A targeted golden rule for public investments?

A comparative analysis of possible accounting methods in the context of the review of the SGP

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Supporting EU economic governance scrutiny
A targeted golden rule for public investments?

Abstract

The Communication by the European Commission to reform the Economic Governance Framework offers welcome headspace for public investment, while avoiding the de jure adoption of a ‘targeted Golden Rule’ as this could conflict with national accounting conventions. However, even with this reform, EU-strategic goals for public investment risk to be missed once the Recovery and Resilience Facility (RRF) runs out. Making a RRF-like instrument a permanent feature of the EU’s fiscal landscape could be a way forward.

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<td>European Central Bank</td>
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<tr>
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<td>Excessive Deficit Procedure</td>
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<td>GDP</td>
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EXECUTIVE SUMMARY

The recent communication by the European Commission to reform the Stability and Growth Pact, an offshoot of the Economic Governance Review launched in 2019, is well timed as renewed calls on government budgets are likely to be made on the heels of massive fiscal support to cushion the impact of the pandemic and the energy supply crises. Crucially, the communication is a welcome effort to root the EU’s fiscal framework better in today’s realities and prospects, striking a better balance between the requirements of sustainable public finances, a (environmentally) sustainable economy and macroeconomic stabilisation.

According to the communication member states may qualify for exemptions from a prior agreed medium-term fiscal consolidation path to debt-finance public investment in the pursuit of the EU’s strategic goals (climate, digital, defence), if certain conditions are met. Specifically, the 3% deficit ceiling must always be respected while the ratio of debt to GDP, after an initial ‘adjustment period’ of four to seven years (depending on the initial debt ratio), possibly extended by up to three years, must remain on a downward path if it exceeds the 60% mark. The commitments to achieve a structural budget position that is ‘close to balance or in surplus’ in the medium run (the ‘Medium Term Objective’ or MTO) and to cut the public debt ratio to GDP to 60% within a twenty-year period (the ‘1/20th rule’) would be dropped.

A crucial novelty in the proposed framework is that the required pace of debt reduction is left unspecified, which leaves the door open to a sustained (as opposed to a temporary) increase in public investment to be debt-financed -- broadly in line with the tenets of a ‘targeted Golden Rule’ -- if the conditions continue to be met. While some observers have labelled this as a ‘weakness’, it may in fact be a strength. The corollary is, however, that member states that fall short of the 3% deficit constraint or fail to put debt on a downward path, would see some of their investment projects rejected. Unfortunately, as illustrated by the numerical simulations in this paper, many member states would be in the latter camp, unless the Commission is confident that structural reform will produce significantly stronger economic growth. As a result, the EU could miss its strategic goals.

This challenge may be less acute in the near term, owing to the availability of co-funding for public investment from the Recovery and Resilience Facility (RRF) consistent with the EU’s strategic goals. However, this source of funding is poised to dry up by 2027, while the EU’s strategic public investment goals are projected to run much longer. To secure the achievement of the EU’s strategic goals, easing the funding constraints for those member states most in need by making co-funding from the centre a permanent feature of the fiscal framework, would therefore be worth considering.

A mixed approach, whereby part of the public investment requirements in the pursuit of the EU’s strategic objectives is funded from the centre and the remainder is funded at the national level, would combine the advantages of both – i.e. limit the risk of underinvestment while containing moral hazard. Given the imminence of the EU’s strategic objectives, in particular to reduce its dependence on fossil fuels and further its climate goals, a way forward could therefore be to make the RRF a permanent feature of the EU’s fiscal landscape.
1. INTRODUCTION

The European Union’s fiscal framework is at a crossroads. In response to the pandemic the fiscal rules were suspended by the Council early 2020, with the intention to reinstate them when the worst was over, most likely in 2024. The Russian invasion of Ukraine, the ensuing energy crisis and uncertain economic outlook put this intention on hold. Instead, the Commission used this window to issue a far-reaching proposal for reform (European Commission 2022a) with the aim to root it better in today’s realities and prospects.

The Commission’s communication is an offshoot of the Economic Governance Review launched early 2020, just before the pandemic hit (European Commission (2020a), but obviously recent developments leave their mark on the proposal. Indeed, major calls on governments budgets are again likely to be made on the heels of massive fiscal support to cushion the impact of the pandemic and the energy supply shock. The ongoing energy crisis transformed the longer-term climate challenges into an acute need to lessen the dependency on fossil fuels. Calls to compensate households and businesses for surging energy prices add to demands for increased defence spending. The rebound in interest rates have raised concerns over the cost of debt, a concern further heightened by soaring inflation. Clearly, a new balance needs to be struck between the requirements of sustainable public finances and a sustainable economy.

From the debate in recent years many reform proposals have emerged, including to move away from a rules-based approach to ‘standards’ for fiscal sustainability and to create new borrowing capacity for governments to fund ‘strategic’ public investments via a ‘targeted Golden Rule’. According to the analysis in this paper the Commission’s bid heeds these proposals to a considerable extent, even if it does not include a \textit{de jure} Golden Rule. It has so far also steered clear from recommending co-funding of EU-strategic public investments from the centre on a permanent basis. Apparently, it does not want to mix these issues, intertwined as they may be from a fiscal sustainability perspective.

Against this backdrop, this paper takes the Commission’s communication as a starting point, with the focus on the degree to which it respects the basic tenets of a ‘targeted Golden Rule’ and whether enhancing the proposed framework by including the supranational level would be feasible or beneficial in the longer run. Section 2 discusses the Commission’s communication in some detail, including its enforcement and governance aspects, while Section 3 assesses the degree to which it can be branded as a ‘targeted Golden Rule’. Section 4 then considers the possibility of centralised debt funding of strategic public investments, and Section 5 concludes. The Annex presents the simulation model developed for this paper to produce the numerical illustrations.
2. THE COMMISSION COMMUNICATION

By invoking the ‘General Escape Clause’ stipulated in the Stability and Growth Pact (SGP) in case of an ‘unusual event outside the control of one or more Member States’, the full application of the fiscal rules were suspended at an early stage of the COVID-19 pandemic in 2020. The General Escape Clause is expected to be lifted in 2024, while the energy transition and security issues have become acute with the war in Ukraine at a time when fiscal deficits and debt already reached unprecedented heights in some member states. Therefore, it should not come as a surprise that on 9 November 2022 the European Commission (2022a) issued a sweeping proposal for a reform of the fiscal framework. Section 2.1 discusses the motivation for the proposal, and Section 2.2 spells out the proposed new rules in more detail. Section 2.3 then looks into the potential governance implications for these changes as perceived by the Commission.

2.1. Motivation

When the COVID-19 pandemic faded in early 2022 the economy was hit by another vast adverse shock, this time related to soaring energy prices and an overall drop in sentiment prompted by the Russian invasion of Ukraine. As a result, the economy is likely to have again entered a technical recession according to the latest forecast by the European Commission (2022c). This has further depressed the fiscal outlook, not least because it again prompted EU member states to adopt far-reaching income support measures to contain social hardship for those most hit and vulnerable. The Commission estimates the budgetary cost of these measures in the EU to average 1.2% of GDP in 2022 and in the range of 0.9 to 2% of GDP in 2023. Moreover, the Russian invasion of Ukraine led to pressure on member states to increase their defence efforts, as well as to reduce their dependency on natural gas from Russia -- all of which is bound to weigh on their public finances for an extended period.

