A QUANTITATIVE EVALUATION OF THE EUROPEAN COMMISSION'S FISCAL GOVERNANCE PROPOSAL

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In the new European Union fiscal framework proposed by the European Commission in April 2023, medium-term fiscal adjustment requirements would be determined by country-by-country debt sustainability analysis (DSA), the 3 percent deficit ceiling and simple rules requiring minimum deficit and debt adjustments ('safeguards'). These elements are controversial, with some EU countries (and ourselves) preferring a DSA-based approach, while others prefer to stick to simple rules. This paper evaluates the proposal by replicating the DSA methodology and computing fiscal adjustment implications for all EU countries with debt above 60 percent or deficits above 3 percent of GDP.

We find that the proposed framework would require ambitious fiscal adjustment: on average, more than 2 percent of GDP over the medium term, in addition to the adjustment that is already planned for 2023-24. However, for most high-debt countries, these requirements are below those implied by the current framework.

We also find that for most countries with debt above 60 percent of GDP, these adjustment requirements are driven by the DSA rather than the safeguards, but with significant exceptions. The main exception is France, for which the 'debt safeguard' – which requires debt to fall within four years – imposes much higher fiscal adjustment than the DSA. If the adjustment period were to be extended from four to seven years (as is possible under the framework for countries that submit growth-enhancing reform and investment plans), the safeguards would also be binding for several other countries. In addition, a requirement to reduce the deficit by at least half a percent per year if it exceeds 3 percent of GDP could become binding *ex post*, in response to output shocks, even if countries implement the fiscal adjustment required *ex ante*.

Finally, we find that while the Commission's DSA methodology is reasonable, it would benefit from review. This should be done by an independent expert group in consultation with the Commission, member states and other stakeholders, and endorsed by the Council. We recommend the endorsement of the Commission's proposal after ambiguous aspects are clarified, the debt safeguard and other safeguards are removed or modified, the excessive deficit procedure is reformed to avoid procyclical adjustment, and a process for reviewing the DSA methodology is put in place.

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1 Introduction

On 26 April 2023, the European Commission published a legislative proposal on reform of the economic governance of the European Union. In line with ideas first communicated in November 2022 (European Commission, 2022), the core proposal is to require EU member states to establish medium-term fiscal-structural plans using debt sustainability analysis (DSA), and to implement these plans by enacting a set of binding net expenditure ceilings. Unlike the November outline plan, however, the April proposal stipulated that fiscal adjustment in all countries with debt higher than 60 percent or deficits higher than 3 percent must comply with a set of additional constraints. These require the debt-to-GDP ratio after four years to be lower than at the beginning, expenditure growth to be slower than GDP growth during this period and the speed of adjustment to be at least 0.5 percent of GDP per year as long as the deficit exceeds 3 percent. These 'safeguards' were a concession to Germany and other countries, which were concerned that the Commission's initial ideas on debt reduction were insufficiently ambitious, and that the proposed DSA-based approach would give the Commission too much discretion, making it vulnerable to politically motivated manipulation[1].

Although the Commission's April proposal was an attempt at compromise, it remains unclear whether member states will back it. On one side are the critics of the DSA-based approach, who argue that the safeguards offered by the Commission are too lax[2]. On the other side, there are concerns that the Commission may have conceded too much, adding a set of country and time-invariant debt and deficit reduction requirements that undermine the main point of the proposal: to use country-specific analysis to establish how fast debt needs to come down in each case (Reichlin, 2023; Pench, 2023).

Here, we present a quantitative analysis to help decide whether these concerns are justified or not. The goal is to answer four questions:

1. What are the fiscal adjustment requirements implied by the proposed methodology for all EU countries with debt above 60 percent or deficits above 3 percent?

2. Which elements of the proposed methodology drive the adjustment requirements? Would the debt and deficit reduction safeguards envisaged in the April legislative proposal be binding, in the sense that they would require more stringent adjustment than what would be required if the adjustment plans were based solely on the Commission's DSA and the need to reduce deficits to below 3 percent by the end of the adjustment period?

3. How does the fiscal adjustment and debt reduction that would be prescribed by the European Commission's proposal compare to fiscal adjustment and debt reduction prescribed by the current fiscal rules?

4. Based on the answers to the first three questions, is there a need to reconsider certain elements of the legislative proposal and the DSA methodology?

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[1] See for example Jorge Liboreiro and Lauren Chadwick, 'Fiscal rules: Germany and the Netherlands push for minimum debt reduction targets for EU countries', *Euronews*, 11 April 2023, https://www.euronews.com/my-europe/2023/04/11/fiscal-rules-germany-wants-binding-debt-reduction-targets-for-eu-countries.

[2] See Federal Ministry of Finance, 'Op-ed by German Finance Minister Christian Lindner and other European finance ministers on the reform of Europe's fiscal rules', https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press_Room/Namensartikel/2023-06-15-reform-of-europes-fiscal-rules.html, signed by the finance ministers of Austria, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Germany, Latvia, Lithuania, Luxembourg and Slovenia.

We answer the second question from both *ex-ante* and *ex-post* perspectives. The *ex-ante* perspective checks if the expected debt and deficit paths that follow from the Commission's debt-sustainability requirements are consistent with the debt and excessive deficit safeguards. The *ex-post* perspective refers to the possibility that even when the deficit safeguard is satisfied *ex ante*, it might be breached *ex post* if an output or an interest rate shock pushes the deficit above 3 percent. The question is how likely this outcome might be, and how much extra adjustment it would require.

Although our main purpose is to assess the fiscal adjustment implications of the European Commission's proposal *based* on the Commission's methodology, rather than to evaluate the latter, applying the Commission's DSA methodology inevitably sheds some light on its technical assumptions. To the extent that these merit discussion, we raise them briefly in the paper, and in more detail in an annex[3].

Section 2 describes the Commission´s proposal and the methodology we use to compute the quantitative implications of the proposal. Section 3 presents the fiscal adjustment that countries with debts above 60 percent of GDP and/or deficits above 3 percent of GDP would be required to undertake, and checks whether the debt and deficit safeguards are binding *ex ante*. We also check the likelihood that the excessive deficit procedure might be triggered *ex post* as a result of unfavourable growth and/or interest rate shocks. We next compare the fiscal adjustment that would be required by the proposed framework with that required under the current fiscal rules. Section 4 presents some observations on the Commission's DSA methodology, and section 5 concludes.

2 Methodology

The European Commission's April 2023 proposal to replace the current EU fiscal framework comprises two regulations and one directive.

- The main reforms are contained in a proposed regulation "*on the effective coordination of economic policies and multilateral budgetary surveillance and repealing Council Regulation (EC) No 1466/97*" (European Commission, 2023a), which would replace the 'preventive arm' of the current Stability and Growth Pact.

- A proposal *"amending Regulation (EC) No 1467/97 on speeding up and clarifying the implementation of the excessive deficit procedure"* (European Commission, 2023b). This would abolish the '1/20th rule', which requires countries with debt above 60 percent of GDP to reduce their debts by at least 1/20th of the difference between its debt ratio and 60 per year. It would also refocus the existing 'debt-based' excessive deficit procedure (EDP) on departures from the fiscal path agreed with the Council under the regulation replacing the preventive arm. However, the 'deficit-based' EDP would remain largely unchanged. In particular, there would be a continued requirement that *"for the years when the general government deficit is expected to exceed the reference value, the corrective net expenditure path shall be consistent with a minimum annual adjustment of at least 0.5% of GDP as a benchmark"*[4].

- Finally, a proposal for a directive *"on requirements for budgetary frameworks of the Member States"* (European Commission, 2023c) aims mainly to strengthen national-level independent

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[3] In a follow-up paper, we will explore how sensitive the empirical results are to these assumptions and will recommend some improvements.

[4] Net expenditure is defined as government expenditures minus (1) interest expenditures, (2) expenditures on EU programmes fully matched by EU funding, (3) cyclical elements of unemployment benefit expenditures, (4) increases in net revenue attributable to discretionary revenue measures.

fiscal institutions and medium-term budgetary frameworks, in part to bring them in line with the requirements of the fiscal governance framework proposed in European Commission (2023a).

This paper focuses on the fiscal adjustment that the first regulation (European Commission, 2023a) would require of countries with debt or deficits above the treaty benchmarks of 60 percent and 3 percent of GDP. The regulation lays out a process, envisaged to happen every four years, in which:

1. The Commission would publish a *"technical trajectory for net expenditure covering a minimum adjustment period of four years"* for all EU countries with debt or deficits above the treaty benchmarks of 60 percent and 3 percent of GDP[5];

2. After a *"technical dialogue"* with the Commission, all EU countries (including those with debt below 60 percent of GDP and deficits below 3 percent of GDP) would submit a *"national medium-term fiscal-structural plan"*. These would include a net expenditure trajectory covering at least four years and fiscal-structural measures that underpin the proposed fiscal path. Countries would discuss their proposed paths with the Commission. The adjustment period could be extended from four to seven years if the country commits to a set of specific, verifiable reforms and investment measures which *"taken together"* are growth enhancing, support fiscal sustainability, address common priorities of the Union, address relevant country-specific recommendations addressed to the country, and increase the medium-term level of public investment (European Commission, 2023a, Article 13);

3. The Commission assesses the national medium-term fiscal-structural plan based on a set of criteria and makes a recommendation to the Council. Based on this, the Council may endorse the plan or ask for a revision.

The technical trajectory needs to comply with six criteria (Annex I of European Commission, 2023a):

"For Member States having public debt above the 60% of GDP reference value or government deficit above the 3% of GDP reference value, the technical trajectory shall ensure that:

> a) *by the end of the adjustment period, at the latest, the 10-year debt trajectory in the absence of further budgetary measures is on a plausibly downward path or stays at prudent levels;*
>
> b) *the government deficit is brought and maintained below the 3% of GDP reference value in the absence of further budgetary measures over the same 10-year period;*
>
> c) *for the years that the Member State concerned is expected to have a deficit above the 3% of GDP reference value, and the excess is not close and temporary, the technical trajectory is also consistent with the benchmark referred to under Article 3 of Council Regulation (EC) No 1467/97 on speeding up and clarifying the implementation of the excessive deficit procedure as amended by Regulation [X];*
>
> d) *the adjustment effort is not postponed towards the final years of the adjustment period, that is to say the fiscal adjustment effort over the period of the national medium-term*

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[5] For countries with a deficit below 3 percent of GDP and public debt below 60 percent of GDP, the Commission will compute the structural primary balance required to continue to respect these reference values without any additional policy measures over a 10-year period after the end of the national fiscal-structural plan. We do not analyse these countries in this paper.

> *fiscal-structural plan is at least proportional to the total effort over the entire adjustment period;*

>   e)   *the public debt ratio at the end of the planning horizon is below the public debt ratio in the year before the start of the technical trajectory*

>   f)   *national net expenditure growth remains below medium-term output growth, on average, as a rule over the horizon of the plan."*

We refer to (a) as the 'DSA-based requirement', (b) as the 'deficit benchmark requirement', (c) as the 'excessive deficit safeguard', (d) as the 'no-backloading safeguard', (e) as the 'debt safeguard' and (f) as the 'net expenditure growth safeguard'. The wording of several of these safeguards is ambiguous (explained in detail in section 2.2). Note that these criteria apply to all countries with debt <u>or</u> deficits above the treaty benchmarks of 60 percent and 3 percent of GDP. Hence, the debt safeguard applies even to countries with debt below 60 percent of GDP when their deficit exceeds 3 percent of GDP.

Although the European Commission is required to assess the first five of the six conditions when presenting its recommendation to the Council (Article 15 of European Commission, 2023a), EU countries must observe only conditions (a) and (b) when submitting their medium-term fiscal-structural plan (Article 12). Hence, there is a tension between the requirements that the EU countries must observe and that the Commission must observe. We return to this issue in the concluding section.

The remainder of this section explains how we attempt to quantify the impact of the six conditions on the fiscal adjustment that would be expected from countries that exceed the debt or deficit benchmarks.

2.1 Applying the DSA-based requirements

Annex V of European Commission (2023a) states that the requirement that *"the public debt ratio is put or remains on a plausibly downward path, or stay at prudent levels"* should be interpreted in light of the medium-term methods applied in the Commission's Debt Sustainability Monitor 2022 (DSM; European Commission, 2023d). This uses the structural primary balance (SPB) as the main measure of fiscal adjustment. This means that the DSA-based requirement involves setting the SPB at the end of the adjustment period such that the projected debt ratio meets two conditions. First, it must continuously decline (or stay at prudent levels) for 10 years under the deterministic scenarios described in the DSM. Second, the debt ratio at the end of the adjustment period must exceed the debt ratio five years after the adjustment period with sufficiently high probability, as assessed by the Commission's stochastic analysis[6]. We refer to the resulting structural primary balance as the SPB*.

While the 2022 DSM is very transparent about its methods[7], it does not answer all questions that are important to the application of those methods in the context of the economic governance review[8]. To

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[6] Annex V mentions only Article 8 of the proposed regulation, which deals with the technical trajectory, but does not mention Article 15 dealing with the national fiscal-structural plan. This creates uncertainty about whether plausibility will be assessed in the same way for the fiscal-structural plan and for the technical trajectory. We assume that the same method will indeed be applied to both the technical trajectory and the assessment of the national fiscal-structural plan.

[7] See particularly section 2.1 of the 2022 DSM, describing stress scenarios; Annex A1, describing the probability thresholds used in the stochastic analysis; Annex A3, explaining how interest rates are projected, and Annex A4, describing how the stochastic analysis is conducted (European Commission, 2023d).

[8] In particular: exactly how the costs of ageing are incorporated, exactly how some of the stress tests are applied to the setting of the proposed fiscal governance framework, how outliers are dealt with for the purposes of estimations underlying

close these gaps, we made our own assumptions, checking subsequently with Commission staff that these were in line with the Commission's (see Annex 2 for details)[9]. Furthermore, the analysis requires projections about future nominal growth (inflation and real growth), since this determines the denominator of the debt ratio, and about interest rates, which influence its numerator. We are grateful to the Commission staff for providing us with annual growth and inflation projections. With respect to interest rates, we used market-based projections, trying to stay as close as possible to the Commission's methods and sources. Box 1 provides further detail[10].

In addition to reflecting growth and interest rate projections, the DSA requirement reflects the expected fiscal costs of ageing over a 10 year horizon after the end of the adjustment period, as follows. The SPB after the adjustment period is assumed to remain unchanged at the level of SPB*, except for ageing-related changes. As a result, countries for which the costs of ageing are projected to worsen in the 10 years after the adjustment period are required to create the fiscal space to absorb those costs by the end of the adjustment period (as opposed to adjusting as these costs arise). Conversely, countries for which ageing-related fiscal costs are projected to decline in the 10 years after the adjustment period are allowed to adjust correspondingly less, rather than benefiting from the fiscal space that is freed up by declining ageing-related costs only at the time when the declines are realised. Hence, projected aging costs in the 10 years after the adjustment period influence SPB*. This turns out to be of first-order importance for the results, as there are large variations between EU countries both in the level of, and projected changes in, costs of ageing during the 10-year period that is relevant for the determination of SPB (Figure 1).

Figure 1: Costs of ageing in selected EU countries, 2020-2050, % of GDP
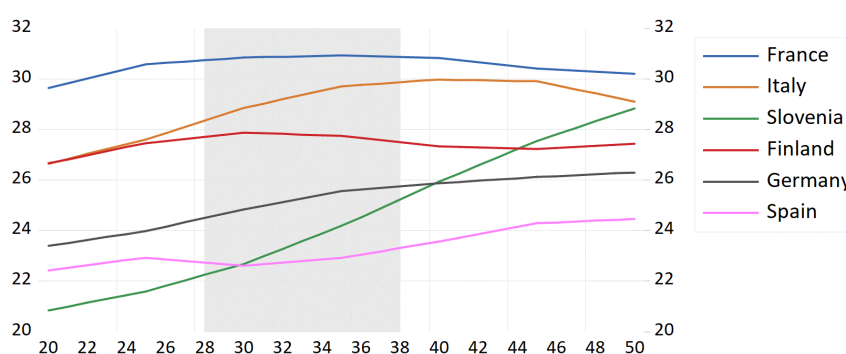
Source: European Commission (2021), Table III.1.137: Total cost of ageing as % of GDP - AWG reference scenario. Note: the ageing report provides values for 2019, 2025, 2030 and all subsequent fifth years. We have linearly interpolated the values between these years.

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the stochastic analysis, and whether the stochastic analysis considers shocks during the adjustment period or only after the end of the adjustment period.

[9] In two instances, both referring to the implementation of the DSA for countries with debt below 60 percent of GDP, our methodology differs from that used by Commission staff, for reasons explained in footnote 15.

[10] We use the same growth forecasts when analysing both the four- and seven-year adjustment periods. This assumption could somewhat bias upwards the fiscal adjustment results for the seven-year period if the investments and reforms used to justify the extension of the adjustment period to seven years raise growth. However, Article 13 of the draft regulation (European Commission, 2023a) allows the consideration of Recovery and Resilience Facility (RRF) commitments for an extension of the adjustment period, and EU countries already face difficulties in implementing RRF commitments. Thus, it is unlikely that, at least for the period until end-2026, countries would propose new investments and reforms to obtain an extension, while the impact of existing RRF commitments have already been incorporated into the official growth projections on which the table is based.

Box 1: Economic assumptions entering debt and deficit ratio projections

The Commission's DSA relies on the following economic assumptions about future real growth, inflation, interest rates, and aging costs.

Potential growth: this relies on the EU Commonly Agreed Methodology (EUCAM) to estimate potential output, developed over the years and agreed by EU countries. This methodology specifies the calculation of T+5 and T+10 projections (where T is the current year). The Commission has made available specific software, called EUCAM, for replication purposes (Blondeau *et al*, 2021). The methodology for incorporating the growth impact of structural reforms involves some judgment but is also largely standardised. While the room for discretion is limited, the DSA results are sensitive to Commission forecasts and EUCAM calculations; see Box 5 in section 4.

Output gap. Given potential growth, projected real GDP depends on output gap estimates and forecasts. Beyond the T+2 forecast horizon, the output gap is assumed to be gradually eliminated by T+5. Fiscal consolidation is assumed to generate negative output gaps, for which a uniform 0.75 temporary fiscal multiplier is used for all countries, based on Carnot and de Castro (2015).

Inflation projections for euro-area countries and those non-euro area countries in which the central bank has a 2 percent inflation target (Bulgaria, Czechia, Denmark, Sweden) are based on the euro-area inflation swaps. Taking the T+2 country-specific Commission forecast for the GDP deflator as the starting point (which, however, can include judgements), it is assumed that the GDP deflator (which is needed for calculating nominal GDP growth) converges linearly to market-based euro-area harmonised index of consumer prices (HICP) inflation expectations by T+10. Beyond T+10, inflation is expected to converge with the European Central Bank's 2 percent target by T+30. For countries outside the euro area with a different inflation target to the ECB (Hungary, Poland and Romania), it is assumed that half of the spread relative to the euro-area inflation forecast in T+2 remains by T+10, and by T+30, the national central banks' targets will be achieved.

Interest rate projections are also largely market based. The Commission's methodology differentiates between short-term and long-term interest rates. Interest rates on new borrowing are supposed to converge linearly with the forward rates by T+10. By T+30, a 2 percent real interest rate is assumed, which implies a 4 percent nominal interest rate for countries with a 2 percent inflation target (including euro-area countries), a 4.5 percent nominal rate for Poland and Romania, and 5 percent for Hungary, reflecting the higher inflation targets of the central banks of these countries. The derivation of the average interest rate on existing debt, which is called 'implicit interest rate' in EU jargon, uses some simplifications; see section 4.

Costs of ageing are from the 2021 Ageing Report (European Commission, 2021); we use *"Table III.1.137: Total cost of ageing as% of GDP - AWG reference scenario"* (note: AWG denotes the Economic Policy Committee's Working Group on Ageing Populations and Sustainability). The publicly available Excel file includes data for every fifth year. We received all annual data from the European Commission/AWG.

In line with the 2022 DSM, we assume that the DSA-based requirement applies not only in the baseline scenario, but also in three stress scenarios[11], and with respect to a stochastic criterion. The *stress scenarios* are as follows:

1. *Lower SPB*. The structural primary balance is permanently lower than SPB* by 0.5 percent of GDP in every year after a short transitory period following the end of the adjustment period[12];

2. *Adverse r-g*. The interest rate-growth differential is permanently higher by 1 percentage point than assumed in the baseline following the end of the adjustment period[13]; and

3. *Financial stress*. Borrowing rates rise temporarily, for one year only, by 1 percentage point for countries with a debt ratio below 90 percent of GDP, and 1 percentage point plus 0.06 times the gap between the debt level and 90 percent for countries with debt levels exceeding 90 percent[14].

These stress events are assumed to set in after the adjustment period, ie in 2029 in case of four-year adjustment, or 2032 in case of seven-year adjustment.

The *stochastic criterion* is based on a five-year debt fan chart following the adjustment period (ie a probability distribution of debt between 2029 and 2033 for the four-year adjustment period), using baseline projections for growth, interest rate and cost of ageing assumptions, as well as the historical variance-covariance of shocks to these variables, estimated on historical quarterly data. Annex 2 describes how the baseline projections and the fan charts are derived, and explains the three stress scenarios in greater detail.

The deterministic scenarios and the stochastic criterion are interpreted differently depending on whether debt is above or below 60 percent of GDP. Specifically, we assumed that the requirement that debt is *"put or remains on a plausibly downward path"* refers to debt above 60 percent, while the requirement that it *"stay at prudent levels"* refers to debt below 60 percent, and that *"staying at prudent levels"* means staying below 60 percent of GDP.

- If debt is above 60 percent of GDP at the beginning of the adjustment period, SPB* is set such that (1) in all three stress scenarios, debt falls monotonously after the end of the adjustment period as long as it remains above 60 percent of GDP, and remains below 60 percent if it falls below 60 percent of GDP, until at least the tenth year after the end of the adjustment period (deterministic scenarios); and (2) the probability that the debt ratio at the end of the fifth year after the adjustment period exceeds the debt ratio at the end of the adjustment period is lower than 30 percent (stochastic criterion).

- If debt is below 60 percent of GDP at the beginning of the adjustment period, SPB* is set such that (1) in all three stress scenarios, debt does not exceed 60 percent at any time during the 10-year period after the end of the adjustment period (deterministic scenarios), and (2) the probability that the debt ratio at the end of the fifth year after the adjustment period exceeds 60 percent of GDP is lower than 30 percent (stochastic criterion)[15].

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[11] The DSM employs four stress scenarios, but footnote 9 on pages 11-12 of the DSM states that there will be some differences in the stress scenarios to be used for the new fiscal framework. In particular, the historical structural primary balance scenario will be omitted, and the lower structural primary balance (SPB) scenario will be different.

[12] For the lower SPB scenario, we assume the SPB is gradually lowered by 0.5 percentage points of GDP in two years if the adjustment lasts for four years (ie by 0.25 percentage points in both years), and in three years (ie 0.5/3 in each year) if the adjustment lasts for seven years.

[13] The growth impact immediately lowers growth by 0.5 percentage points in the first year after the end of the adjustment period and all subsequent years. The 0.5 percentage-point higher interest rate applies to new borrowing from the first year after the end of the adjustment period but does not influence the interest rate on existing debt, so it takes time before the average interest rate increases by 0.5 percentage point.

[14] European Commission, Debt Sustainability Monitor 2022, section 2.1.5.

[15] The Commission currently does not apply the stochastic analysis to countries with debt below 60 percent of GDP, relying instead only on the requirement that in all three stress scenarios, debt does not exceed 60 percent at any time during the 10-years after the adjustment period. Since this is not stated in Annex V of European Commission (2023a), and cannot be

In all scenarios, we assume – in the same way as the Commission – that fiscal consolidation temporarily depresses output. A uniform 0.75 fiscal multiplier is assumed for all countries, that is, a one percentage point of GDP increase in the structural primary balance reduces the output gap by 0.75 percentage points in the same year. This effect is gradually eliminated over three years[16].

The medium-term required SPB implied by the Commission's DSA approach is defined as the maximum of the SPBs defined by the deterministic and stochastic scenarios. For the near term (between 2024, when the new framework is assumed to take effect, and the end of the adjustment period, assumed to be either 2028 or 2031 in the calculations shown below), SPBs are computed through interpolation between the 2024 SPB projected in the Commission's spring 2023 forecast and the 2028 (or 2031) required SPB[17]. Thus, we assume the same adjustment (expressed as a share of GDP) each year.

Figure 2, explained and discussed in Box 2, provides an example of the application of this framework using Belgium. The top row of the figure shows the adjustment for Belgium if the only requirement was to generate a continuously declining debt path under baseline assumptions, and confirms that this would be insufficient to meet both the stochastic criterion and the deficit benchmark requirement. The bottom row shows the adjustment required under the most demanding of the criteria described above, which in this case, turns out to be the r-g stress scenario, and confirms that this would also meet the deficit criterion (see section 2.2).

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inferred from the practice of the 2022 DSM, which applies stochastic analysis to all countries in the EU (see Graph 2.20, p. 53), we take a different approach, as described above. However, for countries with debt below 60 percent, the stochastic criterion turns out to be binding in only one case, and section 3.2 is clear on how the results would be affected if the stochastic criterion is disregarded.

[16] The multiplier value and its time profile were derived based on Carnot and de Castro (2015). Fiscal consolidation is assumed not to affect potential output. The negative output gap lowers the primary balance, for which we use the country-specific values of the budget balance semi-elasticity to the output gap from Table I.3 (p. 41) of Mourre *et al* (2019) after correcting a typo for Germany: the budget balance semi-elasticity in the last column should be the difference between the values in the previous two columns (0.504 for Germany), but instead, the value 4 appears in the table. We used 0.504, as does the Commission in its calculations. Values for the other 26 countries range from 0.298 to 0.63.

[17] Except when the excessive deficit or debt safeguards are binding; see our discussion of this issue later.

