

A green fiscal pact: climate investment in times of budget consolidation

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Executive summary

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THE ADDITIONAL PUBLIC INVESTMENT need required to meet the European Union's climate goals is between 0.5 percent and 1 percent of GDP annually during this decade. Increasing green public investment while consolidating deficits will be a major challenge. While our simulations show that budget consolidation can be done at a moderate pace in line with EU rules if those rules are interpreted flexibly, past consolidation episodes resulted in major public investment cuts. This time, there is a need for a major increase in investment.

A **'GREEN GOLDEN RULE'** (excluding net green investment from the fiscal indicators used to measure fiscal rule compliance) is the most promising option to address this tension. Relaxing the strictness of the EU fiscal framework beyond its existing flexibility and the proposed green golden rule does not appear necessary in the next few years.

THE UNCERTAIN GROWTH IMPACT of green public spending and the risks to growth from climate change create difficult trade-offs in fiscally weaker countries. In any case, better regulatory policy and a higher price on emissions should incentivise private green investment and reduce public costs. These ingredients should be combined to form a 'green fiscal pact'.



Recommended citation

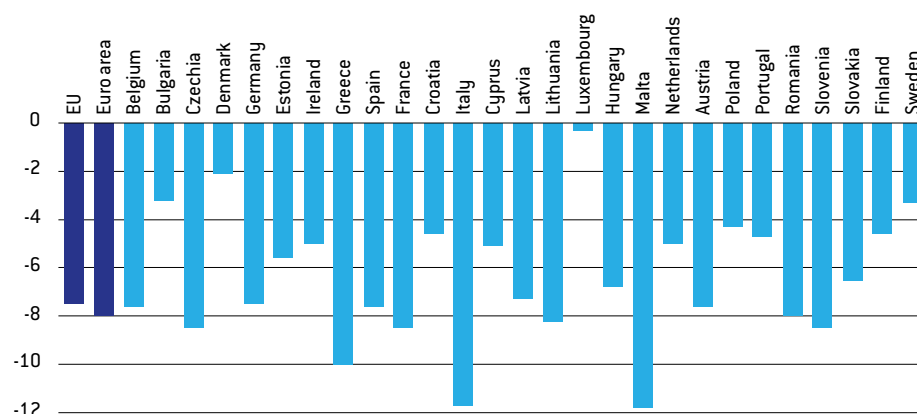
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1 Introduction

The European Union economy is gradually exiting its biggest recession since the Second World War. After a drop in GDP of 6 percent in 2020, the growth rate is forecast to be 4.8 percent in 2021 and another 4.5 percent in 2022¹. These estimates continue to be fraught with considerable uncertainty. One important factor of uncertainty will be the further development of the pandemic, for example the emergence and impact of new coronavirus variants. Further uncertainty arises from global supply chain disruption.

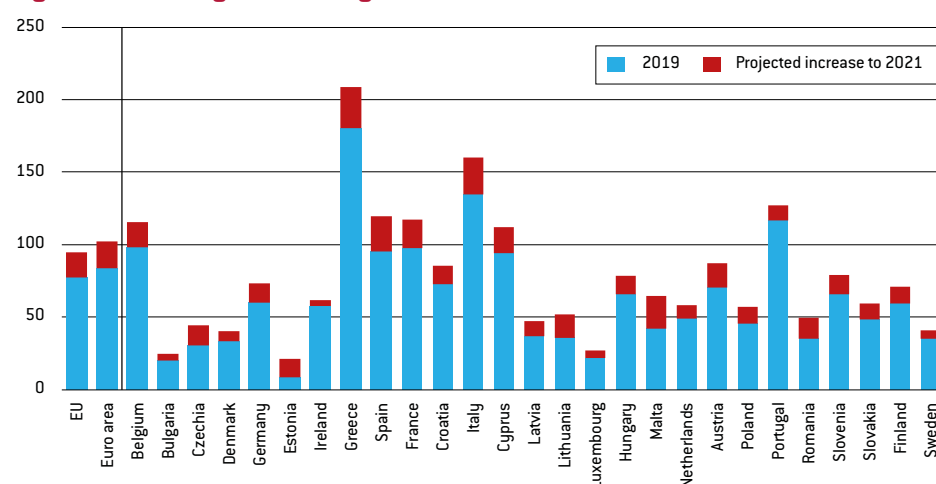
Substantial fiscal resources were rightly used to buffer the impact on the economy of the pandemic and public health measures, and debt levels have increased substantially. The EU fiscal deficit increased from 0.5 percent of GDP in 2019 to 7.5 percent in 2021 (Figure 1). Public guarantees for loans increased by 5 percent to 10 percent of GDP in some countries in 2020 (Anderson *et al*, 2021). Public debt to GDP has increased from 79 percent of GDP in 2019 to 94 percent in 2021 (Figure 2). In some countries, public debt is substantially higher.

Figure 1: General government balance as % of GDP in 2021



Source: Bruegel based on European Commission Spring 2021 Forecast.

Figure 2: General government gross debt as % of GDP, 2019-2021



Source: Bruegel based on European Commission Spring 2021 Forecast.

¹ According to the European Commission's Summer 2021 Economic Forecast.

A fiscal exit strategy must be put in place when the EU is pursuing the major goal of cutting its emissions

As the economy recovers, the fiscal exit strategy from this substantial support will be of paramount importance. In a previous note to the informal ECOFIN, we warned against a premature fiscal exit (Claeys *et al*, 2021). We have also discussed the importance of a gradual shift from firm-specific fiscal support towards broader demand support in order to facilitate the adjustment of economic structures towards a new steady state after the acute phase of the pandemic. The design and the speed of the fiscal consolidation will have major ramifications for the recovery.

The fiscal exit strategy needs to be put in place when the EU is pursuing the major and justified goal of cutting its greenhouse gas emissions. Achieving the targets of the European Green Deal and the 'Fit for 55' package will require substantial additional investment and major regulatory and tax measures. And while the EU's share of global emissions is modest, EU investment also advances climate mitigation technology, which contributes to global reductions². These investments will have to be funded and we discuss how this will complicate fiscal policy trade-offs in this decade.

The EU's fiscal rules are under discussion, but this paper does not discuss EU fiscal-rule revision in general. A substantial literature exists on this and there is fairly broad consensus that the current rules face technical problems (related to the definition and measurement of potential output and structural balances), do not take account of cross-border demand externalities and the interplay between monetary and fiscal policies, and fall short on implementation. It has even been argued that existing fiscal rules lack economic justification and should be discontinued. At interest rates lower than growth rates, fiscal sustainability is less of a concern³. But there is uncertainty about the effect of climate change on both growth and interest rates, and therefore on sustainability. Beyond the academic debate, the European Parliament, in an 8 July 2021 resolution⁴, stressed *"the importance of having a clear pathway towards a reviewed fiscal framework, preferably prior to the deactivation of the general escape clause,"* and highlighted that *"the application of the current fiscal framework, in particular the adjustment paths, would lead to a high speed of debt reduction that could undermine the recovery path of the economies"*.

In previous work (Claeys *et al*, 2016; Darvas *et al*, 2018), some of us argued for reform of the fiscal rules. Approaches close to these proposals are now advocated by, for example, the European Fiscal Board. The proposals focus on country-specific medium-term debt targets as an anchor and an expenditure rule as the operational target, thereby allowing a debt feedback mechanism. A resilient framework requires operational targets that reduce debt ratios prior to any financial market doubts about debt sustainability. Lower debt ratios increase the robustness of the system and the capacity of the state to react to new negative shocks, as has been shown during the pandemic, with countries with relatively low debt levels able to initially react more vigorously with fiscal policy than countries with high debt levels.

Instead of going deeper into the debate about which specific fiscal rule would be optimal, we assess the scope for public green investment if fiscal rules are reinstated in their current form as of 2023. We draw lessons from past experiences of fiscal consolidation in terms of the speed and composition of public spending. We simulate different fiscal-adjustment scenarios

2 Tagliapietra and Wolff (2021) argued for a climate club to incentivise more countries beyond the EU to accelerate their climate efforts in line with increased EU climate efforts.

3 One of the most frequently discussed is from Blanchard *et al* (2021), under which fiscal rules would be replaced by fiscal standards – qualitative prescriptions that would be based on a debt sustainability analysis and adjudicated by an EU-level court. However, we reject the idea of discontinuing European fiscal rules in favour of standards. In a monetary union, the risk of free-riding on monetary support would be substantial and triggering fiscal adjustments only in reaction to a negative assessment on debt sustainability would, in itself, trigger negative market reactions undermining debt sustainability. Moreover, debt sustainability analyses often generate uncertain results and adjustments would come too late if only done once a fiscal position looks unsustainable with a high probability. We do not discuss here Blanchard *et al*'s (2021) governance approach, which is largely outside the EU legal and institutional system and would hardly be implementable.