A shown in Figure 1, only three member states (Denmark, Luxembourg, and Sweden) are expected to print a public debt ratio below 60% of GDP and a structural deficit below the required Medium Term Objective in 2022, while all other member states would breach one or both of these marks. Italy, in particular, would face a herculean fiscal challenge, with both its structural deficit and debt ratio massively exceeding these marks (Greece is also in this camp but can rely on conditional support via its ESM economic adjustment programme).

Figure 1: Public debt and structural deficits in 2022
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Against this backdrop it is not surprising that the Commission’s reform proposal aims to provide more fiscal leeway for member states. The Commission explicitly mentions the following three key motivations:

- Reinstatement of the existing fiscal rules, and an associated inevitable return to ‘fiscal austerity’, is not seen as realistic at this juncture, and indeed unlikely to be supported by those member states that have been hit most severely by the pandemic (Italy being a case in point) and/or the ongoing energy, security and refugee crisis;

- In view of the current fragility of the economic prospects, a return to fiscal austerity is seen as potentially backfiring, with the outlook for public finances perhaps even deteriorating rather than improving if budgets are cut (in this context the Commission points to a severe risk of ‘procyclicality’ of fiscal policy); and

- A return to fiscal austerity could jeopardise the achievement of the European Union’s own ‘strategic objectives’, such as climate neutrality (no net greenhouse gas emissions) by 2050 as stipulated by the European Green Deal, and the ‘digital transition’ of the EU economy), not least because the RRF is poised to expire by 2027.

The suggested changes in the rules embedded in the Commission’s Communication would be groundbreaking. While the 3% and 60% deficit and debt rules continue to play an important role in the framework, the requirement that member states commit to achieve a structural budget position that is ‘close to balance or in surplus’ in the medium run (the ‘Medium Term Objective’ or MTO for a structural deficit of at most 0.5% or 1% of GDP depending on their debt position) and to cut their public debt ratio to GDP to 60% within a twenty-year period (the ‘1/20th’ rule) would be dropped. These rules would be replaced with a more general commitment to put the debt ratio on a downward path towards the 60% mark in the long run, albeit subject to certain conditions, as explained below.

2.2. A shift from rules to standards

From the debate in recent years emerged a broad consensus that the emphasis in the fiscal framework should shift from rules to ‘standards’ for debt sustainability, leaving countries more freedom to apply these standards as deemed appropriate (Alloza et al 2021, Blanchard et al. 2021, Debrun and Reuter 2022, IMF 2022, Martin et al. 2021, Nielsen 2021, Thygesen et al. 2022). This shift is expected to improve the ‘ownership’ of, and therefore the compliance with, the thrust of the fiscal framework, a view that apparently is embraced by the Commission.

As noted, according to the communication both the ‘close to balance or in surplus’ (MTO) and the 1/20th rules would be dropped. This does not necessarily always lead to less stringency in comparison with the current framework, as this depends on the Commission’s judgment of the debt-sustainability situation. Still, it means that member states no longer would be expected to cut their structural fiscal deficit to a prior agreed reference value (at worst 0.5% of GDP if debt exceeds 60% of GDP or 1% otherwise, within an adjustment period of four years embedded in their ‘Stability and Convergence Programmes’), nor would they need to commit to cutting back their public debt ratio towards 60% of GDP within twenty years. Instead, the following provisions are proposed:

- In lieu of the ‘Stability and Convergence Programmes’, member states are expected to submit a new type of four-year programmes, labelled ‘Medium-Term Fiscal Structural Plan’;
Each member state is obliged to base its Fiscal Structural Plan on a prior agreed path for ‘structural net primary expenditure’, i.e. expenditure corrected for the business cycle and one-off items and net of debt interest payments and ‘discretionary changes of government revenues’ (read tax cuts), to be translated into annual expenditure ceilings during a four year adjustment period; and

This prior agreed path should be consistent with a declining debt ratio during the ten-year period after the adjustment period, while, in any event, the fiscal deficit must credibly remain below 3% of GDP both during the four-year adjustment period and the subsequent ten-year period.

The inclusion of a ceiling for structural expenditure heeds a long-standing recommendation by the European Fiscal Board (EFB), see Beetsma et al. (2018) with support from the European Central Bank (Hauptmeier et al. 2022). In principle this is still underpinned by an adjustment path for the structural primary balance, consistent with convergence of the debt ratio towards the 60% mark, but for surveillance purposes the focus will be on meeting the structural expenditure ceiling relative to GDP, thus retaining the room for cyclical fluctuations in the actual expenditure ratio also embedded in the current framework.

Importantly, the Commission’s communication contains two possible exemptions to the ‘debt must be declining after four years’ rule mentioned above (but not the 3% deficit rule):

- A member state whose debt ratio is higher than 60% of GDP, but lower than 90% of GDP, may qualify for an extension of the four-year adjustment period by up to three years, which effectively means that debt would need to be on a declining path only after seven years; and
- A member state that successfully submits a plan for public investment and structural reform, to be implemented during the adjustment period and in line with the above-mentioned EU strategic objectives, may qualify for a (further) extension of the adjustment period by (again) up to three years.

In any event, the declining path for the debt ratio to GDP towards 60% does not involve a deadline (unlike with the 1/20th rule). All that is required is that the debt ratio must be on a declining path during at least ten years after the adjustment period. As this commitment will be renewed with every future ‘Fiscal-Structural Plan’, the debt ratio would ‘asymptotically’ tend towards the 60% mark, though the pace of adjustment is flexible. According to some observers (Blanchard et al 2022) this source of flexibility would be a possible weakness of the proposed framework as it invites abuse, but as discussed below this need not be the case. In any case, as noted, the deficit remains subject to the 3% nominal deficit limit, and whenever this is (likely to be) breached within the Plan’s horizon, an adjustment will be required to correct it.

### 2.3. Enforcement and governance

The threat of sanctions continues to play a similar role as in the existing framework, with a few adjustments. Under the proposed framework, a deficit exceeding 3% of GDP in the projection underpinning the Fiscal Structural Plan triggers the ‘deficit-based’ Excessive Deficit Procedure (EDP) which may eventually lead to sanctions if the member state fails to correct this. Moreover, under the proposed rules, a ‘debt-based’ EDP¹ can be invoked if a member state fails to demonstrate credibly that

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¹ The European debt crisis in the early-2010s prompted a change in the rules with the possibility to open an EDP on the basis of the debt criterion (60% of GDP) under the so-called ‘Six Pack’.
its debt ratio is on a declining path from the end of the adjustment period onward, in which case its Medium-Term Fiscal Structural Plan is rejected. This can eventually culminate in sanctions as well, broadly in line with the existing debt based EDP.

To prevent sanctions as much as possible, and to secure a smooth adoption and implementation of the Structural Fiscal Plans, the communication contains several provisions for coordination and surveillance. Specifically:

- Each Plan must contain a baseline projection for the adjustment period and the ten years thereafter, approved by the Commission;
- The Plan may include an alternative projection based on a requested extension (if any) of the adjustment period to implement public investment, scrutinised by the Commission;
- This request must be underpinned by ‘appropriate and timebound reform and investment commitments’ and ‘supported by Debt Sustainability Analysis (DSA) carried out by the Commission covering the ten years after the (extended) adjustment period confirming that the debt ratio reverts to a downward path’;
- The ‘appropriateness’ of the ‘investment commitments’ is assessed by the Commission on multiple criteria, including the extent to which the investments have been vetted by other EU processes and accordingly incorporated in member states’ National Energy and Climate Plans (n the framework of the European Green Deal), National Digital Decade Roadmaps and, during the lifetime of the Recovery and Resilience Facility (until 2027), their National Recovery Plans – to ensure consistency with the EU’s strategic objectives; and
- As before, ultimately the Fiscal Structural Plans are either accepted or rejected (if the Commission issues a negative advise) by the European Council. In case of the latter, the Council may decide to launch an EDP if the member state concerned refuses to adjust its Plan.