Figure 2: Four-year adjustment under baseline and adverse r-g scenarios for Belgium, 2022-2050

A) Adjustment under baseline

B) SPB* corresponding to adverse r-g conditions with baseline growth and interest rate assumptions
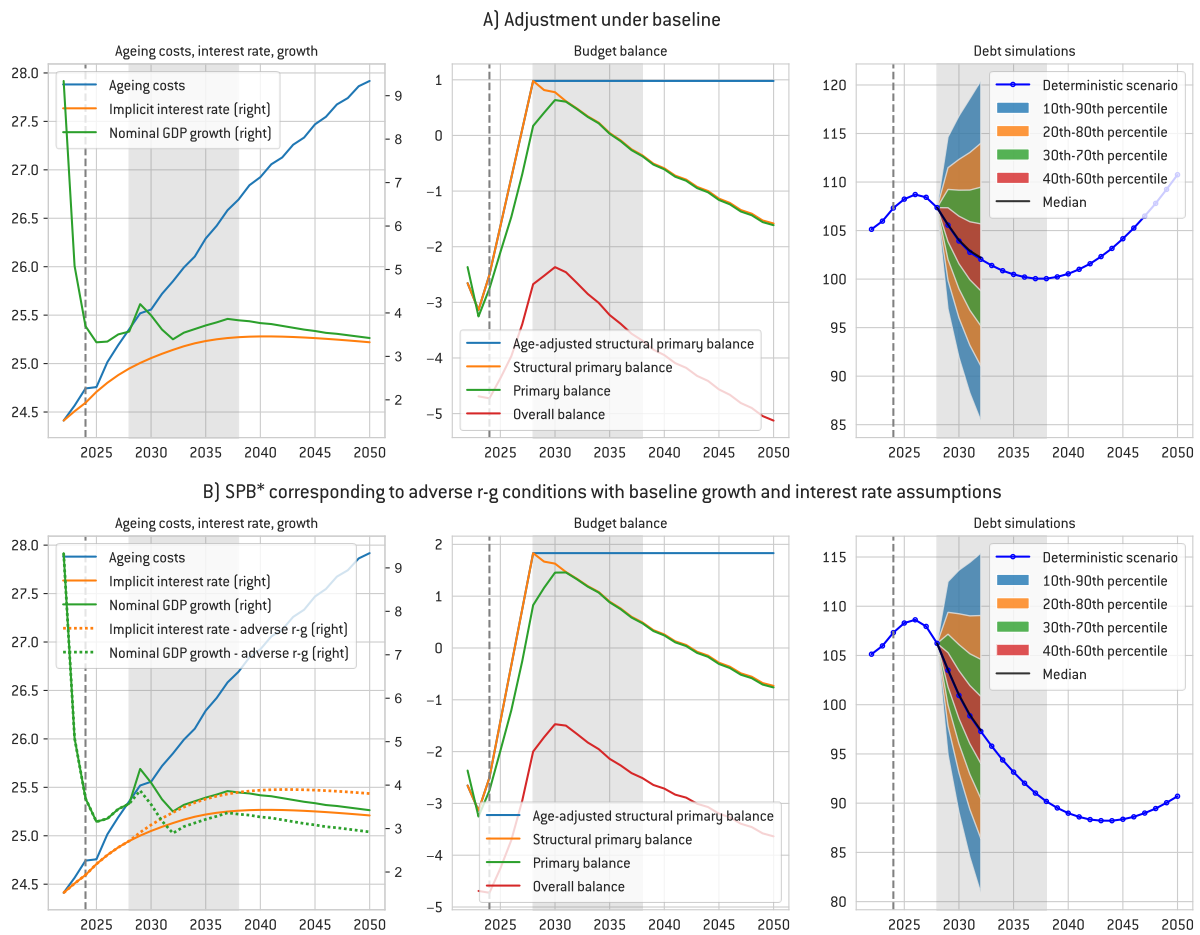
Source: Bruegel. Note: the dashed vertical line indicates 2024, the last year before fiscal adjustment starts under the new rules. The shaded area indicates the 10-year post-adjustment period.

Box 2: Illustrative application of the Commission's DSA method to Belgium

Figure 2 illustrates how the Commission's DSA methodology is used to compute fiscal adjustment in a specific case, Belgium, assuming a four-year adjustment period.

- The left panel of Figure 2A shows the drivers of the debt dynamics (beyond the primary balance): costs of ageing in percent of GDP (expected to increase rapidly), baseline nominal GDP growth (influenced by the 2024-2028 fiscal consolidation), and the implicit interest rate on public debt. Under the baseline, this is expected to remain below the nominal growth rate. The reason for the temporary growth acceleration after 2028 is that fiscal consolidation in 2025-2028 lowers the growth rate of actual output and thus creates a negative output gap, generating higher growth as output catches up with potential after 2028.
- The middle panel shows the implications, for various fiscal balance indicators, of the requirement that debt must continuously fall under baseline assumptions in the 10 years after the adjustment period. Conditional on baseline growth, ageing and interest-rate assumptions, Belgium would need to increase its SPB from a projected deficit of 2.5 percent of GDP in 2024 to a surplus of 0.9 percent of GDP by 2028. Fiscal consolidation (the increase in the SPB) results in a negative output gap and thus a lower primary balance, so the green line is below the orange line not just in 2024-2028 when fiscal adjustment is ongoing, but also in 2029-2031, as the output gap slowly closes. From 2029 onwards, the SPB excluding the change in costs of ageing from 2028 (the blue line) remains unchanged, while the increase in costs of ageing leads to a worsening SPB and PB (which coincide once the output gap closes). Consequently, the overall budget balance (red line) also deteriorates after 2030, breaching the 3 percent deficit threshold by 2035.
- The right panel of Figure 2A shows the resulting debt path. The requirement for a continuously declining debt ratio in 2028-2038 becomes binding in the last year. This is the year within the 2028-2038 period when the costs of ageing are highest, and the gap between the growth rate and the interest rate is one of the smallest (left panel). After 2038, the debt ratio turns upwards. The right chart also shows the 'debt fan chart', representing the distribution of the debt ratio in 2028-2033, using the Commission's stochastic methodology. It looks rather wide: in 2033, the debt ratio is estimated to be between 83 percent of GDP and 122 percent of GDP with an 80 percent probability (the gap between the 2033 values of the upper end of the upper orange area and the lower end of the lower orange area). The upper end of the upper green area, which shows the debt ratio values that will be exceeded with 30 percent probability, indicates that the assumed adjustment does *not* satisfy the stochastic criterion, since its 2033 value is above its 2028 value.

The adjustment scenario shown in Figure 2A clearly does not satisfy the requirement that the *"public debt ratio is put or remains on a plausibly downward path"*. Not only does it violate the stochastic criterion, but it will also violate all three stress criteria (by construction, since it was calibrated to produce just enough adjustment to lead to continuously declining debt under the baseline). The question is which of the criteria is binding, in the sense of requiring sufficient adjustment so that all the other criteria are also met. The answer in this case, as we show in Table 1A, is the adverse r-g scenario.

Figure 2B shows the impact of this scenario on adjustment and the debt paths. To illustrate the difference in assumptions, the left panel now plots the interest rate-growth differential under both the baseline (solid lines) and the stress scenario (dotted lines), showing that in the stress scenario, the implicit interest rate is projected to exceed the nominal growth rate after 2031. The middle chart shows the SPB* needed to ensure continuously falling debt under this adverse scenario, namely 1.7

percent of GDP by 2028 – 0.8 percent of GDP higher than under the baseline. The right panel shows the resulting debt path, based on baseline assumptions (as expected, this falls much faster than the equivalent path in Figure 2A) and confirms that this SPB* ensures that the stochastic criterion is also met (the 2033 value of the upper end of the upper green area is now below its 2028 value).

2.2 Applying the deficit criterion and the 'safeguards'

In addition to the DSA-based requirement, the proposed regulation requires deficits to fall to 3 percent by the last year of the adjustment period, and to not exceed 3 percent in the 10 years after the adjustment period (the 'deficit benchmark requirement'), and the four 'safeguards' outlined in Article 15 of the regulation to be met. Applying the deficit benchmark requirement is straightforward. Applying the safeguards, however, requires some assumptions that resolve ambiguities in the drafting of the proposed regulation.

i) *Formulation of no-backloading safeguard*. This safeguard requires that *"the fiscal adjustment effort over the period of the national medium-term fiscal-structural plan is at least proportional to the total effort over the entire adjustment period."* This is a strange formulation, since the *"period of the plan"* is generally the same as the adjustment period (four years). In this case, the total adjustment effort during the planning period and the adjustment period would be identical, and the condition would be satisfied regardless of how much backloading there is within the common period. As drafted, the safeguard would only ensure that the average adjustment in the last three years of a seven-year adjustment is not smaller than the average adjustment in the first four years. But it would not prevent backloading within the four-year adjustment period, nor would it prevent backloading within the first four years and last three years of the seven-year adjustment period.

We assume that this ambiguity will eventually be removed to prevent backloading more meaningfully. Consistent with this, our calculations assume the same annual adjustment over the adjustment period, measured by the change in the SPB as a share of GDP. The only exception would be in cases in which the debt safeguard or excessive deficit safeguards are binding and require more initial adjustment.

ii) *Definition of 'planning horizon'*. While the draft regulation defines the *"adjustment period"* (Article 2, either four or seven years), it defines neither the *"period of the plan"* nor the *"planning horizon"* (two terms that appear to be used interchangeably), stating only that the plan should present a trajectory *"covering a period of at least four years"* (Article 11). This implies the plan can cover more than four years but leaves it unclear whether the planning horizon is extended to seven years when the adjustment period is seven years. The latter would make sense: presumably, a seven-year long adjustment period can only work if there is a plan for at least seven years. However, this interpretation would imply that the no-backloading safeguard would not restrict backloading even in the seven-year adjustment period. We therefore assume that the planning period remains four years, even when the adjustment period is extended to seven years. Importantly, this implies that the debt safeguard, which requires that "*the public debt ratio at the end of the planning horizon is below the public debt ratio in the year before the start*", must be met by the fourth year, ie by 2028, even when the adjustment period is extended to 2031[18]. We return to this issue in sections 3 and 5.

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[18] For calculations based on the seven-year adjustment period when the debt safeguard is binding, we assume linear adjustment to the SPB required by the debt safeguard by the fourth year of the adjustment period, followed by no further adjustment if the 3 percent deficit reference value is met in 2028, or 0.5 percent adjustment after 2028 until the 3 percent deficit reference value is met.

iii) *Application of the excessive deficit safeguard*. While the proposed revision to the regulation on the excessive deficit procedure (European Commission, 2023b) maintains the requirement that countries with excessive deficits must undertake "*a minimum annual adjustment of at least 0,5% of GDP as a benchmark*", it does not state the indicator to be used for measuring this adjustment[19]. In our calculations, we assume that the adjustment is measured in terms of the structural primary balance (SPB)[20].

iv) *Application of the expenditure growth safeguard*. While conceptually straightforward – net expenditure as a share of GDP must be no higher at the end of planning horizon than at the beginning – this safeguard is difficult to apply within the framework of the 2022 DSM, which uses the structural primary balance, not net expenditure, for the purposes of quantifying adjustment. However, the two concepts are very close[21]. We therefore apply this safeguard by assuming that it precludes the structural primary balance after four years from being lower than at the beginning.

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[19] This contrasts with the current regulation, which is clear in this respect (*"a minimum annual improvement of at least 0,5% of GDP as a benchmark, in its cyclically adjusted balance net of one-off and temporary measures"* – that is, the structural budget balance (SB)).

[20] We interpret the *"a minimum annual adjustment of at least 0,5% of GDP as a benchmark"* wording in the draft regulation on the excessive deficit procedure as at least a half percent adjustment. In our numerical calculations, we assume exactly half a percent when otherwise adjustment would be less than half a percent. However, Pench (2023) argued that the adjustment requirement can be less than half a percent, because this safeguard, as well as the debt reduction safeguard, could be given a subordinated role relative to the sustainability criterion when the Commission and the Council make an overall assessment of the medium-term plans. Moreover, he argued that an EDP might not be opened for breaching the 3 percent criterion for countries with public debt below 60 percent.

[21] $S_{NC}-T_D$, where S_{NC} refers to non-interest spending minus expenditure on EU programmes fully matched by EU funds revenue and cyclical elements of unemployment benefit expenditure,and T_D to increases in tax revenue due to discretionary revenue measures.The SPB is defined as $-(S_{CA}-T_{CA})$,where S_{CA} and T_{CA} refer to cyclically adjusted non-interest rate spending and tax revenue,respectively.Net expenditures and the SPB are hence closely related,but are not the same concepts.In particular,the cyclical adjustment of non-interest expenditure leading to S_{CA} may remove cyclical spending that goes beyond the cyclical element of unemployment benefits,and T_{CA} includes non-discretionary increases in cyclically adjusted tax revenue (eg stemming from the progressivity of the tax system) while T_D does not.

3 Results

3.1 Fiscal adjustment implications of the Commission's proposal

Tables 1A and 1B present our main results for the four-year adjustment period and seven-year adjustment period, respectively, for all EU countries with debt above 60 percent or deficits above 3 percent. EU countries are listed in declining order of their 2024 projected debt ratios, according to the European Commission's May 2023 forecast, shown in column (1). Only countries with projected debt over 60 percent of GDP or a 2024 projected deficit of more than 3 percent of GDP are shown. Hence, the five countries at the bottom of the table – Slovakia, Malta, Poland, Romania and Bulgaria – are included because their 2024 projected deficits, shown in column (2), are expected to exceed 3 percent in 2024, even though their debt is expected to remain below 60 percent.

Column (3) shows the 2024 projected structural primary balance. This is the starting point for any additional adjustment required by the proposed framework, as well as the floor for the required 2028 structural primary balance (according to our interpretation of the net expenditure growth safeguard, see above).

Columns (4) – (8) of the tables show the structural primary balance that the countries must reach, by the end of the adjustment period, to satisfy the DSA-based requirements prescribed by the new methodology (ie criterion (a) in Annex I of European Commission, 2023a). Specifically,

- Column (4) shows the (minimal) SPB that would need to be attained by the end of the adjustment period to ensure that the debt falls monotonically in the 10 years after the end of the adjustment period (or in the case of countries with debt below 60 percent, remains below 60 percent), conditional on *baseline* assumptions about future growth and interest rates, and assuming that the SPB remains at the level it reaches at the end of the adjustment period (except for changes reflecting increases or decreases in the fiscal costs of ageing).

- Columns (5), (6) and (7) similarly show the minimum SPB that would need to be reached to ensure that the debt falls monotonically in the 10 years after the end of the adjustment period (or in the case of countries with debt below 60 percent, remains below 60 percent), conditional on the three *stress* scenarios discussed in the previous section (a permanent increase in r-g, a permanent reduction in the SPB below SPB* by a half percent of GDP, and a transitory interest rate shock of 1 percent). The difference between these columns and column (4) indicates the extra fiscal adjustment these scenarios require.

- Column (8) shows the minimum SPB that is required to meet the stochastic DSA criterion. For countries with debt above 60 percent, this ensures a less than 30 percent probability that the debt ratio in the fifth year after the end of the adjustment period is higher than the debt ratio at the end of the adjustment period. For countries with debt below 60 percent, it ensures that the probability that debt will exceed 60 percent in the fifth year is less than 30 percent. Unfortunately, data limitations prevent us from checking the stochastic criterion in the cases of Bulgaria, Croatia, Cyprus, Greece and Italy[22].

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[22] For Bulgaria, the available time series for interest rates was too short. In the four other cases, we did not have access to the quarterly budget data needed for the estimation of the variance-covariance matrix of shocks, as this is considered confidential. However, the European Commission has access to this confidential data and uses it for its stochastic analysis.

Columns (9) – (12) in Table 1A provide information about the additional criteria required by the proposed framework for the four-year adjustment case.

- Column (9) shows the minimum 2028 SPB that is required to meet the deficit benchmark requirement, ie criterion (b) in Annex I of European Commission (2023a).

- Column (10) shows the minimum 2028 SPB which ensures that the debt safeguard holds – that is, to ensure that debt at the end of the adjustment period is no higher than at the beginning (assuming that the adjustment toward this SPB is linear, as explained in the last section).

- Column (11) checks whether the excessive deficit safeguard would ever be binding, ie whether a country where the adjustment satisfies all previous requirements – that is, conditions (a) through (d) of Article 6 – would be subject to the deficit-based EDP during the adjustment period. This would be the case if, *conditional on the adjustment implied by the highest SPB of columns (4) – (10)*, both of the following conditions hold: (i) the country's deficit is higher than 3 percent of GDP during some years in the adjustment period (typically at the beginning of the period, for countries whose deficits are projected to exceed 3 percent in 2024); (ii) the annual average adjustment associated with the maximum SPB target in columns (4) – (10) falls short of 0.5 percentage points of GDP. Countries for which the excessive deficit safeguard is binding would be required to further increase their adjustment during the years in which the deficit is projected to exceed 3 percent, in order to meet the 0.5 percentage point minimum. In general, this would be expected to *lower* the minimum SPB that is necessary to meet all other criteria, as the adjustment is frontloaded, lowering debt accumulation during the adjustment period[23]. This SPB is given in column 11 for the countries for which the excessive deficit safeguard is binding (for all other countries, the column shows 'n.a.' – not applicable).

Column (12) of Table 1A shows SPB*, that is, the minimum SPB at the end of the four-year adjustment period consistent with meeting all the requirements of the framework. When the excessive deficit safeguard is not binding, this is the maximum of the SPBs meeting the DSA requirement, the deficit benchmark requirement, the net expenditure growth safeguard and the debt safeguard. When the excessive deficit safeguard is binding, it is the value shown in column (11), which is slightly lower than what SPB* would otherwise have been, reflecting frontloaded adjustment. Hence, column (12) shows the minimum SPB* that meets all requirements of the framework, after the impact of the excessive deficit safeguard on the adjustment path has been taken into account.

As a guide to the main results of the table, we highlighted certain cells, as follows:

- Yellow shading identifies the requirement that would determine the fiscal path in the absence of the debt safeguard, the excessive deficit safeguard and the net expenditure growth safeguard, ie the maximum value across columns (4) – (9). When none of these three safeguards is binding, the yellow-highlighted values are reproduced in column (12).

- Red highlights in column (10) identify countries for which the debt safeguard would be binding.

- Green shading in column (3) shows the cases when the net expenditure growth safeguard would be binding.

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[23] The excessive deficit safeguard could also lead to a higher SPB, but only if it requires higher adjustment in *every* year of the adjustment period. This was never the case in our sample.

- Beige highlights in column (11) identify countries for which the excessive deficit safeguard is binding, and – due to the resulting frontloading of adjustment – modifies the highest SPB* of columns (3)-(10).

- Light blue highlights indicate the cases for which the stochastic analysis cannot be performed because of missing data.

Finally, columns (13) – (15) of Table 1A show the adjustment implications of the new framework. Column (13) is a reminder of the adjustment that is already projected by the European Commission before the new framework kicks in. Conditional on this adjustment happening, column (14) describes the additional adjustment expected from countries under the framework, and (15) expresses the latter in annual average terms.

Table 1B is constructed in the same way, but with one important difference, which reflects the fact that the 'planning horizon' over which the debt safeguard would require the debt ratio to fall is always four years, even when the adjustment period is seven years. As a result, the debt safeguard can be binding for some countries for which it was not binding with a four-year adjustment period: namely, when the (more gradual) adjustment in the first four years of the seven-year period is insufficient to lower the 2028 debt ratio below its 2024 projected value. To check if this is the case, Table 1B contains an extra column, (10), which shows the value of the 2028 SPB implied by linear adjustment to the minimum 2031 SPB that would be required to meet the DSA-based criteria, deficit benchmark and net expenditure growth benchmark. If this is lower than the 2028 SPB required to meet the debt safeguard (reproduced in column (11), from column (10) in Table 1A), then the debt safeguard is binding. Adjustment during the seven-year period would in this case be frontloaded relative to linear adjustment, leading to lower interest payments and debt accumulation, and hence lowering the 2031 SPB required to meet the remaining criteria. The value of the latter is given in column (12), which now shows the 2031 SPBs when either the debt or deficit safeguard is binding. Finally, column (13) is analogous to column (12) in Table 1A. When neither the debt nor the deficit safeguard is binding, it shows the maximum of the SPBs meeting the DSA requirement, the deficit benchmark requirement and the net expenditure growth safeguard; when either the debt safeguard or the excessive deficit safeguard is binding, it is the value shown in column (12).

The results can be summarised as answers to two questions. First, which of the many requirements imposed by the proposed regulation would do the heavy lifting? Second, how large is the fiscal adjustment implied by the proposed framework?

Which requirements do the heavy lifting? When debt is above 60 percent of GDP, mostly the DSA-based criteria; when it is below 60 percent of GDP, mostly the deficit benchmark requirement or the safeguards. The latter play a particularly large role for the seven-year adjustment period.

- With initial debt higher than 60 percent of GDP, the DSA-based requirement is binding in 10 out of 13 cases when the adjustment period is four years, and eight out of 13 when it is seven years. Among the five criteria that the DSA-based adjustment must satisfy, it is mostly the stochastic criterion that is binding (see highlights in columns 4-8) followed by the adverse r-g scenario. Note that these findings likely underestimate the relevance of the stochastic criterion (and by extension, of the DSA-based criteria relative to the others), since we were not able to conduct the stochastic analyses for Bulgaria, Croatia, Cyprus, Greece and Italy because of lack of data (see above).

- With four-year adjustment, the deficit benchmark requirement (column 9) is binding only for Slovenia. With seven-year adjustment, it would be binding in only two cases, France and Italy.

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However, the excessive deficit safeguard in the case of Italy and the debt safeguard in the case of France require a more frontloaded adjustment, resulting in a slightly lower 2031 SPB than the deficit benchmark would require.

- In contrast, and as might be expected, the DSA-based criteria are never binding for countries with debt below 60 percent of GDP. For these countries, the deficit benchmark requirement almost always prescribes a higher SPB than the DSA (the only exception is Malta).

- The net expenditure growth benchmark, which prevents SPB* from falling below the SPB in 2024, is binding for Greece and Cyprus, reflecting the fact that current and projected SPBs are high for these countries (above 2 percent of GDP), in excess of what the DSA-based and deficit benchmark criteria would require.

The relevance of the remaining safeguards depends on the adjustment period:

- With a four-year adjustment period, the *debt safeguard* is binding for only two countries: France and Bulgaria, where it raises SPB* substantially: from a 1.1 percent of GDP surplus that would be required by the DSA, to 2.3 percent of GDP for France, and from a 0.9 percent deficit that would be required by the deficit benchmark, to a 3.1 percent surplus for Bulgaria, in case of a four-year adjustment. With a seven-year adjustment period, it is binding also for Belgium, Slovakia and Romania;

- In the four-year adjustment case, the *excessive deficit safeguard* is binding for Malta and Poland. With a seven-year adjustment, however, it is also binding for Italy, Spain and Hungary. As for the debt safeguard, the latter reflects the lower average *annual* adjustment required by the DSA and deficit benchmark if adjustment is stretched over seven years. As a result, further countries with initial deficits above 3 percent of GDP slip below the minimum adjustment threshold of 0.5 percent of GDP.

The fact that France and Bulgaria are the only countries for which the debt safeguard is binding even for the four-year adjustment horizon, relates to the combination of very large initial deficits (4.3 percent for France, 4.8 for Bulgaria) and relatively favourable fundamentals, which mitigate the adjustment requirement imposed by the DSA or the deficit benchmark requirement. France's debt is high, but unlike most other EU countries, costs of ageing are projected to start falling within 10 years of the four-year adjustment period, and interest rates are projected to remain below the growth rate. Bulgaria's debt, meanwhile, is one of the lowest in the EU. As a result, the adjustment imposed by the DSA and deficit benchmark requirements on France and Bulgaria would not be fast enough to prevent the debt ratio at the end of the adjustment period from rising above its level at the beginning. Consequently, the debt safeguard is binding in both cases.

Table 1A: Fiscal adjustment requirements under the proposed framework, assuming a four-year adjustment period, 2025-2028 (% of GDP)

	European Commission forecasts for 2024			2028 SPB as determined by DSA-based criteria					2028 SPB to ensure deficit below 3% by end of adjustment period	Application of debt and exc. deficit safeguards		2028 SPB consistent with satisfying all debt and deficit criteria (SPB*)	Overall adjustment (ΔSPB)		
	Debt	Fiscal balance	SPB	Baseline scenario	Adverse r-g	Adverse SPB	Financial stress	Stochastic criterion		2028 SPB to ensure debt safeguard is satisfied	2028 SPB implied by deficit safeguard if binding		2023-2024 (EC forecast)	2025-2028 (total required)	2025-2028 (annual average required)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12) =max {3,4,5,6,7,8,9,10} when (11) = n.a.; otherwise (12) = (11)	(13)	(14)=(12)-(3)	(15)=(14)/4
Greece	154	-0.6	2.1	0.7	1.6	1.3	0.7	n.a.	1.7	-9.3	n.a.	2.1	2.0	0.0	0.0
Italy	140	-3.7	-0.3	2.1	3.2	2.7	2.1	n.a.	3.1	1.3	n.a.	3.2	3.9	3.5	0.9
France	110	-4.3	-2.2	0.3	1.1	0.9	0.3	0.9	0.8	2.3	n.a.	2.3	0.6	4.6	1.1
Spain	109	-3.3	-0.8	0.5	1.4	1.0	0.5	1.7	1.2	-2.5	n.a.	1.7	0.8	2.5	0.6
Belgium	107	-4.7	-2.5	1.0	1.8	1.5	1.0	1.4	1.5	1.0	n.a.	1.8	0.2	4.3	1.1
Portugal	103	-0.1	1.9	1.1	2.0	1.7	1.1	2.7	1.3	-5.0	n.a.	2.7	0.8	0.8	0.2
Finland	76	-2.6	-0.7	-0.9	-0.3	-0.3	-0.9	0.4	-0.7	-2.4	n.a.	0.4	-0.6	1.1	0.3
Austria	73	-1.3	-0.2	0.7	1.1	1.0	0.7	1.1	0.2	-4.5	n.a.	1.1	2.7	1.3	0.3
Cyprus	72	2.1	2.6	-0.6	-0.2	-0.2	-0.6	n.a.	-0.6	-8.0	n.a.	2.6	0.4	0.0	0.0
Hungary	71	-4.4	0.5	2.5	2.9	2.8	2.5	3.4	2.5	1.3	n.a.	3.4	4.1	2.9	0.7
Slovenia	67	-2.9	-2.3	0.8	1.2	1.2	0.8	1.2	1.7	-2.7	n.a.	1.7	1.6	4.0	1.0
Germany	64	-1.2	-0.1	0.4	0.8	0.8	0.4	1.0	-0.1	-1.7	n.a.	1.0	1.5	1.1	0.3
Croatia	62	-1.3	-0.7	-0.3	0.0	0.0	-0.3	n.a.	-0.8	-2.1	n.a.	0.0	-1.1	0.7	0.2
Slovakia	59	-4.8	-3.3	0.4	0.7	0.8	0.4	0.5	1.1	-0.4	n.a.	1.1	-2.3	4.5	1.1
Malta	56	-4.5	-2.4	-1.6	-1.2	-1.2	-1.6	-0.7	-0.9	-1.6	-0.8	-0.8	2.2	1.6	0.4
Poland	53	-3.7	-0.8	-1.2	-0.9	-0.8	-1.2	-1.2	-0.3	-1.9	-0.3	-0.3	2.6	0.5	0.1
Romania	46	-4.4	-2.4	-0.5	-0.2	-0.1	-0.5	0.2	0.9	0.1	n.a.	0.9	2.2	3.3	0.8
Bulgaria	28	-4.8	-4.4	-2.1	-1.8	-1.7	-2.1	n.a.	-0.9	3.1	n.a.	3.1	-1.7	7.5	1.9

Sources: Bruegel based on European Commission May 2023 forecasts and Bloomberg. Note: Yellow shading refers to the criterion that would determine the fiscal path in the absence of the debt safeguard, the excessive deficit safeguard and the net expenditure growth safeguard, ie the maximum value across columns (4) – (9). Red shading in column (10) denotes binding debt safeguard; this is the case when the value in column (10) is higher than the (yellow shaded) maximum value across columns (4)-(9). Green shading in column (3) shows the cases when the net expenditure growth safeguard is binding. Beige shading identifies countries for which the excessive deficit safeguard is binding. Blue highlights indicate the cases for which the stochastic analysis cannot be performed due to missing data. See the text for further explanations.

