2. MEDIUM-TERM FISCAL SUSTAINABILITY ANALYSIS

The analysis of medium-term fiscal sustainability risks relies on a comprehensive toolkit based on the Commission's debt sustainability analysis (DSA) and the S1 indicator. *The DSA combines deterministic debt projections up to 2032 with stochastic projections covering a wide range of possible shocks. The deterministic projections include the impact of ageing-related expenditure. They consider alternative scenarios to the 'no-fiscal policy change' baseline, such as reverting to past fiscal behaviour, implementing only part of the forecast structural adjustment, benefiting from a less favourable interest-growth rate ('r-g') differential, and facing temporary turmoil on financial markets. This is complemented by an assessment of liquidity challenges based on governments' gross financing needs. Finally, S1 highlights challenges from a different angle by measuring the consolidation effort that would be needed to reduce debt to 60% of GDP in 15 years' time.*

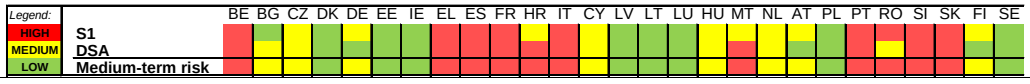
This report includes methodological changes that streamline the analysis and make it more relevant for the post-COVID environment. *The main change is a simplified decision tree that remains anchored on the projected debt level but gives more prominence than previous reports to the debt trajectory and to the plausibility of fiscal assumptions, in line with best practices (see Box* I.2.2*). Moreover, the assessment of the plausibility of fiscal assumptions and the feasibility of potential corrective measures (as measured by the available 'fiscal consolidation space') is based on country-specific rather than EU-wide past observations, making it more relevant for individual countries. Finally, the DSA risk classification gives more weight to stochastic projections in stress-testing the baseline, to better reflect the macroeconomic uncertainty around the baseline. As for specific variables, Box* I.2.1 *presents inflation projections and Box* I.2.3 *envisages possible paths to project stock-flow adjustments.*

In the EU as a whole, at unchanged fiscal policy, debt is projected to decline as a ratio to GDP until the mid-2020s, when the rising cost of ageing would reverse the trend*. The 'r-g' differential is assumed to remain negative. This will support the initial debt reduction and then dampen the increasing pressure from ageing costs on public finances. An alternative scenario shows that debt could fall back to its pre-crisis level by 2032 if the structural primary balance converged back to the slight surplus observed on average in the past 15 years. Conversely, a more limited fiscal adjustment, a less favourable 'r-g' differential or temporary financial stress would worsen the debt dynamics.*

The stochastic projections point to significant uncertainty around the baseline. *With an 80% probability, debt will lie between 85% and 108% in the euro area as a whole by 2026, coming below the 2021 level with a 69% probability. In 2026, the debt ratio could stand above or below 96% with equal probability. High uncertainty in some countries reflects volatile macro-financial and fiscal conditions.*

Overall, 11 countries are found to be at high medium-term fiscal sustainability risk, 8 at medium risk and 8 at low risk. *The high-risk classification is mainly driven by high and/or increasing debt ratios under the baseline (Belgium, Greece, Spain, France, Italy, Slovenia and Slovakia), along with elevated uncertainty surrounding the baseline projections, as highlighted by the stochastic analysis (Portugal) and vulnerability to more adverse macro-financial conditions (Croatia) or a weaker fiscal position (Malta). The S1 indicator largely confirms the DSA classification, with only one additional country (Romania) classified at high risk according to this indicator alone. Furthermore, projected financing needs suggest that countries with the highest debt ratios may also face higher liquidity challenges.*

Table I.2.1: **Overview of S1, DSA and overall medium-term risk classifications.**



Source: European Commission.

This chapter assesses fiscal sustainability risks over the medium term, based on the Commission's rich analytical toolkit. Going first through the various elements of the debt sustainability analysis (DSA) toolkit, the chapter starts with a baseline for debt trajectories over the next 10 years, along with a set of additional deterministic debt projections underpinned by alternative assumptions (Section 2.1). To assess how a broad range of possible shocks could affect debt in the coming years, the DSA also crucially relies on stochastic debt projections, highlighting the uncertainty around the baseline (Section 2.2). Finally, the DSA is complemented by projections of governments' gross financing needs over the next decade, which provide information on potential liquidity risks (Section 2.3). The chapter then moves on to the S1 indicator, which measures the fiscal consolidation effort needed to bring debt to 60% of GDP over the medium term (Section 2.4). The chapter concludes with an overall assessment of medium-term fiscal risks based on both the DSA and the S1 indicator, and a comparison with the 2020 DSM (Section 2.5).

This chapter also includes three boxes highlighting specific issues. In particular, Box I.2.1 presents the new inflation projections based on market expectations. Box I.2.2 describes the streamlined decision trees guiding the DSA risk classification. Finally, Box I.2.3 discusses possible paths to review the assumptions underlying stock-flow adjustment projections for certain countries.

2.1. DETERMINISTIC GOVERNMENT DEBT PROJECTIONS

The first component of the DSA consists in a set of deterministic projections based on various scenarios. Each deterministic projection provides a single path for debt until 2032 under certain assumptions for budgetary, macroeconomic and financial variables. In addition to the baseline, four other scenarios are taken into account for the medium-term risk classification. These are the 'historical structural primary balance (SPB)', 'lower SPB', 'adverse interest-growth rate differential (r-g)' and 'financial stress' scenarios. They highlight the impact on debt of alternative assumptions for fiscal policy, real GDP growth and interest rates (Table I.2.2). Finally, an additional policy scenario – the 'updated stability and convergence programmes' (SCP) scenario – also informs the overall assessment, although only in a qualitative manner.

Table I.2.2: **Debt projections in the deterministic scenarios**

			Difference to the baseline in 2032 (pps. of GDP)				
			DSA scenarios				Compl. scenario
	Baseline 2021	Baseline 2032	'Historical SPB' scenario	'Lower SPB' scenario	'Adverse r-g' scenario	'Financial stress' scenario	'Updated SCP' scenario
BE	112.7	133.6	-23.8	7.7	9.4	2.0	-3.7
BG	26.7	36.4	-12.7	2.7	2.2	0.3	-9.0
CZ	42.4	67.1	-14.9	9.5	4.5	0.5	-6.4
DK	41.0	15.6	0.8	18.6	1.9	0.3	-13.6
DE	71.4	61.6	-12.1	18.0	5.1	0.6	-9.3
EE	18.4	25.7	-8.7	8.0	1.5	0.1	-5.6
IE	55.6	45.7	7.2	14.1	3.2	0.2	8.3
EL	202.9	154.7	-11.8	29.2	10.9	4.3	0.2
ES	120.6	126.1	-9.4	0.5	10.0	2.8	-7.9
FR	114.6	122.3	-8.0	11.8	9.1	2.2	4.6
HR	82.3	76.7	-1.0	1.8	5.8	0.5	8.4
IT	154.4	161.6	-24.4	11.5	13.2	6.3	-1.8
CY	104.1	77.8	-10.0	12.5	5.7	0.3	-10.2
LV	48.2	48.8	-0.7	28.6	3.8	0.6	-0.2
LT	45.3	39.4	5.8	13.4	2.9	0.3	-9.9
LU	25.9	18.2	-7.1	0.2	1.4	0.1	-3.5
HU	79.2	68.1	-7.5	13.9	5.6	0.6	-3.3
MT	61.4	73.2	-21.6	21.3	5.2	0.7	-2.2
NL	57.5	62.8	-8.1	12.4	4.7	0.6	6.0
AT	82.9	76.3	-7.4	10.3	5.5	0.6	-5.9
PL	54.7	48.3	2.9	1.7	3.4	0.3	6.6
PT	128.1	126.2	-5.3	1.5	10.0	2.3	-3.6
RO	49.3	76.9	-10.5	6.2	5.1	0.4	-18.4
SI	77.7	95.2	-17.8	8.5	6.4	0.5	-13.8
SK	61.8	72.2	-2.7	12.3	4.2	0.4	-11.7
FI	71.2	63.9	-9.4	6.3	4.3	0.4	1.1
SE	37.3	11.2	0.3	5.0	1.2	0.1	17.1
EU	92.1	89.2	-10.0	11.4	6.9	1.8	-2.2
EA	100.0	99.0	-11.6	12.3	7.7	2.2	-2.8

Source: European Commission.

The deterministic projections feed into the medium-term risk classification using the debt level in 2032, the debt trajectory and the available 'fiscal consolidation space'. While a high level of debt is an obvious source of vulnerability, it is only a crude indicator of sustainability. That is why, compared to previous reports, the risk classification in this report gives increased weight to two criteria in addition to the debt level. The first one is the path followed by debt over the coming decade. The second one is the 'fiscal consolidation space'. This space is measured by how often more stringent fiscal positions than assumed in a given scenario were observed in the past in the country under consideration. This gives an indication of whether the country has plausible fiscal room for manoeuvre to take corrective measures if necessary. Therefore a high debt level or an increasing debt path in the baseline do not necessarily imply high sustainability risks, as long

as the government has available 'consolidation space' to rein in debt ([48]). The decision tree applied along these three criteria is described more closely in Box I.2.2 and Annex A1.

This section focuses on the economic reading and main results of each scenario. It explains why the selected scenarios – some of which are new – are relevant in the current context, and it discusses the results both for the aggregate level and across countries. Box 1 in the introduction of this volume includes further technical information on the underlying assumptions, and detailed projection tables can be found in Annex A7.

2.1.1. Baseline: no fiscal policy change

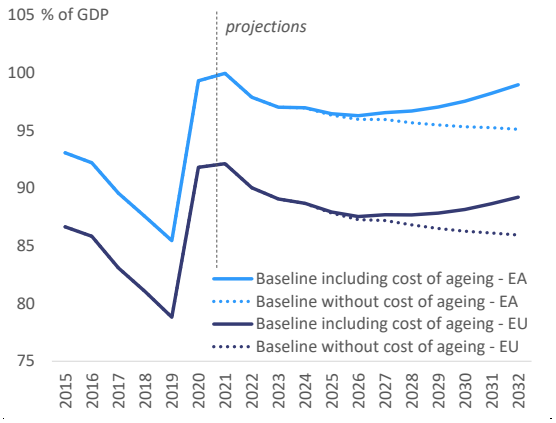
The baseline for the medium-term debt projections assumes that structural primary budgetary positions remain at their 2023 level until 2032, except for the impact of ageing-related costs. The 2023 level is the one expected in the Commission 2021 autumn forecast (for the EU as a whole, a SPB of -1.4% of GDP), which includes the impact until 2023 of policy measures adopted by end October 2021 ([49]). As from 2024, the projections do not incorporate any new measures, and the SPB is only affected by changes in the cost of ageing as projected in the 2021 Ageing Report ([50]) (the EU's overall SPB would gradually decline to -2.1% by 2032). Therefore, the baseline does not necessarily present what is most likely to happen, but rather highlights what would happen in the absence of new measures, as a benchmark.