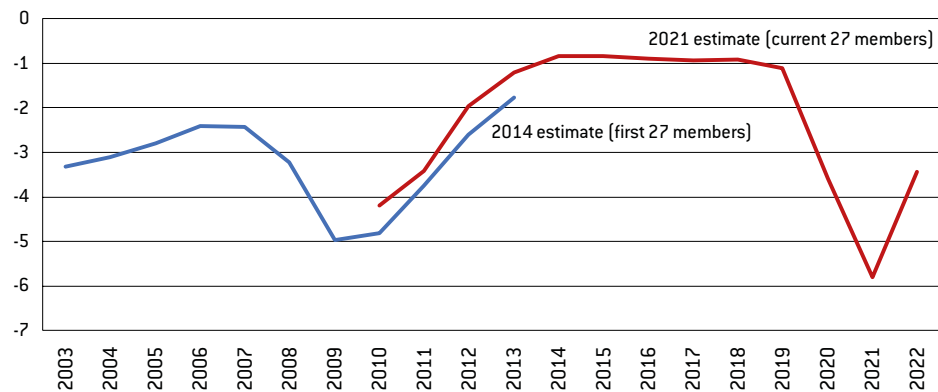
4 See https://www.europarl.europa.eu/doceo/document/TA-9-2021-0358_EN.html.

under the existing fiscal rules. We summarise estimates of public investment needs in green infrastructure. The overall message is that there are substantial investment needs that will be very difficult to achieve in the current fiscal setting. We highlight major political trade-offs and conclude with recommendations.

2 Lessons from previous fiscal consolidations

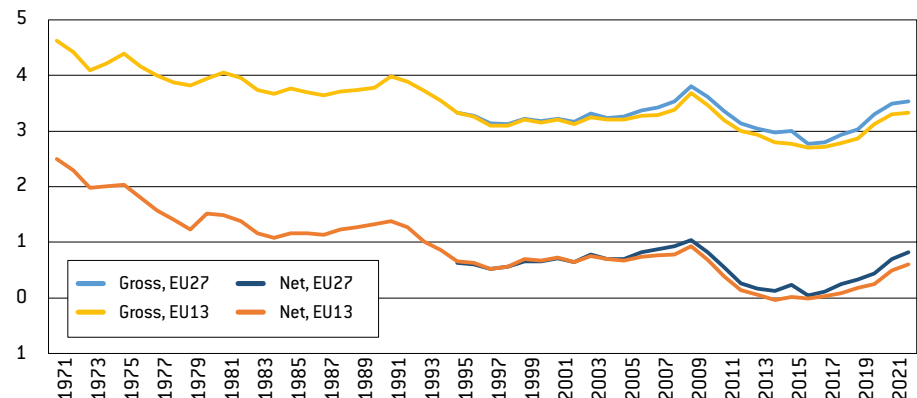
In the midst of the escalating euro crisis of the early 2010s, fiscal consolidation in the EU was rather fast. In the current 27 EU members, the structural budget balance as a share of GDP increased by 0.8 percentage points in 2011, 1.5 percentage points in 2012 and 0.8 percentage points in 2013. This rapid fiscal consolidation was a major driver of the recession of 2012 (Figure 3).

Figure 3: Structural budget balance in the EU (% potential GDP)



Source: Bruegel based on the May 2014 and the May 2021 AMECO datasets. Note: the latest May 2021 AMECO includes estimates and forecasts for 2010-2022, so we include the May 2014 AMECO which also includes earlier estimates.

Figure 4: Gross and net public investment in the EU, % GDP, 1971-2022



Source: Bruegel based on the May 2021 AMECO dataset. Note: EU13 is the aggregate of the first 15 members of the EU except the United Kingdom and Luxembourg. The forecasts for 2021-2022 include the impact of NGEU.

While the magnitude of fiscal consolidation in EU countries differed depending on their fiscal situation and the market pressure they faced, almost all countries cut public investment. Public investment was also a victim of fiscal consolidation in previous episodes (Figure 4). Gross public investment fell by about 0.8 percentage points of GDP from 2009 to 2013 in the EU as a whole. Even in the group of long-standing EU members that did not face market pressure, the real value of public investment was slightly lower in 2013 than in 2009, while overall primary expenditures increased by about 5 percent in this period (Annex Table A1). Public investment was cut more dramatically, by around one-half, in Greece, Ireland, Portugal, Italy and Spain – countries that faced heavy market pressure. Also, in the central and eastern members of the EU, investment was cut substantially during this period. Other more future-oriented spending items were also cut⁵. Overall, investment has been a major victim of fiscal consolidations.

3 Green public investment needs to meet EU targets

Achieving the goal of net-zero greenhouse gas emissions in the EU by 2050 requires an immediate expansion of annual investment in clean and efficient energy use and transport by about 2 percent of GDP. The middle scenario in the European Commission's impact assessment (European Commission, 2020) estimated additional annual investment needs of €360 billion on average, with annual investment needing to increase to €1040 billion on average (at 2015 prices), up from €683 billion per year invested over the last decade, in order to reach the intermediate goal of a 55 percent emissions reduction by 2030 compared to 1990⁶. Even more investment is needed beyond 2030 (Figure 5)⁷. As a share of GDP, this is an increase from 5.3 percent to 7.0 percent according to the Commission⁸. This Commission estimate is in line with estimates of the International Energy Agency (IEA, 2020) for the world, the International Renewable Energy Agency (IRENA, 2021), and BloombergNEF (2021), which suggest that additional investment needs in energy and transport amount to roughly 2 percentage points of GDP. D'Aprile *et al* (2020) similarly estimated that, on average, €980 billion in capital investment per year is needed in the EU between 2021 and 2050 to achieve net-zero emissions⁹.

A significant part of this additional investment will have to be funded by the public sector with estimates of a public-private ratio of 1:4 to 1:5. For overall climate-related investments in energy and transport, the European Investment Bank (2021) gathered data reported by EU countries. This self-reported data showed that governments planned to provide on average around 28 percent of the necessary funding for investments in energy and transport in the

5 Research and development (R&D) spending also suffered, at least in relative terms (with the exception of newer EU member states), even though many EU governments spend much less on R&D than other advanced countries. Spending on education also suffered, except in the EU9. See Table A1 in the Annex.

6 Estimates refer to the MIX scenario as set out in European Commission (2020). Note that the €360 billion is the annual average over the decade with no precise numbers given on the spending profile during the decade.

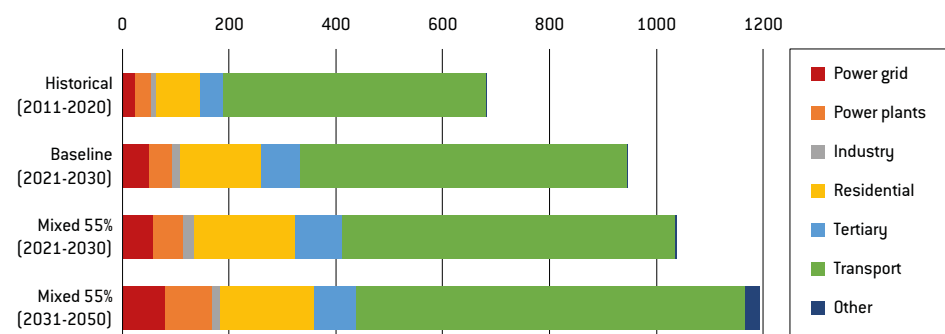
7 Note that estimates for 2031-2050 do not assume any particular policy change to reach net zero in 2050, but assume that policies implemented before will continue their effects beyond 2030.

8 €360 billion is 2.7 percent of 2019 GDP at 2015 prices. The Commission assumes positive GDP growth during the decade.

9 McCollum (2018) presented smaller estimates, though for a more restrictive sectoral definition of investments.

EU¹⁰. If one assumes that the new additional investments as reported by the Commission were in line with these self-reported estimates of the public share of funding, an annual additional public investment of €100 billion (at 2015 prices), or 0.8 percent of 2019 EU GDP, would result. IRENA's (2021) 1.5°C scenario estimated a somewhat lower public share at the global level. Public funding accounted for 22 percent of the relevant investments in 2019. This share would decline to 17 percent beyond 2030, while in absolute terms, public investment would more than double because of the large growth of overall green investment needs. The EIB (2021) report emphasised the importance of public funding to mobilise and facilitate private financing. Similarly, numbers presented by the World Economic Forum (2013) confirmed that public-private leverage ratios of 1:4 to 1:5 are possible if public funds are used efficiently¹¹.