Table 1B: Fiscal adjustment requirements under the proposed framework, assuming a seven-year adjustment period, 2025-2031 (% of GDP)

	European Commission forecasts for 2024			2031 SPB as determined by DSA-based criteria					2031 SPB to ensure deficit below 3% by end of adjustment period	Application of debt and excessive deficit safeguards			2031 SPB consistent with satisfying all debt and deficit criteria (SPB*)	Overall adjustment (ΔSPB)		
	Debt	Fiscal balance	SPB	Baseline scenario	Adverse r-g	Adverse SPB	Financial stress	Stochastic criterion		2028 SPB implied by maximum 2031 SPB from cols (4)-(9)	2028 SPB to ensure debt safeguard is satisfied	2031 SPB implied by debt and deficit safeguard if binding		2023-2024 (EC forecast)	2025-2031 (total required)	2025-2031 (annual average required)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10) = (3)+4*[max{3,4,5,6,7,8,9}-(3)]/7	(11)	(12)	(13) =max {3,4,5,6,7,8,9} when (12) = n.a.; otherwise (13) = (12)	(14)	(15)=(14)-(3)	(16)=(15)/7
Greece	154	-0.6	2.1	0.8	1.5	0.7	0.8	n.a.	1.8	2.1	-9.3	n.a.	2.1	2.0	0.0	0.0
Italy	140	-3.7	-0.3	1.3	2.5	1.9	1.4	n.a.	2.7	1.4	1.3	2.6	2.6	3.9	3.0	0.4
France	110	-4.3	-2.2	0.1	0.7	0.1	0.1	0.7	0.9	-0.4	2.3	0.9	0.9	0.6	3.1	0.4
Spain	109	-3.3	-0.8	1.2	2.0	1.7	1.2	1.9	1.5	0.8	-2.5	2.0	2.0	0.8	2.8	0.4
Belgium	107	-4.7	-2.5	1.1	1.9	1.6	1.1	1.6	1.5	0.0	1.0	1.9	1.9	0.2	4.4	0.6
Portugal	103	-0.1	1.9	0.5	1.3	1.0	0.5	2.4	0.6	2.2	-5.0	n.a.	2.4	0.8	0.5	0.1
Finland	76	-2.6	-0.7	-1.0	-0.6	-0.6	-1.0	0.3	-0.8	-0.1	-2.4	n.a.	0.3	-0.6	0.9	0.1
Austria	73	-1.3	-0.2	0.3	0.7	0.6	0.3	1.3	-0.3	0.7	-4.5	n.a.	1.3	2.7	1.5	0.2
Cyprus	72	2.1	2.6	-0.8	-0.5	-0.5	-0.8	n.a.	-0.6	2.6	-8.0	n.a.	2.6	0.4	0.0	0.0
Hungary	71	-4.4	0.5	2.9	3.2	3.2	2.9	3.8	3.1	2.4	1.3	3.8	3.8	4.1	3.3	0.5
Slovenia	67	-2.9	-2.3	1.1	1.4	1.4	1.1	1.9	1.9	0.1	-2.7	n.a.	1.9	1.6	4.3	0.6
Germany	64	-1.2	-0.1	0.1	0.4	0.4	0.1	0.8	-0.4	0.4	-1.7	n.a.	0.8	1.5	0.9	0.1
Croatia	62	-1.3	-0.7	-0.3	0.0	0.0	-0.3	n.a.	-0.8	-0.3	-2.1	n.a.	0.0	-1.1	0.7	0.1
Slovakia	59	-4.8	-3.3	0.8	1.1	1.1	0.8	0.9	1.3	-0.7	-0.4	1.3	1.3	-2.3	4.7	0.7
Malta	56	-4.5	-2.4	-1.1	-0.7	-0.8	-1.1	-0.4	-0.5	-1.3	-1.6	-0.6	-0.6	2.2	1.8	0.3
Poland	53	-3.7	-0.8	-0.9	-0.6	-0.6	-0.9	-0.9	-0.2	-0.5	-1.9	-0.3	-0.3	2.6	0.5	0.1
Romania	46	-4.4	-2.4	0.1	0.4	0.5	0.1	0.9	1.2	-0.3	0.1	1.1	1.1	2.2	3.5	0.5
Bulgaria	28	-4.8	-4.4	-1.2	-0.9	-0.9	-1.2	n.a.	-0.5	-2.2	3.1	-1.1	-1.1	-1.7	3.3	0.5

Sources: Bruegel based on European Commission May 2023 forecasts and Bloomberg. Note: Yellow shading refers to the criterion that would determine the fiscal path in the absence of the debt safeguard, the excessive deficit safeguard and the net expenditure growth safeguard, ie the maximum value across columns (4) – (9). Red shading in column (11) denotes binding debt safeguard; this is the case when the value in column (11) is higher than that in column (10). Green shading in column (3) shows the cases when the net expenditure growth safeguard is binding. Beige shading in column (12) identifies for which 2031 SPB* is lower as a result of the frontloading of adjustment required by either the debt safeguard or the excessive deficit safeguard. Blue highlights indicate the cases for which the stochastic analysis cannot be performed due to missing data. The average annual adjustment requirement shown in the last column of the table refers to the average over the seven-year period. However, for countries for which the debt safeguard is binding (France, Belgium, Slovakia, Romania and Bulgaria), all of the adjustment happens in the first four years, so the average adjustment in these years is the value in column (11) minus column (3) divided by four.

It is important to note that the finding that the debt and excessive deficit safeguards are rarely binding, particularly in the four-year adjustment period, relates to the fact that we have imposed a strong no-backloading safeguard in our calculations, via the assumption that the primary balance rises linearly to SPB*. This sets a floor below the pace of deficit reduction at the beginning of the adjustment period and lowers debt relatively quickly. It also suggests that there is some (though not full) redundancy in imposing debt and excessive deficit safeguards on top of a stringent no-backloading safeguard[24].

How large is the required adjustment?

- SPB* ranges from slightly negative (Malta and Poland) to over 3 percent of GDP for Italy and Hungary, and (with a four-year adjustment only) Bulgaria, in the latter case, driven entirely by the debt safeguard[25].

- The (minimum) annual adjustment requirement is zero for Cyprus and Greece, on account of large current primary surpluses that exceed the required SPB* and the binding net expenditure growth safeguard. In all other cases, the requirement is positive, with its extent depending on the adjustment period. In case of four-year adjustment, the annual average requirement is around one percentage point of GDP per year for Italy, France, Belgium, Slovenia, Slovakia and Romania, and 1.9 percent of GDP for Bulgaria. In the case of a seven-year adjustment period, the annual average adjustment requirement in these countries drops to 0.4-0.6 percent of GDP.

- Where the debt safeguard is binding, the average adjustment requirement in the seven-year period reflects the combination of sharper annual adjustments in the first four years (to meet the debt safeguard) and lower adjustments in the remaining three years. In the cases of France and Bulgaria, the frontloading of adjustment takes an extreme form, as the 2028 SPB required to meet the debt safeguard (2.3 percent of GDP for France) significantly exceeds the 2031 SPB* required to meet the remaining criteria (0.8 percent of GDP for France). Hence, after requiring a large adjustment in the first four years, the framework would allow expansionary fiscal policy in the last three years (see Figure 2 for France, extracted from Annex 3).

Annex 3 presents in greater detail the binding adjustment scenarios underlying Tables 1A and 1B and the assumptions driving them, showing the assumed growth, interest rate and ageing-costs paths for each case, as well as the time profiles for the fiscal balance and debt ratio during and after the adjustment period.

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[24] At this point, however, the proposed no-backloading safeguard is not stringent at all; see section 2.3.
[25] Without the debt safeguard, the SPB* under a four-year adjustment for Bulgaria would fall to negative (determined by the deficit benchmark requirement), reflecting the fact that Bulgaria has one of the lowest debt levels in the EU.

Figure 3: Minimum adjustment required for France, 7-year adjustment period (% of GDP)
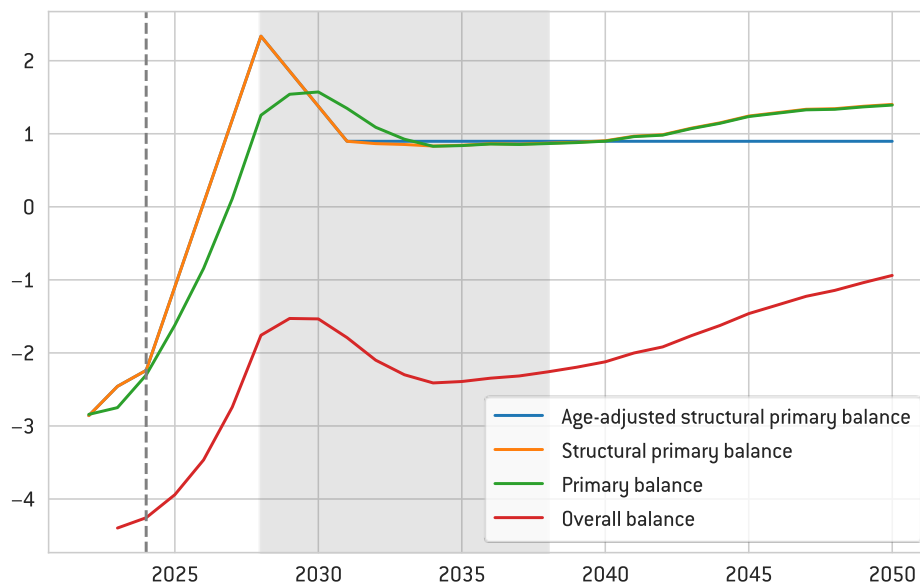
Source: Bruegel, based on calculations underlying Table 1B and Annex 3.

3.2 The chances of an excessive deficit procedure during the adjustment period

The previous section found that the excessive deficit safeguard, guaranteeing the minimum adjustment required by the deficit-based EDP (European Commission, 2023b), would be binding in just two cases with the four-year adjustment period, and in five cases if the adjustment period were to be extended to seven years. In this section, we investigate the chances that the EDP might become binding *ex post*, as a result of output and interest rate shocks during the adjustment period, *on the assumption that that the country in question sticks to the net expenditure path that satisfies all the requirement of the regulation replacing the preventive arm* (as calculated in the previous section). This might be the case when these requirements imply deficits below 3 percent *ex ante* (so that the excessive deficit safeguard is not triggered *ex ante*) but close enough to 3 percent so that a sufficiently large shock will cause a deficit above 3 percent *ex post*[26].

To assess the likelihood of entering the EDP during the adjustment period, we adapt the Commission's stochastic analysis. We assume that the SPB follows the adopted plan but allow for growth and interest rate shocks. While the SPB is not impacted by these shocks, the PB is, as it reflects cyclical revenues and expenditures. To model the resulting uncertainty, we estimate the variance-covariance matrix in the same way as for the Commission's stochastic analysis, except that we do not include primary balance shocks, and we assume the same country-specific budget balance semi-elasticity to the output gap that the Commission uses in its DSA[27]. We then calculate the probability of experiencing an 'excessive deficit' for

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[26] One might also ask about the probability that the EDP might become binding *ex post* after the adjustment period. However, this possibility is of lesser relevance, since at that point the net expenditure plan would be governed by a new medium-term fiscal-structural plan.
[27] See footnote [16].

each country and year during the adjustment period (2025-2028 or 2025-2031), that is, a deviation from the 3 percent of GDP reference value that is not minor and temporary[28].

Table 2 shows these probabilities for the same countries as Table 1, except that they are now listed in declining order of the 2024 deficit forecast, rather than the debt forecast, and that the five countries for which we do not have data to conduct a stochastic analysis are dropped[29]. Not surprisingly, the probabilities of breaching the reference value in 2025 are high (above 50 percent) for all countries that are projected to breach it in 2024. Probabilities decline with time, due to the fiscal consolidation built into the net expenditure paths that countries are assumed to follow. As the SPB increases during the adjustment period, the likelihood of an EDP falls.

In a second step, we identify the countries and years, highlighted in yellow, for which the EDP would force adjustment beyond what countries are already planning. These are the countries for which the medium-term fiscal-structural plans do not already require adjustment of at least 0.5 percent in the year after the breach[30]. Hence, for the yellow-highlighted countries, the numbers in the table represent the probability that a country might be forced into (possibly procyclical) additional adjustment, even though it is sticking to a net expenditure path that complies with all requirements of European Commission (2023a).

The main result is that for the four-year adjustment period, the probability of being forced into additional adjustment as a result of the EDP is high – around 40 percent – for two countries (Malta and Poland); but for the seven-year adjustment period, this number goes up to five (Malta, Romania, Hungary, Poland and Spain). This reflects the slower pace of planned fiscal consolidation during this period. Furthermore, the probability is around 30 percent for Finland, and it would also be very high for France were it not for the debt safeguard, which would force France into annual adjustment that is considerably higher than required by the EDP.

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[28] Specifically, we consider a deficit 'excessive' either when it exceeds 3.5 percent of GDP (even when it is temporary in the sense of falling below 3 percent in the subsequent year), or when it exceeds 3 percent and is expected to remain above 3 percent in the subsequent year (even if the breaches are minor in the sense that they are both below 3.5 percent of GDP). While not specified in the Treaty or legislation, this definition is broadly in line with historical practice. To be able to check the second condition for the last year of the adjustment period, we extend the simulations by one year after the end of the adjustment period.

[29] Namely, Bulgaria, Croatia, Cyprus, Greece and Italy, for the reasons explained in footnote [22].

[30] This is based on the assumption that the Council will impose exactly 0.5 percent adjustment and not more, not less.

Table 2: Chances of an excessive deficit procedure during the adjustment period for countries that follow the required adjustment path (in percent)

| | EC fiscal balance forecast | Probability of a deficit above 3 percent during adjustment period | | | | | | | | | | |
| | | Four-year adjustment period | | | | Seven-year adjustment period | | | | | | |
	2024	2025	2026	2027	2028	2025	2026	2027	2028	2029	2030	2031
Slovakia	-4.8	65	49	31	17	70	60	49	37	27	19	14
Belgium	-4.7	67	57	44	30	68	62	52	40	33	27	23
Malta	-4.5	59	52	46	43	59	53	45	43	41	40	39
Romania	-4.4	56	52	45	39	58	54	50	46	43	40	38
Hungary	-4.4	56	48	39	31	58	53	46	41	36	30	26
France	-4.3	66	54	37	19	66	54	37	19	16	17	21
Poland	-3.7	51	42	38	40	51	42	37	36	37	39	41
Spain	-3.3	49	46	40	34	50	48	44	40	37	34	31
Slovenia	-2.9	37	29	20	10	41	39	35	26	18	12	7
Finland	-2.6	33	28	23	20	35	32	28	27	27	25	24
Austria	-1.3	17	16	14	11	18	18	17	15	13	11	10
Germany	-1.2	8	7	5	4	9	9	8	8	7	6	6
Portugal	-0.1	11	12	13	11	12	13	15	15	14	13	13

Source: Bruegel. Note: Yellow highlights identify countries for which a deficit-based EDP would be triggered, forcing higher adjustment than required by the medium-term fiscal-structural plan meeting all requirements of European Commission (2023a).

3.3 Comparing fiscal adjustment under the existing and proposed fiscal frameworks

Would the new framework require less fiscal adjustment than the framework it would replace? To answer this question, we consider two rules under the current framework. First, the structural balance must reach the medium-term objective (MTO) in four years. Second, the public debt ratio should be reduced by the 1/20th of the gap between the actual debt ratio and the 60 percent of GDP reference value, on average over three years.

The *country-specific MTO* has a crucial role in the current framework. It is the anchor of the structural balance, to be reached in at most four years if a country has not yet reached it[31]. The MTO is set on the basis of the highest of three criteria:

a) It should ensure a safety margin with respect to the 3 percent of GDP deficit limit, by taking into account past output volatility and the budgetary sensitivity to output fluctuations;

b) It should ensure the convergence of the debt ratio towards prudent levels, with due consideration for the economic and budgetary impact of ageing populations;

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[31] Small deviations from the MTO (when a country has reached it), or from the adjustment path towards the MTO, are allowed, but we do not consider these options in our calculations. For countries at the MTO, 0.25 percent of GDP deviation is allowed, but this deviation is added into the required adjustment in the following year. The so-called 'structural reform clause' and the 'investment clause' allow temporary deviations from the MTO, or the adjustment path toward it, for at most 0.75 percent of GDP if both clauses are approved, by at most three years, but by the fourth year, the MTO must be reached (European Commission, 2019). Since we compare the total adjustment over four years, we do not take into account the impact of these temporary deviations.

c) For euro-area and Exchange Rate Mechanism (ERM II) members, it should be at least minus 1 percent of GDP (as per Regulation 1466/97), while countries subject to the requirement of the Fiscal Compact must have an MTO of at least minus 0.5 percent when debt is over 60 percent of GDP.

The Vade Mecum on the Stability and Growth Pact details how the first two criteria should be quantified (European Commission, 2019).

The MTO is defined in terms of the (overall) structural balance (SB), while the proposed framework focuses on the net expenditure path, though the structural *primary* balance (SPB, ie the SB excluding interest payments), will be reported as an intermediate/technical variable. In Tables 1A and 1B, we calculated the SPB that meets the criteria of the new framework. To compare the two, we express the SPB in SB terms. Column (3) of Table 3 shows the (updated) MTO implied by the current framework, while columns (4) and (5) show the corresponding structural balance target under the proposed framework for the four and seven-year horizons. This is computed as SPB*, taken from Tables 1A and 1B, minus the interest payments projected conditional on SPB* as well as baseline growth and interest rate projections. Columns (6) and (7) show the differences between these 'MTO-equivalent' adjustment targets under the proposed framework, and the MTO under the current framework. A negative sign means that the adjustment requirements under the proposed framework are less than under the current one.

The results can be summarised as follows:

- On average, the requirements in the proposed framework are less stringent than those under the current framework. The difference between the average medium-term adjustment needs under the MTO-based framework and under the proposed framework is about 0.6 percent of GDP for four-year adjustments and 1 percent of GDP for seven-year adjustments.

- This said, the *correlation* between adjustment requirements implied by the MTO and those implied by the new framework is high (correlation coefficient of 0.75-0.80). In other words, the current and proposed frameworks tend to agree on the countries for which adjustment should be relatively high and those for which it should be relatively low.

- The two frameworks generally do not agree, however, on the *absolute* adjustment requirements for individual countries (see columns (9) and (10)). For about half of the member states with debts or deficits above the benchmark values, the proposed framework would impose lower adjustment needs of at least 1 percent of GDP. For the four-year adjustment period, the differences are: -2.6 percent of GDP for Greece, -2.4 percent for Malta, -2 percent for Italy, -1.7 percent for Poland, -1.7 percent for Belgium and -1.5 percent for Spain. For an additional six countries – Finland, Hungary, Slovenia, Croatia, Slovakia and Romania – adjustment needs would go down by 0.5 percent to 0.9 percent of GDP. In contrast, adjustment needs would go up by a lot for Bulgaria (courtesy of the debt-reduction safeguard). For Austria, France, Germany and Portugal, the new framework would not make much of a difference when it is first applied (in France's case, this is due to the debt safeguard, otherwise the adjustment requirement would be lower), while Cyprus's adjustment requirement would go up by 1.3 percent.

Table 3: Comparison of adjustment requirements based on the medium-term objective (MTO) of the current framework and those of the proposed framework (in percent of GDP)

	European Commission forecasts for 2024		Medium term targets, in structural balance terms			Adjustment requirements, in structural balance terms			Difference in adjustment requirements, proposed versus current	
	Debt	Structural balance	Current (MTO)	Proposed		Current	Proposed		4-year	7-year
				4-year	7-year		4-year	7-year		
	(1)	(2)	(3)	(4)	(5)	(6)=(3)-(2)	(7)=(4)-(2)	(8)=(5)-(2)	(9)=(4)-(3)	(10)=(5)-(3)
Greece	154	-1.0	0.5	-2.1	-2.4	1.5	-1.0	-1.4	-2.6	-2.9
Italy	140	-4.5	0.25	-1.8	-2.5	4.7	2.7	2.0	-2.0	-2.7
France	110	-4.2	-0.4	-0.7	-2.2	3.8	3.5	2.0	-0.3	-1.8
Spain	109	-3.2	0	-1.4	-1.4	3.2	1.8	1.8	-1.4	-1.4
Belgium	107	-4.5	0.75	-1.0	-1.1	5.2	3.5	3.3	-1.7	-1.9
Portugal	103	-0.8	-0.5	-0.2	-0.4	0.3	0.7	0.5	0.3	0.1
Finland	76	-1.9	-0.5	-1.4	-1.7	1.4	0.5	0.2	-0.9	-1.2
Austria	73	-1.5	-0.5	-0.5	-0.4	1.0	0.9	1.0	0.0	0.1
Cyprus	72	1.3	0	1.3	1.4	-1.3	0.0	0.1	1.3	1.4
Hungary	71	-3.8	-1	-1.4	-0.9	2.8	2.4	2.9	-0.4	0.1
Slovenia	67	-3.7	0.75	0.2	0.3	4.4	3.8	4.0	-0.6	-0.4
Germany	64	-1.0	-0.5	-0.5	-0.8	0.5	0.6	0.3	0.0	-0.3
Croatia	62	-1.9	-1	-1.8	-2.0	0.9	0.1	-0.1	-0.8	-1.0
Slovakia	59	-4.5	0.25	-0.6	-0.5	4.8	4.0	4.0	-0.8	-0.7
Malta	56	-3.9	0	-2.4	-2.1	3.9	1.5	1.7	-2.4	-2.1
Poland	53	-2.9	-1	-2.7	-2.7	1.9	0.2	0.2	-1.7	-1.7
Romania	46	-4.1	-1	-1.5	-1.4	3.1	2.5	2.7	-0.5	-0.4
Bulgaria	28	-5.0	-1	2.1	-1.9	4.0	7.1	3.1	3.1	-0.9

Source: AMECO for (1) and (2); European Commission (2023c) for the latest MTO (3). Note: Columns (4) and (5) are computed by taking the SPB* estimates from Tables 1A and 1B, respectively, and subtracting projected interest payments as a share of GDP, conditional on baseline growth and interest rate assumptions.

The reason why the proposed system generally churns out somewhat lower adjustment requirements than the MTO-based current system is as follows.

- Although the MTO is supposed to *"ensure the convergence of the debt ratio towards prudent levels, with due consideration to the economic and budgetary impact of ageing populations"*, which sounds similar to the DSA-based requirement under the proposed system, the former is calculated via a formula rather than by projecting debt paths. This ignores uncertainty and does not check the robustness of the convergence of the debt ratio to unfavourable events. At the same time, it penalises

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countries with high debt levels using an *ad-hoc* parametrisation[32]. In practice, this approach leads to MTOs that fluctuate within a relatively narrow range, from -1 to +0.75.

- In contrast, what matters under the proposed approach is less the level of debt than the fact that projected debt above 60 percent is on a falling trajectory (and debt below 60 percent stays under 60 percent) with high probability and in a variety of stress scenarios. Given the current parametrisation of the stress tests and the stochastic analysis (in which 'high probability' is defined as 70 percent and uncertainty is considered only after the adjustment period; see section 4), this delivers a lighter adjustment requirement for most high-debt countries. Portugal is an exception both because its current MTO is relatively low (-0.5 percent of GDP) and because of its recent history of macroeconomic volatility, which leads to a relatively high adjustment target under the proposed system.

For countries with projected debt above 60 percent of GDP in 2024, Table 4 compares the annual debt reduction required under the 1/20th rule to the average decline implied by the proposed system. Because the required debt reduction under the 1/20th rule would decline over time (as the difference between the projected debt ratio and the required 60 percent declines) we undertake the comparison, first, in the first three years of the adjustment period, and second, in the first three years of the post-adjustment period. In the first case, the annual debt change required under the adjustment rule is based on the 2024 projected debt level, while in the second case, it is based on the debt ratio for the end of the adjustment period that would be projected if the proposed system is implemented. These changes are compared to the average debt reduction under the proposed system for the first three years of the adjustment period and the first three-years of the post-adjustment period, respectively.

A positive difference between the debt reduction under the proposed system and the 1/20th rule means that the proposed system implies a smaller debt reduction in absolute terms, and hence the 1/20th rule would not be met by the new system.

The results turn out to depend on whether the comparison is made at the beginning of the adjustment period or at the beginning of the post-adjustment period:

- At the beginning of the adjustment period, the proposed framework would deliver smaller debt reductions than the 1/20th rule for all countries but one with projected debt above 100 percent of GDP (Greece, Italy, France, Spain and Belgium; Portugal would be the exception). For all remaining countries, except for Finland for the both the four- and seven-year long adjustments and Hungary for the seven-year long adjustment, it would imply faster debt reductions than the 1/20th rule.