([48]) This is in line with the definition of debt sustainability used by the IMF, the ECB and the Commission. Debt is deemed unsustainable only in cases when there is *no politically and economically feasible fiscal path that can at least stabilise debt over the medium term* (under the baseline and realistic shock scenarios), keeping rollover risk at an acceptably low level while preserving potential growth.

([49]) The projections include in particular the sizeable favourable impact on growth of Next Generation EU over the period it covers, i.e. until 2026. More specifically, it includes the impact of the investments under the Recovery and Resilience Facility (RRF), but not the likely positive impact of structural reforms under the RRF, as it is more difficult to quantify at this stage.

([50]) See https://ec.europa.eu/info/sites/default/files/economy-finance/ip148_en.pdf.

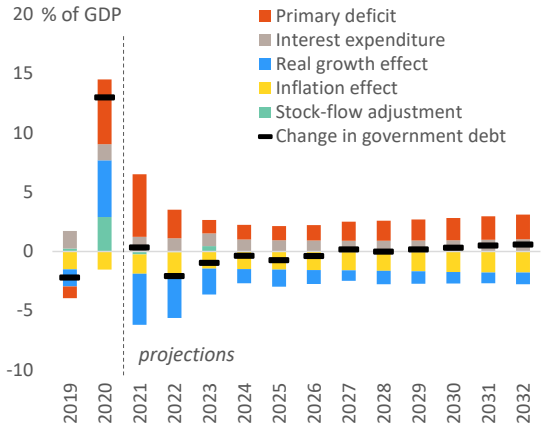
Graph I.2.1: **Gross government debt baseline projections, EU and euro area**



Source: European Commission.

The baseline points to an initial decline of the EU debt ratio from its 2021 peak, until the rising cost of ageing reverses the trend as from the mid-2020s. The projected debt for the euro area as a whole follows a parallel path (Graph I.2.1). The impact of the cost of ageing in the EU is visible in the worsening primary deficit (Graph I.2.2). At the same time, the still favourable snowball effect – reflecting the difference between interest payments and nominal GDP growth – would dampen the increase in debt throughout the projection horizon ([51]).

Graph I.2.2: **Drivers of the change in debt under the baseline, EU**



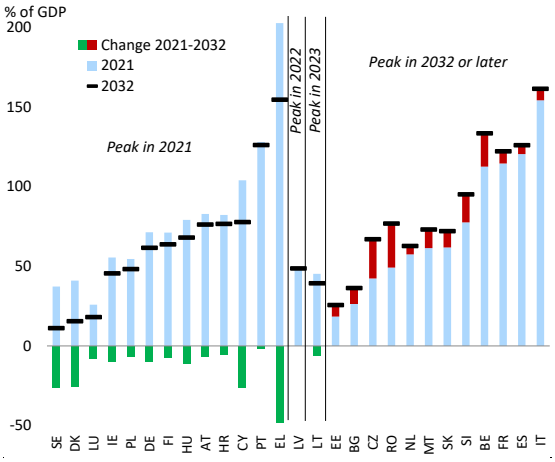
Source: European Commission.

The projected debt paths of individual Member States show contrasted situations. In a majority

([51]) For further details on the breakdown of the change in debt, see the statistical annex, Tables A7.8 and A7.9.

of countries, the debt ratio projected for 2032 remains below the level of 2021 (Graph I.2.3). In most of these countries, debt started declining after the peak of 2021 (or is expected to do so one or two years later, in the case of Latvia and Lithuania) and is projected to either broadly stabilise after a few years or keep declining over the medium term. In Croatia and Portugal, however, debt would increase again in the last years of the projection period. By contrast, debt is projected to increase throughout the period in the remaining 12 Member States.

Graph I.2.3: **Gross government debt projections for EU Member States under the baseline, 2021-2032**



Source: European Commission.

The debt paths envisaged in the baseline rely on low SPB levels by historical standards, suggesting sizeable fiscal consolidation space in most countries. This can be seen by plotting the projected SPB level (before cost of ageing) against country-specific SPB values observed in the last decades (Graph I.2.4). As most countries have often recorded higher SPBs than the level assumed in the baseline, they can plausibly aim to move again towards such higher levels in the coming decade, improving sustainability compared to the baseline.

Graph I.2.4: **Structural primary balance projected under the baseline and past observations**

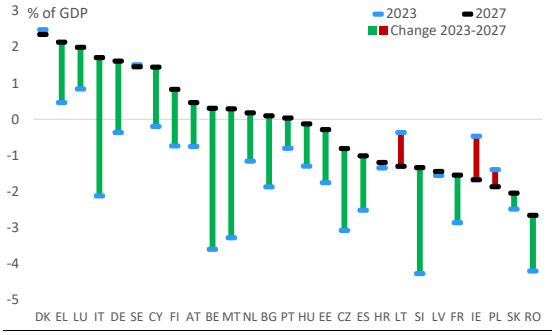
Notes: (1) The 2023-2032 average is the value in the baseline before cost of ageing. (2) Past observations start at the earliest in 1980, depending on the country, and end in 2020.
Source: European Commission.

2.1.2. Policy scenario: historical structural primary balance

The first alternative scenario assumes a change in fiscal policy over the medium term – namely that the SPB will gradually converge to its average past value. This scenario illustrates the prospect of countries reverting to past fiscal behaviour instead of keeping the SPB at its 2023 level. More specifically, by 2027, each country's SPB would reach the average value observed in the country over the past 15 years, i.e. in 2006-2020 (Graph I.2.5). For most Member States, this implies a tightening compared to the level forecast for 2023, although by 2027 there would still be a structural primary deficit, in some cases large, in nearly half of the Member States.

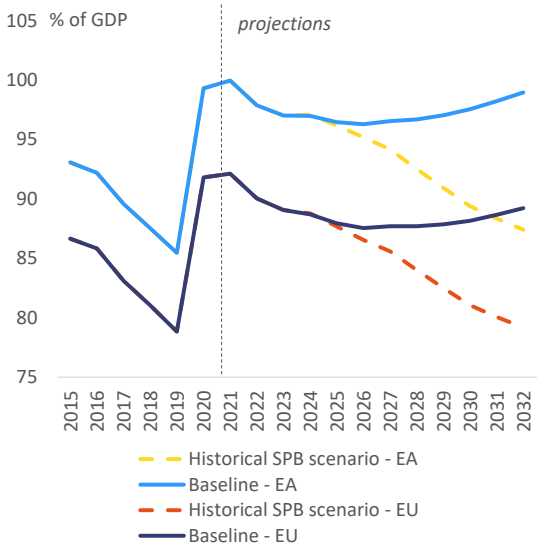
Reverting to past structural positions would put EU debt on a firm downward path. For the EU as a whole, this would mean that the SPB would improve from a deficit of 1.4% in 2023 to a surplus of 0.3% of GDP by 2027. With support from the favourable snowball effect, this would be sufficient to bring debt back to its pre-crisis level by 2032 (Graph I.2.6). The same would happen in the euro area if the structural primary deficit of 1.6% in 2023 gradually improved to a surplus of 0.3% of GDP.

Graph I.2.5: **'Historical SPB' scenario: structural primary balance in 2023 and 2027**



Note: The 'historical SPB' scenario assumes that the SPB gradually converges, from 2024 to 2027, to the SPB observed on average in the country in 2006-2020.
Source: European Commission.

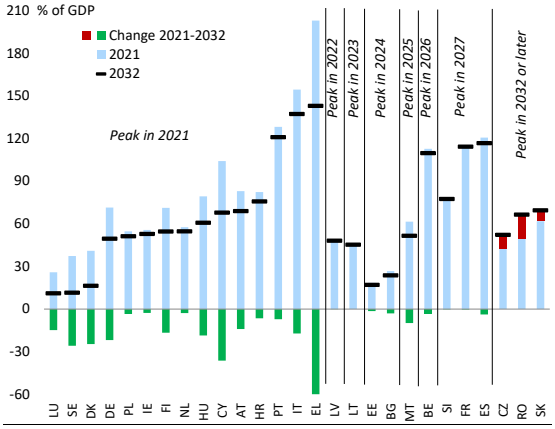
Graph I.2.6: **Debt projections: 'historical SPB' scenario vs. baseline, EU and euro area**



Note: The 'historical SPB' scenario assumes that the SPB gradually converges, from 2024 to 2027, to the SPB observed on average in 2006-2020.
Source: European Commission.

At the country level, the 'historical SPB' scenario generally leads to lower debt levels by 2032 compared to the baseline. In the 3 countries where this scenario implies a loosening compared to the baseline (Ireland, Lithuania and Poland), debt would still remain at a low level by 2032. In the other countries, debt would decline more and/or peak earlier, or at least not increase as much as in the baseline. This is particularly the case for Belgium, Spain, France and Italy.

Graph I.2.7: **Gross government debt projections under the 'historical SPB' scenario**



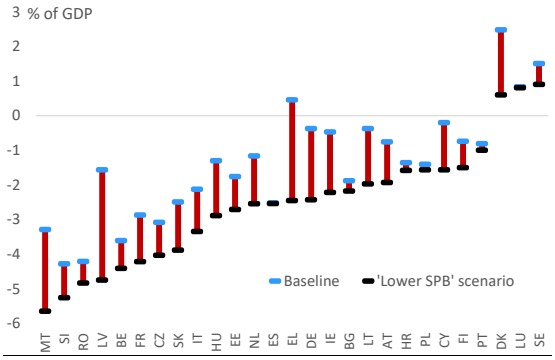
Source: European Commission.

2.1.3. Policy scenario: lower structural primary balance

The 'lower SPB' scenario assumes less fiscal consolidation (or more deterioration) than in the baseline. As in the baseline, this scenario keeps the SPB unchanged as from 2023, but at a lower level than in the baseline (Graph I.2.8). For the countries in which the Commission 2021 autumn forecast expects the SPB to tighten overall in 2022 and 2023, this scenario assumes that only half of the adjustment is delivered – and for the countries where the SPB is expected to deteriorate overall over these two years, the scenario assumes a 50% larger fall. This would be the case, for instance, if some governments decided to keep support measures in place for longer than expected.