Figure 5: Average annual green investment needs in the EU (€ billions, 2015 prices)



Source: Bruegel based on European Commission (2020). Note: 'Baseline' is a scenario in which current policies and targets for 2030 continue to apply (-40% GHG emissions). 'Mixed 55%' is a scenario (MIX) that features a combination of expanded carbon pricing and moderately increased ambitions in energy regulations to achieve 55% emission cut by 2030. Beyond that, the estimates for 2031-2050 do not assume any particular policy change to reach net zero in 2050.

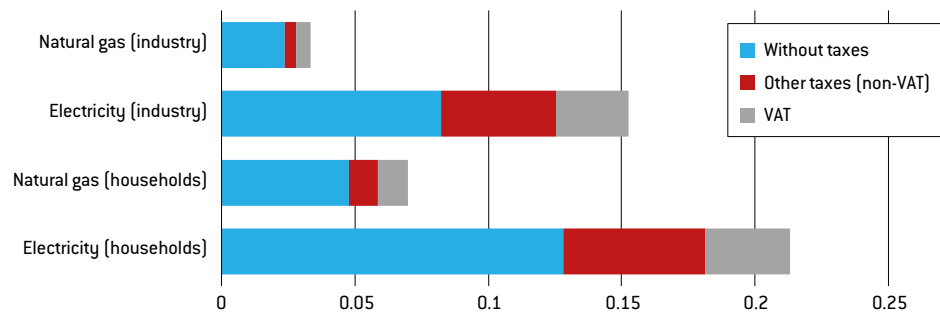
However, the share of public funding can be reduced by appropriate policy to reduce the costs to the public pursue. Appropriate government regulation, taxation policy and, in particular, a higher carbon price should make green investments more profitable for the private sector. The percentage of public funding therefore depends on the willingness of the public sector to tax emissions. Nevertheless, some public spending cannot be done by the private sector because of market failures. It is also crucial to remove distortions in the taxation and subsidisation of the energy system in order to incentivise more private investment. For example, currently there is a substantially larger (average) tax on electricity consumption (both for the industrial sector and the household sector) than on natural gas consumption (Figure 6). Although experts agree that the greening of the energy system involves its electrification, current tax policy is actually slowing down that transformation¹². Substantial subsidies for fossil-fuel consumption also remain, distorting incentives.

10 This data was gathered from the National Energy and Climate Plans, which member states had to submit by the end of 2019. While written under the assumption of outdated climate targets, the estimated shares of public and private funding are still informative. The EIB (2021) reported an unweighted average public share in the EU of 45%. Our own weighted average puts the share at 28%. The public share is highest in central and eastern European countries (60%) because of the role of EU funds, while public funding is expected to play a more limited (though still 20%-30%) role in much of northern and western Europe.

11 The size of the public share of green investment depends on the composition of overall green investment needs, as one can expect the share to be lower for, for example, transport investment (since it mostly concerns replacement of private vehicles) than for supply-side investment in grids and power plants. The composition of investment needs according to the Commission and McKinsey is roughly similar: the transport sector accounts for the largest share by far, followed by investment in energy efficiency of buildings, and supply-side investments.

12 See, for example, Figure 2.10 on page 62 of IEA (2021).

Figure 6: Adapt taxation policy: average energy prices for EU households and industry (€ per KWh), including VAT and other taxes, second half 2020



Source: Bruegel based on Eurostat's 'Gas prices for non-household consumers [nrg_pc_203]', 'Electricity prices for non-household consumers [nrg_pc_205]', 'Gas prices for household consumers [nrg_pc_202]' and 'Electricity prices for household consumers [nrg_pc_204]' datasets.

Overall, in the course of this decade, to achieve EU climate goals, total green investment in the EU must be increased by about 2 percentage points of GDP annually, of which public investment will have to amount to between 0.5 percent and 1 percent of GDP. EU countries should tax emissions more so that investment in climate infrastructure becomes more profitable for the private sector, relieving the public purse. However, given the public-goods nature of some of the necessary investments and existing political choices, our best estimate is that public spending will still need to increase by some €100 billion per year. This is a major fiscal effort that will need to be financed.

4 Fiscal adjustment needs under current rules

It is difficult to compute the precise fiscal adjustment needs – ie adjustments to the headline deficit and the structural balance – under the current EU rules. Major caveats and disagreements must be taken into account:

- First, what is the right level of potential output? There are good reasons to believe that potential output could be strengthened by the crisis; however, official EU estimates assume a lowering of potential output in most EU countries. *We take the current official estimates as given in our simulation*, but higher potential output would imply less urgent fiscal consolidation.
- Second, there is substantial scope to interpret the fiscal rules restrictively or rather flexibly. To accommodate this, we present a scenario in line with the practice of the past decade (which we call the 'historical scenario') and a scenario with a more flexible interpretation of the rules (see the Annex for the detailed assumptions).
- Third, substantial differences exist between countries that are placed under the excessive deficit procedure (EDP) and those that are not. We estimate that about 14 countries will be under the excessive deficit procedure.
- Fourth, an important operational target, the Medium-Term Objective (MTO) for the structural budget balance, can be set and might be adjusted upward given higher debt levels, thereby requiring greater fiscal adjustment needs. We use the 2020 MTOs.
- Fifth, we assume the non-application of the 1/20th debt reduction rule, which would require a fiscal effort big enough to close the gap between current debt levels and the 60

Table 1: Fiscal adjustment scenarios

EU27	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Output gap		1.3	-5.9	-3.1	-0.4	-0.3	-0.1	0	0	0	0	0	0	0	0	0
Historical scenario	SB		-1.1	-3.6	-5.8	-3.4	-2.8	-2.1	-1.5	-1.1	-0.8	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3
	BB		-0.5	-6.9	-7.5	-3.7	-2.9	-2.2	-1.5	-1.1	-0.8	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3
Flexible scenario	SB		-1.1	-3.6	-5.8	-3.4	-3.1	-2.7	-2.2	-1.8	-1.4	-1.2	-1.0	-0.6	-0.4	-0.3	-0.3
	BB		-0.5	-6.9	-7.5	-3.7	-3.3	-2.8	-2.2	-1.8	-1.4	-1.2	-1.0	-0.6	-0.4	-0.3	-0.3
NGEU grants				0.0	0.5	0.5	0.6	0.6	0.3	0.2							
	NGEU grants+loans			0.0	0.7	0.8	0.9	0.8	0.4	0.2							
France	Output gap		1.8	-7.1	-2.7	0.1	0.1	0.0	0	0	0	0	0	0	0	0	0
Historical scenario	SB		-3.3	-4.6	-6.7	-4.7	-3.9	-3.2	-2.5	-1.9	-1.3	-0.7	-0.4	-0.4	-0.4	-0.4	-0.4
	BB		-3.1	-9.2	-8.5	-4.7	-4.0	-3.2	-2.5	-1.9	-1.3	-0.7	-0.4	-0.4	-0.4	-0.4	-0.4
Flexible scenario	SB		-3.3	-4.6	-6.7	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.4	-0.4	-0.4
	BB		-3.1	-9.2	-8.5	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.4	-0.4	-0.4
NGEU grants				0.2	0.2	0.2	0.4	0.5	0.3	0.2							
	Output gap		1.0	-4.8	-2.7	-0.0	-0.0	-0.0	0	0	0	0	0	0	0	0	0
Germany																	
Historical scenario	SB		1.0	-1.8	-6.2	-2.5	-1.9	-1.3	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	BB		1.5	-4.2	-7.5	-2.5	-1.9	-1.3	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Flexible scenario	SB		1.0	-1.8	-6.2	-2.5	-2.4	-1.9	-1.4	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	BB		1.5	-4.2	-7.5	-2.5	-2.4	-1.9	-1.4	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
NGEU grants				0.0	0.3	0.2	0.1	0.1	0.1	0.1							
	Output gap		0.6	-8.6	-4.8	-1.4	-1.0	-0.5	0	0	0	0	0	0	0	0	0
Italy																	
Historical scenario	SB		-2.0	-4.9	-9.3	-5.1	-4.2	-3.4	-2.5	-1.8	-1.0	-0.3	0.5	0.5	0.5	0.5	0.5
	BB		-1.6	-9.5	-11.7	-5.8	-4.7	-3.6	-2.5	-1.8	-1.0	-0.3	0.5	0.5	0.5	0.5	0.5
Flexible scenario	SB		-2.0	-4.9	-9.3	-5.1	-4.6	-4.1	-3.6	-3.1	-2.6	-2.0	-1.4	-0.8	-0.3	0.2	0.5
	BB		-1.6	-9.5	-11.7	-5.8	-5.0	-4.3	-3.6	-3.1	-2.6	-2.0	-1.4	-0.8	-0.3	0.2	0.5
NGEU grants				0.6	0.5	0.5	1.1	1.3	0.7	0.4							
	Output gap			1.6	2.4	2.7	2.7	2.7	1.3	0.4							
Poland																	
Historical scenario	SB		-2.5	-6.2	-3.9	-2.9	-2.4	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	BB		-0.7	-7.0	-4.3	-2.3	-2.0	-1.7	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Flexible scenario	SB		-2.5	-6.2	-3.9	-2.9	-2.9	-2.4	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	BB		-0.7	-7.0	-4.3	-2.3	-2.5	-2.2	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
NGEU grants				0.7	0.5	1.1	1.2	0.7	0.4								
	Output gap			1.0	1.1	1.6	1.6	0.9	0.4								
Spain																	
Historical scenario	SB		1.8	-9.3	-5.0	-0.0	-0.0	-0.0	0	0	0	0	0	0	0	0	0
	BB		-3.7	-4.2	-4.9	-5.2	-4.3	-3.4	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0
Flexible scenario	SB		-2.9	-11.0	-7.6	-5.2	-4.3	-3.4	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0
	BB		-3.7	-4.2	-4.9	-5.2	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-0.5	0	0
NGEU grants				-11.0	-7.6	-5.2	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-0.5	0	0
	Output gap		-2.9	-11.0	-7.6	-5.2	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-0.5	0	0