The ‘European Semester’ – the annual cycle of economic and fiscal policy coordination in place since the adoption of the ‘Six Pack’ in 2011 – would remain the basic governance process. Moreover, as before, member states would be committed to incorporate their adopted Structural-Fiscal Plans in their Budgets for the duration of the adjustment periods.

A major difference with the existing procedure is that, whereas the Convergence and Stability Programmes could be renewed every year, renewal of the Fiscal Structural Plans is possible only once the adjustment period has expired after (at least) four years, barring exceptional circumstances. ² According to the Commission’s communication this serves to avoid credibility loss due to frequent revisions and extensions from which the current procedure has suffered. It is unclear if a change of government (after elections) would qualify as an ‘exceptional circumstance’. Be that as it may, there is nothing in the proposed rule book that would prevent member states to submit new investment projects for approval with each subsequent round of Fiscal Structural Plans. This is potentially an important feature of the communication, as discussed in the next section.

² This is worded as follows: ‘The plans would need to be translated in national budgets for the whole adjustment period, with the possibility for Member States to revise the plan only after a minimum period of four years.’ A clause is added that ‘The plan could be revised earlier in case of objective circumstances making the implementation of the plan infeasible, but would have to undergo the same validation process’.
3. A FIRST STEP TOWARDS A ‘TARGETED GOLDEN RULE’?

The Commission’s communication provides room for debt-financed public investment projects to the extent these qualify as ‘strategic’ vetted by the relevant EU processes. In this sense the communication at least to a degree relies on the basic tenets of a ‘targeted Golden Rule’. The extent to which this is the case is the subject of this section.

3.1. Rationales for a targeted golden rule

From the debate have emerged proposals to create new borrowing capacity for governments to fund ‘strategic’ public investments in line with the tenets of a ‘targeted Golden Rule’, see for instance Darvas and Wolff (2021) and (for the specific case of the Netherlands) Van den Noord (2021). The Commission’s bid heeds these proposals to an extent. However, it steers clear of using this terminology, perhaps because in a EU context the Golden Rule is often interpreted as meaning that public investment could be ‘taken out’ of the fiscal deficit and hence not tested against the relevant numerical limits, such as the -3% deficit norm – which is clearly not the intention of the Commission.

This ‘Euro-centred’ interpretation of the Golden Rule is not necessarily always inconsistent with the conventional definition of the Golden Rule, which states that current expenditure must be financed by taxes while public investments which carry a social or financial return could be financed by debt. However, these approaches are mutually consistent only if debt-financed public investment qualifies as investment in ‘financial’ or ‘non-produced’ assets such as loans, equity or real estate in the second-hand market (Eurostat 2013, 2019). As pointed out in Van den Noord (2020), only in those cases the outlays concerned can be reported as a ‘stock-flow adjustment’, hence ‘below the line’ and not included in the fiscal deficit.

In all other cases, however, debt-financed spending must be reported ‘above the line’ as part of the fiscal deficit. The upshot is that treating public investment (even if limited to projects that meet the criteria of the EU’s strategic objectives) below the line, may be contested before a national Constitutional Court or the European Court of Justice on the ground that national accounting rules are violated (Corti et al. 2022). Again, this is obviously not the route the Commission wants to go.

It could still be argued that public investments – be they financial or real – ought to be debt financed on the grounds that they create ‘capital’ that will ‘pay a return’. While sensible in principle, there are practical complications with this approach:

- The ‘social’ capital created by public outlays may be intangible and the associated outlays of the government may therefore not qualify as public investment in an accounting sense. This is, for instance, the case for the creation of ‘human capital’ through education expenditure. As pointed out by (Alcidi et al. 2022), the solution would be to treat education expenditure as an investment for the purposes of the fiscal rules, even if in an accounting sense this does not involve, or little, public investment;

- The return on this type of ‘social’ capital may not, or only partly, accrue to the government budget. Taking again the example of education expenditure, the pay-off for the government is mostly indirect – e.g. in the form of an increase in better paid employment and an associated increase in the tax take.

As also indicated by the example of education, though this holds equally well for the energy transition of defence expenditure, a promising rationale for debt financing of public investment is to frame it in terms of ‘intergenerational equity’. Indeed, it could be argued that the pay-off of public investment,
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however uncertain its exact size may be, accrues mostly to younger and future generations. It therefore would seem reasonable that at least some of the burden be borne by those generations. This would arguably call for a significant fraction of public investment (however defined) to be debt-financed, much in the spirit of the ‘targeted Golden Rule’ but without implying an undue violation of accounting conventions.

As noted in Van den Noord (2020), the intention of applying the principle of a ‘targeted Golden Rule’, however, cannot be to saddle future generations with a legacy of high debt, possibly leading to recurrent debt crises or an excessive tax burden unduly stifling their work incentives. A balance therefore needs to be struck between the requirements of intergenerational equity, financial stability, and economic efficiency. Hence it is important to ascertain that those public investment projects that are selected for debt financing are indeed most likely to earn a high future pay-off. This puts a heavy weight on the vetting procedures for public investments, as duly acknowledged by the Commission in its communication.

3.2. Nexus with the Commission communication

At a first reading the Commission’s communication seems to allow only for a temporary (not a permanent) easing of the path towards the 60% of GDP reference for public debt to finance public investment. However, as noted above, while the proposal prevents member states to demand a higher debt ceiling while a Fiscal Structural Plan is still running, this does not rule out the possibility for member states to submit new public investment plans for approval in next rounds of Fiscal Structural Plans, possibly (but not necessarily) prompted by a change in government or elections. Hence, while the reform proposal does not go as far as to raise the debt ceiling on a permanent basis in a de jure sense (as has been recommended by the European Stability Mechanism (Francová et al, 2021, Regling 2022), it does leave de facto room for a permanent increase in public investment to be financed by a permanent increase in debt – precisely as a ‘targeted Golden Rule’ would prescribe.

How this might pan out in practice is illustrated in Figure 2 for a hypothetical Structural-Fiscal Plan. The dark grey bars in the left-hand panel depict the projected development of the primary deficit (excluding cyclical effects and one-offs) according to the baseline projection, as approved by the Commission. The primary deficit is assumed to drop during the adjustment period of four years to a level consistent with a fall in the public debt ratio during the next ten years. The light grey bars depict the development of the (temporarily higher) primary deficit after inclusion of the approved investment projects. While the structural primary deficit is temporarily higher than baseline, it must revert to baseline at the latest by the seventh year of the (extended) adjustment period.

As noted, however, in a next round, after at least four years of the start of the going Plan, member states could be entitled to submit a revised Plan, possibly incorporating new investment projects, again calling for an extension of the adjustment period and postponement of debt reduction. In theory this could be repeated ad infinitum, as illustrated by the right-hand panel of Figure 2. The upshot is that the structural primary balance need never revert to its initial baseline path, and debt reduction would be indefinitely postponed. In fact, with each round, the starting point for debt would be higher than in the previous round. As a result, in the long run debt would trend up. Box 1 discusses the mechanics that underpin this assessment.