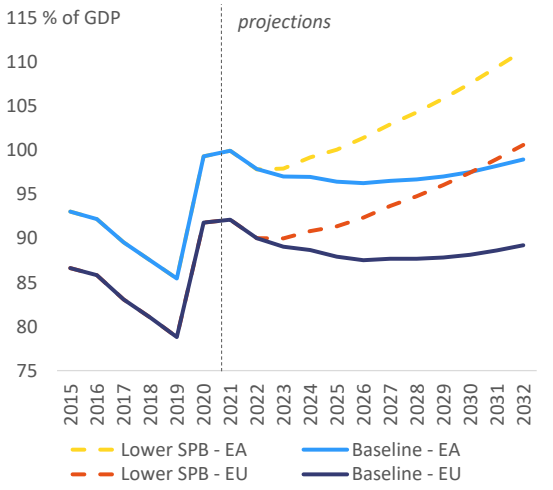
A smaller consolidation by 2023 than expected in the Commission 2021 autumn forecast, followed by no consolidation, would imply a steady increase in EU debt over the medium term. The same holds for the euro area (Graph I.2.9). In both cases, debt would be about 10 pps. of GDP higher than in the baseline by 2032, reaching around 100% of GDP in the EU as a whole.

Graph I.2.8: **Structural primary balance in 2023-2032 in the baseline and the 'lower SPB' scenario**



Note: The 'lower SPB' scenario assumes a smaller consolidation (or a larger deterioration) in the SPB in 2022 and 2023 than in the Commission 2021 autumn forecast. The SPB then remains constant as from 2023, except for the impact of the cost of ageing.
Source: European Commission.

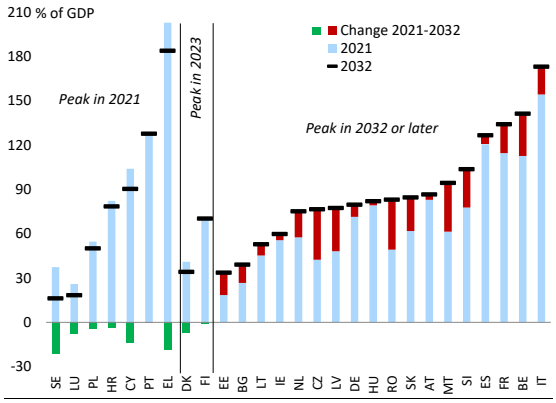
Graph I.2.9: **Debt projections: 'lower SPB' scenario vs. baseline, EU and euro area**



Note: The 'lower SPB' scenario assumes that the change in the SPB in 2022 and 2023 is half the change included in the Commission 2021 autumn forecast. The SPB then remains constant as from 2023, except for the impact of the cost of ageing.
Source: European Commission.

Under this scenario, debt would not peak by 2032 but exceed its 2021 level in a majority of Member States. The largest debt increases from 2021 to 2032 would be recorded in Czechia, Latvia, Malta and Romania. Among the countries with highest debt levels, the debt increase would be sizeably larger than in the baseline for Belgium, France and Italy.

Graph I.2.10: **Gross government debt projections under the 'lower SPB' scenario**



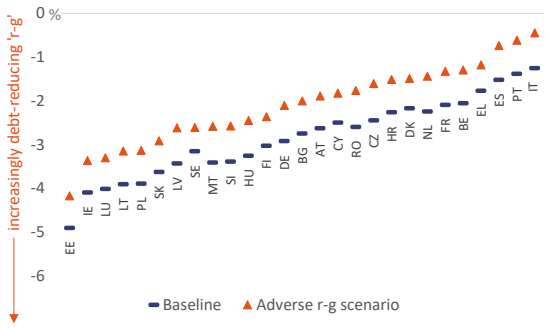
Source: European Commission.

2.1.4. Stress test: adverse 'r-g' differential

This new scenario captures risks related to a reversal or a reduction of the currently favourable interest-growth rate differential. It is motivated by the fact that, in most countries, the 'r-g' differential assumed in the baseline – extending the current environment of very low and often negative differentials – is lower than historical averages. Stress-testing this differential is therefore important to assess the consequences for debt sustainability risks of a possible structural correction of 'r-g'. To do so, the difference between *market* interest rates and nominal GDP growth is permanently increased by 1 pp. compared to the baseline. Depending on the debt structure, this shock gradually translates into a higher 'r-g' differential where r is the *implicit* interest rate (Graph I.2.11). This diminishes the debt-reducing impact of the snowball effect, resulting in an even higher debt increase in the last years of the projection horizon in Italy and Romania.

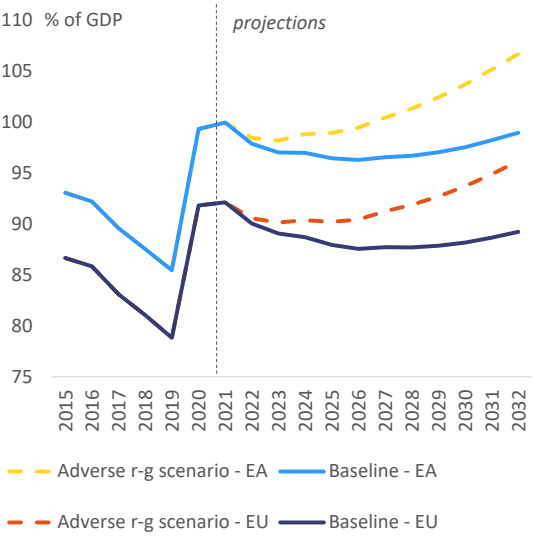
Both on aggregate and in individual countries, this scenario has adverse implications for debt developments. Debt would not decline in the first years of the projection period, unlike in the baseline, and it would grow faster in the outer years (Graph I.2.12). At the country level, debt would exceed its 2021 level by 2032 in more countries than in the baseline (Graph I.2.13).

Graph I.2.11: **Interest-growth rate differential in the baseline and the 'adverse r-g' scenario, 2022-2032 averages**



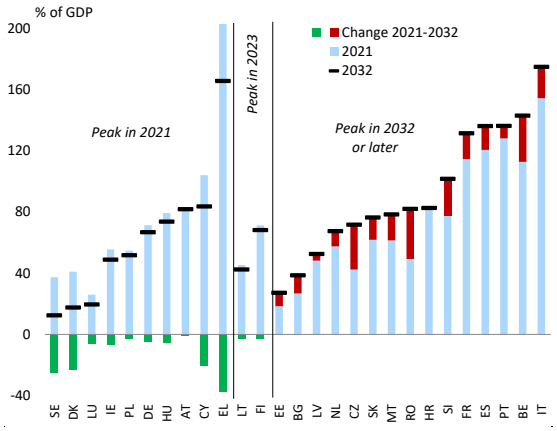
Note: The 'adverse r-g' scenario assumes that the differential between the market interest rate and nominal GDP growth is permanently 1 pp. higher than in the baseline from 2022 to 2032. This graph shows the impact on the differential between the implicit interest rate and nominal GDP growth, taking into account the debt structure.
Source: European Commission.

Graph I.2.12: **Debt projections: 'adverse r-g' scenario vs. baseline, EU and euro area**



Note: The 'adverse r-g' scenario assumes that the interest-growth rate differential is permanently 1 pp. higher than in the baseline from 2022 to 2032.
Source: European Commission.

Graph I.2.13: **Gross government debt projections under the 'adverse r-g' scenario**



Source: European Commission.

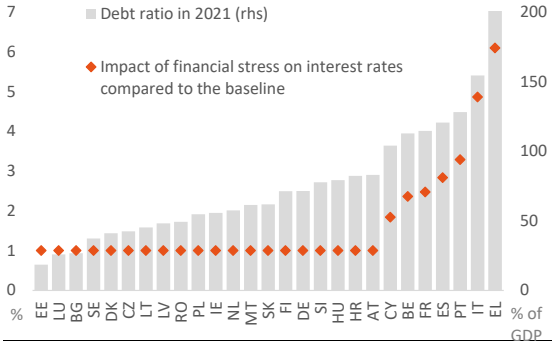
2.1.5. Stress test: financial stress

This new scenario aims to capture risks linked to stylised temporary turmoil on financial markets. It replaces the 'interest rate' shock scenario of the 2018 FSR, in which interest rates were uniformly and permanently higher than in the baseline throughout the projection horizon. Under the new scenario, the shock on market interest rates would last only one year, in 2022. Furthermore, the scenario assumes that financial turmoil hits high-debt countries harder: while a flat 1 pp. interest rate hike applies to all countries, it is augmented by a 'risk premium' for highly indebted countries ([52]) (Graph I.2.14).

Despite its temporary nature, the shock on interest rates has a persistent (although limited) adverse impact on debt dynamics. As can be seen for the EU and euro area as a whole, the debt path would be only slightly above the baseline, by less than 2% of GDP by 2026 (Graph I.2.15). The initial impact on debt would be limited, as the higher interest rates would only affect newly issued debt. The gap would however be persistent and increase over time, as the shock would keep affecting the service of debt newly issued in 2022 and make higher interest payments generate in turn new debt each year, compared to the baseline.

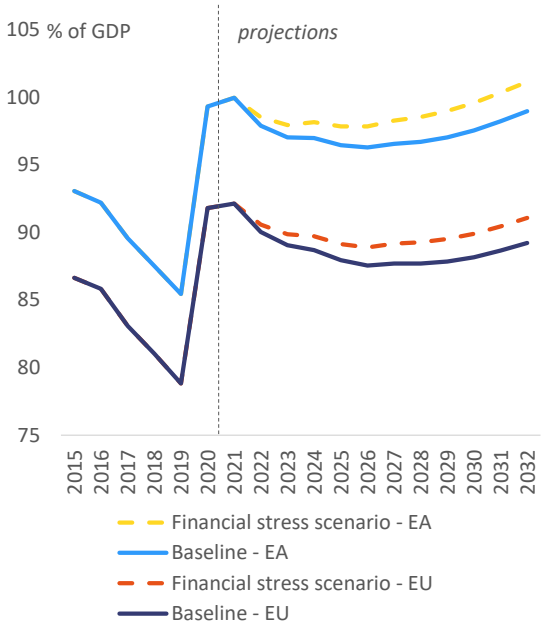
([52]) The risk premium is equal to 0.06 times the excess of debt over 90% of GDP based on Pamies et al. (2021) – see Box 1 in the introduction for more details. The level of long-term interest rates is capped at 7%.

Graph I.2.14: **Impact of the 'financial stress' scenario on interest rates in 2022**



Note: The 'financial stress' scenario assumes that the interest rate is temporarily raised by 1 pp., plus a risk premium in countries where debt exceeded 90% of GDP in 2021 (90% being the upper debt threshold used to identify high risk in the DSA classification). The risk premium is equal to 0.06 times the excess of debt over 90% of GDP.
Source: European Commission.

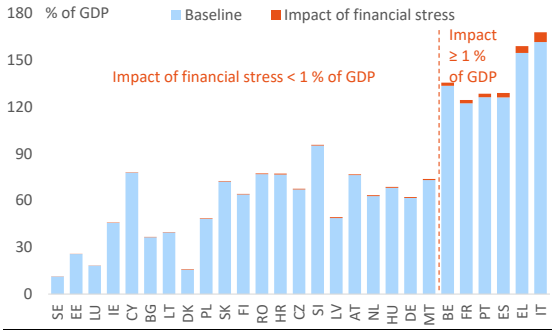
Graph I.2.15: **Debt projections: 'financial stress' scenario vs. baseline, EU and euro area**



Note: The 'financial stress' scenario assumes that the interest rate is temporarily raised by 1 pp., plus a risk premium in countries where debt exceeded 90% of GDP in 2021 (90% being the upper debt threshold used to identify high risk in the DSA classification).
Source: European Commission.