Source: Bruegel. Note: SB = structural budget balance expressed as percent of potential GDP; BB = headline budget balance expressed as % of actual GDP. NGEU payments are expressed as percent of actual GDP. May 2021 European Commission forecast for 2019-2022 for SB and BB and for 2019-2025 for the output gap; pink: excessive deficit procedure; light blue: preventive arm with structural balance below the MTD; green: preventive arm with structural balance at or above the MTD [no fiscal adjustment requirement]. Regarding the time profile of NGEU, the Recovery and Resilience Facility time profile is included only in the submitted plans of Germany and Spain (among the five countries included in the table) and we use these time profiles. For the other components of NGEU in the cases of Germany and Spain, and all components of NGEU for the other three countries, we use the time profile derived from European Commission [2020a]; see Darvas [2020]. For NGEU loans, we consider the actual amounts requested by Italy and Poland.

percent debt benchmark of the EU treaties at the required pace. Thirteen countries would violate the 1/20th rule in at least one year under our flexible scenario. For countries with debt ratios over 100 percent of GDP, inconceivably large fiscal adjustments would be needed to meet this rule, with adverse impacts on output. We ignore the 1/20th rule because violations of this rule in the past decade did not lead to excessive deficit procedures as relevant factors were taken into account, such as the implementation of structural reforms.

- Sixth, Next Generation EU funds can substantially change the fiscal adjustment dynamics in some countries, depending on their precise treatment in the fiscal rules.
- Finally, we take the Commission's GDP and output gap estimates up to 2025 as given (and assume the 2025 growth rate for subsequent years), but obviously different fiscal adjustment paths have different impacts on GDP that we do not analyse. If the Commission's GDP scenario is consistent with our historical fiscal adjustment scenario, then our flexible scenario could result in (temporarily) faster growth. A key issue is if fiscal consolidation reduces the level of potential output or not¹³. We call for a growth-friendly consolidation strategy, and in particular, for increasing public investment, in which case fiscal consolidation might not have an adverse impact on potential output, implying that possible transitory GDP impacts would not undermine the interpretation of our scenarios.

Table 1 shows alternative scenarios for fiscal adjustment for the EU as a whole and the five most populous EU countries (results for the other EU countries, as well as the main assumptions for the simulations, are available in the Annex).

The expected significant reduction in the structural deficit from 2021 to 2022 mainly results from unwinding of pandemic-support measures. The European Commission expects the EU structural deficit to reduce from 5.8 percent of potential output in 2021 to 3.4 percent in 2022 (Table 1). This fiscal tightening is expected to result from the partial unwinding of the 2020-2021 discretionary expenditure measures (Figure A1 in the Annex)¹⁴.

Table 1 shows that substantial flexibility in the fiscal consolidation would be possible with the EU fiscal rules reinstated from 2023 and with NGEU further easing adjustment paths initially. In the EU as a whole, our flexible scenario implies 0.3 percent fiscal consolidation in 2023, 0.4 percent in 2024 and 0.5 percent in 2025. There are some differences between countries, but they do not change the overall picture. For example, in our flexible scenario, the fiscal consolidation effort that France would have to undertake from 2022 to 2023 would amount to 0.5 percent of GDP, reduced by 0.2 percent of GDP because of the increase in the transfer from NGEU from 2022 to 2023. In Italy, the increase in NGEU grants would even completely offset the fiscal consolidation need in 2023. If Germany and Poland invoke the structural balance clause already in 2023, as we assume in our flexible scenario, then practically no fiscal consolidation will be needed in 2023. Only Spain will face a sizeable fiscal consolidation in 2023 in our flexible scenario, because of the 0.5 percent adjustment required by the EDP, which would be reinforced by a 0.4 percent decline in NGEU grants. Yet we note that the time profile of NGEU payments planned by the Spanish government (which we use in our simulations) is heavily frontloaded and might be difficult to implement. Slower implementation in line with the Commission's 2020 assumptions (that we use for Italy and Poland, for example) would result in an increase in NGEU funding from 2022 to 2023, thereby reducing the impact

13 Fatás (2019) argued that a negative loop might have been at work after the global financial crisis in Europe: low GDP growth was seen as structural so potential output estimates were revised downwards, and this pushed policymakers to believe that further fiscal policy adjustments were needed. The successive rounds of fiscal contractions might then have caused further reductions in potential output, via hysteresis effects, that validated the initial pessimistic estimates.

14 Yet some of the COVID-19-induced discretionary expenditure measures and most of the discretionary revenue measures are expected to remain in place in 2022. This could help fiscal consolidation after 2022, because it should be easier to unwind crisis-support measures than to cut long-standing entitlements. One-off and other temporary measures were rather small in the past years and hence do not play a significant role in fiscal adjustments.

of the EDP-induced fiscal consolidation need in 2023. In summary, under a flexible interpretation of the existing fiscal rules, fiscal consolidation needs in 2023 would be rather small.

For most countries, a small increase in NGEU grants is also expected for 2024 (thereby partially compensating for the consolidation requirement under fiscal rules), but NGEU grant payments are expected to decline in 2025-2026, aggravating the impact of fiscal consolidation¹⁵.

Overall, fiscal deficits will have to be reduced gradually as the EU exits the 2020 recession, but substantial flexibility exists. Our simulations suggest that with a flexible interpretation of current rules, the fiscal consolidation requirement will be relatively small in 2023 in many EU countries, and further eased by grants from NGEU. Thereafter, fiscal adjustment will have to resume at or somewhat above 0.5 percent of GDP in countries that have not yet reached their MTOs.

5 Policy trade-offs

The central policy challenge for finance ministries in the coming years will be to consolidate deficits while increasing green investment. Evidence suggests that in the current fiscal framework, this will not be achieved because of political economy constraints. There are important reasons why politicians prefer cutting investment over current spending. First, in aging societies, the interests of future generations have less electoral support. Vote-maximising politicians are then likely to decide against the future, as seen in previous fiscal consolidation episodes. Second, fiscal rules disadvantage investments by treating them fully as current expenses, even though the benefits of investments accrue over long periods¹⁶. This biases the political economy further against investment. Basic accounting logic would allow net investments to be funded by deficits as they increase the stock of assets¹⁷.

We discuss three options for dealing with the trade-off between fiscal consolidation and increased green public investment:

- A general relaxation of EU fiscal rules;
- The introduction of a green golden rule;
- Centralised EU capacity to fund green investment, possibly via EU borrowing.

A general relaxation of the stringency of fiscal rules would not provide direct incentives to increase green public investment and would create risks of excessive deficits in good times. Our simulations suggest that a flexible interpretation of the existing fiscal rules would allow for a correction of deficits over several years. Combined with NGEU, the fiscal adjustment required during 2023 and 2024 would actually be small compared to previous consolidation episodes¹⁸. Less-stringent fiscal rules on deficit reduction do not, however, provide incentives to increase public investment. Additional fiscal resources could well be used for recurrent consumptive spending given the political economy reality. Going beyond existing flexibility in the fiscal rules would thus not necessarily increase green investment.

¹⁵ We discuss this further in Darvas and Wolff (2021).

¹⁶ Note that corporate accounting rules treat current spending and investment spending differently: the cost of an investment is not charged to a single year when the investment is implemented, but distributed over the service life of the capital good.

¹⁷ This evident point was already made by Blanchard and Giavazzi (2004).