- In contrast, in the post-adjustment period, the debt reduction delivered by the proposed framework would be faster than that required by the 1/20th rule for almost all countries; the exceptions are the

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[32] The formula is: $MTO = Balance_{debt-stabilizing(60\%ofGDP)} + \alpha * AgeingCosts + Effort_{debt-reduction}$, where the first right hand side term represents the budgetary balance that would stabilise the debt ratio at 60 percent of GDP, the second *"represents the budgetary adjustment that would cover a fraction of the present value of the projected increase in age-related expenditure, where α=33% and the ageing cost corresponds to the discounted value of the increase in the cost of ageing, calculated to an infinite horizon"*, and the third *"represents a supplementary debt-reduction effort, specific to Member States with general government gross debt above 60% of GDP. It follows a continuous linear function: Effort*$_{debt-reduction}$= *0.024*debt - 1.24 which ensures a supplementary effort of 0.2% of GDP when debt reaches 60%, while requiring a supplementary effort of 1.4% of GDP when the debt ratio attains 110% of GDP"* (European Commission, 2019, p. 12).

two with the highest debts, Greece and Italy, along with France (only when the adjustment lasts for seven years) and (marginally) Spain.

Table 4: Comparison of DSA-based requirements under the 1/20th debt reduction rule and under proposed framework (in percent of GDP)

| | First three years of adjustment period, 2025-27 | | | | | First three years of post-adjustment period | | | | | |
| | | Proposed framework, 4-year adjustment period | | Proposed framework, 7-year adjustment period | | After 4-year adjustment period (2029-31) | | | After 7-year adjustment period (2032-34) | | |
	annual change required by the 1/20th rule	annual change	diffe-rence	annual change	diffe-rence	annual change required by the 1/20th rule	annual change under propose d system	diffe-rence	annual change required by the 1/20th rule	annual change under propose d system	diffe-rence
	(1)	(2)	(3)=(2)-(1)	(4)	(5)=(4)-(1)	(6)	(7)	(8)=(7)-(6)	(9)	(10)	(11)=(10)-(9)
Greece	-4.7	-4.0	0.7	-4.0	0.7	-4.0	-2.3	1.7	-3.6	-1.9	1.7
Italy	-4.0	-0.1	3.9	0.1	4.1	-3.9	-2.4	1.5	-3.8	-1.4	2.4
France	-2.5	0.6	3.1	0.6	3.1	-2.5	-2.7	-0.2	-2.1	-0.8	1.3
Spain	-2.5	-1.3	1.1	-1.2	1.2	-2.2	-2.1	0.1	-2.0	-1.8	0.2
Belgium	-2.4	0.2	2.6	0.4	2.7	-2.3	-2.5	-0.1	-2.1	-2.0	0.0
Portugal	-2.2	-2.8	-0.6	-2.7	-0.5	-1.6	-2.3	-0.7	-1.3	-2.0	-0.7
Finland	-0.8	-1.1	-0.3	-1.0	-0.2	-0.6	-1.4	-0.8	-0.5	-1.3	-0.8
Austria	-0.6	-2.1	-1.5	-2.0	-1.3	-0.2	-1.7	-1.5	n.a.	-1.5	n.a.
Cyprus	-0.6	-4.5	-3.9	-4.5	-3.9	n.a.	-3.7	n.a.	n.a.	-3.0	n.a.
Hungary	-0.6	-1.8	-1.3	-1.6	-1.0	-0.2	-2.2	-2.0	0.0	-2.1	-2.1
Slovenia	-0.3	-1.4	-1.1	-0.9	-0.6	n.a.	-2.7	n.a.	n.a.	-2.2	n.a.
Germany	-0.2	-1.0	-0.8	-0.9	-0.7	n.a.	-1.0	n.a.	n.a.	-0.9	n.a.
Croatia	-0.1	-0.8	-0.7	-0.7	-0.6	n.a.	-0.5	n.a.	n.a.	-0.1	n.a.

Source: Bruegel. Note: The required annual decline is (debt ratio-60)/20, for which the 2024 debt ratio is used from the May 2023 Commission forecast in column (1), and our projected debt ratio for 2028 (column (6)) or 2031 (column (9)) by conditioning on SPB* in Table 1 and baseline assumptions for growth and interest rates. Annual change (columns 2, 4, 7, 9) is the expected average annual change over the three years indicated in the header of the table, under the same scenario.

4 Observations on the European Commission's DSA methodology

The purpose of this paper is to explore the implications of the proposed fiscal governance framework *conditional* on the Commission's DSA methodology, rather than to evaluate that methodology itself. As we replicated the methodology, however, we noticed certain features that would merit discussion and possibly review (see Annex 4 for more detail).

Sensitivity to technical assumptions. While the Commission's methodology is broadly in line with DSA methodologies used by other international organisations (Chapter 1.2 of ECB, 2019; IMF, 2022) and in applied academic work (Zenios *et al*, 2021; Zettelmeyer *et al*, 2018), it also makes a number of technical assumptions that are *sui generis*. They fall into two categories:

- *Simplifications* that could be avoided with manageable additional effort, with the likely effect of improving the accuracy of the analysis and avoiding possible bias. These include assumptions relating to the maturity structure of public debt, inflation expectations, borrowing rates, the currency composition of public debt and the modelling of uncertainty (see Annex 4).

- *Assumptions reflecting judgment.* Any DSA methodology must make assumptions that are to some extent arbitrary, in the sense that statistics or economics do not give clear guidance. These assumptions reflect perceived trade-offs and feasibility constraints that would merit wider discussion among DSA stakeholders. Examples include: (a) the probability threshold that determines when the risk of unsustainable debt becomes unacceptably high (currently set at 30 percent); (b) how far ahead fiscal policy should be required to pre-fund the future costs of ageing, when these costs could in principle also be addressed by structural reform or adjustment outside the adjustment period (currently, the window is set at 10 years after the end of the four to seven year adjustment period); and (c) whether a 2 percent real interest rate should be assumed for all EU countries. The current conventions are not unreasonable, but alternative assumptions could also be justified as reasonable, and may lead to different results.

Sensitivity to economic forecasts. The fact that DSA and its implications for fiscal adjustment are sensitive to growth and interest-rate forecasts is a feature, not a bug, of the DSA approach: ignoring future expectations would be much worse. Furthermore, unlike the 'arbitrary' assumptions listed above, the forecast methodologies employed by the Commission are, for the most part, standard (use of market information for interest rates), or employ methodologies that have been discussed extensively with member states. These include the EU Commonly Agreed Methodology (EUCAM) to estimate potential output growth over the medium-term, and long-term forecasts taken from the Commission's Ageing Report, which reflects input from EU countries.

This said, these methodologies may sometimes lead to results that clash with those generated by those of respectable alternatives (such as IMF growth and output gap forecasts). This argues for systematically checking the robustness of the fiscal adjustment results (ie the SPB*) relative to these alternatives, and for the establishment of a procedure setting out when and how to make adjustments if the differences in results are substantial. Box 3 provides an example.

Box 3: Implications of the alternative output forecasts for France, Germany and Italy

For several countries, the EUCAM forecasts a major reduction in potential output growth in the medium term, while IMF projections do not share this pessimism (Figure 4). However, for 2040 and beyond, the 2021 Ageing Report projections, which are still used, suggest a major acceleration of potential growth. Thus, the growth projections used for the DSA suggest a significant potential growth deceleration and then an acceleration by 2040, a trajectory that is hard to rationalise with economic arguments (Figure 4).

Figure 4: Potential output growth projections, 2022-2050
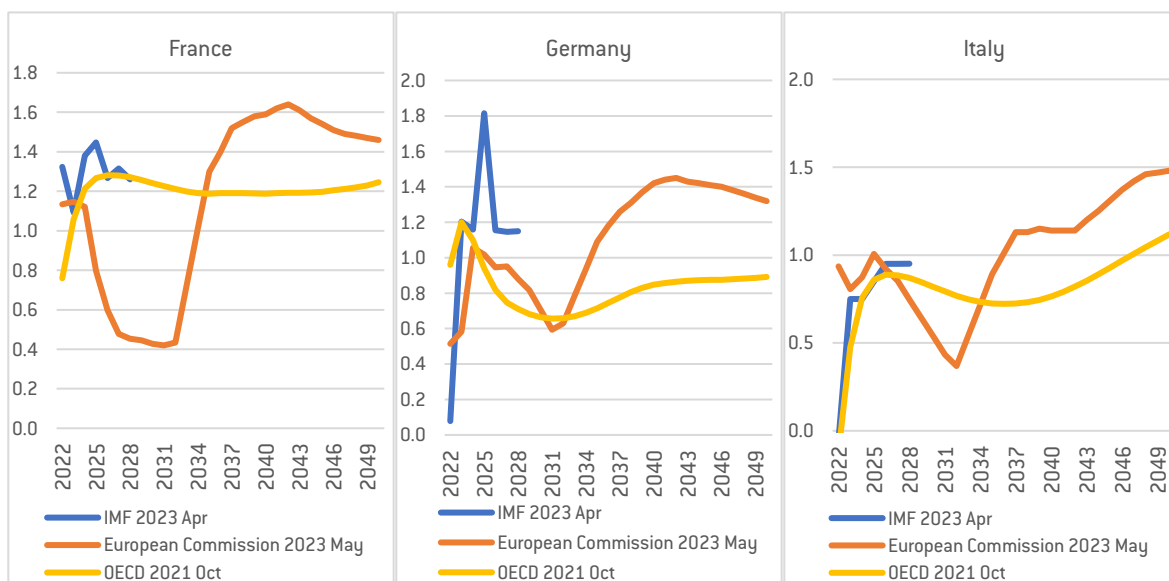
Source: Bruegel using the output gap and actual GDP projections from the IMF World Economic Outlook April 2023 database, OECD October 2021 Economic Outlook, and data received from the European Commission.

This unusual potential growth shape is particularly problematic for France, where growth deceleration starts already in 2025 with a major impact on assumed economic conditions during the fiscal adjustment period.

Cases like these suggest that: (1) the robustness of the fiscal adjustment prescriptions to alternative growth projections should be checked routinely; (2) a procedure should be in place for establishing if and how to modify the prescriptions when the adjustment implications of alternative projections are significant.

5 Conclusions and policy recommendations

The findings of this paper can be summarised in five main points.

First, notwithstanding the safeguards added in the Commission's legislative proposal, the proposal largely preserves the DSA-based character set out in the Commission's November 2022 communication (European Commission, 2022). The requirements of the DSA drive the results for 10 out the 13 countries with debt above 60 percent when adjustment lasts for four years, and six such countries when adjustment lasts for seven years, at the first application of the new framework from 2024, so long as there is no backloading of fiscal adjustment within the adjustment period[33].

Second, there are important cases when the safeguards would be binding. The debt safeguard would be binding for two high-debt countries, France and Belgium (the latter only for the seven-year adjustment period). But since the safeguard as currently drafted in the proposed regulation applies to all countries breaching either the 3 percent deficit or the 60 percent debt benchmark, not just countries with debt above 60 percent, it would also be binding for Bulgaria, as well as Slovakia and Romania in the seven-year adjustment period. The net expenditure growth safeguard would be binding for Greece and Cyprus, where it effectively freezes the structural primary balances their high projected 2024 levels. Finally, the excessive deficit safeguard, which would require countries to adjust by at least 0.5 percent of GDP per year when deficits exceed 3 percent, becomes binding in a half dozen cases when the adjustment period is extended to seven years. In future applications of the framework, these safeguards could be binding for additional countries, requiring a greater degree of fiscal adjustment than either the DSA or an amended no-backloading condition would suggest.

Third, even if it is not binding *ex ante*, countries choosing the seven-year adjustment period face a high probability that the EDP's minimum adjustment requirement of 0.5 percent of GDP will become binding *ex post*, in response to a bad growth or interest rate shock.

Fourth, while the medium-term adjustment requirements under the proposed framework are considerable – for the four-year adjustment period, an unweighted average of 2.5 percent of GDP measured in structural primary balance terms, with adjustment exceeding 2 percent of GDP required of nine countries – they are lower than the average adjustment requirement under the current, MTO-based framework (by 0.6 percent to 1 percent of GDP, depending on the adjustment period). Note that these adjustment requirements come on top of an assumed adjustment of over 1 percent of GDP on average, which is expected to occur in 2023-24. The reason for the discrepancy between the current and proposed methodology is not so much that the methodologies disagree on the countries that need to adjust (they largely agree, with a few exceptions), but that the proposed methodology generally imposes less-extreme adjustment requirements on high-debt countries, reflecting the fact that the current, MTO-based methodology penalises high debt levels in an *ad-hoc* manner.

Fifth, while the European Commission's DSA methodology is reasonable and broadly in line with methodologies of other international organisations, it makes some simplifications and assumptions that

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[33] We assume equal annual adjustment, a much stronger form of no-backloading than the no-backloading condition proposed in the framework (see section 2.2).

either could be avoided altogether or at least are worth a discussion, given the central role the methodology would take in the proposed system[34].

Our takeaway from these conclusions is two-fold. First, the April 2023 proposal, if enacted, would mark a significant improvement for the EU and for most EU countries compared to the current fiscal framework. Second, there are several aspects of the proposed framework that should be changed and/or require further discussion. We have nine policy recommendations. Annex 5 shows how the first five of these recommendations could be reflected in the drafting of the legislative proposal.

1. ***Define a proper no-backloading safeguard, with an exception to accommodate a temporary investment push.***

Any safeguard – that is, any requirement that the system introduces to constrain fiscal adjustment, over and above the prescriptions of the DSA and of the Treaty – imposes a cost, in the sense that it reduces the flexibility of fiscal adjustment and may thus unduly constrain national policy. At the same time, a no-backloading safeguard can have a major benefit, which is to ensure that policymakers do not procrastinate in undertaking the medium-term fiscal adjustment prescribed by the DSA and the Treaty. However, for the reasons explained in section 2.2, the current drafting of the safeguard does not prevent backloading. It should be redrafted to serve the purpose that its name implies.

At the same time, however, it is essential to avoid the unintended consequences of such a safeguard for public investment. Many EU countries need to raise public investment (Zettelmeyer *et al*, 2023). To find the fiscal space to do so, they will generally need to adjust, through higher revenues and lower current spending, over and above the adjustment that would be required to ensure fiscal sustainability at current public investment levels. However, for countries that wish to raise public investment in the short and medium terms, it is unreasonable and economically counterproductive to force a net adjustment consistent with a decline in the structural primary balance (inclusive of investment) in the short term. The new framework should hence accommodate temporary investment pushes *during* the adjustment period, as long as SPB* is reached at the end of the adjustment period, and as long as the public investment occurs under EU-endorsed and monitored programmes. Hence, while the DSA and hence SPB* should reflect the debt issued to finance such investment, the no-backloading condition should be applied net of this investment.

2. ***Abolish the net expenditure growth safeguard***.

The net expenditure growth safeguard, which would be binding for Greece and Cyprus, prevents countries that are fiscally overperforming, or planning to overperform by 2024, from lowering their structural primary balances after the new framework has kicked in, even when their debts and deficits are on track to fall faster than is required by the DSA-based criteria and the deficit benchmark requirement. This restriction cannot be justified by either economic arguments or the Treaty. It also creates incentives for fiscally overperforming countries to run down their SPBs, or adjust less ambitiously, before the new framework kicks in, even if fiscal prudence and cyclical conditions might argue for fiscal restraint in the short term.

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[34] In a future paper, we will investigate whether the net result of these simplifications and assumptions is to bias the required adjustment under the system in one way or the other.

3. ***Abolish the debt safeguard.***

One of the main results of our analysis is that, with a proper application of the no-backloading condition, the debt safeguard would be binding in only two high-debt countries, France, and (for the seven-year adjustment case) Belgium. It should nonetheless be dropped:

- The main reason why the new framework may prove more effective than the current one is a greater degree of national ownership. But an economically arbitrary requirement to lower the debt ratio within four years will not generate this ownership if it contradicts the adjustment required by the DSA and the Treaty-based deficit benchmark. For France, that contradiction would be very large. With the safeguard, the structural primary balance required after four years would be 2.3 percent, without the safeguard, just 1.1 percent.

- The application of the debt safeguard is particularly sensitive to short- and medium-term economic projections. Using IMF potential growth projections instead of European Commission growth projections, the debt safeguard would require a 0.6 percent of GDP lower SPB* for France.

- Finally, for the countries for which it is binding, the debt safeguard undermines the purpose of the seven-year adjustment period, which is to create an incentive for good reform in exchange for more gradual adjustment. Under the safeguard, the required adjustment during the first four years is invariant to the length of the adjustment period. As a result, the adjustment requirement for the seven-year period would follow a very odd path (see Figure 2 for France).

4. ***If the debt safeguard cannot be abolished, redraft it to make it less counterproductive***.

For political reasons, the debt safeguard may stay. If it stays, it should, at a minimum, be changed in three ways to make it less damaging[35]:

- It should apply only to countries with initial debt above 60 percent of GDP (see also Pench, 2023).

- It should apply to the duration of the adjustment period, rather than the planning horizon of four years (or alternatively, the distinction between the adjustment period and planning horizon should be abolished). This would remove one of the three undesirable implications of the debt safeguard as currently drafted, namely, that it renders the extension of the adjustment period meaningless for the countries to which it applies.

- It should incorporate an exception for EU-endorsed and monitored public investment, analogous to that proposed above for the no-backloading safeguard.

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[35] An alternative would be to reformulate the debt safeguard to require a minimum debt reduction during the 10 years <u>after</u> the end of the adjustment period. If this can be agreed in a way that does not exceed the DSA-based adjustment requirements presented in this paper, this would be an improvement over the current plan. However, it is hard to imagine a safeguard that is both meaningful and does not interfere with the DSA unless the longer-term debt-reduction requirements are linked to the debt level, as well as other factors influencing the DSA. Hence, agreeing on a common, transparent DSA may be a better approach than attempting to fine-tune a debt safeguard, as argued in our recommendation 8.

5. ***Align the conditions that must be met by member states' medium-term fiscal-structural plans with the conditions that must be observed by the European Commission***.

As described in section 2.1 and Annex 1, there is a difference between the requirements that member states must comply with in preparing their medium-term structural plans (Article 12 of European Commission 2023a) and those that the European Commission must observe, both when putting forward its technical trajectory and when examining member states' medium-term fiscal-structural plans (Articles 6 and 15 of European Commission, 2023a)[36]. However, once the safeguards cited in Article 15 have been modified along the lines suggested above, the regulation should require member states' plans to satisfy these safeguards. Furthermore, differences in language between Articles 12 and 15 could lead to unnecessary tensions between the Commission and EU countries. Therefore, Articles 6, 12 and 15 should be aligned to include the same requirements, differentiated by the relevant subgroups of member states (countries with debt above 60 percent of GDP, countries with debt below 60 percent of GDP but deficits above 3 percent of GDP, and countries with debts and deficits below the reference values).

6. ***Modify the excessive deficit safeguard in European Commission (2023a) and the amendments to the regulation implementing the excessive deficit procedure (European Commission, 2023b) to ensure that their application does not introduce procyclicality***

One of the objectives of the proposed reform is to avoid procyclical fiscal adjustment. Since the proposal will require a major fiscal adjustment by most countries by 2028, procyclicality cannot completely be avoided – some of this adjustment may coincide with a downturn. However, countries that are on the agreed adjustment path that meets all of the proposed *ex-ante* requirements should not have to undertake additional adjustments in response to a bad shock, unless this bad shock threatens debt sustainability. Yet, as we have established in section 3.2, this is precisely what the 0.5 percent of GDP minimum adjustment requirement imposed by the EDP regulation might lead to.

The deficit-based EDP should hence make an explicit exception to the 0.5 percent minimum adjustment requirement. When the member state complies with the net expenditure path agreed with the Council, and the Commission confirms that the DSA-based and deficit requirements continue to be satisfied by the agreed expenditure path, even after the shock that triggered the excessive deficit, the *"corrective path"* required by the regulation should be the same as the original net expenditure path. When the member state complies with the original net expenditure path and the DSA-based or deficit requirements are violated after a shock, the corrective path should restore compliance with these requirements, but not insist on 0.5 percent of GDP minimum deficit reduction. Only when a member state violates the original net expenditure path should the 0.5 percent of GDP minimum reduction be required, along with a corrective path that also restores the DSA and deficit requirements.

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[36] There is also a difference between the criteria for the technical trajectory and the aspects of the Commission's examination of fiscal structural plans: the expenditure growth safeguard is included only in the former; see section 2.

7. *Clarify whether reforms and investment commitments must satisfy all or only some of the criteria listed in Article 13 and Annex VII of European Commission (2023a) to justify an extension of the adjustment period, and to what extent the DSA should reflect the growth boost expected from some of these reforms*.

European Commission (2023a) lists five assessment criteria that proposed reforms or public investment commitment *"shall fulfil, taken altogether"* in order to merit an extension of the adjustment period. Some of these overlap (for example, the condition that *"the set of reform and investment commitments support fiscal sustainability"* should be automatically satisfied if *"the set of reform and investment commitments are growth enhancing"*); others do not (for example, a reform or investment commitment that contributes significantly to an EU priority, such as the Green Deal, or addresses a relevant country-specific recommendation, need not be good for growth or fiscal sustainability).

It is unclear whether these criteria are necessary (that is, all must be satisfied to justify an extension) or sufficient (it is enough for one of them to be satisfied). In our view, the latter would be setting the bar too low, and the former too high.

It is equally unclear to what extent growth claims associated with a particular reform and investment would be reflected in the DSA that underlies the adjustment requirement over the extended adjustment period, if this granted. The short-term output impact of an investment programme is relatively easy to estimate; the long-term growth impact is not. Consequently, we would recommend that the long-term potential output growth projections underlying the DSA should not reflect the supposed growth gains from a particular reform, even if that reform is viewed as sufficiently serious to justify the extension of the adjustment period.

8. *Review the Commission's DSA methodology within 12 months of the approval of the economic governance review, based on the recommendations of an independent expert group.*

As argued in section 4 and Annex 4, the Commission's DSA methodology warrants review. While there is nothing wrong with the broad design of the methodology, there are several technical assumptions and simplifications that could be improved (or discarded) with manageable effort. Furthermore, joint 'ownership' of the DSA methodology is essential to the main objective of the review: to increase national ownership of the fiscal framework. To achieve this, all EU countries need to understand and be comfortable with the assumptions underlying the Commission's methodology, and must be able to apply the methodology themselves without help from the Commission.

Freezing the methodology after it is reviewed and giving all members the technical ability to apply it should also address fears that the methodology will be manipulated in response to political pressure, which partly motivates the preference of some member states for simple rules. We thus view a jointly owned, transparent DSA methodology as a substitute for most of the safeguards tabled in the Commission's proposal (or the even tighter safeguards that some member states would prefer), without the economically undesirable implications of these safeguards.

The objective of the review should not be to reinvent the framework from scratch, only to address the technical issues described in section 4 and Annex 4, including agreeing on a procedure to manage significant discrepancies between the growth and inflation forecasts of the Commission and other well-

established institutions. In spite of this relatively limited remit, however, a review that is sufficiently thorough will take time. To expedite the review and ensure its success, two steps could be envisaged:

1. The technical review should be delegated to an independent expert group. This should seek the views of Commission staff, members states, the European Central Bank, the European Stability Mechanism and the European Fiscal Board, and submit a report to the Council recommending changes. Following Council endorsement, the proposed methodology should be used by Commission and member states as a common language for formulating and discussing technical trajectories and medium-term fiscal-structural plans.

2. The framework could be approved before the review has been finalised, as long as a deadline is set that does not exceed one year. This implies that 2024 would be a transition year, with the full implementation cycle under the new framework beginning in 2025, based on the new methodology.

9. ***Upgrade the legal status of the main features of the DSA methodology after it has been reviewed and agreed.***

As explained in section 2.1, the DSA methodology underlying the proposed regulation is currently described in general terms in Annex V of European Commission (2023a), mostly by cross-referencing an existing European Commission document (the 2022 Debt Sustainability Monitor). In line with the previous recommendation, the main features of the agreed DSA methodology should be inserted into the Code of Conduct of the Stability and Growth Pact, and Annex V of European Commission (2023a) should be modified by replacing the reference to the DSM with a reference to the Code of Conduct. Consistent with the joint process leading to the agreed methodology, the Commission should not be given delegated powers to amend Annex V (or any other annexes in the regulation that govern critical aspects of the methodology)[37]. Instead, Annex V could lay out a process for both the initial review of the methodology and subsequent reviews ahead of its application every four years.

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[37] Article 32 of European Commission (2023a) states that *"the Commission is empowered to adopt delegated acts in accordance with Article 33 to amend Annexes II to VII to adapt them to take due account of further developments or needs regarding the information in the national medium-term fiscal-structural plan (Annex II) or in the annual progress reports (Annex III), regarding the functioning of the control account (Annex IV), regarding the methodology for the assessment of plausibility (Annex V), regarding the common priorities of the Union (Annex VI) or regarding the assessment framework (Annex VII)."* This article should either be deleted (together with Article 33, which governs the exercise of delegation) or focused on a smaller subset of the annexes that excludes annexes that are essential to the fiscal adjustment implications of the proposal, including Annex IV.

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Annex 1: Text of Article 12 (requirements for the medium-term fiscal-structural plan) and Article 15 (requirement for the Commission's assessment of the medium-term fiscal-structural plan) of European Commission (2023a)

Article 12

Requirements

The national medium-term fiscal-structural plan shall:

(a) ensure the fiscal adjustment necessary to put or keep public debt on a plausibly downward path by the end of the adjustment period at the latest, or remain at prudent levels, and to bring and maintain the government deficit below the 3% of GDP reference value over the medium term;

(b) explain how it will ensure the delivery of investment and reforms responding to the main challenges identified within the European Semester, in the country-specific recommendations, correct the identified macroeconomic imbalances under the Macroeconomic Imbalances Procedure if applicable, and address the common priorities of the Union referred to in Annex VI of this Regulation, including the European Green Deal, European Pillar of Social Rights and the Digital Decade while being consistent with the updated National Energy and Climate Plans and the National Digital Decade Roadmaps;

(c) if applicable, explain how it will ensure the delivery of a relevant set of reforms and investments referred to in Article 13, underpinning an extension of the Member State's adjustment period by 3 years at most;

(d) explain how it will ensure consistency with the Recovery and Resilience Plan of the Member State concerned during the period of availability of the Recovery and Resilience Facility in accordance with Regulation (EU) 2021/241.

Article 15

Assessment of national medium-term fiscal-structural plans by the Commission

1. The Commission shall assess each national medium-term fiscal-structural plan within 2 months of its submission. The Member State concerned and the Commission may agree to extend the period of assessment by a reasonable period if necessary.