The impact of the simulated financial stress is concentrated in high-debt Member States. The 'financial stress' scenario increases debt by more than 1% of GDP by 2032 in only 6 countries, namely those with the highest projected debt ratios for 2032 in the baseline – Belgium, Greece, Spain, France, Italy and Portugal (Graph I.2.16). This is because higher interest rates affect interest payments more strongly if they apply to a high debt, and this effect is exacerbated by the assumption that high-debt countries get larger shocks on interest rates. To a lesser extent, the sensitivity of individual countries to the interest shock also depends on the maturity of their debt, because a relatively short maturity implies that the higher market rate is rapidly transmitted to the implicit interest rate.

Graph I.2.16: **Gross government debt projections for 2032, 'financial stress' scenario vs. baseline**



Note: Countries are ranked by increasing impact of financial stress.
Source: European Commission.

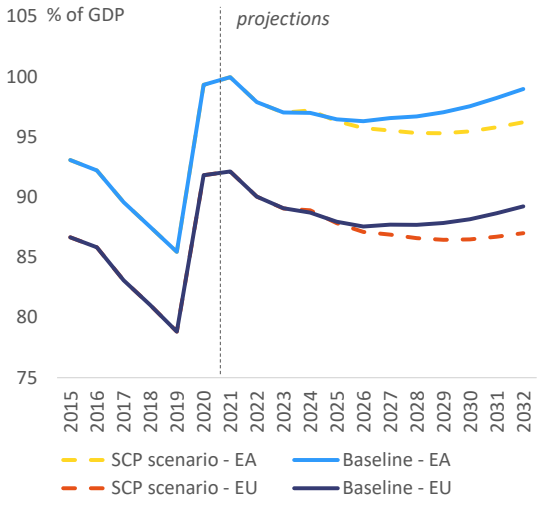
2.1.6. Additional scenarios

Two more scenarios provide additional information that qualifies sustainability risks, although without affecting the risk classification. The first one is a policy scenario: the 'updated SCP' scenario, as described below. The other one is a stress test, namely the 'exchange rate' scenario, which is mostly relevant for non-euro area countries and is therefore not discussed in detail in this chapter. Its assumptions are described in Box 1 in the introduction of this volume, and its outcome can be found in Volume 2 of this report.

The 'updated SCP' scenario assumes that governments fully implement their medium-term budgetary plans. The Commission 2021 autumn forecast – which underpins the first years of the baseline – incorporates government plans, but only to the extent that they have already translated into adopted measures. This usually implies more limited developments than those presented by governments in their SCPs. To assess the full impact of government plans, this scenario

uses only the year 2022 of the Commission forecast as a basis and modifies the fiscal policy assumptions as from 2023. For 2023 and 2024, it assumes that governments implement their fiscal plans fully in line with their 2021 SCPs or more recent medium-term plans, if available. The SPB is then assumed to remain unchanged at its 2024 level, except for the impact of the cost of ageing.

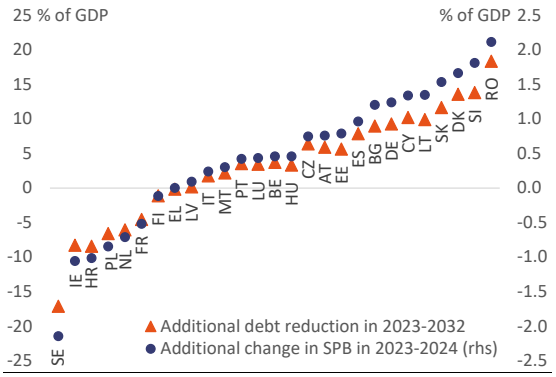
Graph I.2.17: **Debt projections: 'updated SCP' scenario vs. baseline, EU and euro area**



Note: The 'updated SCP' scenario assumes that Member States implement in 2023 and 2024 the budgetary measures described in their 2021 stability and convergence programmes or in more recent medium-term plans, if available, and that as from 2025 the SPB is only affected by the cost of ageing.
Source: European Commission.

Fully implementing governments' own medium-term budgetary plans would slightly curb debt paths compared to the baseline. For most cases, SCPs imply smaller structural primary deficits (or larger surpluses) than in the baseline and therefore lower debt levels by 2032 (Graph I.2.18). As a result, at the aggregate level, debt would keep declining over a few more years than in the baseline and pick up again only at the end of the projection period (Graph I.2.17).

Graph I.2.18: **Structural adjustment and debt projections, 'updated SCP' scenario vs. baseline**



Note: The blue dots show by how much SPBs would improve compared to the baseline if governments fully implemented their medium-term budgetary plans in 2023 and 2024. The red triangles show the impact in terms of additional debt reduction compared to the baseline up to 2032.
Source: European Commission.

2.2. STOCHASTIC GOVERNMENT DEBT PROJECTIONS

Stochastic debt projections account for wide-ranging uncertainty around the baseline. Unlike deterministic projections, the outcome of stochastic projections is not a single debt path under a specific scenario, but a distribution of debt paths resulting from a wide set of shocks. These projections aim to show the impact on debt dynamics of numerous possible shocks affecting governments' budgetary positions, economic growth, interest rates and exchange rates compared to the baseline ([53]). The shocks, applied in up to 2000 different simulations, are calibrated to capture country-specific conditions, namely the volatility observed over the past and the correlation between the different variables.

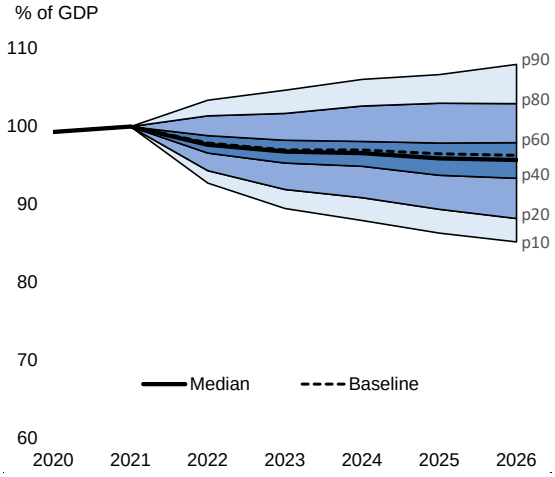
The results of stochastic projections are shown in a fan chart around the baseline. The cone covers 80% of all simulated debt paths over a 5-year horizon, with the lower and upper limits representing respectively the 10th and 90th percentiles of the distribution. This means that, if future shocks follow the same pattern as in the past, there is an 80% probability that debt will actually lie within that cone in the next 5 years. The chart excludes the debt paths derived from the

([53]) The methodology for stochastic debt projections is presented in Annex A7 of the 2020 DSM, and in Berti (2013).

20% most extreme shocks, or 'tail events'. The different shades within the cone represent different portions of the overall distribution of debt paths.

The stochastic projections point to significant uncertainty over the debt trajectory in the euro area. For 2026, they suggest that, with an 80% probability, the euro area debt ratio will lie between 85% and 108% of GDP, a range of 23 pps. (Graph I.2.19). The median debt ratio for 2026 is estimated at 96% of GDP, i.e. there is an equal probability that debt will be higher or lower than that level. Moreover, while the baseline points to a decline in the debt ratio over the next 5 years, the stochastic projections suggest with a 31% probability that debt might actually be higher in 2026 than it was in 2021.

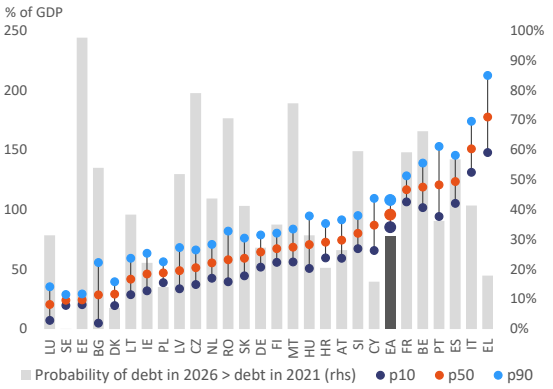
Graph I.2.19: **Stochastic debt projections, euro area, 2021-2026**



Source: European Commission.

The degree of uncertainty varies greatly across countries. The results for individual countries are summarised in Graph I.2.20. On the one hand, they indicate very low uncertainty for Estonia and Sweden, where the debt ratio is likely to lie within a narrow range of about 20% to 30% of GDP in 2026 – although with opposite dynamics. Indeed, debt in Estonia is projected to increase (hence the very high probability of debt in 2026 exceeding the 2021 level) while debt in Sweden is projected to fall (and accordingly, the probability of a higher debt in 2026 than in 2021 is very low). At the other end of the spectrum, uncertainty appears to be particularly elevated for Bulgaria, Greece and Portugal: in Bulgaria, for instance, debt could lie anywhere between 5% and 55% of GDP by 2026 and there is a broadly equal chance that it will increase or decrease from its current level. Such uncertainty around the baseline reflects a high volatility of macro-financial and fiscal conditions.

Graph I.2.20: **Stochastic debt projections for EU Member States**



Notes: How to read this graph: for each country, there is an 80% probability that debt in 2026 will lie between the dark blue dot (the 10th percentile of the debt distribution) and the pale blue dot (the 90th percentile). The more these two points are distant, the higher the uncertainty. The median debt level in 2026 is indicated by the red dot. The grey bars indicate the probability with which debt will be higher in 2026 than it was in 2021.
Source: European Commission.

2.3. MEDIUM-TERM GOVERNMENT GROSS FINANCING NEEDS

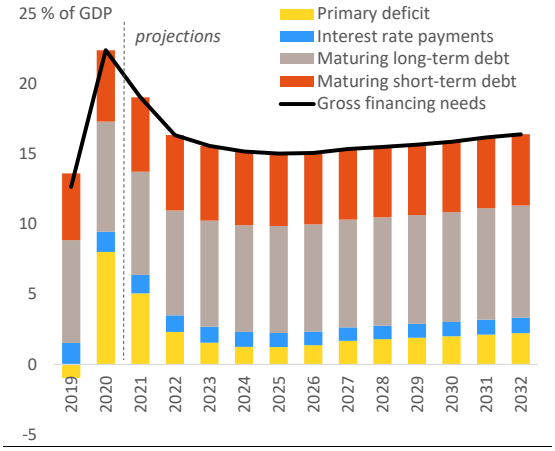
Projected gross financing needs (GFN) over the medium term serve as a measure of governments' upcoming liquidity challenges. While debt is a stock, GFN are a flow metric that provides complementary information. The projected trajectory of GFN indicates to what extent governments may need to use financial markets over the coming years to finance deficits, repay or roll over maturing debt and service their debt ([54]). Elevated GFN projections therefore suggest a higher vulnerability with regard to liquidity risks.