¹⁸ One can, of course, debate whether slower or faster fiscal adjustment is advisable, given the state of the EU's economies. This is outside the scope of our note. For slower adjustment, a general revision of the fiscal rules would be necessary. Under the basic agreements of the EU's monetary union, however, fiscal consolidations are unavoidable.

The need to increase climate-related public investments should revive the discussion of a golden rule focusing on green investment

Allowing green investment to be funded by deficits that would not count in the fiscal rules would provide a positive incentive to maintain and increase green investment during the consolidation phase, because such investment would be excluded from the consolidation requirements.

Exempting investment spending from deficits as considered in the fiscal rules has been rejected in the past. The main reasons include the difficulty of defining what exactly constitutes ‘investment’ with positive future returns. It might create distortions, with favoured investments preferred over other forms of capital or current spending that might also be beneficial over the long run. There would be significant incentives to record current expenditure as capital spending. While we believe that these worries can be satisfactorily addressed with political will, the need to increase climate-related public investments should revive the discussion of at least a limited golden rule focusing on green investment. Of course, also in the case of green investment, there are problems defining exactly their scope but arguably less so thanks to the narrower goal of carbon emission reductions.

Good reasons justify deficit funding of green investment. The green infrastructure that is built will be used over decades and the net investment needs are massive. A rebuilding of the energy system and the transport infrastructure is a huge expense that simply won’t be funded from current budgets given the political-economy constraints. The climate investment need is so large that it has a macroeconomic dimension.

The impact of green investment on growth is uncertain. Investment in green technology can certainly create *economic growth opportunities* if new products are exported globally. In particular, efforts to create new technologies to address climate change are not only imperative from a climate perspective but also create substantial economic opportunities. Moreover, green investment can have positive multiplier effects in an economy of demand shortage¹⁹. On the other hand, green investment is often still more expensive than the brown alternative. Green infrastructure replaces brown infrastructure that might still operate for years with some sunk costs, an argument that led Pisani-Ferry (2021) to a pessimistic assessment of the growth effects. The strength of these various effects is hotly debated. Major additional green investments, as well as climate change, could also affect the real equilibrium interest rate, a variable of central importance for the sustainability of debt²⁰. While in the eyes of the European Commission, the Green Deal constitutes “*Europe’s growth strategy*”, the model results presented by the Commission are less clear-cut or even negative for growth²¹. We definitely see the need for more research on this question.

Failing to invest in climate *adaptation* in particular would entail substantial risks to output and livelihoods, as recent extreme weather has shown. As the frequency of extreme-weather events increases, their costs will become increasingly visible. There is so far no agreement on how big the costs will be. But there can be no doubt that extreme-weather costs have major implications for European societies, and policymakers need to invest in adaptation²².

19 Hepburn *et al* (2020) found that professional respondents to a survey were optimistic in particular about the multiplier effects of investment in infrastructure for connectivity and clean energy, and in clean research and development (R&D).

20 It is beyond the scope of this note to discuss this in detail but it is important to highlight that climate change could lower the real equilibrium interest rate, as highlighted in Bylund and Jonsson (2020). However, the major increase in required investment in the energy system that we document would suggest an increase in the real equilibrium interest rate.

21 Model simulations reported in Table 13 of European Commission (2020b) shows that the green deal could well have negative growth effects, depending on the modelling approach used and the accompanying policy measures.

22 A controversial literature tries to understand the implications of climate change for GDP. Especially given the increased likelihood of tipping points, previous economic cost estimates may underestimate the real cost of climate change; see for example Keen *et al* (2021). Kiley (2021) found that the effects of temperature on downside risks to economic growth are substantial. The costs of the 2021 fires in Greece, for example, are estimated to be substantial (<https://m.naftemporiki.gr/story/1759664/sobara-ta-egkaumata-stin-oikonomia-apo-tis-purkagies>) as are the costs of the 2021 floods in Germany and Belgium (<https://www.reuters.com/business/environment/berenberg-sees-2-3-bltn-reinsurance-losses-european-floods-2021-07-19/>).

Important policy trade-offs emerge in the case of a green golden rule, i.e. a rule that would exclude green public investment from the computation of the deficit and debt relevant for the fiscal rules. For reasons of economic logic and political economy, public green investment should be funded from government deficits. However, given the uncertain growth effects of green public investment, the debt sustainability question cannot be ignored. Investment in climate adaptation after the fires in parts of southern Europe is necessary, but will weigh on debt sustainability if funded via deficits.

One bold and certainly controversial policy option would be to centrally fund all EU climate expenditure, for example via a permanent dedicated NGEU-type borrowing mechanism. An advantage of such a fund would be the approval of national green investment plans by the Commission and the Council, thereby ensuring consistency with EU goals. However, such a fund would need to amount on average to 1 percent of GDP over the next decade(s) and would thus be much larger than NGEU. An important question would be whether or not such a fund would involve redistribution, similarly to the EU budget and NGEU. Since the EU budget and NGEU in particular are highly redistributive towards poorer countries, such an approach would provide financial support to countries with greater budgetary constraints. *But important arguments weigh against such an approach.* Unlike the immediate recovery from the COVID-19 recession, in which significant cross-border demand spillovers and risks of single market distortion justified a joint approach, no such demand spillovers exist for climate policies in the steady state. Moreover, the climate externality from one country's emissions is of trivial size for the rest of the EU, and the marginal benefit of additional climate spending is probably higher in low-income countries outside the EU. Finally, a permanent mechanism would represent a centralisation of fiscal policy that, while beneficial from a euro-area and EU perspective, is hardly politically desired nor backed by the current EU treaties.

6 Conclusions

During the upcoming fiscal consolidation phase, policymakers should be mindful of its pace and of the composition of public spending. An overly fast pace of fiscal consolidation, such as implemented after the 2007 global financial and subsequent euro crises, can adversely impact potential output and trigger a new recession and should therefore be avoided. In addition, policy makers should not only avoid cutting future-oriented spending such as investments in climate mitigation and adaption, but should increase such spending significantly. Political economy constraints have in previous consolidation episodes meant that expenditure cuts came at the expense of investment, education spending and R&D spending – despite pledges to the contrary. EU policymakers will need to do better this time if they want to achieve their climate goals and keep up spending for the future.

We recommend a 'green fiscal pact' composed of the following elements:

- Introduction of a green golden rule that excludes net green public investment from the deficit and debt calculations under the EU's fiscal rules;
- Beyond the new green golden rule and the most flexible application of existing fiscal rules, a further relaxation of deficit adjustment paths is not necessary;
- Fiscally weak countries should, for the moment, rely on NGEU for their green investment and cannot ignore risks to budget constraints;
- Incentivises for private investment through appropriate taxation and regulation.

A green golden rule would incentivise the necessary public investments in climate. Without the possibility of deficit funding, the EU will fail to achieve its goal of climate neutrality, and budget consolidation will come at the expense of investment because of political

economy constraints. Allowing deficit funding of net green public investments would – *de facto* – delay the budgetary consolidation in the coming years. This should support the macroeconomic recovery and contribute to the medium-term attainment of the European Central Bank’s inflation goal. However, given the uncertain growth effects of green investment, *we cannot in general recommend a further relaxation of deficit adjustment paths*. We do think, however, that existing flexibility should be used to the full. On the whole, some form of a green golden rule would usefully complement the existing fiscal framework. This would provide clear incentives for green public investment without opening the Pandora’s Box of increasing deficit funding in general²³.

For countries with greater debt-sustainability concerns, difficult policy trade-offs continue to exist and the application of a green golden rule needs to be handled more carefully. We do not assess here the actual fiscal sustainability concerns but would like to point out that *climate change may well tighten budget constraints in countries with already high debt levels because of its negative growth effects*. Ultimately, it is a political choice how to resolve this tension between green investment needs and budget constraints. NGEU goes some way in the direction of reducing the trade-off by directing European money at climate investments in fiscally less-strong countries. Only after NGEU expires, does the question of a green golden rule become relevant for these countries.

Finally, we would like to emphasise the need to ensure that private investment be incentivised through appropriate taxation and regulation, to reduce the bill to the public sector. Political instinct may be to avoid unpopular taxes on emissions while preferring to subsidise expensive investments. But this strategy would mean that decarbonisation will become more expensive and the negative growth effects might be larger because of the less-efficient approach chosen. And the fiscal costs would be higher and budgetary trade-offs more difficult.

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23 Accordingly, national fiscal rules that may be more binding would need to be adapted to allow for green investment in line with EU goals. On the controversial debate in Germany, see Hüther and Südekum (2020) and Feld *et al* (2021).

