. This view might be overly optimistic if fiscal policies react as they have done in the past.

In line with evidence on the limited role that public investment has on economic growth (Romp and de Haan, 2007), public policies should carefully design the role and purpose of such programmes in order to avoid a self-defeating leniency in fiscal policy. The focus of the reformed SGP on longer term sustainability and public investment is better designed as it attempts to control the underlying spending incentives that EU Member States may have, and can therefore avoid the necessary distortionary impact of tax increases to keep debt under control.

The interpretation of the results come with some caveats. This paper describes the typical procyclical and distortionary patterns of fiscal policy common in OECD economies that seem to deviate strongly from optimal policy prescriptions. It is not an argument that fiscal policy can never work under economic stagnation. In fact, theoretical work on the use of fiscal policy demonstrates that well-designed countercyclical policies might have a strong stabilising effect that permanently lifts output to a higher level (Cerra *et al.*, 2023). This paper also does not discuss specific policy programmes that have targeted productivity. Watson and Tervala (2018) discuss the role of welfare spending programmes on scarring in labour markets; Larch *et al.* (2024) look into the role of public investment in reducing scarring. IT would be interesting to include the composition of spending into the analysis presented here.

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Appendix

Table A1: Major economic downturns by country and identification method

Country	(a) Harding Pagan	(b) standard deviation	(c) output gap
Australia	1982, 1990, 2019	1977, 1982, 1990, 2019	1974, 1982, 1990, 2000, 2019, 1975, 1978, 1981, 1993, 2001, 2009
Austria	1975, 1978, 1981, 2009, 2020	1975, 1978, 1981, 2009, 2020	2020, 1975, 1977, 1981, 1993, 2001, 2009
Belgium	1975, 1981, 1993, 2009, 2020	1975, 1981, 1993, 2009, 2020	2020
Canada	1982, 1991, 2009, 2020	1982, 1990, 2009, 2020	1975, 1982, 1991, 2003, 2009, 2020
Denmark	1974, 1980, 1988, 2008, 2020	1974, 1980, 2008, 2020	1974, 1980, 1988, 2002, 2009, 2020
Finland	1991, 1999, 2012, 2020	1991, 2009, 2012, 2020	1976, 1981, 1991, 2002, 2009, 2020
France	1975, 1993, 2009, 2020	1975, 1993, 2009, 2020	1975, 1981, 1993, 2002, 2009, 2020
Germany	1975, 1982, 1993, 2002, 2009, 2020	1975, 1982, 1993, 2003, 2009, 2020	1974, 1981, 1993, 2002, 2009, 2020
Greece	2020	1974, 2009, 2020	1974, 1982, 1990, 1993, 2011, 2020
Iceland	1983, 1988, 1991, 2009, 2020	1983, 1992, 2009, 2020	1974, 1983, 1992, 2009, 2020
Ireland	1983, 2008	1983, 1986, 2008, 2012	1983, 1986, 1991, 2009, 2016
Italy	1975, 1993, 2008, 2012, 2020	1975, 2009, 2012, 2020	1975, 1982, 1992, 2002, 2009, 2020
Japan	1974, 1998, 2008, 2020	1974,1998, 2008, 2020	1974, 1993, 1998, 2009, 2020, 1972, 1975, 1980, 1989, 1992, 1998
Luxembourg	1975, 1981, 2008, 2012, 2020	1975, 1981, 2008, 2012, 2020	1975, 1980, 1994, 2003, 2009, 2020
Mexico	1982, 1986, 1995, 2001, 2009, 2019	1983, 1986, 1995, 2009, 2020	2020
New Zealand	2020	2020	1977, 1986, 1989, 1997, 2008, 2020
Norway	1988, 2009, 2020, 1970, 1975, 1977, 1986, 1991, 2008	1982, 1988, 2008, 2019, 1970, 1975, 1977, 1986, 1991, 2008	1981, 1988, 1999, 2001, 2009, 2018
Portugal	2020	1975, 1984, 2009, 2011, 2020	2020
South Korea	1980, 1998, 2020	1980, 1998, 2009, 2012, 2019	2003, 2008, 2019
Spain	1981, 1993, 2009, 2011, 2020	1993, 2009, 2011, 2020	1979, 1993, 2009, 2020
Sweden	1977, 1981, 1991, 2008, 2012, 2020	1977, 1981, 1991, 2008, 2012, 2020	1977, 1992, 2001, 2009, 2020, 1979, 1989, 1991, 1994, 1999, 2001
Switzerland	1975, 1982, 1991, 2002, 2009, 2020	1975, 1982, 1991, 2009, 2020	1975, 1982, 1992, 2002, 2009, 2020
The Netherlands	1981, 2009, 2012, 2020	1975, 1981, 2002, 2009, 2012, 2020	1975, 1981, 1992, 2002, 2009, 2020
Turkey	1979, 1994, 1999, 2001, 2009	1979, 1989,1994, 1999, 2001, 2009, 1970, 1974, 1980, 1982, 1991, 2008	2008, 2014, 2016, 2019
United Kingdom	1974, 1980, 1991, 2008, 2020, 1981, 1987, 1993, 2015	1974, 1980, 1991, 2009, 2020	1975, 1980, 1991, 2009, 2020
USA	1974, 1980, 1982, 1991, 2008, 2020	2020	1974, 1980, 1991, 2001, 2009, 2020