GFN in the EU are projected to remain above pre-crisis level and rise mildly in the coming decade. Once the impact of the COVID-19 crisis has abated, GFN should average 16% of GDP,

([54]) For a more elaborate description of GFN and their use for the assessment of short-term sustainability risks, see Chapter 1.

3 pps. above their 2019 level. The slowly upward trajectory projected for the next 10 years is driven by two trends: a rebound in primary deficits, reflecting mainly higher ageing-related expenditure, and the need to amortise a slightly larger amount of long-term debt. On the other hand, interest payments are projected to remain very low (at around 1% of GDP, less than half what they amounted to in the 2010s) and maturing short-term debt should keep ebbing to 5% of GDP, reflecting the recent lengthening of debt maturities.

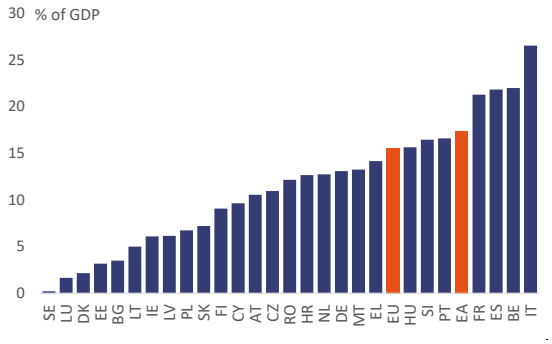
Graph I.2.21: **General government gross financing needs and their drivers, baseline, EU**



Source: European Commission.

The GFN projections indicate larger liquidity challenges in high-debt Member States than the euro area average. In 4 euro area countries – Belgium, Spain, France and Italy – GFN are projected to exceed 20% of GDP on average between 2023 and 2032 under the baseline, above the euro area average of about 17% of GDP (Graph I.2.22). As these countries are also projected to have high and increasing debt ratios, their potential vulnerability to liquidity risks adds to sustainability challenges. By contrast, for the 6 Member States with the lowest projected debt levels for 2032 under the baseline (Bulgaria, Denmark, Estonia, Lithuania, Luxembourg and Sweden), GFN would be limited to less than 5% of GDP.

Graph I.2.22: **General government gross financing needs under the baseline, 2023-2032 average**



Source: European Commission.

2.4. THE S1 INDICATOR

S1 provides additional information on medium-term fiscal challenges by measuring the consolidation effort that would be needed to reduce debt to 60% of GDP in 15 years' time. This effort, as measured by the additional improvement in the SPB compared to the baseline, is assumed to be concentrated over the 5 years that follow the forecasting period, i.e. from 2024 to 2028. Afterwards, the SPB would remain unchanged, except for the cost of ageing. The aim is to reach a 60% debt ratio in 2038. Consistently with the S2 indicator, S1 is calculated on the basis of both the baseline and alternative scenarios.

The risk classification based on S1 depends on the amount of consolidation required. A country with a high debt level, a weak initial SPB and/or a strong projected increase in the cost of ageing will need to make a demanding cumulative effort of more than 2.5 pps. of GDP, which classifies it at high risk. Conversely, if debt is projected to stand below 60% of GDP without requiring any further consolidation effort, S1 has a negative value and the country is deemed at low risk. Intermediate values of S1 of 0 to 2.5 pps. of GDP signal a medium risk.

2.4.1. Baseline results

According to the S1 indicator, 9 Member States face high fiscal risks in the long term, 9 face medium risks and 9 low risks. The high-risk countries are Italy, Belgium, Portugal, Greece, France, Spain, Slovenia, Romania and Slovakia, which would need to improve their SPB by more

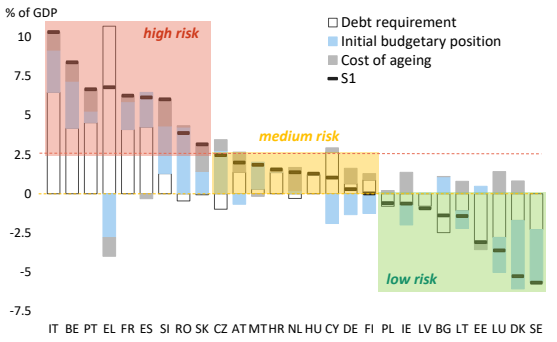
Table I.2.3: **S1: breakdown (% of GDP)**

S1		Initial budgetary position		Debt requirement	Cost of ageing	of which			
		Gap to debt-stabilising SPB	*Cost of delaying adjustment*			*Pensions**	*Healthcare*	*Long-term care*	*Education*
BE	8.4	2.0	1.0	4.2	1.2	*0.9*	*0.2*	*0.3*	*-0.2*
BG	-1.4	1.3	-0.2	-2.5	0.0	*-0.2*	*0.1*	*0.0*	*0.1*
CZ	2.5	2.5	0.3	-1.0	0.7	*-0.1*	*0.3*	*0.3*	*0.2*
DK	-5.3	-3.8	-0.6	-1.7	0.8	*-0.3*	*0.2*	*1.0*	*-0.1*
DE	0.3	-1.4	0.0	0.6	1.0	*0.5*	*0.1*	*0.1*	*0.2*
EE	-3.1	0.8	-0.3	-3.2	-0.4	*-0.6*	*0.2*	*0.1*	*-0.1*
IE	-0.6	-1.2	-0.1	-0.7	1.4	*0.9*	*0.3*	*0.3*	*-0.1*
EL	6.8	-3.6	0.8	10.7	-1.2	*-1.0*	*0.2*	*0.0*	*-0.3*
ES	6.2	1.5	0.8	4.3	-0.3	*-0.5*	*0.4*	*0.1*	*-0.3*
FR	6.3	1.0	0.7	4.1	0.4	*0.2*	*0.2*	*0.2*	*-0.2*
HR	1.6	-0.2	0.2	1.4	0.2	*0.1*	*0.2*	*0.0*	*-0.1*
IT	10.3	1.4	1.3	6.5	1.1	*0.9*	*0.3*	*0.2*	*-0.2*
CY	1.0	-2.0	0.1	2.7	0.3	*0.4*	*0.1*	*0.1*	*-0.2*
LV	-0.9	0.1	-0.1	-0.8	-0.2	*-0.5*	*0.2*	*0.1*	*0.1*
LT	-1.4	-1.0	-0.2	-1.1	0.8	*0.4*	*0.2*	*0.2*	*0.1*
LU	-3.6	-1.8	-0.4	-2.8	1.4	*1.4*	*0.2*	*0.1*	*-0.3*
HU	1.3	-0.1	0.1	1.2	0.0	*-0.1*	*0.2*	*0.1*	*-0.2*
MT	1.8	1.5	0.2	0.3	-0.2	*-0.7*	*0.5*	*0.3*	*-0.3*
NL	1.4	0.0	0.2	-0.3	1.5	*0.6*	*0.3*	*0.8*	*-0.1*
AT	2.0	-0.9	0.2	1.4	1.3	*0.7*	*0.3*	*0.3*	*-0.1*
PL	-0.6	0.1	-0.1	-0.8	0.2	*-0.6*	*0.4*	*0.3*	*0.0*
PT	6.7	-0.1	0.8	4.5	1.4	*0.9*	*0.5*	*0.1*	*-0.1*
RO	3.9	3.8	0.5	-0.5	0.1	*-0.2*	*0.3*	*0.1*	*0.0*
SI	6.0	2.4	0.7	1.3	1.7	*1.1*	*0.4*	*0.2*	*0.0*
SK	3.2	1.1	0.4	-0.1	1.8	*0.8*	*0.5*	*0.3*	*0.2*
FI	0.0	-1.3	0.0	0.9	0.4	*-0.1*	*0.3*	*0.6*	*-0.4*
SE	-5.7	-2.7	-0.6	-2.3	0.0	*-0.4*	*0.2*	*0.4*	*-0.3*
EU	3.1	0.0	0.4	2.0	0.7	*0.3*	*0.3*	*0.2*	*-0.1*
EA	4.1	0.1	0.5	2.7	0.8	*0.4*	*0.2*	*0.2*	*-0.1*

* Net of taxes on pensions and compulsory social security contributions paid by pensioners.
Source: European Commission.

than 2.5 pps. of GDP overall, compared to the baseline, to reach the 60% debt target in 2038 (Graph I.2.23). The medium-risk countries, which could reduce their debt to 60% of GDP with a smaller effort, are Czechia, Austria, Malta, Croatia, the Netherlands, Hungary, Cyprus, Germany and Finland. Finally, the low-risk countries, which have room to let their structural primary position deteriorate compared to the baseline without breaching the 60% of GDP debt threshold, are Poland, Ireland, Latvia, Bulgaria, Lithuania, Estonia, Luxembourg, Denmark and Sweden.

Graph I.2.23: **S1: baseline results**



Source: European Commission.

S1 depends on the initial budgetary position, the debt level and the projected increase in ageing costs. The contributions of these three drivers are reported in Table I.2.3. First, *the 'initial budgetary position' component* measures the effort due to the level of the SPB forecast for 2023 and has two subcomponents. One is the gap between the SPB in 2023 and the SPB that would stabilise debt. The other subcomponent, named 'cost of delaying adjustment', reflects the fact that the assumed adjustment of the SPB takes place over 5 years rather than immediately, implying that debt may keep increasing in the meantime. Second, *the 'debt requirement' component* measures the additional adjustment that is needed to reach the 60% of GDP debt target: the larger the excess of debt over 60% of GDP, the higher the 'debt requirement' component. Finally, *the 'cost of ageing' component* accounts for the need to absorb the projected change in ageing-related public expenditure.

For the EU and the euro area as a whole, S1 signals a need for a significant consolidation

effort to reduce the debt ratio to 60%, mainly because of the initial debt level. The aggregate SPB in the EU would need to improve by a total of 3.1 pps. of GDP in 5 years compared to the baseline, of which 2.0 pps. would stem from the high debt level, 0.7 pp. from the projected increase in the cost of ageing (nearly equally driven by pensions, healthcare and long-term care) and 0.4 pp. from spreading the adjustment over several years. For the euro area as a whole, S1 indicates a higher gap of 4.1 pps. of GDP mainly due to the larger 'debt requirement' component (2.7 pps.).

The main lessons from the breakdown of S1 for medium-term fiscal challenges are as follows.

– *For the countries with the six highest values of S1, the main driver is the high debt level.* In Belgium, Greece, Spain, France, Italy and Portugal, the debt ratio exceeds 100% of GDP and the 'debt requirement' component represents at least one half of S1.