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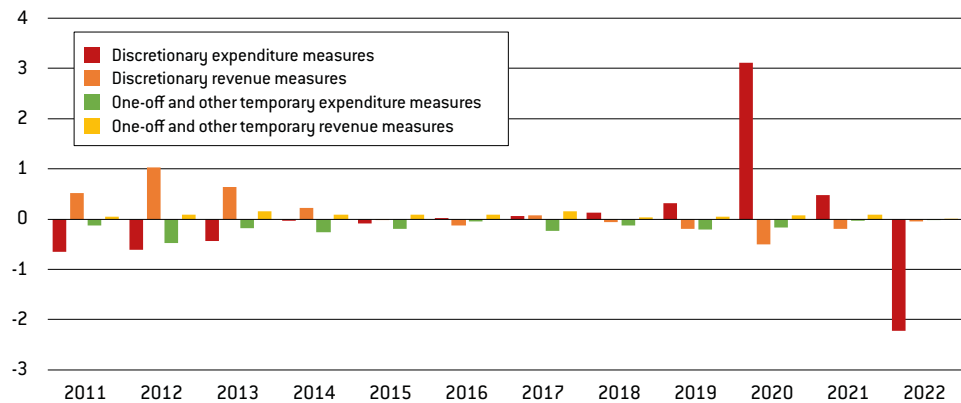
Annex

Table A1: Public expenditure adjustment after the global crisis, % change in constant price values from 2009 to 2013

	EU	Greece, Ireland and Portugal	Italy and Spain	NMS13	EU9
Primary expenditure	1.0%	-10.7%	-6.0%	1.3%	4.7%
Interest expenditure	1.3%	14.1%	24.9%	18.5%	-15.3%
Investment	-18.0%	-50.3%	-45.4%	-13.4%	-0.6%
R&D	-3.0%	-21.2%	-13.3%	24.0%	1.0%
Unemployment	-2.9%	7.9%	8.7%	-30.8%	-6.1%
Old age	7.4%	-4.5%	7.9%	9.0%	8.0%
Family, children, housing	-1.9%	-18.3%	-17.9%	-5.0%	1.9%
Education	-0.7%	-11.5%	-13.5%	-0.5%	4.8%
Health	1.2%	-23.7%	-9.2%	2.2%	7.4%
Environment protection	4.0%	5.8%	-6.1%	15.3%	7.2%
General services (general public services, defence, public order and safety, housing and community amenities)	-1.9%	-27.4%	-12.7%	-1.2%	5.2%

Source: Bruegel based on AMECO and COF0G datasets. Note: NMS13: EU members that joined in 2004-2013; EU9: AT, BE, DE, DK, FI, FR, LU, NL, SE. Current price values were deflated with the national GDP deflator. Country-group aggregates including non-euro countries were calculated with using a fixed exchange rate to the euro (the 2008-2020 average) in order to avoid exchange rate fluctuations in floating-rate countries impacting the values expressed in euros.

Figure A1: Discretionary and one-off measures in the EU (%GDP)



Source: Bruegel based on May 2021 AMECO dataset. Note: data refer to the current 27 EU countries.

Assumptions for our fiscal scenarios presented in Table 1 and Table A2

- We use the GDP and output gap forecasts and projections of the European Commission up to 2025, which assume a zero output gap for all countries from 2025 onwards, though a close-to-zero gap is forecast already for 2022 for some countries²⁴. We assume the 2025 growth rate for subsequent years (see our discussion on the interaction of fiscal consolidation and GDP growth in the main text).
- We assume no one-off fiscal measures from 2023.
- Historical scenario for excessive deficits: in the past decade, for several countries, the time allowed to correct an excessive deficit was three years and the required structural adjustment would have reduced the structural deficit to 2.5 percent of GDP.
- Flexible scenario for excessive deficits: the Treaty and the Stability and Growth Pact (SGP) legislation does not define an upper time limit for adjusting excessive deficits, while the SGP sets half a percent of GDP as the minimum adjustment. Thus, this scenario requires half a percent adjustment in the structural balance per year until the headline deficit falls below 3 percent.
- Historical scenario for the preventive arm: a country not yet at its MTO should reach it by implementing fiscal consolidation, depending on the economic situation and the level of public debt, according to a matrix endorsed by the February 2016 ECOFIN Council. For many instances in the past decade, the MTO had to be reached in four years. Given that the output gap is projected to be in the range of $\pm 1.5\%$ in 2023 in almost all EU countries, the matrix implies a 0.5 percent annual adjustment for countries with public debt below 60 percent of GDP, and more than 0.5 percent for countries with debt ratios above 60 percent. For the latter countries, we consider either 0.6 percent or more if that is needed to reach the MTO in four years.
- Flexible scenario for the preventive arm: this scenario considers the adoption of the structural reform clause, because all EU countries will implement major structural reforms according to their recovery and resilience plans²⁵. This clause can allow a temporary deviation from the adjustment path to the MTO by 0.5 percent of GDP in the first year of its application, which should be compensated for in subsequent years. However, one of the conditions of the adoption of the structural reform clause is that the maximum initial dis-

²⁴ Croatia, France, Germany, Latvia, Netherlands, Portugal, Slovenia and Spain.

²⁵ We do not consider the investment clause, because one of its conditions is that the negative output gap should be greater than 1.5 percent of GDP. According to the May 2021 European Commission projections, only Lithuania (-1.76 percent) and Luxembourg (-1.77 percent) are expected to have a larger than 1.5 percent of GDP negative output gap in 2023.

tance of the structural balance from the MTO is 1.5 percent of GDP, in order to ensure that in the benchmark case of an annual adjustment of 0.5 percent of GDP, the MTO can be achieved within the four-year horizon of the Stability or Convergence Programme. Thus, if this condition is not expected to be met in 2023, then for initial few years after 2023, we consider the speed as required by the matrix mentioned above. We assume the application of the structural balance clause in the first year when the gap to the MTO would be reduced to 1.5 percent or below, and thereafter assume 0.5 percent annual adjustment²⁶.

- For the three countries that are expected to exceed their MTOs in 2022 (Denmark, Luxembourg and Sweden) we assume that the 2022 structural balance remains unchanged in later years.
- The 2020 MTOs remain unchanged; thus, when a country reaches its 2020 MTO, no further fiscal consolidation is done.

Whenever the output gap is zero and there are no one-offs, the structural balance is the same as the headline balance. Thus, the change in the headline balance is driven by two main factors: the cyclical recovery (the change in the output gap multiplied with a country-specific elasticity) and the fiscal effort (the change in the structural balance). We assume that countries in which the headline budget deficit would exceed 3 percent in 2023 in the absence of fiscal effort are placed in an excessive deficit procedure (EDP). We simulate the development of the structural and headline balances under our scenarios and assume that an EDP ends when the headline balance falls below 3 percent. From that year, we continue our simulation by assuming our scenarios for the preventive arm, until the MTO is reached.

26 An example for our application of the structural reform clause: Austria's MTO is 0.5 percent deficit, so the clause could be applied when the structural deficit falls to 2.0 percent or below. According to our historical scenario, the Austrian structural deficit would evolve as: 2023: 2.3 percent, 2024: 1.7 percent, 2025: 1.1 percent, 2026: 0.5 percent. Consequently, Austria could apply the clause in 2024 with a 0.5 percent deviation, so in our flexible scenario, the structural deficit is assumed to be 2.2 percent instead of 1.7 percent in 2024. Thereafter, we assume the structural deficit is reduced by 0.5 percent in 2025, 2026 and 2027, while the remaining 0.2 percent gap to MTO would be eliminated in 2028.