2. When assessing the national medium-term fiscal-structural plan the Commission shall examine for all Member States:

(a) whether the national medium-term fiscal-structural plan ensures that public debt is put or kept on a plausibly downward path by the end of the adjustment period at the latest, or stays at prudent levels;

(b) whether the government deficit is maintained below the 3% of GDP reference value throughout the duration of the plan or whether the government deficit returns swiftly below the 3% of GDP reference value at the latest by the end of the adjustment period when the deficit is above this reference value at the time of submission of the national medium-term fiscal-structural plan;

(c) whether the government deficit is maintained below the 3% of GDP reference value in the absence of further budgetary measures over a period of 10 years;

(d) whether the fiscal adjustment effort over the period of the national medium-term fiscal-structural plan is at least proportional to the total effort over the entire adjustment period;

(e) whether for the years that the Member State concerned is expected to have a deficit above the 3% of GDP reference value, and the excess is not close and temporary, the fiscal adjustment is consistent with the benchmark referred to under Article 3 of Council Regulation (EC) No 1467/97 on speeding up and clarifying the implementation of the excessive deficit procedure as amended by Regulation [X]; and

(f) whether the public debt ratio at the end of the planning horizon is below the public debt ratio in the year before the start of the technical trajectory.

3. In addition the Commission shall examine for the Member State concerned:

(a) whether the set of reform and investment commitments underpinning an extension of the adjustment period fulfil the conditions set out in Article 13;

(b) whether the other reform and investment commitments contained in the plan comply with the requirements of Article 12, letter b.

Annex 2: Methodology and code for implementing the European Commission's DSA in the context of the economic governance review

This annex describes the methodology, data sources and implementation of the debt sustainability analysis. The code and all publicly available data for reproduction of our results are freely available for download from the GitHub repository accompanying this publication[38].

A.2.1 Deterministic debt projections

The starting point for the DSA methodology applied in this paper is the European Commission's Debt Sustainability Monitor (DSM) 2022 (European Commission, 2023d). Annex A3 of the DSM describes debt dynamics and the projection of implicit interest rate government debt. The debt ratio in a given year, d_t, is calculated as

$$d_t = \alpha^n \cdot d_{t-1} \cdot \frac{(1 + iir_t)}{(1 + g_t)} + \alpha^f \cdot d_{t-1} \cdot \frac{(1 + iir_t)}{(1 + g_t)} \cdot \frac{e_t}{e_{t-1}} - pb_t + f_t,$$

where α^n represents the share of total government debt denominated in domestic currency, α^f represents the share of total government debt denominated in other currencies, iir_t represents the implicit interest rate on government debt, g_t represents the nominal growth rate of GDP (in national currency), e_t represents the nominal exchange rate (expressed as national currency per foreign currency)[39], pb_t represents the primary balance ratio, and f_t represents stock-flow adjustments over GDP.

Data sources. Shares of euro-denominated debt are calculated based on European Central Bank data. Exchange rates are taken from Eurostat. Both variables are assumed to remain constant over the projection horizon. Stock-flow adjustments are taken from the AMECO database and based on projections by the European Commission's DG ECFIN, which are available up to 2024; from 2025, stock-flow adjustments are assumed to be zero. Nominal GDP growth, the primary balance, and the implicit interest rate on government debt are endogenous model variables. They build on medium-term real growth, output gap and GDP-deflator projections by the European Commission's Output Gap Working Group, long-term growth and ageing-cost projections based on the European Commission's 2021 Ageing report, long-term market expectations for inflation from Bloomberg, structural primary balance projections from the AMECO database, fiscal multiplier data based on Carnot and de Castro (2015), and budget balance semi-elasticities based on Mourre *et al* (2019). The projection of the implicit interest rate on government debt further relies on ECB data on government debt stocks, shares of short- and long-term debt issuance, and average annual debt redemption, as well as market expectations for interest rates from Bloomberg. All data

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[38] To access the repository, visit https://github.com/lennardwelslau/eu-debt-sustainability-analysis. Data provided to us directly by the European Commission or downloaded from Bloomberg cannot not shared publicly. Commission data, namely real GDP growth, potential GDP, ageing costs net of pension tax revenues and property income, can be approximated using data provided by the Output Gap Working Group and European Commission (2021). Bloomberg data can be downloaded via a Bloomberg Terminal. The 'data_sources' Excel file in the data folder of the GitHub repository describes these additional sources and relevant Bloomberg tickers in detail.

[39] More precisely, the Commission's methodology models debt dynamics differently for euro members and non-members, and also for the deterministic and stochastic analysis. For the deterministic analysis, only US dollar debt is considered for euro members, while both euro and US dollar debt are considered for non-euro members. For the stochastic analysis, no foreign currency debt is considered for euro members and only foreign debt denominated in euro is considered for non-euro members.

sources are described in detail in the 'data_sources' excel file found in the data folder of the accompanying GitHub repository.

Projecting nominal growth. The effect of fiscal stimulus and the cyclical dependence of the budget balance makes growth and primary balance projections mutually dependent. These dependencies affect the variables from the beginning of the adjustment period in 2025. Prior to the adjustment period, ie up to 2024, the model relies directly on projections for the primary balance and nominal growth taken from the AMECO database. From 2025, real growth, as forecasted by the European Commission, is affected by annual adjustments of the structural primary balance. Specifically, in a given year, the effect of the fiscal multiplier effect is proportional to annual adjustments in the structural primary balance relative to its baseline trajectory:

$$m_t = 0.75 * (\Delta spb_t - \Delta spb_t^{BL})$$

Here, 0.75 is the fiscal multiplier of Carnot and de Castro (2015) and Δspb_t^{BL} denotes the annual change in baseline structural primary balance, which is based on the DG ECFIN projections up to 2024 and held constant thereafter. The multiplier m_t affects real growth via its persistent effect on the output gap, narrowing the output gap by m_t in the year of the adjustment t, and reducing its impact by one-third of its initial effect in the two consecutive periods. Thus, the total impact on the output gap in a particular year is the sum of the impact in that year plus 2/3 of the impact from the previous year plus 1/3 of the impact from two years before. For euro-area countries, Bulgaria, Czechia, Denmark and Sweden, inflation numbers used to compute nominal growth rates are based on the European Commission's forecast up to 2024 (GDP deflator), which are linearly interpolated with market expectations for 2033 implied by euro-area inflation swaps (HICP)[40], before converging to the 2 percent HICP inflation targets of these countries by 2053, in line with the Commission's methodology[41]. For Hungary, Poland and Romania, where the central banks have higher inflation target, the Commission's methodology assumes that half of the spread vis-à-vis euro-area inflation observed in 2024 remains by 2033, which in turn gradually converges to the national inflation targets by 2053.

Projecting the primary balance. The primary balance ratio is the sum of the structural primary balance ratio, a cyclical component, a property income component and an ageing cost component. Importantly, the latter component, ageing costs net of pension tax revenues, is not separated out during the adjustment period. After the end of the adjustment period, it is assumed that the structural primary balance without the change in ageing costs remains the same, thus, the change in ageing costs changes the structural primary balance after the end of the adjustment period (see Figure 1 of the main text for a graphical illustration for the case of Belgium). Costs of ageing, pension tax revenues and property income ratios were provided to us directly by the European Commission. The cyclical component is defined as the product of country-specific budget balance elasticities and the output gap.

Projecting the implicit (average) interest rate. The implicit (average) interest rate on the public debt stock, iir_t, is calculated as the weighted average of the short-term market interest rate i_t^{ST} and the long-term implicit interest rate iir_t^{LT}:

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[40] Inflation expectations are based on August 2023 averages of daily data collected from Bloomberg on 1 September.
[41] Beyond the DSM, further details about the inflation projection methodology are presented in Box I.2.1 of European Commission (2022b).

$$iir_t = \alpha_{t-1} * i_t^{ST} + (1 - \alpha_{t-1}) * iir_t^{LT}.$$

Here, α_{t-1} is the share of short-term debt in the total debt stock in t-1 and iir_t^{LT} is calculated as the weighted average of the long-term market rate i_t^{LT} and the long-term implicit market interest rate in t-1:

$$iir_t^{LT} = \beta_{t-1} * i_t^{LT} + (1 - \beta_{t-1}) * iir_{t-1}^{LT},$$

where β_{t-1} is the share of new long-term debt issuance in total long-term debt stock in t-1. Long-term market rates are projected by linearly interpolating from Bloomberg 10-year government bond benchmark rates to 10Y10Y forward rates[42]. Between t+10 and t+30, long-term market rates converge linearly to 2 percent plus national inflation targets, which yields 4.5 percent for Poland and Romania, 5 percent for Hungary and 4 percent for all other countries. Short-term market rates are calculated using 3 months benchmark rates, 3M10Y forward rates, and 0.5 times the country-specific values for the long-term rate in t+30.

To project the implicit interest rate forward, we calculate the new issuance and total stock of short-term and long-term debt in each period t. Gross financing needs, i.e. the size of new issuance, are the sum of all interest and amortization payments, and the primary balance. Here, interest on short-term debt is the product of short-term market rates and the stock of short-term debt in t-1. Interest on long-term debt is the product of the implied interest rate on long-term debt iir_t^{LT} and the long-term debt stock in t-1. Short-term debt is redeemed entirely each period. The share of long-term debt maturing each year is assumed to be equal to the share of long-term debt with maturity below one year in total long-term debt in 2022. By 2033, this share is assumed to converge to the historical average of redemption shares[43]. Like the Commission, we use ECB data for the share of maturing debt in 2022 and the historical average from 2016 to 2021. Given gross financing needs, the share of newly issued short- and long-term debt is calculated such that the share of short-term debt in total debt is held constant. The resulting debt issuances and stocks in period t are then used to calculate the implicit interest rate in t+1[44].

A.2.2 Stochastic debt projections

Stochastic projections of the debt ratio are based on Annex A4 of the DSM[45]. The approach consists of drawing multiple shock series from a joint normal distribution of historical quarterly shocks for the primary balance, nominal short- and long-term interest rates, nominal GDP growth and the exchange rate. After transforming the shocks to annual frequency and constructing the shocks to the implicit interest rate, each series is combined with the projected deterministic path of the respective variable. Recalculating the debt ratio path for each draw using the equation in section A.2.1 produces the probability distribution of debt ratio projections. In contrast to the Commission's practice, which is based on 2,000 draws, we calculate the distribution based on one million draws, for reasons explained in Annex 4.

Definition of shocks. Quarterly shocks are defined as the first differences in the historical quarterly time series. We correct for outliers by replacing observations that are three standard deviations above or below

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[42] Interest rate expectations are based on August 2023 averages of daily data collected from Bloomberg on 1 September 2023.
[43] For Cyprus, Greece, Ireland, Portugal and Spain, the amortisation of institutional debt, based on ESM data, is added to the amortisation payments implied by the redemption shares.
[44] In the periods up to 2024, the implicit interest rate is assumed to be equal to DG ECFIN projections from the AMECO database and the implicit long-term interest rate is constructed to be in line with this assumption.
[45] The DSM methodology is in turn based on Berti (2013) and Beynet and Paviot (2012).

the mean with the respective threshold. Historical series are collected from the same sources that are listed in Annex A4.4 of the DSM. Nominal GDP series are constructed by combining series for real GDP growth and the GDP deflator from Eurostat and the IMF's International Financial Statistics database. Short- and long-term interest rates are collected from the IMF's International Financial Statistics and the OECD's Key short-term economic indicators. Exchange rates are obtained from Eurostat. Primary balance series are constructed by combining net lending/borrowing and payable interest data from Eurostat. These data sources are described in detail in the 'data sources' file referenced above.

Aggregation of shocks. Quarterly shocks for nominal GDP growth, the primary balance, the nominal exchange rate and the short-term interest rate are transformed to annual frequency by summing the historical shocks in each year. In the first projection year, shocks to the long-term interest rate are transformed in the same way. However, because a change in long-term interest rate in a given quarter will affect overall interest on government debt until the debt issued in that quarter has matured, aggregating quarterly long-term interest rate shocks must account for such persistence. A shock in year t is assumed to carry over to subsequent years, proportionally to the share of maturing debt that is progressively rolled over. Thus, shocks to the implicit long-term interest rate $\varepsilon_t^{i^{LT}}$, from the second projection year onward, are defined as

$$\varepsilon_t^{i^{LT}} = \frac{t}{T} \sum_{q=-4t}^{4} \varepsilon_q^{i^{LT}},$$

where T denotes the average maturity of long-term debt in years, calculated as one over the historical average share of long-term debt maturing, and q denotes the quarters of historical shocks being aggregated. Finally, shocks to the implicit interest rate on government debt are calculated as weighted average of annualised shocks to the short- and long-term interest rate:

$$\varepsilon_t^{iir} = \alpha^{ST}\varepsilon_t^{i^{ST}} + (1 - \alpha^{ST})\varepsilon_t^{i^{LT}}$$

Here, α^{ST} is the share of short-term debt in total government debt, calculated based on ECB data. The variance-covariance matrix of the resulting annual shock series is then used to estimate a joint normal distribution with zero mean from which the shocks used in the stochastic projection are drawn.

A.3.3 Implementation

The deterministic and stochastic projections described above, as well as methods for the projection for the optimisation of structural primary balance paths under the varying assumptions of deterministic scenarios, conditions, and safeguards are implemented using Python. All scripts needed for the replication of our results can be found in the 'scripts' folder of the accompanying GitHub repository. The Python files 'EcDsaModelClass.py' and 'EcStochasticModelClass.py' contain the Python class EcDsaModelClass and its subclass EcStochasticModel, which facilitate the deterministic and stochastic analysis. The Jupyter Notebook 'ec_dsa_analysis.ipynb', introduces various class functionalities and produces the results of our analysis. Additional instructions can be found in the 'README.md' file and in the documentation within the three code files.

Annex 3: Graphical representation of economic assumptions and fiscal paths implied by the European Commission proposal

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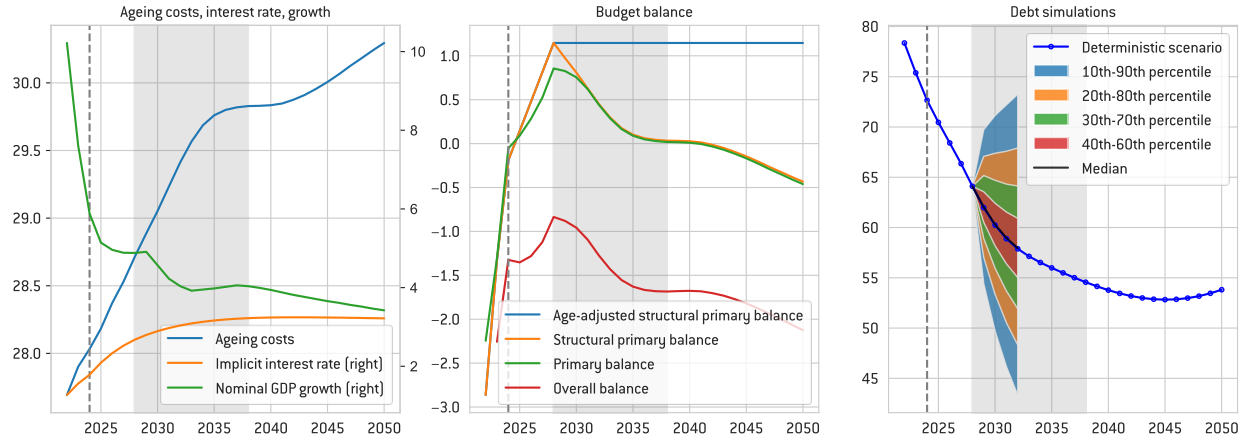
Austria: 7-year scenario
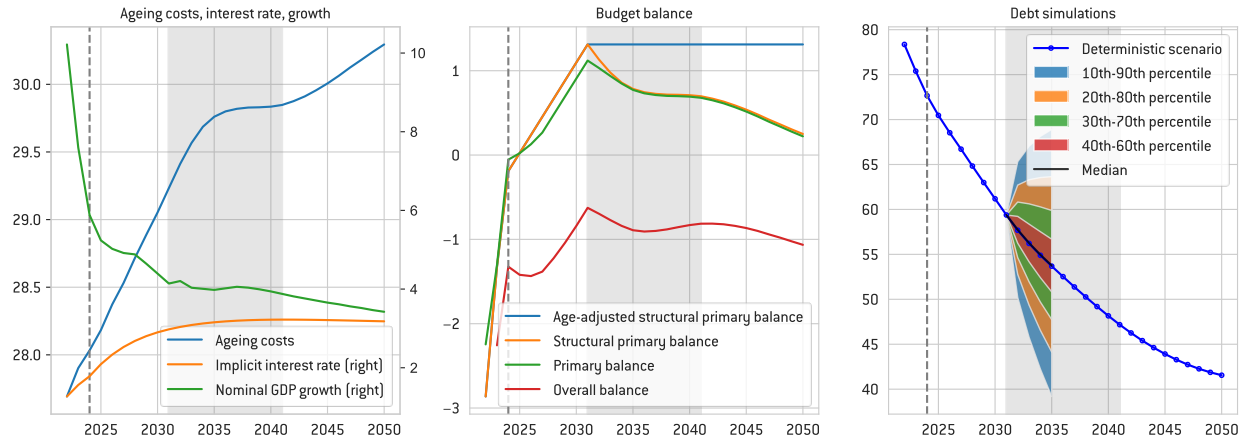
Belgium: 4-year scenario

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Belgium: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Bulgaria: 4-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

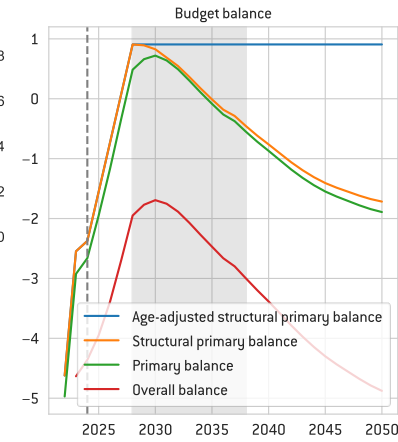## Bulgaria: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

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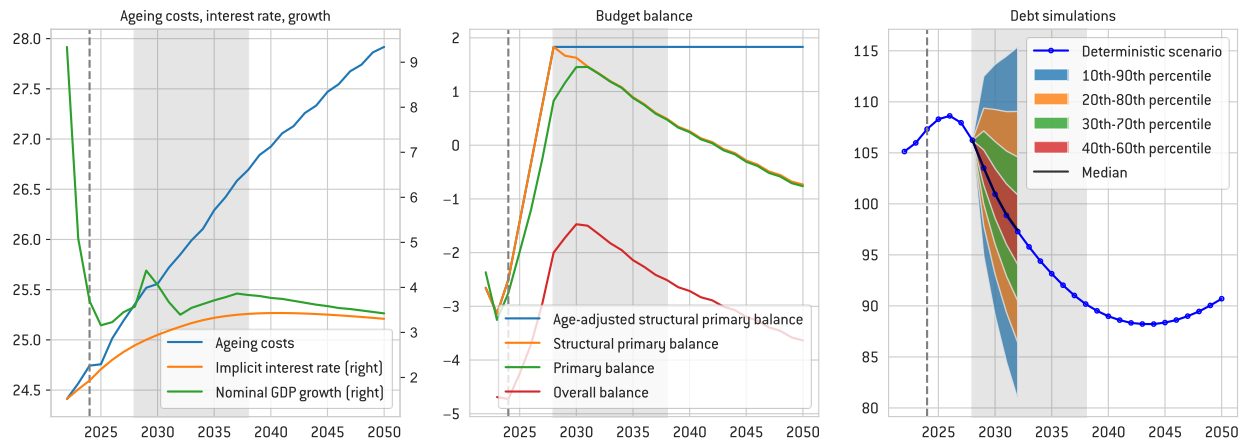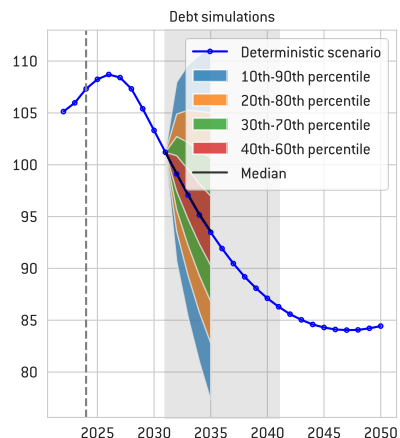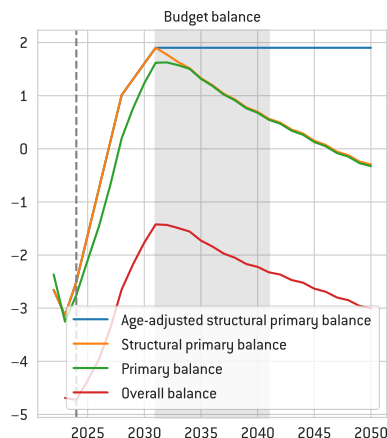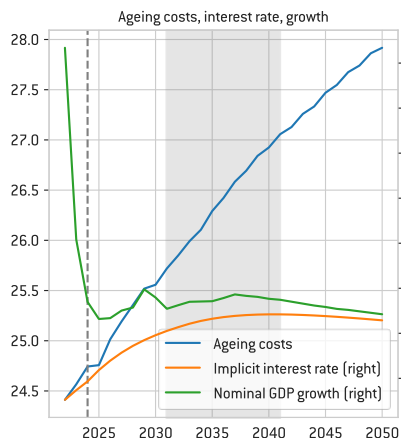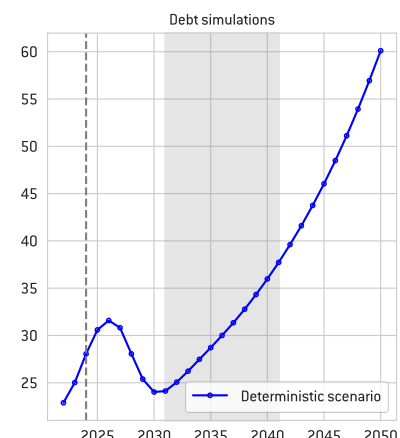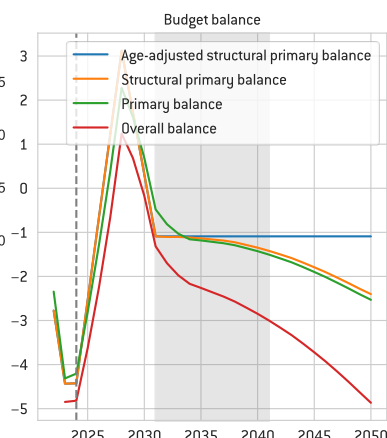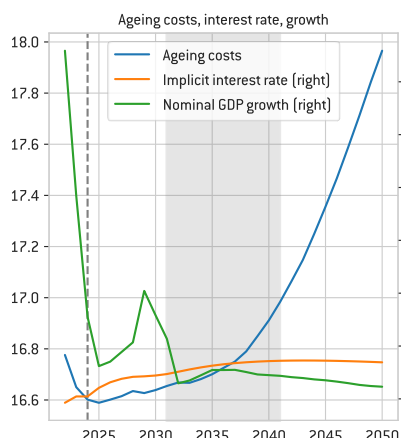
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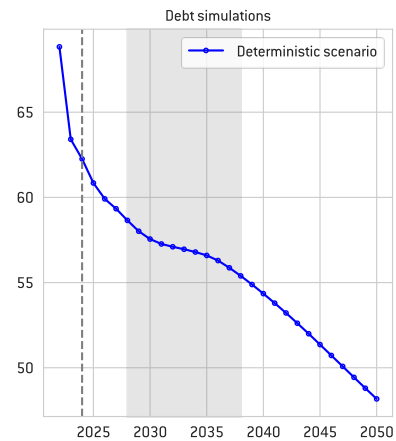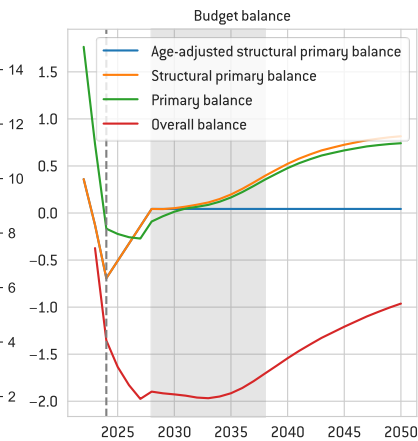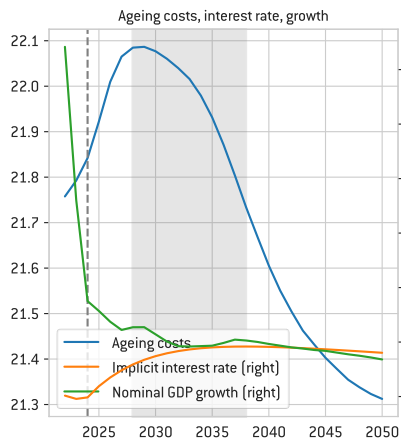
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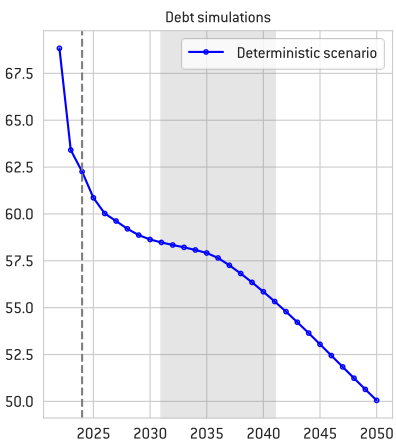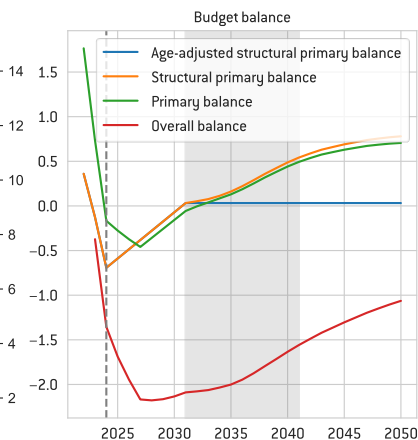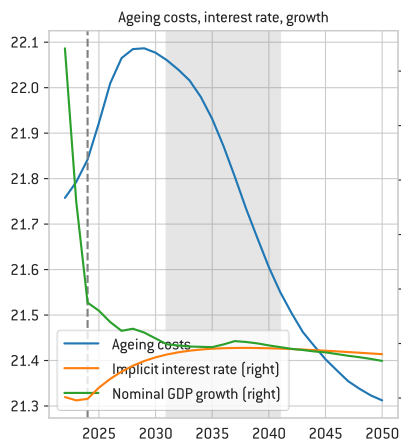
Cyprus: 4-year scenario