The catch, however, is that such a permanent increase in debt can only occur on the condition that the 3% deficit mark is never breached and/or does not lead to an explosive development of the debt ratio. As discussed in Box 1, even if the 3% deficit constraint is respected, an increase in borrowing for public investment may trigger a debt snowball under certain conditions, i.e. if the real interest rate persistently
exceeds the rate of economic growth. If confirmed by the Commission’s assessment, some of the investment projects will appropriately fail to qualify for debt financing, and public debt would have to revert to a downward path until eventually the 60% mark is reached. Therefore, only member states that are projected to stay within the 3% deficit mark and whose debt is assessed to be sustainable would be able to create additional structural fiscal room by a permanent increase in public debt. Member states that are unable to respect these conditions after adoption of debt-financed investment projects, in contrast, would see some of their investment projects scrapped.

**Figure 2**: Stylised succession of ‘Fiscal Structural Plans’

*Single public investment programme*  
*Repeated public investment programmes*

All considered, the proposed new framework could best be qualified as a ‘conditional targeted Golden Rule’. Member states who meet the aforementioned conditions (deficit below 3% of GDP, public debt ratio trending down to a sustainable level in the longer run) may be able to finance their ‘strategic’ public investments by additional debt, in line with the basic tenets of the targeted Golden Rule.

The fact that the pace of debt reduction required to qualify is left open in the Commission communication is seen by some observers as a weakness (Blanchard et al 2022), but it may in fact be its strength as it implies a possibility for member states who meet the conditions are able to finance the EU-strategic public investment on a durable basis. On the other hand, member states who fail to respect these constraints may be forced to finance their public investment plans by cutting other expenditures or miss their stated EU-strategic goals (climate, defence, digital). How serious this problem is depends on the actual numbers, as examined in the next subsection for the specific case of green public investment under the European Green Deal.
Box 1: Public investment and debt sustainability

According to the ‘targeted Golden Rule’ public investment may be financed by debt. However, to remain consistent with the proposed framework, application of the Golden Rule must respect the principle that debt remains sustainable in the longer run. This is illustrated by the diagrams in Figure 3, depicting the relationship between the change of the debt ratio $\dot{d}$ and its level $d$ for a given primary balance position $p$, real interest rate $r$ and real growth rate of the economy $g$, as determined by the dynamic accounting identity $\dot{d} = (r - g) d - p$ (see Annex).

The left-hand panel illustrates the situation for $r < g$, indicating that a permanent cut in the primary balance to fund public investment (however defined, see main text) raises the equilibrium (target) debt ratio $\bar{d} = \frac{p}{r - g}$ to a higher equilibrium level $\bar{d}'$. The debt ratio will automatically converge towards this new equilibrium. If it is lower than the actual debt ratio at the time when the assessment is made this will remain consistent with the ‘debt must trend down’ requirement embedded in the proposed framework.

The right-hand panel indicates what happens if $r > g$. In that case the primary balance $p$ must be in surplus to respect the debt target $\bar{d}$. The initial increase in the debt ratio entailed by a cut in the primary surplus will now trigger an explosive ‘debt snowball’, even if the initial debt target $\bar{d}$ is the same as in the left-hand panel. This clearly violates the ‘debt must trend down’ requirement embedded in the proposed framework.

These findings hold regardless of the adopted accounting method for public investment, i.e. ‘above the line’ or ‘below the line’. In the latter case public investment would be recorded as a ‘stock-flow adjustment’ instead of a cut in the primary balance, but this changes nothing to the implied debt dynamics (though it may ease the overall 3% deficit constraint). By contrast, public investment accompanied by deep structural reform that ‘earns’ enough economic growth could tilt the debt dynamics from explosive to sustainable.

Source: based on Codogno and Corsetti (2022).

Source: Author’s assessment.
3.3. A numerical illustration

The European Green Deal launched in 2019 aims to cut the emission of greenhouse gases by 50-55% by 2030, and to achieve strict climate neutrality (no net emissions of greenhouse gases) by 2050 (European Commission, 2019). The price tag attached to these ambitions is considerable: according to the European Commission’s initial estimate, the ‘green’ investment requirement in the European Union would amount to €260 billion, or about 1.5% of GDP, per annum. A more recent estimate (European Commission, 2020b,c) points to an even higher investment requirement.

It is not entirely clear what fraction of the total green investment requirement would be financed from the public purse. Baccianti and Steitz (2022), estimate this at 1.7% of GDP per annum. However, around 0.6 percentage point of this would be financed from the proceeds from carbon taxes, leaving a green public funding gap of 1.1% of GDP annually – broadly in the ballpark of another recent estimate by Darvas and Wolff (2021). This estimate of 1.1% of GDP is taken as a starting point here.

There are likely to be noticeable differences in the investment requirement between member states, reflecting their carbon emission levels. According to the World Bank the variation in CO2 emissions in metric tons per GDP is quite marked across countries. As shown in Figure 4, emission levels tend to correlate negatively with the cross-country variation in GDP per capita, which suggests that the poorest member states are the ones with the strongest need for green public investments.

**Figure 4**: Carbon emission versus per capita GDP

![Graph showing carbon emission versus per capita GDP](source: World Bank and AMECO)

As noted, the Commission communication implies that some member states may see their public investment plans rejected. To assess this risk for the case of ‘green’ public investment, a numerical simulation has been carried out with the model reported in the Annex. The methodology (see Annex) involves five steps:

- Using the average real rates of interest and economic growth over the period 1999-2021, and assuming that the debt ratio converges to 60% of GDP (or stabilises at its 2021 level if lower than 60%), the steady state levels for the primary and overall deficits are computed;
- Next, for member states where the overall deficit exceeds 3% of GDP in this simulation, the steady-state debt ratio is reduced by whatever fraction needed to cut the overall deficit to 3%
of GDP so to yield a valid baseline scenario (no adjustment is made if the deficit is smaller than or equal to 3% of GDP);

- It is assumed that each member state’s green public investment requirement is determined by its relative emission level, with the aggregate investment requirement adding up to 1.1% of GDP per annum for the EU as a whole;

- Subsequently, for each member state, the primary deficit is raised by the annual amount of ‘green’ public investment required to reduce carbon emissions in the pursuit of the EU’s climate goals. These amounts of ‘required’ green public investment are measured on the horizontal axis of in Figure 3; and

- Finally, the implied steady-state debt and deficits as a per cent of GDP are re-calculated, and whenever as a result of the increase in public investment the deficit appears to exceed 3% of GDP, or exceeds a level that is consistent with sustainable (non-explosive) public debt, the assumed amount of ‘approved’ green public investment is cut by as much as needed to respect the 3% deficit ceiling or debt sustainability requirement, which is shown on the vertical axis of Figure 5.

This simulation results shown in Figure 5 indicate that only a small number of member states – Denmark, Luxembourg and Sweden – would be able to finance the required investment to abate carbon emissions without breaching the 3% deficit limit or prevent explosive debt. All other member states, to varying degrees, would have to cut their plans.

**Figure 5**: Theoretically required and approved green public investment

![Diagram](image)

Source: Author’s computations, see Annex. Dots above the diagonal line indicate an increase in the approval rate.
The simulation results also indicate that the member states with the lowest per capita GDP may not necessarily be the ones that would see the bulk of their green investment plans pass the 3% deficit or debt sustainability test. The ‘approval rates’ (the fractions of the required green investment that can actually be implemented while passing the 3% deficit and debt sustainability tests) turn out to be generally higher for member states with a comparatively high per capita GDP (Figure 6).