Table A2: Fiscal adjustment scenarios for all EU countries

EU27		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
		1.3	-5.9	-3.1	-0.4	-0.3	-0.1	0	0	0	0	0	0	0	0	0	0
Historical scenario	SB	-1.1	-3.6	-5.8	-3.4	-2.8	-2.1	-1.5	-1.1	-0.8	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
	BB	-0.5	-6.9	-7.5	-3.7	-2.9	-2.2	-1.5	-1.1	-0.8	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
	SB	-1.1	-3.6	-5.8	-3.4	-3.1	-2.7	-2.2	-1.8	-1.4	-1.2	-1.0	-0.8	-0.6	-0.4	-0.3	-0.3
	BB	-0.5	-6.9	-7.5	-3.7	-3.3	-2.8	-2.2	-1.8	-1.4	-1.2	-1.0	-0.8	-0.6	-0.4	-0.3	-0.3
NGEU grants			0.0	0.5	0.5	0.6	0.6	0.3	0.2								
	NGEU grants+loans		0.0	0.7	0.8	0.9	0.8	0.4	0.2								
Austria	Output gap	2.1	-5.5	-3.2	-0.2	-0.1	-0.1	0	0	0	0	0	0	0	0	0	0
	SB	-0.6	-5.7	-5.8	-2.9	-2.3	-1.7	-1.1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	BB	0.6	-8.9	-7.6	-3.0	-2.3	-2.2	-1.7	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	SB	-0.6	-5.7	-5.8	-2.9	-2.3	-2.2	-1.7	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Belgium	Output gap	1.1	-6.3	-3.1	-0.9	-0.6	-0.3	0	0	0	0	0	0	0	0	0	0
	SB	-2.8	-5.6	-5.8	-4.4	-3.8	-3.1	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0	0
	BB	-1.9	-9.4	-7.6	-4.9	-4.1	-3.3	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0	0
	SB	-2.8	-5.6	-5.8	-4.4	-3.9	-3.4	-2.9	-2.3	-1.7	-1.6	-1.1	-0.6	-0.1	0.0	0	0
Bulgaria	Output gap	2.8	-3.2	-1.9	0.4	0.3	0.1	0	0	0	0	0	0	0	0	0	0
	SB	1.3	-2.5	-2.6	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	BB	2.1	-3.4	-3.2	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	SB	1.3	-2.5	-2.6	-2.0	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Croatia	Output gap	3.8	-5.5	-3.1	0.1	0.1	0.0	0	0	0	0	0	0	0	0	0	0
	SB	-1.4	-5.0	-3.2	-3.3	-2.8	-2.2	-1.6	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	BB	0.3	-7.4	-4.6	-3.2	-2.7	-2.2	-1.6	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	SB	-1.4	-5.0	-3.2	-3.3	-2.8	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Cyprus	Output gap	5.4	-1.9	-0.9	0.7	0.4	0.2	0	0	0	0	0	0	0	0	0	0
	SB	0.0	-4.7	-4.7	-2.4	-1.8	-1.2	-0.6	0	0	0	0	0	0	0	0	0
	BB	1.5	-5.7	-5.1	-2.0	-1.5	-1.0	-0.6	0	0	0	0	0	0	0	0	0
	SB	0.0	-4.7	-4.7	-2.4	-1.8	-1.7	-1.2	-0.7	-0.2	0	0	0	0	0	0	0
NGEU grants		1.5	-5.7	-5.1	-2.0	-1.5	-1.5	-1.2	-0.7	-0.2	0	0	0	0	0	0	0
	NGEU grants+loans			0.7	0.6	1.3	1.4	0.8	0.5								
				0.9	0.9	1.5	1.6	0.9	0.5								

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Czechia	Output gap	2.9	-4.4	-2.9	-0.7	-0.5	-0.2	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-0.8	-4.4	-7.5	-5.1	-4.2	-3.4	-2.5	-2.0	-1.5	-1.0	-0.75	-0.75	-0.75	-0.75	-0.75
		BB	0.3	-6.2	-8.5	-5.4	-4.4	-3.5	-2.5	-2.0	-1.5	-1.0	-0.75	-0.75	-0.75	-0.75	-0.75
	Flexible scenario	SB	-0.8	-4.4	-7.5	-5.1	-4.6	-4.1	-3.6	-3.1	-2.6	-2.6	-2.1	-1.6	-1.1	-0.75	-0.75
Denmark		BB	0.3	-6.2	-8.5	-5.4	-4.8	-4.2	-3.6	-3.1	-2.6	-2.6	-2.1	-1.6	-1.1	-0.75	-0.75
	NGEU grants		0.1	0.4	0.9	0.9	0.7	0.6	0.1								
	Output gap	0.7	-4.1	-3.3	-2.1	-1.4	-0.7	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	3.4	0.5	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Estonia		BB	3.8	-1.1	-2.1	-1.4	-0.8	-0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Flexible scenario	SB	3.4	0.5	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		BB	3.8	-1.1	-2.1	-1.4	-0.8	-0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	NGEU grants			0.2	0.2	0.1	0.1	0.0	0.0								
Finland	Output gap	2.8	-4.3	-4.5	-2.8	-1.9	-0.9	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.3	-2.8	-4.2	-2.1	-1.6	-1.1	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	0.1	-4.9	-5.6	-3.3	-2.4	-1.5	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Flexible scenario	SB	-1.3	-2.8	-4.2	-2.1	-1.6	-1.1	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
France		BB	0.1	-4.9	-5.6	-3.3	-2.9	-2.0	-1.1	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	NGEU grants			0.5	0.8	0.9	1.1	0.8	0.2								
	Output gap	0.3	-3.6	-2.3	-1.0	-0.7	-0.3	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.2	-3.4	-3.3	-1.5	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Germany		BB	-0.9	-5.4	-4.6	-2.1	-1.3	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Flexible scenario	SB	-1.2	-3.4	-3.3	-1.5	-1.4	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	-0.9	-5.4	-4.6	-2.1	-1.8	-1.1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	NGEU grants			0.1	0.1	0.3	0.3	0.2	0.1								
France	Output gap	1.8	-7.1	-2.7	0.1	0.1	0.0	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-3.3	-4.6	-6.7	-4.7	-3.9	-3.2	-2.5	-1.9	-1.3	-0.7	-0.4	-0.4	-0.4	-0.4	-0.4
		BB	-3.1	-9.2	-8.5	-4.7	-4.0	-3.2	-2.5	-1.9	-1.3	-0.7	-0.4	-0.4	-0.4	-0.4	-0.4
	Flexible scenario	SB	-3.3	-4.6	-6.7	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.4	-0.4	-0.4
Germany		BB	-3.1	-9.2	-8.5	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.4	-0.4	-0.4
	NGEU grants			0.2	0.2	0.4	0.4	0.5	0.3	0.2							
	Output gap	1.0	-4.8	-2.7	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	1.0	-1.8	-6.2	-2.5	-1.9	-1.3	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Germany		BB	1.5	-4.2	-7.5	-2.5	-1.9	-1.3	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Flexible scenario	SB	1.0	-1.8	-6.2	-2.5	-2.4	-1.9	-1.4	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	1.5	-4.2	-7.5	-2.5	-2.4	-1.9	-1.4	-0.9	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	NGEU grants		0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1							

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Greece	Output gap	-3.7	-10.8	-6.9	-2.1	-1.4	-0.7	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-2.0	-4.7	-6.6	-1.5	-0.8	-0.1	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
		BB	1.1	-9.7	-10.0	-3.2	-2.2	-1.1	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Flexible scenario	SB	2.0	-4.7	-6.6	-2.2	-1.6	-1.5	-1.0	0.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25
		BB	1.1	-9.7	-10.0	-3.2	-2.3	-1.8	-1.0	0.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Hungary	NGEU grants			1.5	1.2	2.7	3.0	1.7	1.0								
	NGEU grants+loans			2.6	3.1	4.4	4.5	2.4	1.0								
	Output gap	4.4	-3.9	-2.3	-0.4	-0.3	-0.1	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-3.9	-6.3	-4.3	-3.7	-3.1	-2.5	-1.9	-1.3	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-2.1	-8.1	-6.8	-4.5	-3.9	-2.5	-1.9	-1.3	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Ireland	Flexible scenario	SB	-3.9	-6.3	-5.7	-4.3	-3.8	-2.8	-2.7	-2.2	-1.7	-1.2	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-2.1	-8.1	-6.8	-4.5	-4.0	-3.4	-2.7	-2.2	-1.7	-1.2	-1.0	-1.0	-1.0	-1.0	-1.0
	NGEU grants			0.8	1.4	1.1	1.0	0.6	0.3								
	Output gap	0.0	-0.8	-0.5	0.1	0.1	0.0	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	0.5	-4.6	-4.7	-2.9	-2.3	-1.7	-1.1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Italy		BB	0.5	-5.0	-5.0	-2.9	-2.3	-1.7	-1.1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Flexible scenario	SB	0.5	-4.6	-4.7	-2.9	-2.2	-1.7	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	0.5	-5.0	-5.0	-2.9	-2.3	-1.7	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	NGEU grants			0.0	0.0	0.1	0.1	0.1	0.0								
	Output gap	0.6	-8.6	-4.8	-1.4	-1.0	-0.5	0	0	0	0	0	0	0	0	0	0
Latvia	Historical scenario	SB	-2.0	-4.9	-9.3	-5.1	-4.2	-3.4	-2.5	-1.8	-1.0	-0.3	0.5	0.5	0.5	0.5	0.5
		BB	-1.6	-9.5	-11.7	-5.8	-4.7	-3.6	-2.5	-1.8	-1.0	-0.3	0.5	0.5	0.5	0.5	0.5
	Flexible scenario	SB	-2.0	-4.9	-9.3	-5.1	-4.6	-4.1	-3.6	-3.1	-2.6	-2.0	-1.4	-1.3	-0.8	0.2	0.5
		BB	-1.6	-9.5	-11.7	-5.8	-5.0	-4.3	-3.6	-3.1	-2.6	-2.0	-1.4	-1.3	-0.8	0.2	0.5
	NGEU grants			0.6	0.5	1.1	1.3	0.7	0.4								
Lithuania	NGEU grants+loans			1.6	2.4	2.7	2.7	1.3	0.4								
	Output gap	2.6	-3.6	-3.0	-0.2	-0.2	-0.1	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.6	-3.3	-6.2	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-0.6	-4.5	-7.3	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Flexible scenario	SB	-1.6	-3.3	-6.2	-1.9	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Luxembourg		BB	-0.6	-4.5	-7.3	-2.0	-2.0	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	NGEU grants			1.0	0.8	1.6	1.8	1.0	0.6								
	Historical scenario	SB	-1.0	-6.7	-7.0	-5.0	-4.1	-3.3	-2.5	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	0.5	-7.4	-8.2	-6.0	-4.8	-3.7	-2.5	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Flexible scenario	SB	-1.0	-6.7	-7.0	-5.0	-4.5	-4.0	-3.5	-3.0	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0
		BB	0.5	-7.4	-8.2	-6.0	-5.2	-4.3	-3.5	-3.0	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0
	NGEU grants			0.7	0.6	1.2	1.3	0.7	0.4								
	Output gap	-1.0	-4.7	-3.2	-2.7	-1.8	-0.9	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	2.8	-1.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
		BB	2.4	-4.1	-0.3	-0.1	0.3	0.7	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Flexible scenario	SB	2.8	-1.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
		BB	2.4	-4.1	-0.3	-0.1	0.3	0.7	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	NGEU grants			0.0	0.1	0.1	0.1	0.0	0.0								