Cyprus: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Finland: 4-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Finland: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

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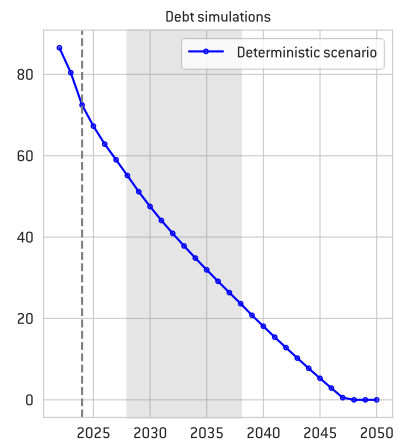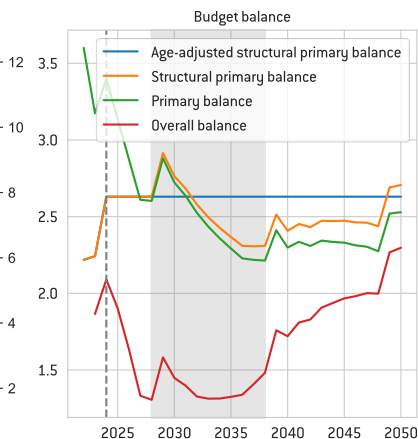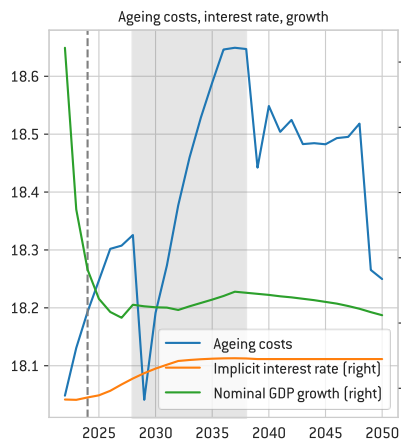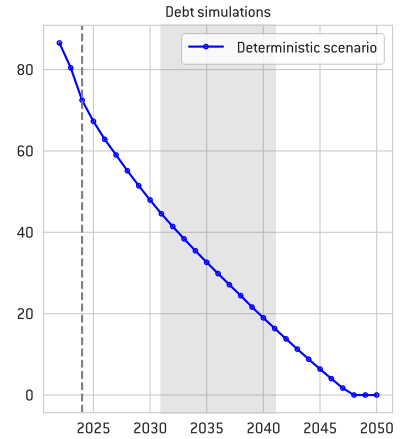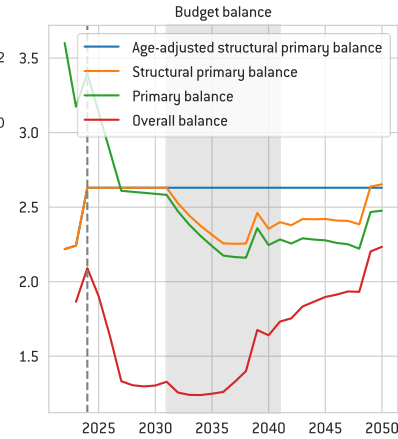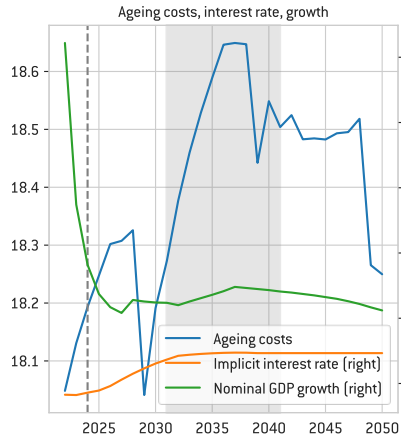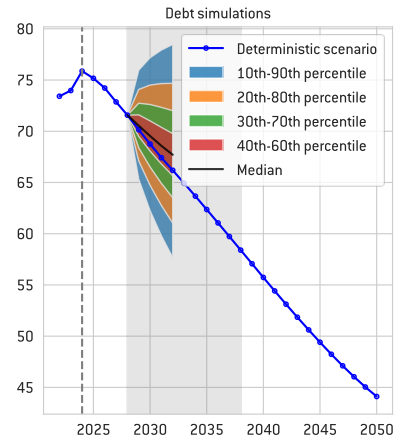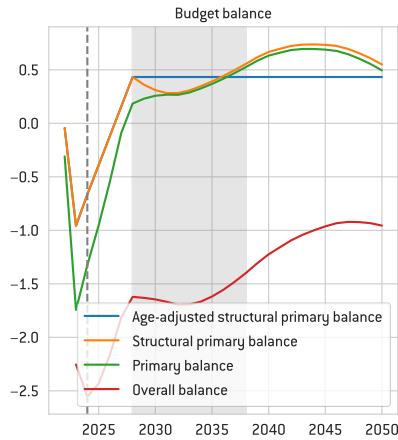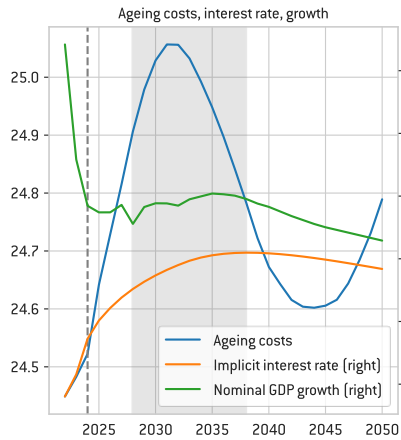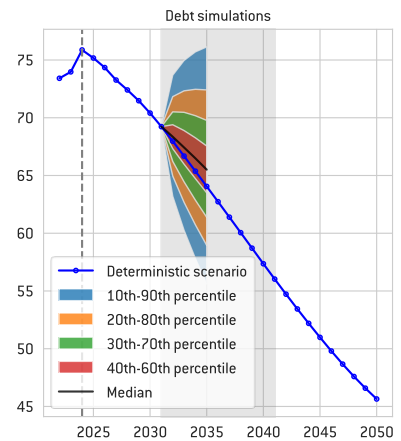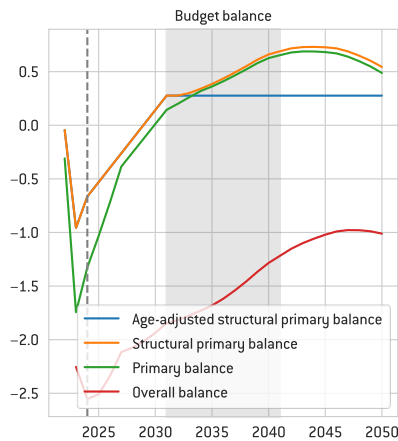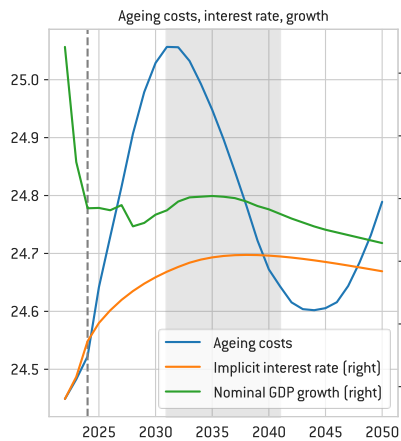
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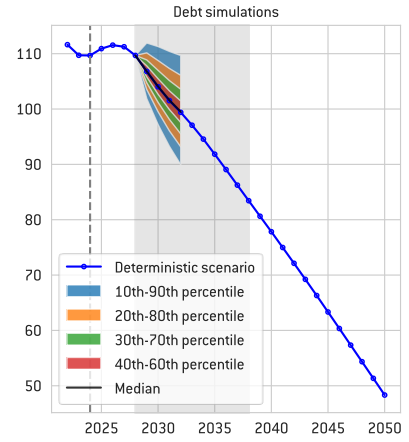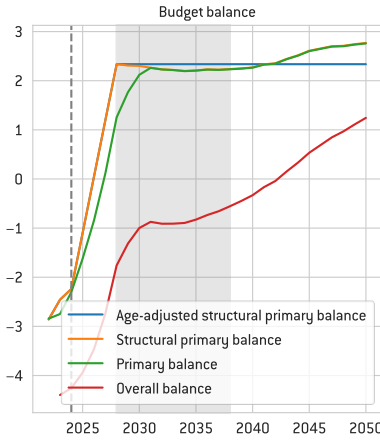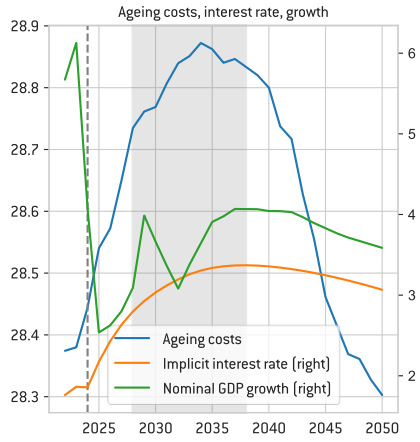
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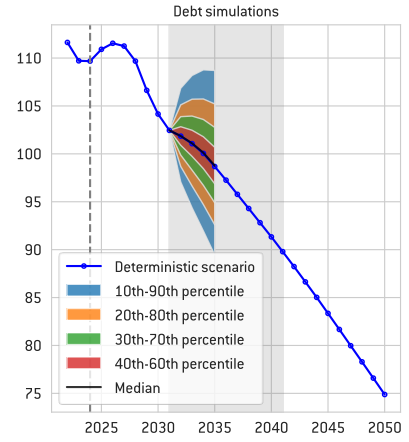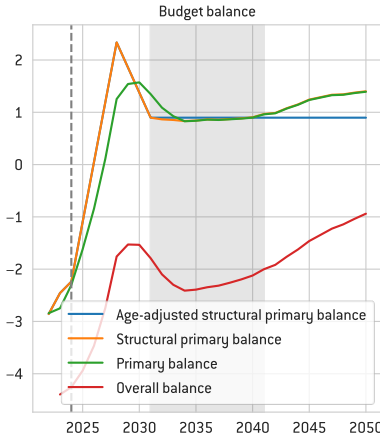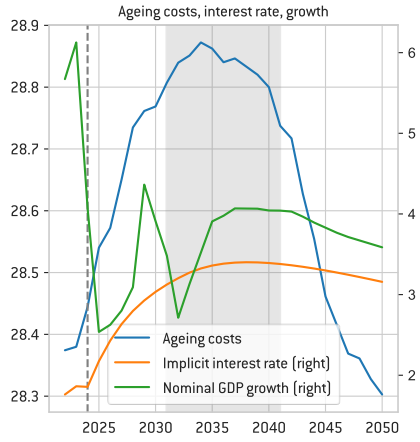
Germany: 4-year scenario

Germany: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Greece: 4-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Greece: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations
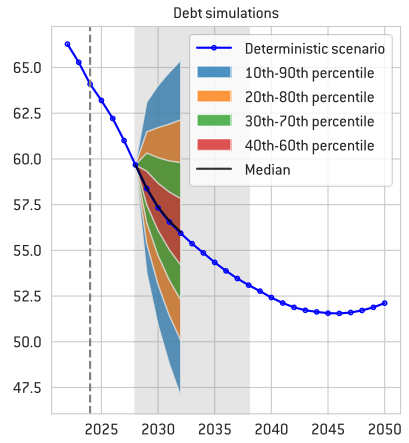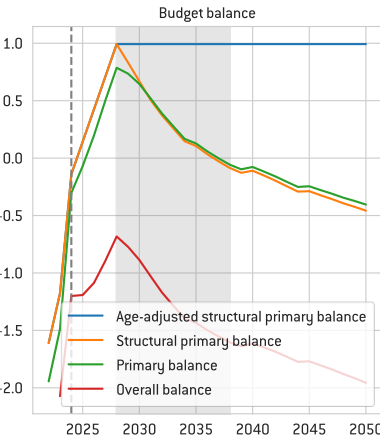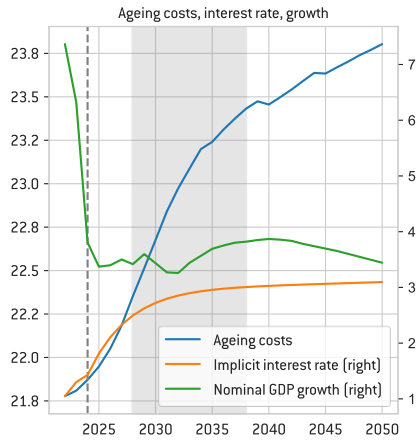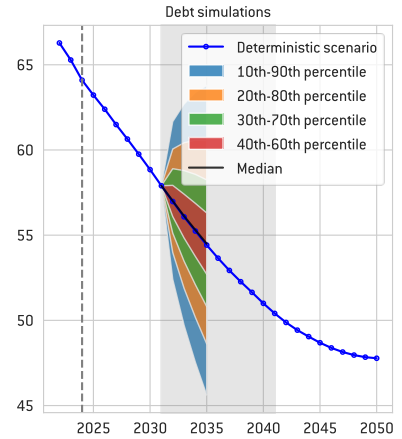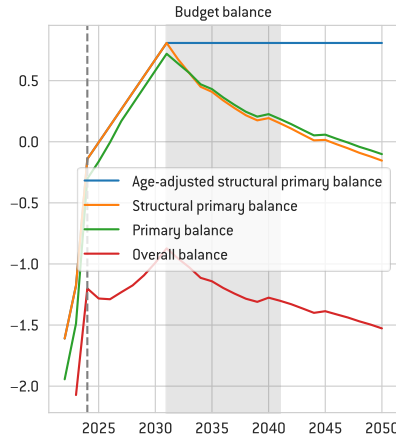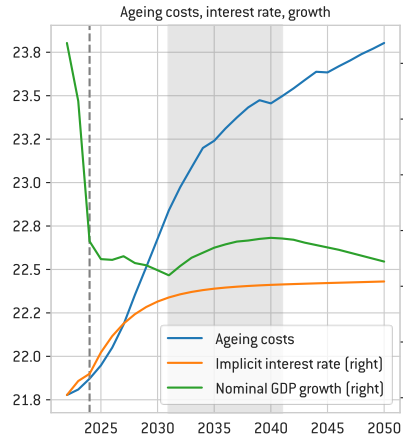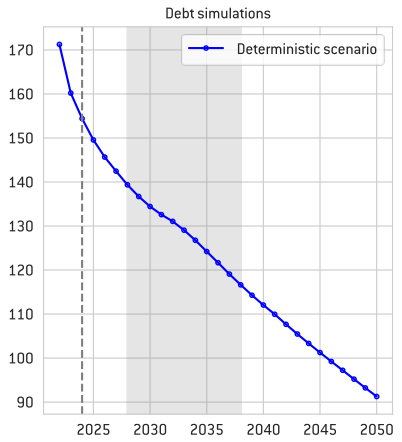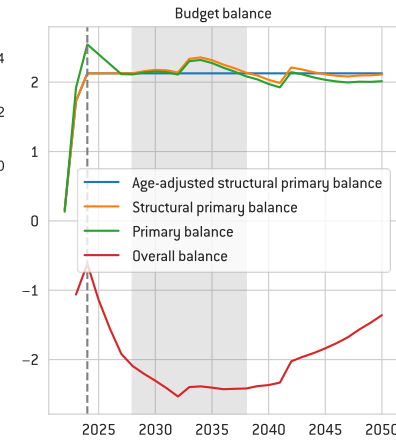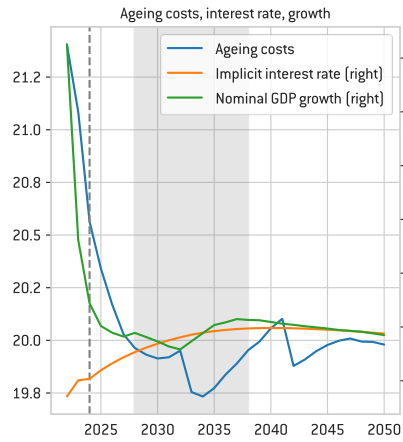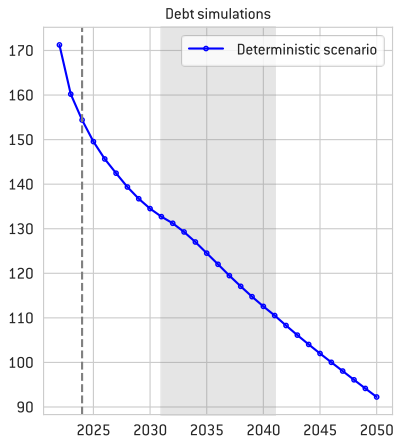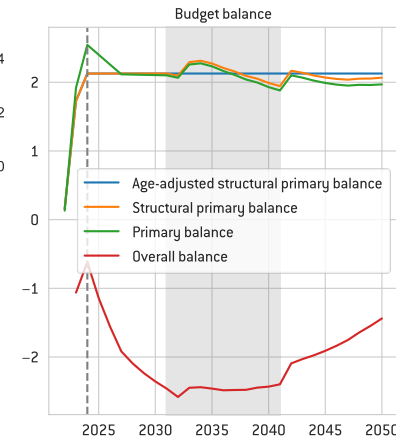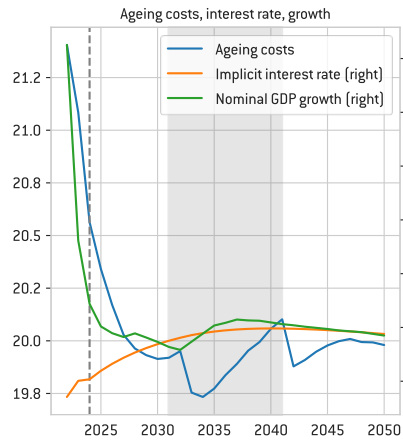
Hungary: 4-year scenario
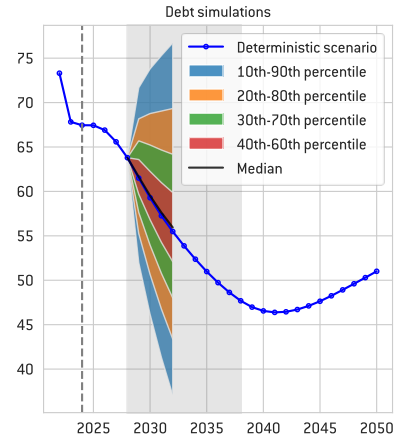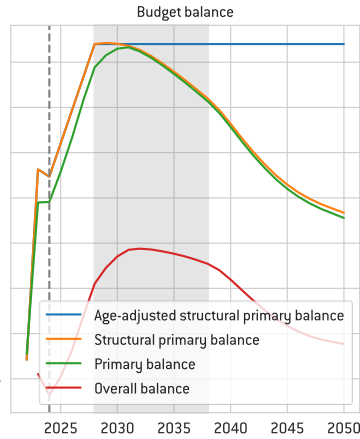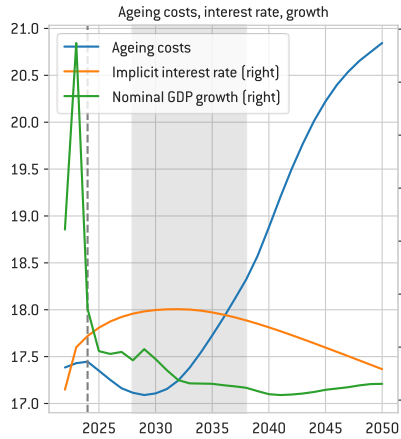
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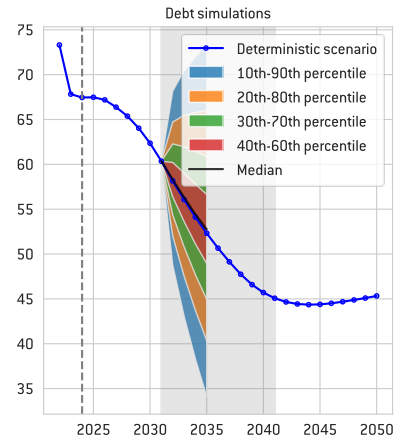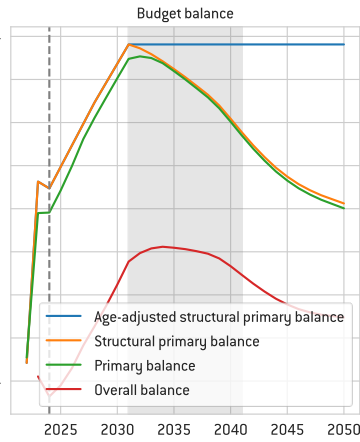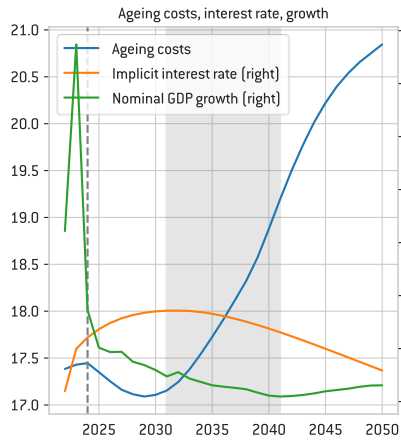
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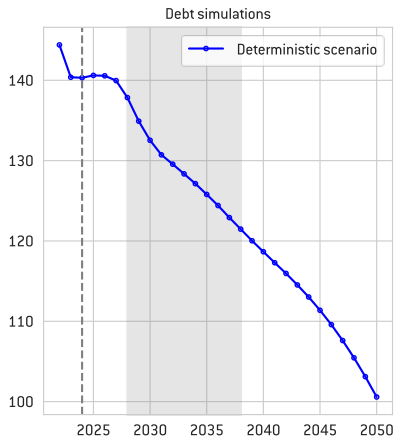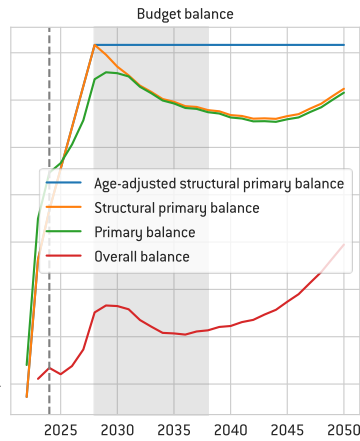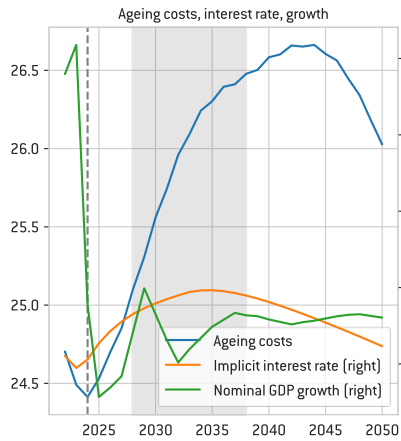
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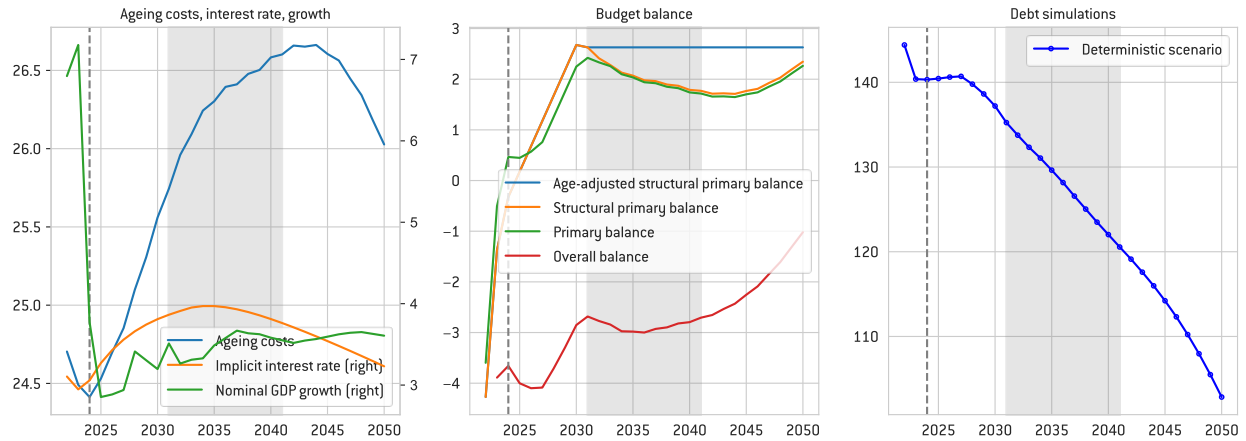
Ageing costs, interest rate, growth · Budget balance · Debt simulations