– *In 10 of the 12 countries with the highest values of S1, S1 is at least partially driven by the need to bridge the gap between initial budgetary positions that cause debt to increase and debt-stabilising SPBs.* The reduced initial positions in the wake of the COVID-19 crisis, remaining below historical standards by 2023, play a particularly large role in Belgium, Czechia, Spain, Italy, Malta, Romania and Slovenia, and to a lesser extent in Portugal, France and Slovakia.

– *Ageing costs are projected to weigh on public debt in 19 Member States.* This affects countries at all levels of sustainability risks. Over the medium term, ageing costs are projected to decline and alleviate consolidation needs (if any) in only 5 countries: Estonia, Greece, Spain, Latvia and Malta.

– *Negative values of S1 are mainly explained by low debt levels and favourable initial budgetary positions.* This is the case for most of the 9 countries for which S1 signals a low risk.

2.4.2. Level and plausibility of the SPB implied by S1

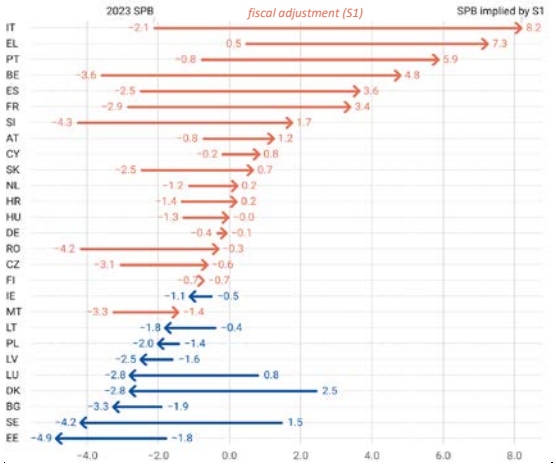
Adjusting SPBs by the amount implied by S1 would bring them to levels ranging from -5% of GDP to over 8% of GDP across Member States. For each country, this implied level of the SPB is the sum of the SPB in 2023 and the value of S1. In about half of the Member States, this would lead to a structural primary surplus, which would reach levels of more than 3% of GDP in 6 countries (Italy, Greece, Portugal, Belgium, Spain and France, see Graph I.2.24). At the other end of the spectrum, the low-risk countries could let their SPB deteriorate into (larger) deficits, in some cases very large, as in Estonia and Sweden (over 4% of GDP), given their (very) low forecast debt levels.

The SPBs implied by S1 can be compared with fiscal positions observed in the past. Technically, this consists in calculating the percentile rank of the required SPB within the distribution observed in the country since 1980 ([55]). This allows assessing how realistic the required fiscal position is, relative to the country's past performance.

The adjustment required by S1 appears very demanding in some countries, especially those for which it implies a structural primary surplus of at least 1% of GDP. Graph I.2.25 orders the required SPBs according to their percentile ranks. Achieving – and sustaining – the required SPB appears unrealistic in Spain, France, Italy, Portugal and Slovakia, where no structural primary surplus ever reached the level currently required by S1 in the last four decades. In Slovenia, Greece, Austria, Belgium and Croatia, the SPB currently implied by S1 was achieved less than 25% of the time.

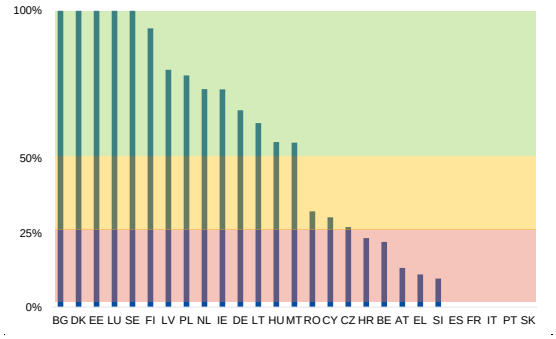
([55]) For some countries, data start after 1980.

Graph I.2.24: **SPB level implied by S1 (% of GDP)**



Source: European Commission.

Graph I.2.25: **Plausibility of the SPB implied by S1 (% of cases achieved in the past)**



Based on available data on SPBs in1980-2021.
Source: European Commission.

2.4.3. S1 – sensitivity analysis

As the S1 indicator is sensitive to changes in key assumptions, its results are tested under four sensitivity scenarios. These scenarios are the same as those used for the S2 indicator, namely the 'non-demographic risk' scenario, the 'lower productivity' scenario, the 'historical SPB' scenario and the 'adverse r-g' scenario (see Chapter 3 and Box I.3.2 for further details). Graph I.2.26 presents the results in terms of deviation from the baseline.

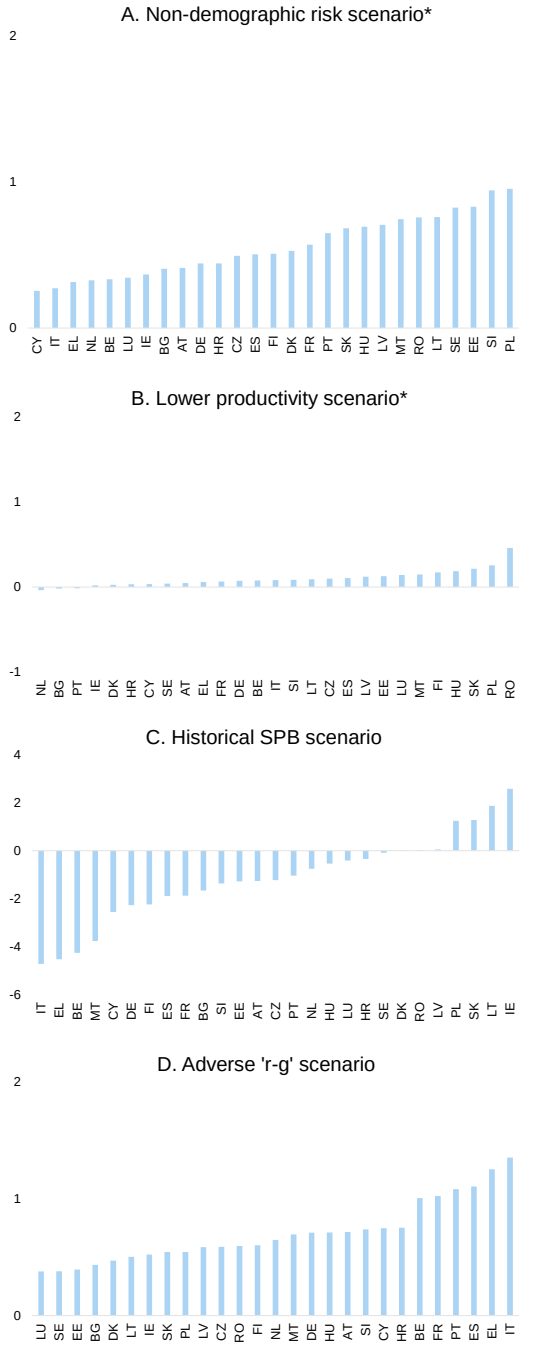
– **The non-demographic risk scenario**, which captures the impact of non-demographic factors on healthcare and long-term care expenditure, increases S1 by less than 1 pp of GDP for all Member States compared to the baseline (see Graph I.2.26-A). Poland, where the increase is the largest, would move from low to medium risk. Moreover, smaller increases in the case of Czechia and Malta would be sufficient to make them move from medium to high risk.

– **The lower productivity scenario**, which assumes that total factor productivity growth converges to 0.8%, only has a limited quantitative impact on S1, with a maximum of 0.5 pp of GDP in the case of Romania (see Graph I.2.26-B). While this scenario would keep the risk category unchanged for most countries, it would affect one borderline country: the 0.1 pp increase for Czechia would bring its S1 just above the high-risk threshold.

– **The historical SPB scenario** reduces the value of S1 in most cases, as for most countries the historical average is tighter than the SPB forecast for 2023. If SPBs were already to converge to their historical levels, the additional fiscal effort from there to bring debt to 60% of GDP would therefore fall – by more than 4 pps of GDP in the case of Italy, Greece and Belgium (see Graph I.2.26-C). This would improve the risk classification of 5 countries: Germany, Cyprus, Malta and Finland would move from medium to low risk, and Greece would move from high to medium risk. On the other hand, 3 countries would be worse off: Ireland, Lithuania and Poland, all from low to medium risk.

– **Finally, the adverse 'r-g' scenario** includes a less favourable snowball effect, so that a higher fiscal effort is needed to bring the debt ratio to 60%, especially for high-debt countries in which the snowball effect is more sizeable. The values of S1 for Belgium, France, Portugal, Spain, Greece and Italy would therefore increase the most (see Graph I.2.26-D), confirming their high-risk classification. For 3 countries (Czechia, Malta and Austria), the risk category would worsen from medium to high risk under that scenario.

Graph I.2.26: **S1 under alternative scenarios – deviation from baseline, pps of GDP**



*2021 Ageing Report scenario. See also Box I.3.2 in Chapter 3 for further explanations on the scenarios.
Source: European Commission.

2.5. OVERALL MEDIUM-TERM RISKS

2.5.1. Overall medium-term risk classification

The medium-term risk classification relies on simpler decision trees that give more weight to the debt trajectory and stochastic projections. For the deterministic projections, the projected debt level in 10 years' time still provides the main information; however, the risk category derived from the debt level can be notched up or down, depending on the debt path and the available 'fiscal consolidation space'. Furthermore, when the stochastic projections point to medium or high risk, they can notch up the preliminary low or medium risk signal provided by the baseline in a more consistent way than in previous reports (along with additional scenarios and stress tests). As in previous reports, however, neither stochastic projections nor additional scenarios and stress tests can notch *down* the risk signal resulting from the baseline. The changes introduced in this report are explained in Box I.2.2.

Based on this approach, 11 EU countries are deemed at high fiscal sustainability risk over the medium term. These are Belgium, Greece, Spain, France, Croatia, Italy, Malta, Portugal, Romania, Slovenia and Slovakia (Table I.2.7).

– Among them, both the DSA and S1 signal high risks for 8 countries. In the case of **Belgium**, **Spain**, **France** and **Italy**, every component of the analysis (i.e. S1, the baseline and other deterministic scenarios, and the stochastic projections) points to high risk, mainly because their debts are well above 90% of GDP and increasing under most scenarios – a trend also largely confirmed by the stochastic projections. For **Greece**, most scenarios flash red because of the very high (although declining) debt level and the rather ambitious fiscal assumptions ([56]). **Slovenia** is at high risk because its debt ratio is projected to increase in most scenarios, exceeding 90% by the end of the projection period. For **Slovakia**, the assessment also reflects the projected increase in debt (which would however remain below

([56]) However, the fiscal assumptions appear plausible considering that Greece recorded an average structural primary surplus of 2.1% of GDP over the last 15 years.

90% of GDP), along with fairly limited room for policy correction. Finally, the high-risk assessment for **Portugal** is jointly driven by S1, the stochastic projections and the two scenarios affecting interest rates, mostly on the back of its very high debt level and uncertainty.