Prominent examples of member states with low approvals of green public investment projects and per capita income are Greece, Portugal, Romania and Slovakia. There are a few outliers as well, such as Ireland where no room for public green investment would exist at all, which is paradoxically the result of its high average rate of economic growth and the associated high (but sustainable) baseline fiscal deficit. Another outlier at the other extreme is Bulgaria, whose approval rate is boosted by its low real interest rate and initial (and steady state) debt ratio. Even so, the overall finding is that poorer member states score less well in terms of the approval of green public investment plans according to the metric used here.

The above concern is compounded with another concern, which is that the member states with the highest carbon emissions per unit of GDP are not necessarily those that would see the bulk of their green investment plans pass the 3% deficit and debt sustainability tests either (Figure 7). A prominent example is Poland, which -- while being among the highest carbon emitters (per unit of GDP) in the EU -- would not see any of its required green investment approved against the 3% deficit rule. This is due to its comparatively high real rate of interest in the reference period 1999-2021, which again contrasts sharply with Bulgaria, also a high carbon emitter (relative to its GDP), but which has so far enjoyed a much lower real interest rate. The upshot is that there may be a disconnect between the approval rates of green public investment projects and relative emission levels, due to the 3% deficit and debt sustainability constraints.
All considered, it appears problematic to reconcile numerically the public finances contraints emanating from the proposals included in the Commission communication with the green public investment requirements identified by the European Green Deal. This problem is potentially compounded with the fact that the assessment of the public investment plans submitted by member states would rely to a large extent on discretion by the Commission. As argued by Blanchard et al. (2022), this may entail a tension with the stated objective of stronger national ownership, and thus further complicate the achievement of the green public investment goals.

These problems may be less acute for the first vintage of Fiscal-Structural Plans to be submitted in the years ahead, owing to the availability of co-funding from the Recovery and Resilience Facility (RRF), which ease the financing constraint to some extent, not least since the allocation of funds is tilted towards the ‘poorest’ member states. However, as noted by the Commission’s communication, this source of support is poised to dry up by 2027, so would provide only temporary relief. Yet the EU’s strategic public investment plans are projected to run much longer — in the case of the European Green Deal until carbon neutrality is attained by 2050. Making co-funding from the centre a permanent feature of the fiscal framework, allowing for distribution between member states and easing the funding constraints for those most in need, may therefore be worth considering, which is explored in the net section.

4. **PERMANENT CO-FUNDING FROM THE CENTER**

The provision of funding for member states through common bond issuance on an ad hoc basis in emergencies, such as for instance via the European Stability Mechanism (ESM) has been in place since around a decade. However, with the creation of the Recovery and Resilience Facility in 2020, for the first time in the history of the European Union, a fiscal capacity has been set up with a mandate to allocate an annual flow of funding to all member states in the form of loans or grants based on a statutory formula. This section looks at the rationales for such central funding, how these have shaped
the RRF, and how making (parts of) the RRF permanent could better secure the funding of public investment projects in the longer run.

4.1. **Rationales for central co-funding**

Public investment projects geared towards achieving the EU’s strategic objectives by their nature are subject to important economies of scope and scale as well as external effects, which can be fully exploited only if coordinated at the supranational level. But to move beyond coordination towards co-funding from the centre has frequently been advocated as well, (see Allianz Research 2022, Beetsma et al. 2020, Brachet 2022, Bruegel 2022, Codogno and Van den Noord 2020, Garicano 2022, D’Amico, L. et al. 2022, Van den Noord 2022), on the following grounds:

- The externalities associated with the cross-border spill-over effects, inherent to the challenges these objectives (climate neutrality for instance) aim to address, potentially entail a risk of under-investment if funding is left to the member states alone;
- The EU can borrow in the market at more favourable terms than high-debt member states, hence channelling public investment funding through a supranational budget may yield a substantial reduction in the cost of funding for them; and
- Centralised funding enables the redistribution of resources towards member states most in need of such investment and/or where fiscal constraints bite most, so as to get more ‘bang for the buck’.

A mixed approach, whereby part of the public investment that meets the needs of EU strategic objectives is funded from the centre and the remainder is funded at the national level, would combine the advantages of supranational funding listed above with containing the potential moral hazard associated with the provision of such funding (Van den Noord 2022). Prolonging parts of the RRF, to make it a permanent feature of the EU’s fiscal landscape, could do the trick.

4.2. **Prolonging the Recovery and Resilience Facility**

In the Summer of 2020, at an early stage of the pandemic, the Council adopted the unprecedented fiscal package ‘New Generation EU (NG-EU)’, aiming to avoid a collapse in aggregate demand and activity, promote structural reforms in the pursuit of robust and sustainable economic growth and achieve ‘strategic’ common policy objectives such as the energy transition and climate control.

The bulk of NG-EU funds are channelled through the Recovery and Resilience Facility (RRF), amounting to €750 bn (almost 5% of EU GDP) over the years 2021-2027 (European Commission 2022b). Each member state is entitled to demand grants and loans from the RRF based on a set of objective indicators such as per capita GDP and population size. Each member state, moreover, is constrained to allocate at least 37% of the loans and grants received to public investment targeted on achieving the EU’s climate goals.

Even though the green public investment need has never been part of the formula to determine the allocation of funding, Figure 8 reports for each member state the annual amount of RRF-funding allocated for green investment projects (assuming that the 37% goal is achieved), alongside the estimated annual required amounts of green public investment based on their carbon emissions.

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3 The corollary is that the cost of borrowing through the center would be more expensive for low-debt member states, thus introducing an element of redistribution. Only if the EU would agree to endow a central fiscal capacity with its own stable revenue base would bonds issued at the centre qualify as a genuine ‘safe asset’, hence reducing the cost of central funding for all (see for a recent discussion Bonfanti and Garicano, 2022).
identified in the previous section. As may be hoped, the member states with the lowest per capita GDP receive the highest amounts of grants and loans relative to their GDP, such as for instance Bulgaria, Greece and Hungary.

**Figure 8:** Green public investment covered by the Recovery and Resilience Facility

Source: Author’s computations, see Annex.

However, due to its design being geared towards compensating member states’ exposure to the COVID-19 pandemic, the allocation mechanism does not necessarily reflect member states’ green public investment requirements, as the correlation appears to be weak. Indeed, several outliers stick out, such as Germany, the Netherlands and Finland, member states that are hardly entitled to RRF-co-funding in line with their high per capita GDP yet portraying a high green investment requirement. If a EU climate fund were to be created, its allocation would ideally be based on a mix of member states’ carbon emissions and their per capita GDP, but this is not how the RRF has been set up (although the 37% fraction has been framed as a minimum, not a ceiling, so in practice outcomes may be more in line with the green investment requirements). Even so, the allocated loans and grants do help to ease the fiscal constraint on green public investment. By how much, is examined in the next subsection.

### 4.3. A numerical illustration

Again using the simulation model in the Annex, the approval rates of green public investment projects are re-computed assuming the availability of co-funding from the centre as presented in Figure 8 would be permanent. The computations are done in several steps:

- As before, for each member state, the baseline primary deficit is raised, relative to the baseline, by the annual amount of ‘green’ public investment required to reduce carbon emissions;

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4 The allocation key to fix the maximum possible amount for the grant component of the RRF per member state implies that 70% of the total of €312.5 billion available in grants, is allocated on the basis of the member states’ population, the inverse of their GDP per capita, and their average unemployment rate over the past 5 years (2015-2019), relative to the EU average. For the remaining 30%, the 2015-2019 unemployment rate indicator in the formula is replaced by the observed loss in real GDP over 2020 and the observed cumulative loss in real GDP over the period 2020-2021. Member States may also request a loan under the Facility. The maximum volume of loans for each Member State will not exceed 6.8% of its Gross National Income. However, an increase will be possible in exceptional circumstances subject to available resources.