Malta: 4-year scenario

Ageing costs, interest rate, growth · Budget balance · Debt simulations

Malta: 7-year scenario

Ageing costs, interest rate, growth · Budget balance · Debt simulations

Poland: 4-year scenario

Ageing costs, interest rate, growth | Budget balance | Debt simulations

Poland: 7-year scenario

Ageing costs, interest rate, growth | Budget balance | Debt simulations
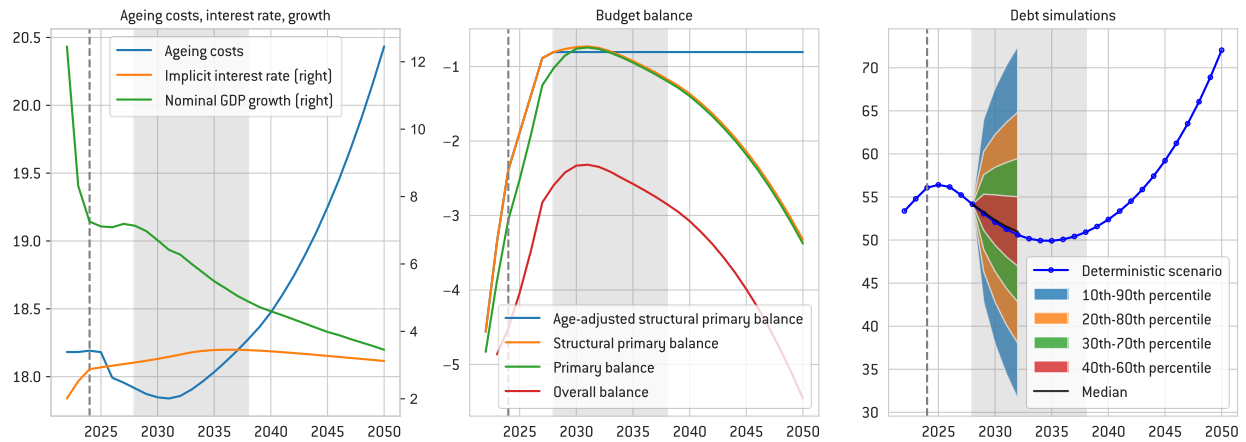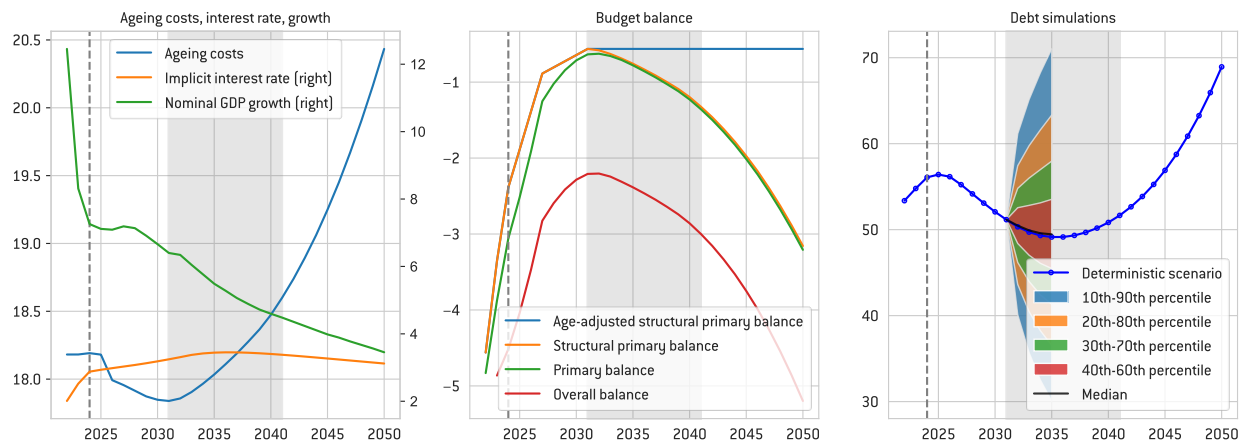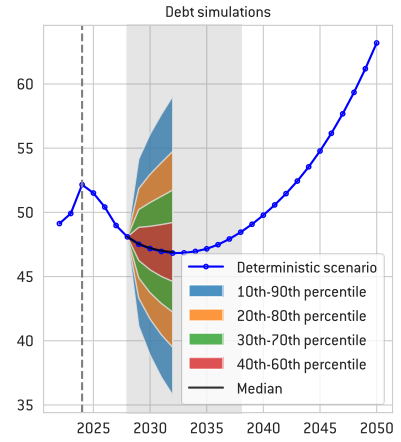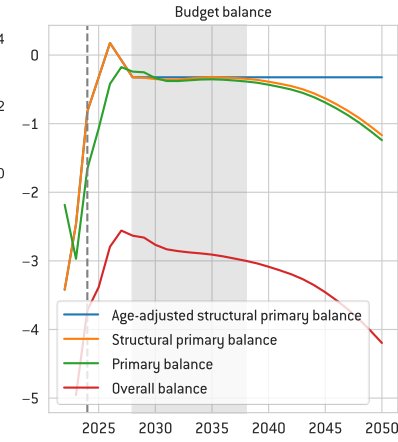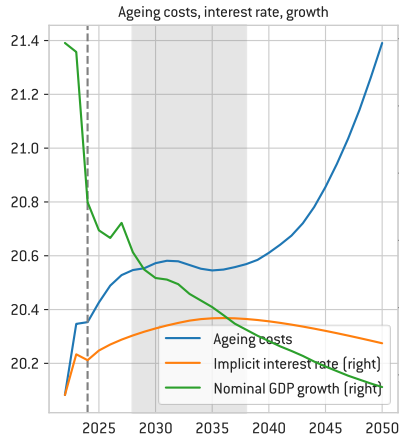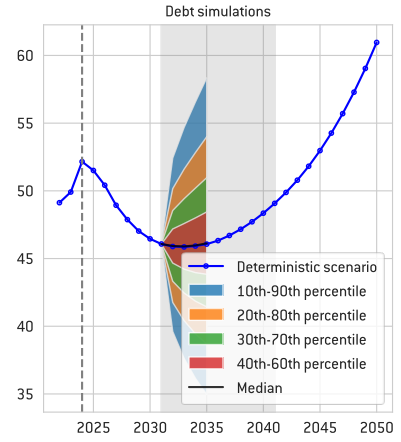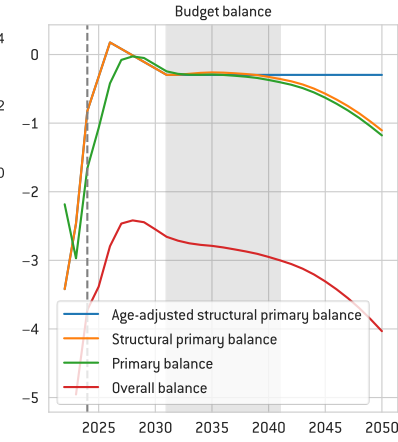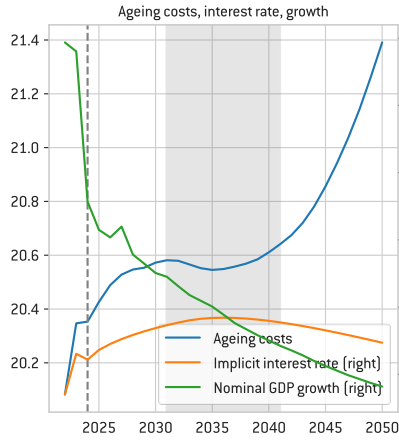
Portugal: 4-year scenario

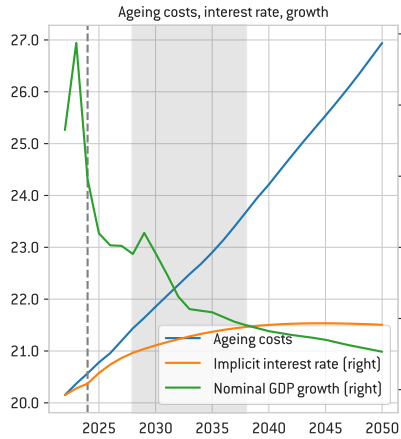Ageing costs, interest rate, growth | Budget balance | Debt simulations
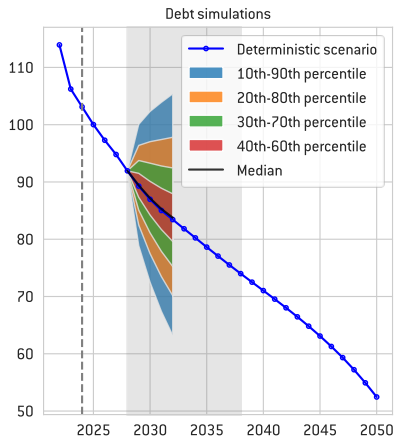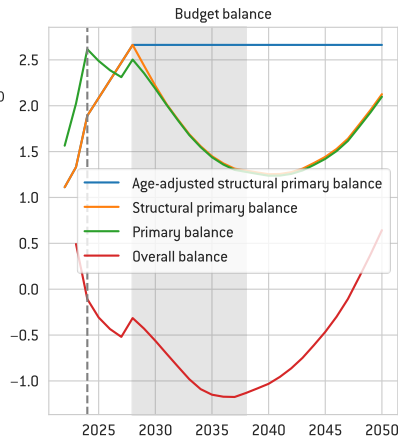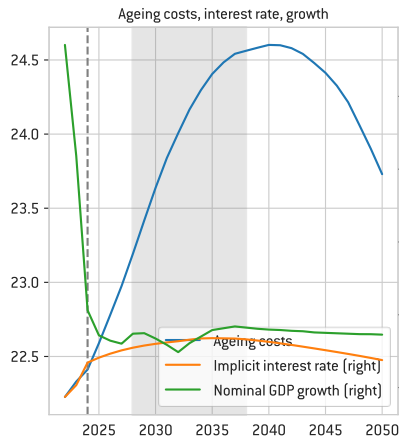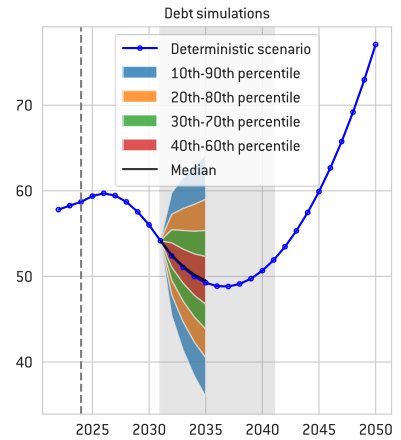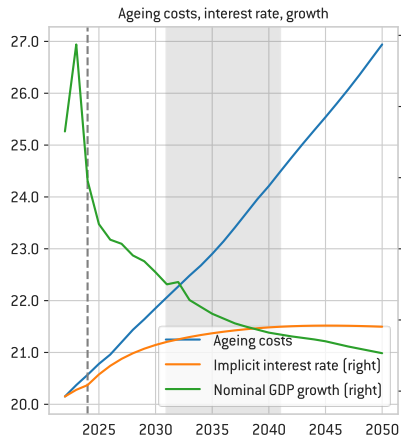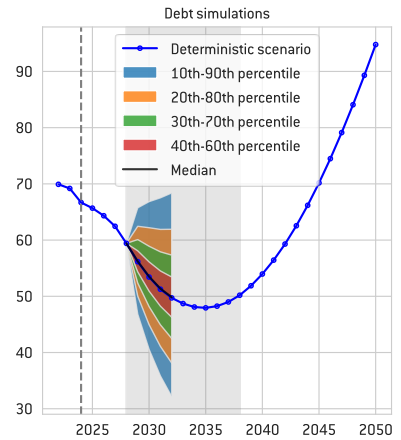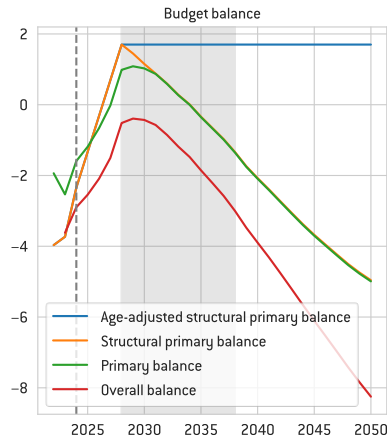
Portugal: 7-year scenario
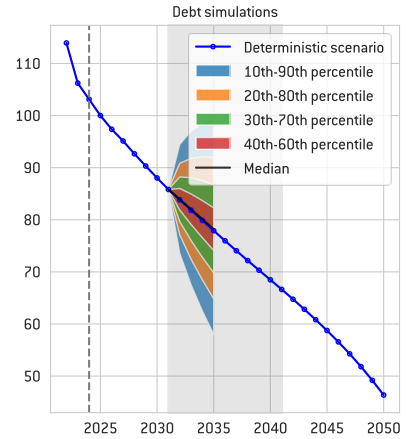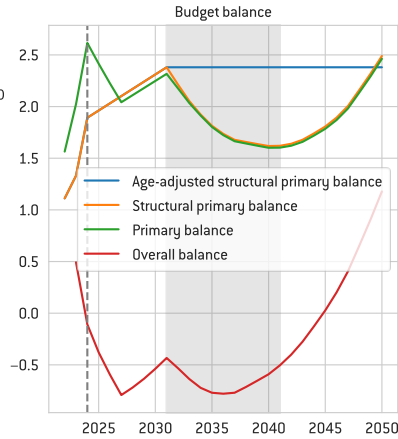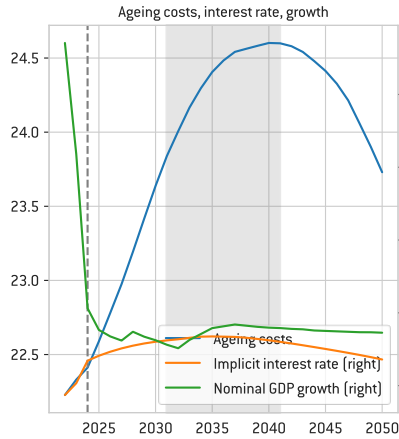
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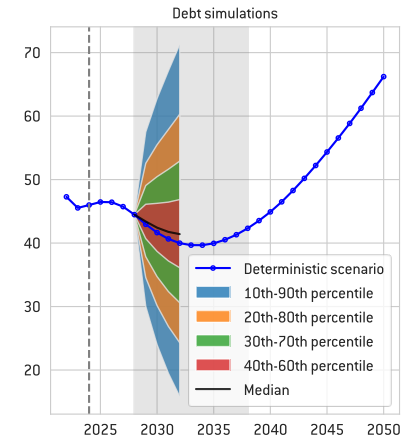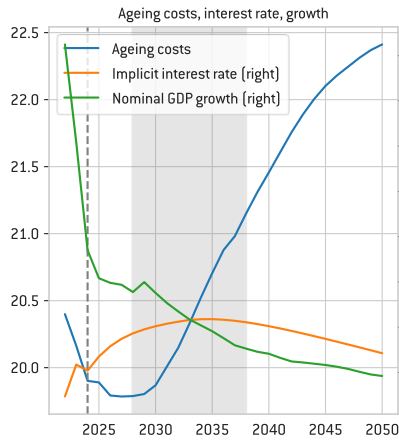
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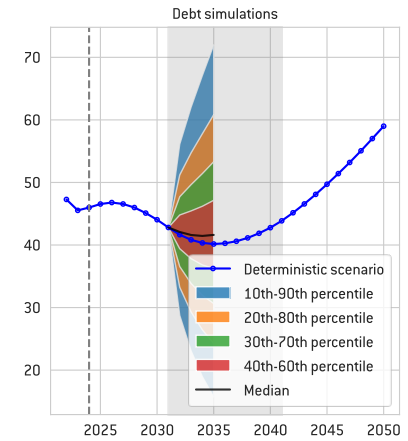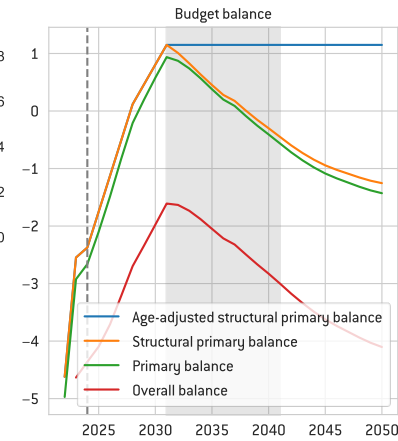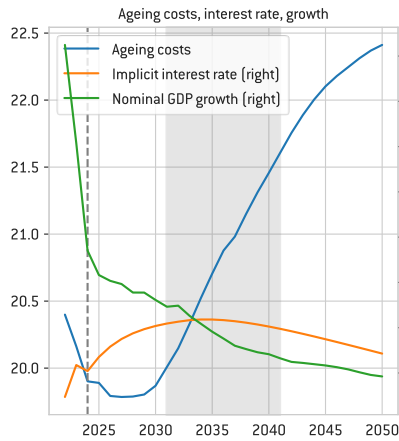
Slovakia: 4-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations
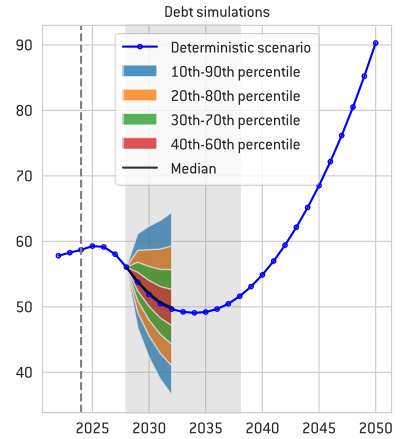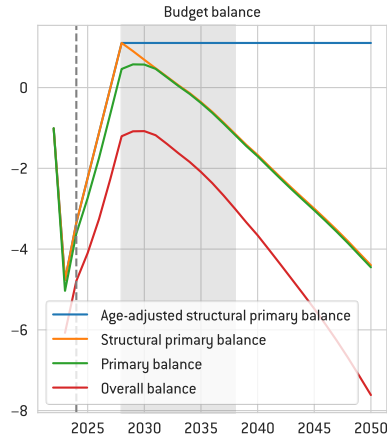
Slovakia: 7-year scenario

Ageing costs, interest rate, growth

Budget balance

Debt simulations

Slovenia: 4-year scenario

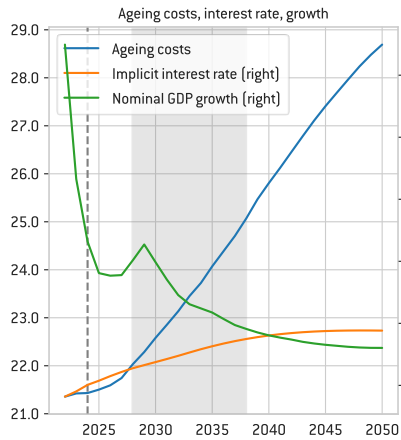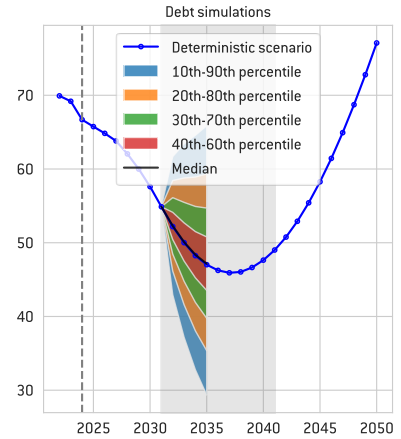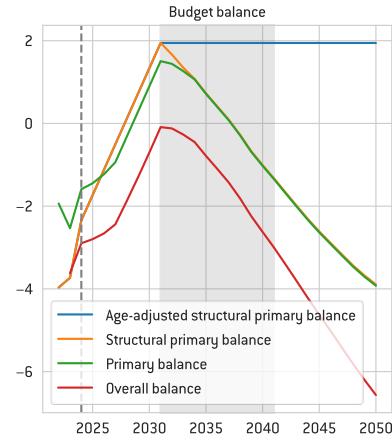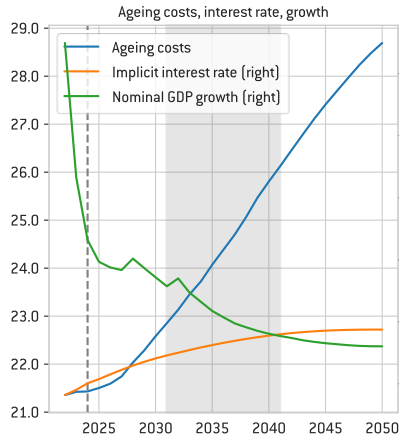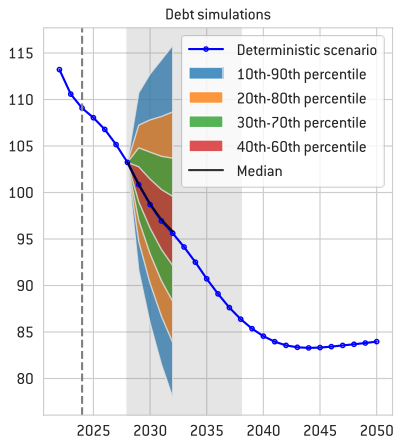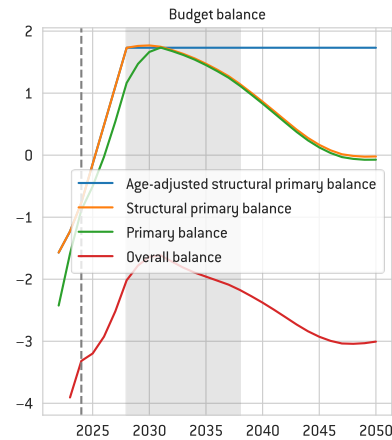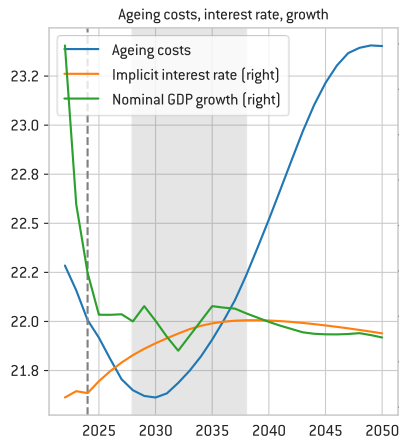Ageing costs, interest rate, growth
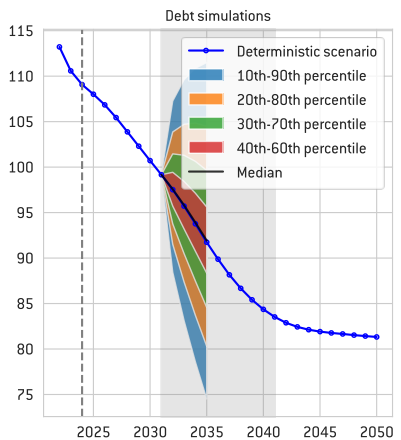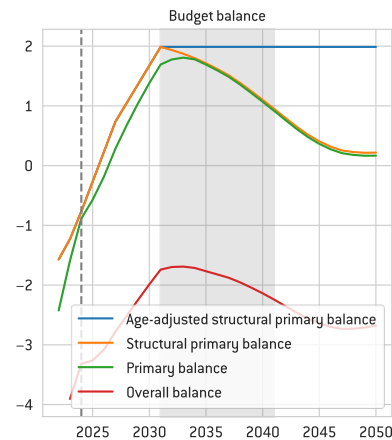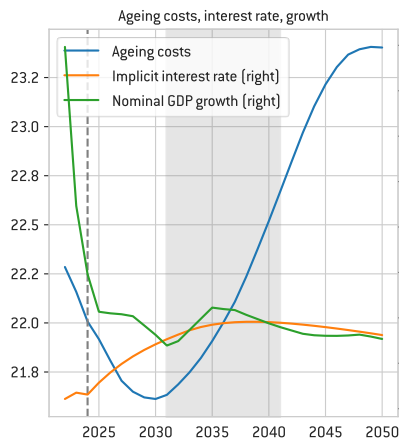

Budget balance

Debt simulations
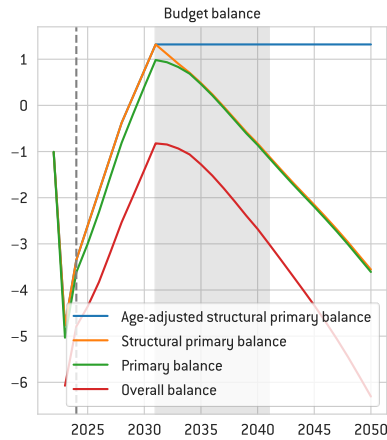
Slovenia: 7-year scenario

Spain: 4-year scenario

Spain: 7-year scenario

Annex 4: Technical assumptions of the Commission's DSA methodology that merit discussion

While the Commission's methodology is broadly in line with DSA methodologies used by other international organisations (Chapter 1.2 of ECB, 2019; IMF, 2022) and in applied academic work (Zenios *et al*, 2021; Zettelmeyer *et al*, 2018), we recommend a review of some technical assumptions of the methodology to make it more efficient. We group these assumptions into two categories: simplifications and assumptions reflecting judgment.

A.4.1 Simplifying assumptions

A.4.1.1 Simplifications relevant to both the deterministic and stochastic scenarios

Inappropriate maturity assumption for public debt maturity. Footnote 116 on page 110 of the DSM says: "*it is assumed that the share of maturing long-term debt linearly converges from the value taken in the last available year (2022) to the country-specific historical average by the end of the T+10 projection horizon.*" Since most EU countries extended the maturity of their public debts during the low-interest era before the recent inflation surge, the assumption implies that the low-interest-bearing debt matures faster (and hence needs to be replaced with higher-interest debt) sooner than these debts actually mature. Information about the actual maturity structure of all government bonds – which account for the bulk of public debt – is available and should be used. Simplifying assumptions could be made for other types of public debt, like loans. Our calculations suggest that in some cases, the simplistic maturity assumption used in the DSM results in a half-percentage point higher average interest rate on the public debt (called 'implicit interest rate' in the EU terminology) than what the use of the actual maturity profile would imply.

Linear interpolation of inflation. The method interpolates inflation from the last forecast year, usually denoted as T+2 (which is 2024 in the Commission's spring 2023 forecast), to swap-implied inflation rate by T+10, i.e. by 2032[46]. Beyond the issue of forecast uncertainty, this assumption is problematic conceptually as well. Whenever a sizeable inflation differential is forecasted for T+2 due to temporary factors (say a tax increase), the assumption implies that it will be only gradually eliminated over eight years, and thereby, there will be persistent inflation differentials. For example, the May 2023 Commission forecast predicts 2.4 percent inflation in Germany and 4.2 percent in Austria (measured in terms of the GDP deflator). The April 2023 IMF forecasts are largely different, as these suggest that Germany is expected to have slightly higher GDP deflator inflation than Austria[47]. When using the Commission forecast, the assumption of linear convergence to T+10 euro-area market-based inflation implies that the total cumulative inflation differential between Austria and Germany during the eight years from 2024 to 2032 is 6.3 percent. This rather large, assumed inflation difference advantages Austria relative to Germany in the debt sustainability analysis. Figure A.4.1 shows the cumulative 2024-2032 inflation gaps to Germany for all EU countries. The high values for some central European countries could be explained (at least partly) by their lower price level than Germany, but this explanation cannot hold for Austria, or for Luxembourg, another developed euro-area country with a high domestic price level. On the other end, Swedish inflation is assumed to undershoot German inflation by 2.8 percent in total over these eight years. When inflation and its volatility are low, the assumed linear approximation can be less of a problem,

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[46] There is also an inconsistency in using consumer price inflation swaps for projecting the GDP deflator; see below.
[47] The April 2023 IMF GDP deflator change projection for 2024 is 2.9 percent for Germany and 2.6 percent for Austria, and for 2025-2027, it is 2.3 percent on average for Germany and 2.0 percent for Austria. Thus, the IMF expects slightly lower GDP deflator change in Austria than in Germany in 2024-2027, contrasting with the European Commission forecasts.

nevertheless, as Figure A.4.1 indicates, it would cause distortions at the first application of the new framework and we cannot exclude the return of high inflation in the future.