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Malta	Output gap	4.3	-5.6	-4.5	-2.1	-1.4	-0.7	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.7	-7.5	-4.5	-3.8	-3.2	-2.5	-1.9	-1.3	-0.6	0	0	0	0	0	0
		BB	0.4	-10.1	-11.8	-4.5	-3.5	-2.5	-1.9	-1.3	-0.6	0	0	0	0	0	0
	Flexible scenario	SB	-1.7	-7.5	-9.7	-4.5	-3.5	-3.0	-2.4	-1.8	-1.7	-1.2	-0.7	-0.2	0	0	0
		BB	0.4	-10.1	-11.8	-5.5	-3.8	-3.0	-2.4	-1.8	-1.7	-1.2	-0.7	-0.2	0	0	0
	NGEU grants			0.4	0.4	0.8	0.9	0.4	0.2								
Netherlands	NGEU grants+loans			2.6	3.1	4.4	4.5	2.4	1.0								
	Output gap	1.4	-3.7	-2.5	-0.2	-0.1	-0.1	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	0.8	-2.0	-3.4	-1.7	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	1.8	-4.3	-5.0	-1.8	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
	Flexible scenario	SB	0.8	-2.0	-3.4	-1.7	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
		BB	1.8	-4.3	-5.0	-1.8	-1.2	-0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Poland	NGEU grants			0.1	0.1	0.2	0.2	0.1	0.1								
	Output gap	3.6	-2.0	-1.2	0.7	0.5	0.2	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-2.5	-6.2	-3.9	-2.9	-2.4	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-0.7	-7.0	-4.3	-2.3	-2.0	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Flexible scenario	SB	-2.5	-6.2	-3.9	-2.9	-2.4	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-0.7	-7.0	-4.3	-2.3	-2.2	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Portugal	NGEU grants			0.7	0.5	1.1	1.2	0.7	0.4								
	NGEU grants+loans			1.0	1.1	1.6	1.6	0.9	0.4								
	Output gap	3.5	-5.6	-3.3	-0.2	-0.1	-0.1	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.2	-2.0	-3.2	-3.2	-2.5	-1.9	-1.2	-0.6	0	0	0	0	0	0	0
		BB	0.1	-5.7	-4.7	-3.4	-2.6	-1.9	-1.2	-0.6	0	0	0	0	0	0	0
	Flexible scenario	SB	-1.2	-2.0	-3.2	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.5	0	0	0	0	0
Romania		BB	0.1	-5.7	-4.7	-3.4	-2.8	-2.2	-2.0	-1.5	-1.0	-0.5	0	0	0	0	0
	NGEU grants			0.9	0.7	1.7	1.9	1.1	0.7								
	NGEU grants+loans			1.1	1.1	2.0	2.1	1.2	0.7								
	Output gap	1.6	-5.3	-3.6	-2.1	-1.4	-0.7	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-4.7	-7.5	-6.9	-6.4	-5.1	-3.8	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-4.4	-9.2	-8.0	-7.1	-5.6	-4.0	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Slovakia	Flexible scenario	SB	-4.7	-7.5	-6.9	-6.4	-5.4	-4.9	-4.4	-3.9	-3.4	-2.9	-2.9	-2.4	-1.9	-1.4	-1.0
		BB	-4.4	-9.2	-8.0	-7.1	-6.4	-4.9	-4.4	-3.9	-3.4	-2.9	-2.9	-2.4	-1.9	-1.4	-1.0
	NGEU grants			0.9	0.8	1.6	1.7	1.0	0.5								
	NGEU grants+loans			1.9	2.4	3.0	2.9	1.5	0.5								
	Output gap	2.4	-3.9	-1.4	0.8	0.6	0.3	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-2.3	-4.7	-6.0	-4.4	-3.7	-3.1	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Slovenia		BB	-1.3	-6.2	-6.5	-4.1	-3.5	-3.0	-2.5	-2.0	-1.5	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
	Flexible scenario	SB	-2.3	-4.7	-6.0	-4.4	-3.4	-2.9	-2.9	-2.4	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0
		BB	-1.3	-6.2	-6.5	-4.1	-3.7	-3.3	-2.9	-2.4	-1.9	-1.4	-1.0	-1.0	-1.0	-1.0	-1.0
	NGEU grants			0.9	0.7	1.6	1.8	1.0	0.6								
	Output gap	4.7	-3.4	-1.6	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-1.7	-6.7	-7.7	-4.7	-4.0	-3.2	-2.5	-1.9	-1.3	-0.7	-0.25	-0.25	-0.25	-0.25	-0.25
Slovenia		BB	0.4	-8.4	-8.5	-4.7	-4.0	-3.2	-2.5	-1.9	-1.3	-0.7	-0.25	-0.25	-0.25	-0.25	-0.25
	Flexible scenario	SB	-1.7	-6.7	-7.7	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.5	-0.25	-0.25
		BB	0.4	-8.4	-8.5	-4.7	-4.2	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.5	-0.25	-0.25
	NGEU grants			0.6	0.5	1.0	1.1	0.6	0.4								
	NGEU grants+loans			0.9	0.9	1.3	1.4	0.7	0.4								

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Spain	Output gap	1.8	-9.3	-5.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	-3.7	-4.9	-5.2	-4.3	-3.4	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0	0
		BB	-2.9	-11.0	-5.2	-4.3	-3.4	-2.5	-1.8	-1.2	-0.6	0	0	0	0	0	0
	Flexible scenario	SB	-3.7	-4.2	-4.9	-5.2	-4.7	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.5	0	0
		BB	-2.9	-11.0	-7.6	-5.2	-4.7	-3.7	-3.2	-2.7	-2.1	-2.0	-1.5	-1.0	-0.5	0	0
Sweden	NGEU grants		0.0	1.9	2.2	1.8	0.6	0.1	0.1								
	Output gap	-0.2	-4.8	-2.5	-1.4	-0.9	-0.5	0	0	0	0	0	0	0	0	0	0
	Historical scenario	SB	0.7	-0.4	-1.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		BB	0.6	-3.1	-3.3	-0.5	-0.3	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Flexible scenario	SB	0.7	-0.4	-1.9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
		BB	0.6	-3.1	-3.3	-0.5	-0.3	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	NGEU grants		0.0	0.2	0.2	0.2	0.1	0.0	0.0								

Source: Bruegel. Note: SB = structural budget balance. BB = headline budget balance. The output gap and the SB are expressed as percent of potential GDP, while the BB and NGEU are expressed as percent of actual GDP. May 2021 European Commission forecast for 2019-2022 for SB and BB and for 2019-2025 for the output gap. Light red: excessive deficit procedure; light blue: preventive arm at or above MTO (no fiscal adjustment requirement). Regarding the time profile of NGEU, the RRF time profile is included only in the submitted plans of Belgium, Czechia, Denmark, Estonia, Germany, Hungary, Spain and Sweden and we use these time profiles. For the other components of NGEU in the cases of these countries, and all components of NGEU for the other three countries, we use the time profile derived from European Commission (2020) – see Darvas (2020). For NGEU loans, we consider the actual amounts requested by Cyprus, Greece, Italy, Poland, Portugal, Romania and Slovenia.