• Next, the primary deficit is cut by the grants received from the RRF and its borrowing is split between loans taken from the RRF and ‘conventional’ borrowing, while the interest expenditure on debt is adjusted to reflect the (in most cases lower) real rate of interest on borrowing from the centre; and

• Debt and deficits are re-computed, and whenever a member state’s deficit exceeds the 3% of GDP ceiling, or debt is found to be explosive, its green public investment is cut by the amount needed to respect the 3% rule and/or the requirement of sustainable debt.

As depicted in Figure 9, the ‘approval rates’ of green public investment projects under this scenario generally increase significantly. Importantly, by far the largest increases in the approval rates would be achieved among member states with comparatively low levels per capita GDP (Greece, Hungary, Poland, Portugal, Romania, Slovenia and Slovakia), indeed a considerable improvement from the situation without co-funding from the centre. The number of member states that achieve a 100% approval rate of their green public investment plans would increase from four (Denmark, Estonia, Luxembourg and Sweden) to seven (Bulgaria, Croatia and Portugal join this group) – another considerable improvement.

Figure 9: Approval rate of green public investment with and without central funding

Source: Author’s computations, see Annex. The horizontal axis indicates the theoretical approval rates of public investment as reported in Figure 5, and the vertical axis indicates the revised approval rates when co-funding from the centre is available. Dots above the diagonal line therefore indicate an increase in the approval rates owing to the availability of co-funding from the centre.

All in all, co-funding from the centre – applying the allocation schedules currently in force for the RRF on a permanent basis – would considerably raise the odds of member states seeing their green public investment plans approved and qualify for a de facto increase of their steady state debt ratio along the lines of the mechanism illustrated in Figure 2 above.

This gives rise to the question by how much their steady state debt ratio would be allowed to increase, and what mix of debt to the centre and ‘conventional debt’ would emerge. A tentative answer is found in Figure 10 indicating that member states’ debt ratios would generally be slightly lower than without co-funding from the centre, helped by the generally lower cost of debt servicing on debt to the centre for high-debt member states. The amount of debt to the RRF would remain rather small however, averaging 4% of GDP for the EU as a whole. Even so, a few countries stand out by their significant level
of debt to the centre, amounting to well above 10% of GDP in the case of Greece, Italy and Portugal and close to 10% of GDP in the cases of Belgium, Spain and Croatia.

Supranational loans and grants need to be refinanced through debt issuance at the centre. The simulations assume that the yield on these bonds is the weighted average of yields on bonds issued by the member states themselves and that debt at the centre is rolled over indefinitely. Accordingly, Figure 11 reports how much gross debt would be on the RRF’s balance sheet in the steady state (16.6% of EU GDP) and its composition in terms of financial assets (3.7% of EU GDP) – which corresponds to the loans extended to the member states – and net liabilities 12.9% of EU GDP. This would thus still be of a rather limited size and perhaps a price well worth paying for the better achievement of the EU’s strategic public investment goals to further the climate transition. But, as always, this is ultimately a political call.

It needs to be stressed that this numerical exercise serves illustrative purposes only. In practice the outcomes strongly depend on macroeconomic developments, the actual allocation of RRF co-funding of green public investment (beyond the 37% floor) and a host of other developments and assumptions. For instance, relaxing the assumption that debt at the centre is rolled over and hence not repaid via contributions from the member states within a given timeframe would considerably change the picture. Even so, the message is clear: without co-funding by the centre there is a risk that the EU’s climate goals may not be achieved, an issue that will need to be addressed.

Figure 10: Mix of conventional debt and debt to the centre

![Figure 10: Mix of conventional debt and debt to the centre](source)

Source: Author’s computations, see Annex.

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5 This assumption is in line with findings for the cost of central funding by Bonfanti and Garicano (2022). As noted earlier, if the central fund would be endowed with its own stable revenue source the cost of central funding could be lower.
5. POLICY ISSUES AND RECOMMENDATIONS

The Commission’s recent communication to reform the economic governance framework is a commendable effort to shift the emphasis from ‘rules’ to ‘standards’ for debt sustainability. This leaves countries more freedom to match these standards as deemed appropriate to support the ownership of their fiscal commitments. However, it would also endow the Commission with more discretionary power to steer the orientation of fiscal policy at the national level. The extent to which this rebalancing of powers turns out to be acceptable to member states remains to be seen. A greater role for the European Fiscal Board (alongside the framework of EU national Independent Fiscal Institutions IFI’s) to provide additional checks and balances, could be worth considering in this context.

While the legal constraints of the 3% and 60% deficit and debt rules enshrined in the Treaty would remain in place, the MTO and the 1/20th rules would be dropped. Accordingly, instead of the present ‘Stability and Convergence Programmes’, member states would submit a new type of four-year programme, labelled ‘Medium-Term Fiscal Structural Plans’, incorporating a prior agreed path for ‘structural primary expenditure’ based on public investments and reforms vetted by other EU processes such as those related to the National Energy and Climate Plans, National Digital Decade Roadmaps and, during the lifetime of the Recovery and Resilience Facility (until 2027), their National Recovery Plans. This requires the coordination of these processes with the European Semester, the annual cycle of economic and fiscal policy coordination. In this context two major issues need to be tackled, which are the timing of the various processes involved (which are not always synchronised at present) and the format of reporting (with the budgetary implications of policies to be made consistent with national accounting standards).

The Commission’s Communication provides room for public investment projects to be debt-financed, hence relying on the basic tenets of a ‘targeted Golden Rule’. Importantly, the communication provides room for a permanent increase in public investment to be financed by a permanent increase in debt – precisely as a ‘targeted Golden Rule’ would prescribe. While this feature may be seen (and indeed in this paper is seen) as a commendable property of the proposed framework, it is hardly made explicit in

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Figure 11: Projected balance sheet of a permanent Recovery and Resilience Facility

Source: Author’s computations, see Annex. Total gross liabilities add up to 16.6% of EU GDP.

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the Communication. It would seem legitimate to encourage the Commission to do so for the sake of clarity and transparency of the discussion and decision making.

According to the Communication, member states that are unable to respect the 3% deficit rule or would fail to keep debt sustainable would see some of their investment projects scrapped and miss their stated EU-strategic goals (climate, defence, digital), or finance their ‘strategic’ public investments by cutting other expenditures. How serious this problem may turn out to be depends on the numbers. The numerical simulations reported in this paper suggest that only a small number of member states would be able to finance their required ‘green’ public investment without breaching the 3% deficit limit or keeping debt sustainable. The simulation results also suggest that the member states with the lowest per capita GDP may not necessarily be the ones that would see the bulk of their green investment plans pass the 3% deficit test, while there may also be a disconnect between the approval rate of green public investment projects and relative emission levels.

Hence the 3% deficit rule and debt sustainability requirement are found to act as binding constraints on member states’ achievement of their green public investment requirements in the long run. As a result, it appears difficult to reconcile the proposals included in the Communication with the green public investment requirements identified by the European Green Deal. This may be less acute for the first vintage of Fiscal-Structural Plans to be submitted in the years ahead, owing to the availability of co-funding from the RRF. However, this source of support is poised to dry up by 2027, while the EU’s strategic public investment plans are projected to run much longer. Making co-funding from the centre a permanent feature of the fiscal framework, allowing for distribution between member states and easing the funding constraints for those most in need, would therefore need to be considered.