– **Croatia** and **Malta** are deemed at high risk on the basis of the DSA, while S1 only signals medium risk. In both cases, the baseline sends a medium-risk signal, as debt, albeit increasing at the end of the projection period, is projected to remain below 90% of GDP (and below its 2021 level in the case of Croatia). Nevertheless, debt's sensitivity to adverse assumptions leads to identifying high risks.

– Finally, **Romania** is classified at high risk because of the value of the S1 indicator, while every component of the DSA suggests a medium risk. This is because debt, although on an increasing path, is projected to remain below 90% of GDP by 2032.

In 8 other countries, medium-term risks are deemed medium. These are Bulgaria, Czechia, Germany, Cyprus, Hungary, the Netherlands, Austria and Finland.

– For 4 countries, the medium-risk classification is due to both the DSA and S1. In **Czechia**, **Cyprus**, **Hungary** and **the Netherlands**, debt is projected to stand at an intermediate level of 60% to 90% of GDP under most scenarios. Moreover, in Czechia and the Netherlands, debt ratios are at projected to increase at least at the end of the projection period, exceeding the 2021 level by 2032 under most deterministic scenarios. For Czechia, the stochastic projections also flag a likely debt increase between 2021 and 2026. For Cyprus, the classification is also driven by the fairly limited fiscal consolidation space. In Hungary, the medium risk originates in the debt level, the high uncertainty and the vulnerability under the 'lower SPB' scenario.

– For **Bulgaria**, the overall medium-risk conclusion stems from the DSA. Bulgaria's debt is projected to increase and, while it would stay at a low level by 2032 under all deterministic scenarios, the stochastic projections suggest that the magnitude of the change in debt is subject to particularly large uncertainty.

– For the 3 other countries, the overall medium-risk conclusion is driven by the S1 indicator. **Germany, Austria** and **Finland** start with favourable initial budgetary positions but with debt ratios above 60%; these are projected to decline, although under pressure from increasing costs of ageing. Finland is a borderline case as its S1 is just above zero, with debt gradually approaching 60% already under the baseline. Germany is in a similar situation with a slightly larger S1, and Austria faces less favourable conditions overall. In Germany and Austria, debt would remain well above 60% of GDP by 2032 if the consolidation forecast for 2022 and 2023 did not materialise.

Finally, the remaining 8 Member States are found to be at low risk over the medium term. These are **Denmark**, **Estonia**, **Ireland**, **Latvia**, **Lithuania**, **Luxembourg**, **Poland** and **Sweden**. In these countries, S1, the baseline and the stochastic projections all point to low risk. This classification is not modified by the few sources of vulnerability. In particular, in Latvia, debt would remain above 60% of GDP by 2032 if the consolidation forecast for 2022-2023 did not materialise, and Estonia's debt is on an upward path – but starting from an extremely low level.

2.5.2. Comparison with the 2020 DSM results

Debt projections

Despite generally lower initial debt levels than in the 2020 DSM, the 2021 FSR does not point to an overall improvement over the medium term. For most countries, the debt levels expected for 2022 in the Commission 2021 autumn forecast are lower than in the 2020 DSM, reflecting mainly the stronger-than-expected recovery in 2021 (Table I.2.4). At the aggregate level, the 2022 debt was revised downwards by close to 5 pps. of GDP. Still, by 2031, the aggregate debt level is projected to be broadly unchanged compared to the 2020 DSM. This is mainly because the 2031 debt level is sizeably below the 2020 DSM projections in only few countries (in particular, Romania, Sweden, Spain and Slovakia), while in a few other

countries, debt has been revised significantly upwards – e.g. in Malta, Czechia, Portugal, Slovenia and Bulgaria.

The less favourable debt paths despite stronger medium-term growth are mainly driven by the revision to fiscal assumptions between the two reports. The 2020 DSM was anchored on the assumption that, as from 2023, the SPB would gradually converge back to the level that was expected for 2021 in the 2019 DSM, prior to the COVID-19 crisis. This convergence rested on the assumption that the temporary support measures aiming to bridge the crisis would be phased out. By contrast, the 2021 FSR is based on the standard 'no-fiscal policy change' assumption, i.e. it assumes that the SPB remains constant at its last forecast value (for 2023), only modified by projected ageing costs. Moreover, the Commission 2021 autumn forecast up to 2023 entails lower SPBs than the 2020 DSM for most countries, on the back of permanent measures increasing current spending. The revised assumption explains the difference in average SPB levels in 2023-2031 (see Table I.2.5). On the other hand, the growth outlook over the medium term is stronger in the Commission 2021 autumn forecast thanks to the investments undertaken under the Next Generation EU package to support the green and digital transition.

Table I.2.4: **Baseline debt projections in the 2020 DSM and the 2021 FSR**

	Debt (Commission T+2 forecast) 2022			Debt (baseline projections) 2031		
	2020 DSM	2021 FSR		2020 DSM	2021 FSR	
BE	118.6	113.1	-5.5	121.2	130.9	9.7
BG	26.3	26.7	0.4	23.0	35.0	12.1
CZ	42.2	44.3	2.1	43.1	64.1	21.0
DK	40.9	38.8	-2.1	24.7	17.7	-7.0
DE	69.0	69.2	0.2	57.1	61.7	4.6
EE	26.4	20.4	-6.0	31.7	25.2	-6.5
IE	66.0	52.3	-13.7	48.3	45.0	-3.3
EL	193.1	196.9	3.8	155.5	159.8	4.3
ES	123.9	118.2	-5.7	140.6	125.7	-14.8
FR	119.4	113.7	-5.7	119.9	121.4	1.5
HR	81.6	79.2	-2.5	76.8	76.3	-0.5
IT	159.1	151.4	-7.8	155.8	159.1	3.3
CY	102.8	97.6	-5.2	82.6	79.3	-3.3
LV	45.5	50.7	5.2	45.3	48.7	3.4
LT	49.5	44.1	-5.3	42.9	39.2	-3.6
LU	28.9	25.6	-3.2	17.9	18.1	0.2
HU	77.2	77.2	0.0	64.0	68.0	4.1
MT	59.3	62.4	3.1	43.3	72.5	29.2
NL	65.9	56.8	-9.1	63.5	61.3	-2.2
AT	85.1	79.4	-5.8	76.3	75.7	-0.7
PL	56.4	51.0	-5.4	46.4	47.9	1.5
PT	127.2	123.9	-3.3	107.6	125.0	17.4
RO	63.6	51.8	-11.8	126.8	73.0	-53.8
SI	79.8	76.4	-3.4	79.1	92.1	13.0
SK	67.6	60.0	-7.5	84.2	69.7	-14.5
FI	72.5	71.2	-1.4	70.5	64.5	-6.0
SE	40.3	34.2	-6.0	30.6	13.2	-17.4
EU	94.9	90.0	-4.8	90.1	88.7	-1.4
EA	102.6	97.9	-4.7	98.2	98.2	0.1

Source: European Commission.

Table I.2.5: **Main baseline assumptions in the 2020 DSM and the 2021 FSR (2023-2031 averages)**

	Structural primary balance			Potential growth			'r-g' differential		
	2020 DSM	2021 FSR		2020 DSM	2021 FSR		2020 DSM	2021 FSR	
BE	-1.6	-3.6	-2.0	0.7	1.1	0.5	-1.6	-1.9	-0.3
BG	0.3	-1.9	-2.2	1.4	1.7	0.3	-1.4	-2.5	-1.1
CZ	-0.6	-3.1	-2.5	1.6	1.8	0.2	-2.0	-2.2	-0.2
DK	0.7	2.5	1.8	1.4	1.5	0.1	-2.6	-2.1	0.5
DE	0.3	-0.4	-0.6	0.8	1.1	0.3	-2.4	-2.6	-0.2
EE	-1.5	-1.8	-0.3	3.0	3.0	0.0	-5.1	-4.8	0.2
IE	0.7	-0.5	-1.2	2.6	4.0	1.4	-3.2	-4.0	-0.8
EL	3.0	0.5		-	1.3		-	-1.4	
ES	-2.9	-2.5	0.4	1.0	1.0	0.0	-1.4	-1.1	0.2
FR	-2.0	-2.9	-0.9	0.9	1.0	0.2	-2.1	-1.9	0.2
HR	0.4	-1.4	-1.7	0.4	1.6	1.2	-0.3	-2.0	-1.7
IT	0.0	-2.1	-2.1	0.6	1.1	0.5	-0.8	-1.0	-0.3
CY	1.3	-0.2	-1.5	1.6	2.1	0.6	-1.4	-2.3	-0.9
LV	-0.8	-1.6	-0.8	1.6	2.0	0.4	-2.3	-3.1	-0.8
LT	-0.3	-0.4	-0.1	2.1	2.4	0.3	-4.0	-3.8	0.2
LU	1.2	0.8	-0.4	1.7	2.2	0.5	-2.9	-3.9	-1.0
HU	0.2	-1.3	-1.5	2.2	3.1	0.9	-2.2	-3.1	-0.8
MT	0.8	-3.3	-4.1	2.6	2.7	0.1	-3.1	-3.1	-0.1
NL	-0.3	-1.2	-0.8	0.4	0.8	0.3	-1.9	-2.0	-0.1
AT	0.1	-0.8	-0.8	0.9	1.3	0.4	-1.8	-2.3	-0.5
PL	-0.5	-1.4	-0.9	2.9	3.0	0.1	-3.6	-3.5	0.1
PT	1.8	-0.8	-2.6	0.6	0.9	0.3	-0.7	-1.0	-0.3
RO	-6.9	-4.2	2.7	2.3	3.0	0.7	-0.5	-2.5	-2.1
SI	-1.7	-4.3	-2.6	2.4	2.9	0.5	-2.5	-3.3	-0.8
SK	-3.0	-2.5	0.5	1.3	2.8	1.4	-1.8	-3.2	-1.5
FI	-1.0	-0.7	0.3	1.0	1.2	0.2	-2.4	-2.9	-0.5
SE	-0.1	1.5	1.7	1.7	1.8	0.1	-3.5	-3.0	0.5
EU	-0.7	-1.4	-0.8	1.1	1.3	0.3	-2.0	-2.2	-0.2
EA	-0.6	-1.6	-0.9	0.9	1.1	0.3	-1.9	-2.1	-0.2

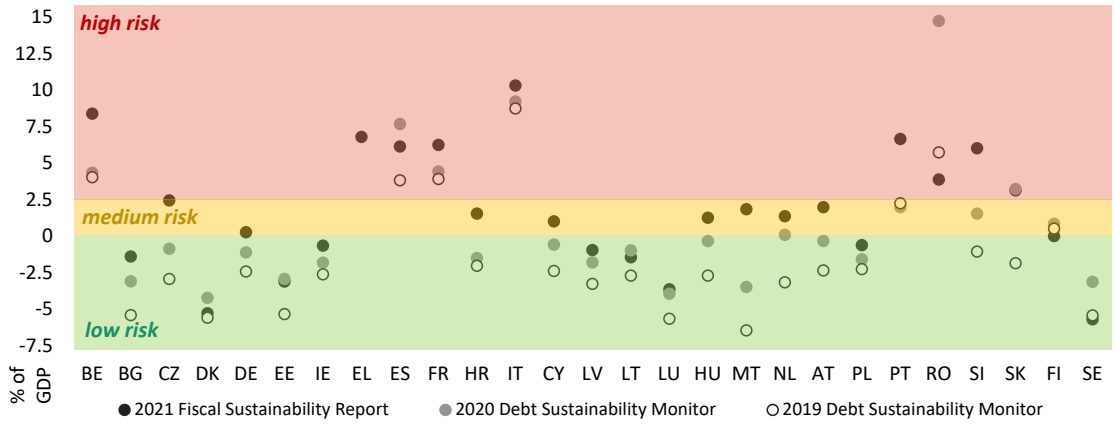
Source: European Commission.