This problem could be lessened by using shorter-horizon market-based inflation forecasts, which are available for each annual maturity (ie 1-year, 2-year, 3-year, …), possibly after adjusting such market-based expectations for the risk premia[48].

Figure A.4.1: Implied cumulative 2024-2032 inflation gap to Germany, based on the May 2023 Commission forecasts (in percent)
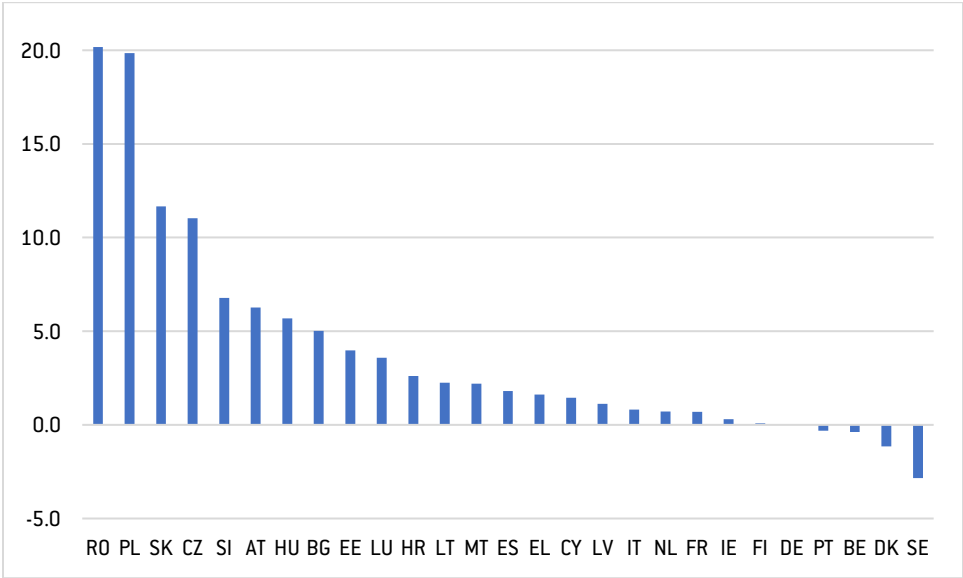
Source: Bruegel based on inflation projection data received from the European Commission.

Risk premia invariant to the debt level. As the public debt ratio decreases in a country, the interest rate spread compared to Germany is expected to decline; conversely, the spread is expected to increase for countries with exploding debt ratios. While market interest rate expectations presumably incorporate a baseline public debt path, the same interest rate is assumed for all DSA scenarios, even though they correspond to different debt trajectories.

Other simplifications. There are some other simplifications which could be eliminated easily.

- **Inconsistency in fiscal multiplier assumptions.** During the adjustment period, the multiplier is applied to the change in the SPB (ie the total SPB including ageing costs), but in the post-

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[48] Similarly, interest rate assumptions, which currently linearly interpolate between current interest rates and 10-year ahead market-based interest rate expectations, could also rely on shorter-horizon market-based expectations. In this regard, let us highlight an inconsistency between interest rate and inflation assumptions. For the interest rate (on new borrowing), the current (ie 2022 in the latest forecast round) market-based interest rate is interpolated with the T+10 (ie 2032) market-based expectations. For inflation, the T+2 Commission forecast (ie 2024) is interpolated with the T+10 (ie 2032) market-based expectations. However, the T+2 Commission inflation forecast can be different from the market-based expectation for the same year.

adjustment period, no multiplier effect is assumed, even though the total SPB (including ageing costs) is assumed to change[49].

- **Treatment of foreign currency debt.** Many EU countries issue debt in foreign currencies. The deterministic scenarios consider three currencies (the national currency, the euro (foreign currency for non-euro area countries) and the dollar (foreign currency for all countries)). In the stochastic scenario, foreign currency debt is disregarded for euro members, while for non-euro countries, only two currencies (local currency and euro) are considered. It would be very simple to include all currencies in which a country borrowed in the debt simulations.

- **Assuming the same interest rate on local currency debt and foreign currency debt.** This is probably a reasonable assumption for developed EU countries, but it is a potentially important issue for some central and eastern EU countries that face a large spread between domestic currency and foreign currency borrowing rates, like Hungary. When uncovered interest rate parity holds (UIP), the expected cost of domestic currency and foreign currency borrowing is the same. However, the empirical literature often rejects the UIP hypothesis. Furthermore, the risk premium component of domestic currency and foreign currency borrowing rates of a non-AAA-rated country could be different. Since information about the interest cost of foreign currency borrowing is available, it would be very simple to include the actual interest cost in the debt simulations.

- **Ignoring the difference between the GDP deflator and HICP in medium- and long-term projections**, which likely leads to higher nominal GDP projections and thus less fiscal adjustment requirements than what the use of the GDP deflator would imply. On average, from 2000-2024 (using the latest, May 2023, European Commission forecast), the gap between the annual percent change of HICP and GDP deflator was 0.31 percentage points in the EU and 0.25 percentage points in the euro area. Extrapolating this annual change to 14 years (four adjustment years and 10 post-adjustment years) results in a gap of 4.5 percent for the EU and 3.5 percent for the euro area. That is, nominal GDP projections, on average in the EU, would be 4.5 percent (EU) or 3.5 percent (EA) higher by the 14th year when CPI is used instead of the GDP deflator, if the average historical differences observed in 2000-2024 prevail in the future. The correlation coefficient between HICP inflation and the gap between HICP and GDP deflator inflation is 0.82 for the EU, indicating that HICP inflation tends to exceed GDP deflator inflation in years when inflation is high. This suggests that the gap between HICP and GDP deflator inflation is expected to be lower when inflation is low. Yet when we limit the sample to the years when HICP inflation was between 1.5 percent and 2.5 percent, the average annual gap was almost the same as in the full sample: 0.27 percentage points for the EU and 0.30 percentage points for the euro area. Moreover, high inflation episodes might return in the future.

- **Using euro-area market-based inflation expectations for Bulgaria, Czechia, Denmark and Sweden**, which are not members of the euro area. While such expectations are not available for Bulgaria and Czechia, they are available for Denmark and Sweden. Data at the time of writing shows that Swedish 10-year expectations are 1 percentage point higher than euro-area expectations. Market-based inflation expectations for Denmark and Sweden could be easily used.

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[49] A related further inconsistency between the deterministic and stochastic scenarios is that in the deterministic scenarios, a uniform 0.75 fiscal multiplier is assumed for all countries, while in the stochastic scenario, the country-specific covariance matrices imply country-specific fiscal multipliers.

A Balassa-Samuelson-type inflation convergence assumption would be appropriate especially for Bulgaria, a country that has a low price level compared to the EU, but also for Czechia.

A.4.1.2 Issues specific to the stochastic analysis

Uncertainty assumed to be zero during adjustment period. For the purposes of computing the technical trajectory, the Commission's methodology assumes that uncertainty sets in immediately after the adjustment period, disregarding uncertainty during the adjustment period. This is problematic because uncertainty during the adjustment period likely influences the probability with which the debt ratio five years after the adjustment period will be above the debt ratio prevailing at the beginning of the adjustment period. While it is appropriate to ignore uncertainty with respect to the structural primary balance during the adjustment period (as it is a policy variable that the member states are assumed to control during this period, adjusting as necessary if there are deviations from the planned path), it is inappropriate to ignore growth and interest rate shocks during this period. It would be straightforward to apply the stochastic analysis for the combined time period, treating growth and interest rates as stochastic during the entire period, while assuming that the SPB is deterministic during the adjustment period and stochastic in the post-adjustment period.

Normality assumption and lack of shock persistence. Shocks are assumed to be normally distributed, however, we found that the null hypothesis of the normal distribution of shocks can be rejected. One reason why the normality assumption is problematic is that it implies that shocks are not persistent[50]. For example, if the primary balance is lowered because of an unexpected shock in a year, this shock is assumed to have no impact on the primary balance in the subsequent year. A bootstrap method, such as the block bootstrap approach used in the IMF's debt sustainability analysis (IMF, 2021; IMF, 2022), may be a way to capture the shock persistence better.

Inconsistent sample lengths when estimating uncertainty. Section A4.4 of the DSM states: "*In general, data starting from the mid 70s until last available data were used to calculate the historical variance-covariance matrix. This period can be shorter in case of limited data availability.*" The country-specific starting dates are not presented in the DSM. Our data collection from the sources listed in the DSM revealed largely different sample periods across EU countries. The longest data sample is available for France starting in 1981, while for a large share of countries, the first available observation is in the mid-1990s, for others, it is in early 2000s. Several current euro-area countries faced much higher and more volatile interest rates before joining the euro than afterwards. Thus, using data from the pre-euro period is questionable, because the volatility of nominal interest rates is likely lower after euro entry. A good option would be to restrict the sample period to start after euro entry for euro-member countries, while for non-members, an economic analysis should determine a reasonable starting year (eg Bulgaria and Romania suffered from very high macroeconomic volatility in the late 1990s, which are unlikely to return).

Small number of draws. The Commission uses only 2000 draws. When repeating the stochastic analysis several times with 2000 draws, we noticed that the resulting probabilities deviated by around 3 percentage points across simulations (for example when running the analysis with 2000 draws we might initially obtain a 40 percent probability, while at another time with 2000 draws, we might obtain a 37

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[50] In the Commission's method, long-term interest shocks have some persistent effects on the average interest rate on public debt (ie the 'implicit interest rate'), since long-term borrowing in a year will carry that interest rate until the bond matures. Yet there is no persistent effect on new borrowing, eg a shock that pushes up the long-term interest rate in a year is assumed to have no effect on the long-term interest rate in the subsequent year.

percent probability). While this is not an excessively large difference, it can be easily eliminated by running a larger number of draws. When using one million draws, the variation across repeated simulations was essentially zero. Therefore, in our own analysis, we used one million draws.

The derivation of shocks from quarterly data and it's it's application to annual data. Since the goal of the analysis is to assess medium- and long-term debt sustainability using annual data, it is unclear why the covariance matrix is estimated from quarterly data, instead of deriving the shocks and the covariance matrix directly from annual data. Moreover, quarterly budget data is confidential for four EU countries (Croatia, Cyprus, Italy and Greece), implying that the calculations cannot be replicated by everyone.

A.4.2 Assumptions reflecting judgment

Treatment of ageing costs. As noted in section 2.3, ageing costs baseline scenarios differ enormously across countries and have major impacts on the DSA calculations. It is assumed that under an unchanged fiscal policy scenario after the adjustment period, the SPB deteriorates with the projected increase in ageing costs. A possible justification of this treatment of ageing costs is that those countries that have not yet introduced reforms (eg pensions, old-age care, healthcare) to address these projected costs, should provide a sufficient budget surplus during the adjustment period (eg 2025-2028) to be able to finance ageing costs in the subsequent ten years (eg 2029-2038) even in the absence of such reforms. This might encourage countries to bring those reforms forward. This is a relevant consideration. However, whether the unchanged fiscal policy scenario considers 10 years, 5 years or 15 years after the adjustment period, significantly impacts the required adjustment during the adjustment period.

2 percent real interest rate in the long run. The DSM assumes a 2 percent real interest rate on long-term borrowing and zero real interest rate on short-term borrowing, for all countries. The share of long-term borrowing is 93 percent on average across the countries. The real interest rate is conceptually defined as the nominal interest rate adjusted by inflation expectations. Due to the difficulties in measuring inflation expectations, the estimation of real interest rates is difficult. In Figure A.4.2, we adjust the implicit interest rate on public debt with the actual average future GDP deflator inflation change in the subsequent 10 years. For example, we deflate the 2000 interest rate with the actual average GDP deflator change from 2000-2010. For more recent years, we use IMF GDP deflator forecasts, which are available up to 2028, and assume that from 2029, the annual GDP deflator change will be the same as the forecast for 2028. While this is an imperfect measure, the chart reveals two main conclusions: (1) real interest rates vary across countries, and (2) real interest rates were below 2 percent over the last decade, even in higher-debt EU countries. Thus, a uniform 2 percent real interest assumption is overly conservative, especially for countries with lower debt levels.

Figure A.4.2: Real interest rate in selected EU countries (in percent)
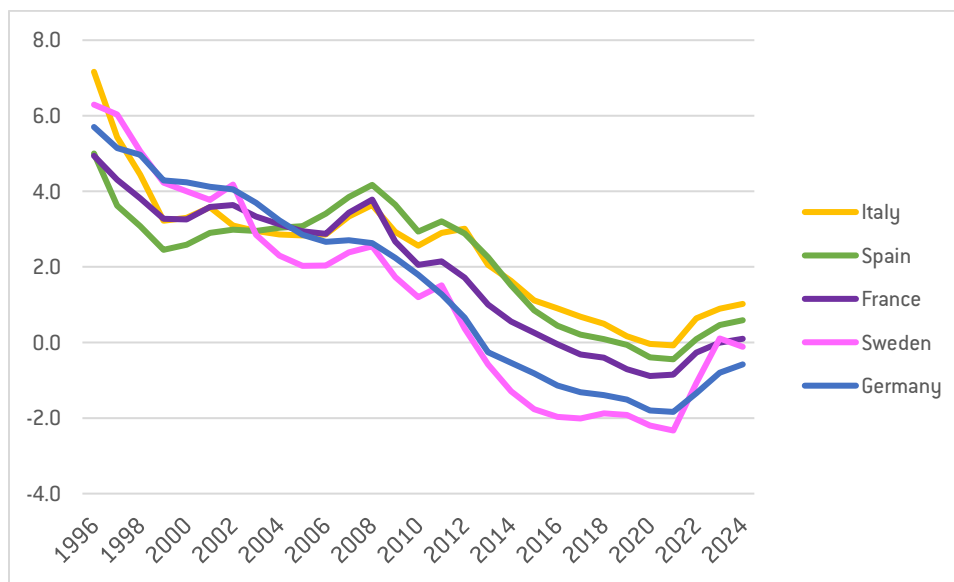
Source: Bruegel based on the May 2023 AMECO dataset. Note: the real interest rate is calculated as the difference between the implicit interest rate on public debt and the actual average future GDP deflator inflation change in the subsequent 10 years. For more recent years, we use IMF forecasts.

30 percent probability cut-off for the stochastic scenario. Annex V of the draft regulation only says that "*the risk of the public debt ratio not decreasing in the 5 years following the adjustment period of the national medium-term fiscal-structural plan is sufficiently low*", but does not specify the value of "*sufficiently low*". In the past, the Commission used a 30 percent cut-off for a similar analysis, so the same value might be used for the fiscal framework, too. Since the selection of this cut-off value has a major impact, it should be properly justified. We note that the IMF uses a 20 percent cut-off value for similar exercises.

Definition of the deterministic scenarios. The adverse r-g scenario assumes a 1 percentage point permanent increase in the interest rate/growth rate differential, while the financial stress scenario assumes a 1 percentage point temporary (lasting for one year) increase in the market interest rate (or somewhat larger values for countries with debt ratios over 90 percent of GDP). The adverse SPB shock will deviate from what is used in the DSM (according to footnote 9 on pages 11-12 of the DSM), but the exact implementation of this scenario is not defined. In our calculations, we interpreted this scenario as a permanently 0.5 percentage point lower SPB. Whatever numerical values will be adopted, their selection needs justification. Furthermore, these shocks are assumed to be uniform across countries (except the financial stress scenario for countries with debt ratios above 90 percent), even though the volatility of macroeconomic variables and interest rates differ across countries. The financial stress scenario leads to a much lower SPB* than the adverse r-g scenario even for high-debt countries, so it is redundant as currently defined.

Fiscal multiplier assumptions. A uniform temporary 0.75 fiscal multiplier is assumed for all countries, which impact is assumed to fade away after three years. These values were calibrated on the basis of Carnot and de Castro (2015). The multiplier value and its time profile could be reconsidered, as well as whether uniform or country-specific values should be used.

Outlier adjustment for the stochastic scenario*.* Footnote 124 on page 115 of the DSM says: "*Before the quarterly data series are turned into shocks, some adjustments are made to eliminate extreme outliers*", but the details of the procedure are not provided. One option would be to drop certain observations from the sample completely, but that reduces the estimated variances significantly. Another option (that we have chosen) is to reduce the outlier values, for example, to three standard deviations away from the mean. This procedure also reduces the variances, but only eliminates the unlikely component of outlier observations (which is beyond three standard deviations), while keeping large shocks (amounting to three standard deviations) in the sample. The results of probability calculations can be sensitive to the outlier adjustment method.

Annex 5: Drafting suggestions for amending the proposed regulations (European Commission, 2023a, b)

European Commission (2023a) (V.1 COM(2023) 240 final, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the effective coordination of economic policies and multilateral budgetary surveillance and repealing Council Regulation (EC) No 1466/97)

Article 2 (Definitions)

Point (7), revise from:

- (7) 'adjustment period' means the period of time over which the fiscal adjustment of a Member State takes place, covering a minimum adjustment period of 4 years of the national medium-term fiscal-structural plan and its possible extension;

to:

- (7) 'adjustment period' means the period of time over which the fiscal adjustment of a Member State takes place, covering a minimum adjustment period of 4 years and a maximum period of 7 years;

Add a new point after the current point (7) as point (8), and increase the number of current point (8) and later points by one:

- (8) 'planning horizon' means the same as the adjustment period;

Article 6 (Requirements for the technical trajectory) and Annex I (Criteria for setting the technical trajectory for Member States having a public debt above 60% of GDP reference value or government deficit above 3% of GDP reference value)

Merge Article 6 and Annex I into a new Article 6 and delete Annex I.

Revise the no backloading safeguard:

Instead of point (c) of Article 6 and point (d) of Annex I:

Article 6 (c) the fiscal adjustment effort over the period of the national medium-term fiscal-structural plan is at least proportional to the total effort over the entire adjustment period;

Annex I (d) the adjustment effort is not postponed towards the final years of the adjustment period, that is to say the fiscal adjustment effort over the period of the national medium-term fiscal-structural plan is at least proportional to the total effort over the entire adjustment period;

Use the following requirement:

- The fiscal adjustment effort should not increase from one year to the next during the adjustment period. Some or all of the increase in public investments that address the common priorities of the Union referred to in Annex [...] may be exempted from the calculation of the adjustment effort

after endorsement by the Council. However, by the last year of the adjustment period at the latest, the total adjustment should satisfy the remaining requirements of this Article.

Delete the debt safeguard (preferably), or at least modify it from:

(e) the public debt ratio at the end of the planning horizon is below the public debt ratio in the year before the start of the technical trajectory;

to:

(e) for Member States having a public debt above 60% of GDP reference value, the public debt ratio at the end of the adjustment period, net of cumulative spending on investments that address the common priorities of the Union referred to in Annex […] as endorsed by the Council, is below the public debt ratio in the year before the start of the technical trajectory;

Article 8 (Assessment of plausibility)

Change from:

- To assess plausibility that the projected public debt ratio of the Member State concerned is on a downward path or remains at a prudent level, the Commission shall use the methodology referred to in Annex V . The Commission shall make public its analysis of plausibility and the underlying data.

To:

- To assess plausibility that the projected public debt ratio of the Member State concerned is on a downward path or remains at a prudent level, the Commission shall use the methodology referred to in the [new] Code of Conduct of the Stability and Growth Pact. The Commission shall make public its analysis of plausibility and the underlying data.

In turn, after the joint review of the methodology by the Commission and member states, as we proposed, the Code of Conduct should be revised and specify the methodology.

Article 12 (Requirements for the national medium-term fiscal-structural plan)

Replace point (a):

(a) ensure the fiscal adjustment necessary to put or keep public debt on a plausibly downward path by the end of the adjustment period at the latest, or remain at prudent levels, and to bring and maintain the government deficit below the 3% of GDP reference value over the medium term;

With:

- (a) for countries with public debt ratio above 60% of GDP or government deficit above 3% of GDP, ensure the requirements listed in Article 6. For countries with below 60% of GDP debt ratio and below 3% of GDP government deficit, ensure that the public debt ratio remains below 60% of GDP and the government deficit remains below the 3% of GDP reference value over the medium term;

Article 15 (Assessment of national medium-term fiscal-structural plans by the Commission)

Revise point 2 from:

- 2. When assessing the national medium-term fiscal-structural plan the Commission shall examine for all Member States:

To:

- 2. When assessing the national medium-term fiscal-structural plan the Commission shall examine the requirements listed in Article 12;

And delete all sub-points (a) to (f) from point (2).

Article 32 (Amendment of the annexes)

The current Annex V of the draft regulation should be revised and the Commission's discretion to amend it unilaterally should be removed from. Since we proposed to remove Annex I, the remaining annexes should be renumbered. This, change this article from:

- The Commission is empowered to adopt delegated acts in accordance with Article 33 to amend Annexes II to VII to adapt them to take due account of further developments or needs regarding the information in the national medium-term fiscal-structural plan (Annex II) or in the annual progress reports (Annex III), regarding the functioning of the control account (Annex IV), regarding the methodology for the assessment of plausibility (Annex V), regarding the common priorities of the Union (Annex VII) or regarding the assessment framework (Annex VII).

to:

- The Commission is empowered to adopt delegated acts in accordance with Article 33 to amend Annexes I, II, III, V, to VI to adapt them to take due account of further developments or needs regarding the information in the national medium-term fiscal-structural plan (Annex I) or in the annual progress reports (Annex II), regarding the functioning of the control account (Annex III), regarding the common priorities of the Union (Annex V) or regarding the assessment framework (Annex VI).

Revise Annex V and change its number to Annex IV, since we proposed to delete Annex I

Change from:

ANNEX V

Methodology to assess plausibility by the Commission

The methodology for the assessment of plausibility pursuant to Article 8 is based on the following conditions:

- public debt ratio should be declining, or stay at prudent levels, under the deterministic scenarios of the Commission's medium-term public debt projection framework described in the Debt Sustainability Monitor 2022;
- the risk of the public debt ratio not decreasing in the 5 years following the adjustment period of the national medium-term fiscal-structural plan is sufficiently low. The risk is assessed with the help of the Commission's stochastic analysis.

To:

ANNEX IV

Review of the debt sustainability analysis and the methodology to assess plausibility by the Commission

An independent expert group shall be established to review technical aspects of the Commission's debt sustainability analysis. The expert group shall be composed of renowned experts in debt sustainability analysis, who are not employed by any European institution, nor ministries and agencies of Member States. Following an open call for expression of interest, members of the expert group shall be selected by the Commission. The mandate of the expert group shall start in [December 2023] and end in [December 2024].

The expert groups shall consult with technical-level experts from the European Commission, Members States, the European Central Bank, the European Stability Mechanism, the European Fiscal Board, national independent fiscal institutions, and other possible experts, to seek their opinion on possible ways to revise the debt sustainability analysis. By considering the opinions collected, the expert group shall form its independent view and publish its draft report on the proposal for methodology revision in [June 2024]. The draft report shall be made public and open for comments. After considering the comments received, the final report of the expert group shall be published in [October 2024]. The final report shall be made public.

Based on the expert group report, the Commission shall submit a recommendation to the Council on revising the methodology in [November 2024]. The methodology approved by the Council shall be codified in the [new] Code of Conduct of the Stability and Growth Pact. A user-friendly software shall be made available by the Commission, along with all underlying data used, allowing the replication of the calculations.

The methodology for the assessment of plausibility pursuant to Article 8 is based on the following conditions:

- public debt ratio should be declining, or stay at prudent levels, in the years following the adjustment period of the national medium-term fiscal-structural plan, under the deterministic scenarios of the European Union's medium-term public debt projection framework described in the [new] Code of Conduct of the Stability and Growth Pact;
- the risk of the public debt ratio not decreasing in the years following the adjustment period of the national medium-term fiscal-structural plan is sufficiently low. The risk is assessed with the help of the European Union's stochastic debt sustainability analysis described in the [new] Code of Conduct of the Stability and Growth Pact.

Annex numbers should be updated throughout the regulation and its annexes.

European Commission (2023b) (COM(2023) 241 final, Proposal for a COUNCIL REGULATION amending Regulation (EC) No 1467/97 on speeding up and clarifying the implementation of the excessive deficit procedure)

Revise point 4 of Article 3:

- 4. The Council recommendation made in accordance with Article 126(7) TFEU shall establish a maximum deadline of six months for effective action to be taken by the Member State concerned. When warranted by the seriousness of the situation, the deadline for effective action may be three months. The Council recommendation shall also establish a deadline for the correction of the excessive deficit. In its recommendation, the Council shall also request that the Member State implements a corrective net expenditure path, which ensures that the general government deficit remains or is brought and maintained below the reference value within the deadline set in the recommendation.

Revised the remaining part from:

- For the years when the general government deficit is expected to exceed the reference value, the corrective net expenditure path shall be consistent with a minimum annual adjustment of at least 0,5% of GDP as a benchmark.

- The corrective net expenditure path shall also put the debt ratio on a plausibly downward path or keep it at a prudent level having regard to the criteria established in Annex I of Regulation (EU) [on the preventive arm]. The corrective net expenditure path shall ensure that the average annual fiscal adjustment effort in the first three years is at least as high as the average annual fiscal effort of the total adjustment period.

To:

- When the excessive deficit developed while the Member State was <u>not compliant</u> with the net expenditure path of the approved national fiscal-structural plan, then, for the years when the general government deficit is expected to exceed the reference value, the corrective net expenditure path shall be consistent with a minimum annual adjustment of at least 0,5% of GDP as a benchmark, measured in terms of the structural primary balance.

- When the excessive deficit developed while the Member State was <u>compliant</u> with the net expenditure path of the approved national fiscal-structural plan, <u>and</u> the Commission assesses that this expenditure path would continue to ensure that the public debt is put or kept on a plausibly downward path by the end of the adjustment period at the latest, or stays at prudent levels and the government deficit returns below the 3% of GDP reference value at the latest by the end of the adjustment period, then the corrective net expenditure path shall be the same as the path in the approved fiscal-structural plan.

- The corrective net expenditure path shall also put the debt ratio on a plausibly downward path or keep it at a prudent level having regard to the criteria established in the [new] Code of Conduct of the Stability and Growth Pact. The corrective net expenditure path shall fulfil the criteria listed in Article 6 of Regulation (EU) [on the preventive arm].

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