A mixed approach, whereby part of the public investment that meets the needs of EU strategic objectives is funded from the centre and the remainder is funded at the national level, would combine the advantages of supranational funding listed above with containing the potential moral hazard associated with the provision of such funding. Making a RRF-like instrument, a permanent feature of the EU’s fiscal landscape could do that trick. According to the simulations reported in this paper, the ‘approval rates’ of for instance green public investment projects under this regime would increase significantly. Importantly, by far the largest increases in the approval rates would be achieved among member states with comparatively low levels per capita GDP. The approval rates could be raised further by endowing an RRF-like instrument with its own stable revenue source to cut its funding cost. By contrast, relying solely on contributions from the member states for its financing would be at the expense of higher funding cost (as risk premiums rise) and reduced fiscal space at the national level.

All in all, co-funding from the centre – applying the allocation schedules currently in force for the RRF on a permanent basis – would considerably raise the odds of member states seeing their EU-strategic public investment plans approved against the 3% deficit and debt sustainability tests and qualify for a de facto increase of their steady state debt ratio. Further increases in the approval rates could be achieved by converting the RRF into a genuine EU Climate Fund, with the allocation mechanisms better geared towards member states’ green investment needs. In addition, endowing this Fund with its own stable revenue flow (for instance part of the proceeds of an EU-carbon tax), could help to lower its cost of funding. Whatever its modalities, however, the message is clear: without co-funding by the centre there is a risk that the investment needs to reach the EU’s strategic goals may not be achieved, an issue that will need to be addressed in the, hopefully not too distant, future.

In sum, from the analysis in this paper the following recommendations emerge:
To offset the intended increase in discretionary power by the Commission embedded in the Communication, the role of external checks and balances should be strengthened, for instance by formally involving the European Fiscal Board;

The various EU processes involved with the achievement of the EU’s strategic goals (climate, digital, economic resilience) should be synchronised with the European Semester and their budgetary implications clearly quantified so as to facilitate fiscal coordination;

The Commission should clarify that the fiscal framework it has proposed in the Communication could imply, subject to certain conditions, a permanent increase in public debt to finance public investment, in line with the tenets of a ‘targeted golden rule’.

It should also make clear from the outset that, to be able to finance the public investment requirements emanating from the EU’s strategic objectives, the fiscal room created by the proposals included in the Communication needs to be complemented by cofunding from the centre;

Eventually, the Recovery and Resilience Facility should be converted into a permanent fiscal capacity, equipping it with allocation mechanisms geared towards achieving the EU’s strategic goals and endowing it with its proper tax base to lower its cost of funding.
A targeted Golden Rule for public investments?

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ANNEX: ANALYTICAL FRAMEWORK

This Annex discusses the simulation model and assumptions underlying the numerical results reported in the main text.

Definitions and symbols

The accounting items in the system are denoted by the following mnemonics (in alphabetical order):

- $A_t^j$: Stock of loans to the private sector held by the national government
- $C_t^j$: Loans issued by the national government to the private sector (or stock-flow adjustment)
- $D_t^j$: ‘Conventional’ debt issued by the national government
- $D_t^*: ‘Conventional’ debt issued by the national government in the baseline
- $E_t^j$: Debt owed by the national government to the center
- $F_t^j$: Net lending of the national government
- $F_t^*: Net lending of the national government in the baseline
- $H_t^j$: Grants from the center to the national government
- $H$: Aggregate grants from the center
- $I_t^j$: Public investment
- $K_t$: Debt issued at the center
- $L_t^j$: Loans from the center to the national government
- $L$: Aggregate loans from the center
- $P_t^j$: Structural primary balance of the national government
- $P_t^*: Structural primary balance of the national government in the baseline
- $\pi$: EU-average inflation rate.
- $\pi_j$: Country-specific inflation rate
- $r$: EU-average real interest rate
- $r_j$: Country-specific real interest rate
- $\rho_j$: Real interest rate on loans to the private sector by the national government
- $g_j$: Rate of economic growth
- $g_j^*$: Rate of economic growth, baseline

The subscript $j = BE, BG, \ldots, SE$ denotes the member state. For each accounting item $X_t^j$ its ratio to GDP is denoted as $x_j$ with as its equilibrium solution $\bar{x}_j$. This equilibrium may be stable, meaning that the variable concerned tends towards this level as the impact of shocks wanes, and may be denoted as a ‘steady state’. However, under certain conditions (see Box 1 in the main text) the equilibrium may be unstable, which has consequences for the deficit target (this may need to be cut to prevent explosive debt as explained below).
**Baseline projection**  
For each member state a baseline projection is constructed, and its equilibrium properties examined. The budget identities for the national government read:

\[ D_t^{*j} = (1 + r_j + \pi_j)D_{t-1}^{*j} - P_t^{*j} \]  
\[ F_t^{*j} = P_t^{*j} - (r_j + \pi_j)D_{t-1}^{*j} \]  

where \( r_j \) and \( \pi_j \) are the projected country-specific real interest and inflation rates. This gives the following equilibrium solutions for the overall and primary structural balances relative to GDP, \( f^{*j} \) and \( p^{*j} \):

\[ f^{*j} = -g_j^* - (g_j^* - r_j)d_j^* \]  
\[ p^{*j} = -g_j^* - (g_j^* - r_j)d_j^* \]  

where \( g_j^* \) is the projected baseline rate of growth of real GDP and \( d_j^* \) is the target to which the debt ratio to GDP should converge in the long run (60% of GDP), unless the debt ratio in 2022 is less than 60% in which case the ratio is assumed to converge to that (lower) level.

The two relationships in (3) are the well-known conditions for a sustainable debt ratio (see Kose et al 2017). However, in the framework proposed by the Commission the overall deficit \( f^{*j} \) must satisfy the additional condition that it cannot be lower than -3%. If that condition is not satisfied, a lower debt target is adopted consistent with a 3% fiscal deficit.

All data is taken from the latest issue of the Commission’s AMECO database (European Commission 2022c). The projected real economic growth and interest rates are fixed at their 1999-2021 averages while inflation is assumed to be 2%, in line with the price-stability objective of the European Central Bank (ECB). The real interest rate is the arithmetic mean of the short-term and long-term interest rates on government bonds.

Table 1 below contains the relevant data for the 1999-2021 period and the situation in 2022 while Table 2 contains the baseline projection based on the above assumptions and relationships. The required cuts in the structural deficit and debt ratios in the baseline relative to their 2022 levels are shown in Figure 11 and 12 at the end of this Annex.

**Including targets for public investment**

Public investment enters the framework as follows. The budget identities for the national government now read:

\[ D_t^I = A_t^I = (1 + r^I + \pi^I)D_{t-1}^I - A_{t-1}^I - P_t^I \]  
\[ P_t^I = P_t^{*j} + (\rho_j + \pi_j)A_{t-1}^I - (I_t^I - C_t^I) \]  
\[ A_t^I = A_{t-1}^I + C_t^I \]  
\[ F_t^I = P_t^I - (r_j + \pi_j)D_{t-1}^I \]  

where \( D_t^I - A_t^I \) indicates the government’s net debt (gross debt net of loans provided to the private sector) and \( I_t^I - C_t^I \) is the amount of public investment net of loans (so spent directly by the government). Note that the interest receipts on these loans \((\rho_j + \pi_j)A_{t-1}^I\) by accounting convention are included in the primary balance.
If $i_j$ denotes the country-specific targeted public investment (as a ratio to GDP) and this target is achieved, the steady-state primary balance $\bar{p}_j$, public debt ratio $\bar{d}_j$, stock of credit to the private sector $\bar{a}_j$, all as a ratio to GDP, are determined as follows:

$$\bar{d}_j = \frac{c_j - \bar{p}_j}{g_j - r_j}, \quad \bar{f}_j = c_j - (g_j + \pi_j)\bar{d}_j, \quad \bar{a}_j = \frac{c_j}{g_j + \pi_j}, \quad \bar{p}_j = \bar{p}_j^* + (\rho_j + \pi_j)\bar{a}_j - (i_j - c_j)$$  \hspace{1cm} (8)

where the assumed rate of economic growth is assumed to be a function of the size of the investment programme, such that:

$$g_j = g_j^* + \alpha i_j$$ \hspace{1cm} (9)

with the numerical value for the ‘growth multiplier’ $\alpha$ fixed at 0.2, broadly in line with estimates in the literature.

The initial projection for $i_j$ is based on the assumption that its aggregate of 1.1% of EU GDP (broadly corresponding to the target for ‘green’ public investment embodied in the European Green Deal) is distributed across member states according to their carbon emissions per unit of GDP in 2019, as explained in the main text. For simplicity credit to the private sector $c_j$ is assumed to be nil.

This system yields equilibrium solutions for debt, the overall primary balance, net lending and the stock of lending to the private sector. However, this is only an intermediary result, to be checked against two conditions that need to be met:

- Like in the baseline the deficit is constrained by the 3% limit, and if is exceeds that limit not all of the public investment projects may go through, meaning that $i_j$ is adjusted downward until the 3% deficit constraint is satisfied;
- The equilibrium must be stable (see Box 1 in the main text), which is not the case if the real interest rate exceeds the growth rate of the economy ($r_j > g_j$), implying that the public investment plans must be dropped to avoid explosive debt ($i_j = 0$).

The projections based on these assumptions and relationships are reported in Tables 3 and 4.

**Co-funding from the centre**

Including the possibility of co-funding from the centre the budget identities for the national government read:

$$D_t^j - A_t^j + E_t^j = (1 + r_j + \pi_j)D_{t-1}^j - A_{t-1}^j + (1 + r + \pi)E_{t-1}^j - P_t^j$$ \hspace{1cm} (10)

$$P_t^j = P_t^{ij} + (\rho_j + \pi_j)A_{t-1}^j - (l_t^j - C_t^j) + H_t^j$$ \hspace{1cm} (11)

$$A_t^j = A_{t-1}^j + C_t^j$$ \hspace{1cm} (12)

$$E_t^j = E_{t-1}^j + L_t^j$$ \hspace{1cm} (13)

$$F_t^j = P_t^j - (r_j + \pi_j)D_{t-1}^j - (r + \pi)E_{t-1}^j$$ \hspace{1cm} (14)

Equation (10) is the identity for the creation of net debt while equation (11) describes the primary balance as the sum of the baseline primary balance, grants received from the centre, the return on green loans to the private sector, less primary spending associated with new public investment. Equations (12) and (13) describe the laws of motion of loans to the private sector and loans from the centre to the national government. Equation (14) is the definition of net lending as the difference
between the primary balance and interest expenditure on debt (which now, comprises both conventional debt and debt owed to the centre).

The steady-state solutions read:

$$\bar{d}_j = \frac{c_j - \bar{p}_j + (r + \pi) \bar{e}_j - l_j}{g_j - r_j}, \quad \bar{a}_j = \frac{c_j}{g_j + \pi_j}, \quad \bar{e}_j = \frac{l_j}{g_j + \pi_j},$$

$$\bar{p}_j = \bar{p}_j^* + \left(\rho_j + \pi_j\right) \bar{a}_j - \left(i_j - c_j\right) + h_j, \quad \bar{f}_j = c_j - l_j - \left(g_j + \pi_j\right) \bar{d}_j$$  \hspace{1cm} (15)

The assumptions for loans and grants from the centre $l_j$ and $h_j$ are described in the main text and refer to the RRF loans and grants for the purposes of 'green' public investment.

A difference with the steady state without financing from the centre described by (8) is that loans from the center $l_j$ lead to a decline in conventional debt $\bar{d}_j$. Note also that grants from the center $h_j$ raise the primary balance (i.e. contribute to ease the government's fiscal constraint).

As before, whenever the overall deficit $-\bar{f}_j$ exceeds 3% of GDP or exceeds the baseline deficit while $r_j > g_j$, public investment $i_j$ is adjusted downward until these constraints are met. The results are reported in Tables 5 and 6. Note that even if the equilibrium is unstable ($r_j > g_j$), the member state concerned can see some of its public investment plans approved, financed by grants from the centre and a decline in debt servicing cost as 'conventional debt' is swapped for debt to the centre with a lower yield.

Finally, the budget identities for the fiscal capacity at the centre read:

$$K_t = (1 + r + \pi) K_{t-1} + H_t + L_t - (r + \pi) E_{t-1}$$ \hspace{1cm} (16)

$$E_t = E_{t-1} + L_t$$ \hspace{1cm} (17)

where for each variable $X_t$ in this system holds that $X_t = \sum_{j=1}^{n} X_t^j$. Hence the total loans and grants at the centre relative to EU GDP are defined as:

$$h = \sum_{j=1}^{n} \frac{Y_j}{Y} h_j, \quad l = \sum_{j=1}^{n} \frac{Y_j}{Y} l_j$$  \hspace{1cm} (18)

Total gross debt $\bar{k}$ and financial assets (outstanding loans) $\bar{e}$ at the center in the steady state are:

$$\bar{k} = -\frac{(r + \pi) \bar{e} + \bar{h} + \bar{l}}{g - r}, \quad \bar{e} = \frac{\bar{l}}{g + \pi}$$  \hspace{1cm} (19)

where $\bar{k} - \bar{e}$ are the net liabilities at the centre.
**Figure 12**: Structural deficit in 2022 and baseline equilibrium

Source: Author’s computations. Dots below the diagonal line indicate a cut in the deficit. The dotted horizontal line indicates the deficit ceiling of 3% of GDP.

**Figure 13**: Public debt ratio in 2022 and baseline equilibrium

Source: Author’s computations. Dots below the diagonal line indicate a cut in the debt ratio. The dotted horizontal line indicates the debt ceiling of 60% of GDP.
Table 1: Situation in 2022

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a Average of the period 1999-2021
b Structural

Source: Author’s computations, European Commission AMECO database Spring 2022.
Table 2: Baseline projection

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Source: Author’s computations.
### Table 3: Projection with ‘new’ public investment

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Source: Author’s computations.
Table 4: Projection with ‘new’ public investment (continued)

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Source: Author’s computations.
## Table 5: Projection with co-funding from the centre

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Source: Author’s computations.
### Table 6: Projection with co-funding from the centre (continued)

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*Source: Author’s computations.*
The Communication by the European Commission to reform the Economic Governance Framework offers welcome headspace for public investment, while avoiding the *de jure* adoption of a ‘targeted Golden Rule’ as this could conflict with national accounting conventions. However, even with this reform, EU-strategic goals for public investment risk to be missed once the Recovery and Resilience Facility (RRF) runs out. Making a RRF-like instrument a permanent feature of the EU’s fiscal landscape could be a way forward.

This document was provided by the Economic Governance and EMU scrutiny Unit at the request of the ECON Committee.