Overall risk classification

The new medium-term classification shows a less favourable risk assessment for five countries compared to the 2020 DSM. Overall, three more countries than in the 2020 DSM are deemed at high risk: Croatia and Malta, up from the medium- and low-risk categories respectively, plus Greece, which is now integrated in the risk classification (Table I.2.6). Two more countries are at medium risk, as Bulgaria, Czechia and Germany joined this category (all up from low risk) while Croatia left it. In total, four less countries are therefore considered at low risk: Bulgaria, Czechia, Germany and Malta.

These changes reflect less favourable initial conditions compared to the pre-crisis forecast level, worsened outlooks and adjustments to the methodology. Croatia moved from medium to high risk mainly on account of its debt dynamics under the new 'adverse r-g' scenario. Bulgaria moved from low to medium risk due to the more decisive role of stochastic projections in the classification. Czechia made the same move because its debt is now projected to exceed 60% of GDP under all scenarios, and Germany because its weaker initial position implies a more gradual decline in debt. Finally, Malta changed from low to high risk, due to a higher initial and projected debt level, as well as a higher initial deficit.

Graph I.2.27: **Comparison of S1 across recent Commission reports**



Notes: (1) S1 was not calculated for Greece in the 2019 and 2020 DSMs. (2) The 2019 DSM was based on the Commission 2019 autumn forecast and the 2018 Ageing Report (using ageing costs projected for 2022 to 2034). (3) The 2020 DSM was based on the Commission 2020 autumn forecast and the 2018 Ageing Report (updated for Croatia, Italy, Romania and Slovakia to reflect pension reforms; ageing costs were taken into account only once the pre-crisis SPB was projected to be reached). (4) The 2021 FSR is based on the Commission 2021 autumn forecast and the 2021 Ageing Report (using ageing costs projected for 2024 to 2038).
Source: European Commission.

Table I.2.6: **Medium-term risk classifications in the 2020 DSM and the 2021 FSR**

2020 DSM medium-term risk \ 2021 FSR medium-term risk	low	medium	high
low	DK, EE, IE, LV, LT, LU, PL, SE	**BG, CZ, DE**	**MT**
medium		CY, HU, NL, AT, FI	**HR**
high			BE, EL*, ES, FR, IT, PT, RO, SI, SK

Note: (1) Greece was not covered in the 2020 DSM risk classification. (2) The risk classification of countries in bold has changed between the two reports.
Source: European Commission.

S1 indicator

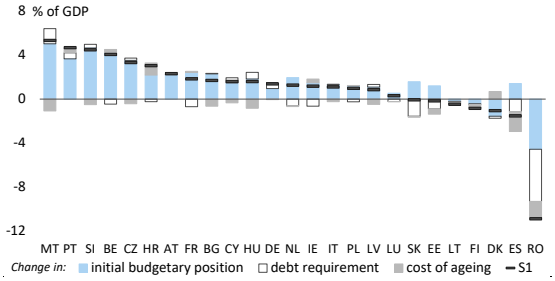
For most countries, the value of S1 is now higher than in the 2019 and 2020 DSMs, with some implications for the risk classification. Among the 9 countries currently deemed at high risk, 5 were already in that category in the 2019 DSM, prior to the COVID-19 crisis: Belgium, Spain, France, Italy and Romania ([57]) (see Graph I.2.27). Slovakia moved into the high-risk category with the 2020 DSM, and Portugal and Slovenia with this report. As for the 9 medium-risk countries, only one (Finland) was already in that category at the time of the 2019 DSM; the others moved from the low-risk category with the 2020 DSM (the Netherlands) or, in most cases, with this report (Czechia, Germany, Croatia, Cyprus, Hungary, Malta and Austria). Finally, 9 countries that were deemed at low risk prior to the pandemic still get the same assessment, despite higher S1 values in most cases. No country has seen its risk category improve.

The main reason for the increase in S1 compared to the 2020 DSM lies in the less favourable initial budgetary positions compared to pre-crisis forecast levels. The 2019 and 2020 DSMs were based on older Commission forecasts and ageing-related projections from the 2018 Ageing Report. Moreover, the 2020 DSM assumed that each country's 5-year fiscal adjustment would start in the year when its baseline SPB would reach the value forecast for 2021 prior to the COVID crisis. Graph I.2.28 shows the revision of S1 between the 2020 DSM and this report and breaks it down into the revision in the initial budgetary position, the debt requirement and ageing costs. It shows that the lower SPBs forecast for 2023 – compared to those used in the 2020 DSM, namely those forecast for 2021 in the 2019 DSM – are the chief driver

([57]) The S1 indicator for Greece was not calculated for the 2019 and 2020 DSMs.

behind the general increase in S1, causing it to rise in all but four Member States. For Malta and Slovenia, the lower SPB pushes up S1 by about 5 pps of GDP, and the impact exceeds 3 pps for Belgium, Czechia and Portugal. By contrast, revisions in the two other components – the 'debt requirement' and the cost of ageing – are in most cases limited or broadly offset each other. The two largest revisions are for Spain and Romania, where these two components significantly reduce the value of S1 compared to the 2020 DSM (although not enough to exit the high-risk territory).

Graph I.2.28: **Breakdown of the change in S1**



Note: S1 was not calculated for Greece in the 2020 DSM.
Source: European Commission.

Table I.2.7: **Heat map of medium-term fiscal sustainability risks in EU countries**

	Heat map for medium-term risks in EU countries																										
	S1 indicator in EU countries																										
	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE
S1 indicator - Baseline scenario	8.4	-1.4	2.5	-5.3	0.3	-3.1	-0.6	6.8	6.2	6.3	1.6	10.3	1.0	-0.9	-1.4	-3.6	1.3	1.8	1.4	2.0	-0.6	6.7	3.9	6.0	3.2	0.0	-5.7
S1 indicator - overall risk assessment	HIGH	LOW	MEDIUM	LOW	MEDIUM	LOW	LOW	HIGH	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	LOW	LOW	LOW	MEDIUM	MEDIUM	MEDIUM	MEDIUM	LOW	HIGH	HIGH	HIGH	HIGH	MEDIUM	LOW
	Debt sustainability analysis: Sovereign-debt sustainability risks in EU countries																										
	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE
Baseline ('no-policy change' scenario)	HIGH	LOW	MEDIUM	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	LOW	LOW	LOW	LOW	MEDIUM	MEDIUM	LOW	LOW	MEDIUM	MEDIUM	HIGH	HIGH	LOW	LOW
Debt level (2032)	133.6	36.4	67.1	15.6	61.6	25.7	45.7	154.7	126.1	122.3	76.7	161.6	77.8	48.8	39.4	18.2	68.1	73.2	62.8	76.3	48.3	126.2	76.9	95.2	72.2	63.9	11.2
Debt trajectory (debt peak year)	2032	2032	2032	2021	2021	2032	2021	2021	2032	2032	2021	2032	2021	2022	2023	2021	2021	2032	2032	2021	2021	2021	2032	2032	2032	2021	2021
Fiscal consolidation space (percentile rank avg SPB 2023-32)	98%	94%	81%	64%	71%	89%	65%	38%	92%	96%	48%	75%	42%	72%	35%	83%	67%	81%	92%	94%	69%	56%	81%	97%	48%	94%	60%
Stochastic projections	HIGH	MEDIUM	MEDIUM	LOW	LOW	LOW	LOW	MEDIUM	HIGH	HIGH	LOW	HIGH	MEDIUM	LOW	LOW	LOW	MEDIUM	LOW	LOW	LOW	LOW	HIGH	MEDIUM	LOW	LOW	LOW	LOW
Probability of debt in 2026 greater than in 2021 (%)	66%	54%	79%	7%	27%	98%	22.2%	18%	57%	59%	21%	41%	16%	52%	38%	31%	31%	76%	44%	26%	14%	36%	71%	60%	41%	35.0%	0%
Difference of the 10th and 90th percentile in 2026 (p.p. of GDP)	37.4	50.7	28.8	19.9	26.9	9.0	31.4	64.7	40.3	21.7	28.9	42.7	43.7	34.6	30.4	28.2	43.9	27.6	28.3	32.3	17.5	58.7	42.3	27.8	31.7	24.5	9.1
Historical SPB scenario	HIGH	LOW	MEDIUM	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	MEDIUM	MEDIUM	MEDIUM	HIGH	LOW	LOW
Debt level (2032)	109.7	23.7	52.1	16.4	49.5	17.0	52.8	143.0	116.7	114.3	75.7	137.2	67.8	48.1	45.3	11.1	60.7	51.5	54.7	68.9	51.2	121.0	66.4	77.4	69.5	54.5	11.6
Debt trajectory (debt peak year)	2026	2024	2032	2021	2021	2024	2021	2021	2027	2027	2021	2021	2021	2022	2023	2021	2021	2025	2021	2021	2021	2021	2032	2027	2032	2021	2021
Fiscal consolidation space (percentile rank avg SPB 2023-32)	86%	79%	33%	65%	38%	66%	77%	22%	73%	85%	48%	48%	29%	69%	53%	73%	59%	52%	83%	73%	75%	52%	75%	72%	45%	68%	60%
Adverse 'r-g' differential scenario	HIGH	LOW	MEDIUM	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	LOW	LOW	LOW	LOW	MEDIUM	MEDIUM	LOW	LOW	HIGH	MEDIUM	HIGH	HIGH	LOW	LOW
Debt level (2032)	143.0	38.6	71.6	17.5	66.8	27.2	48.8	165.6	136.1	131.4	82.6	174.8	83.6	52.5	42.4	19.5	73.7	78.4	67.5	81.8	51.7	136.3	82.0	101.6	76.4	68.2	12.4
Debt trajectory (debt peak year)	2032	2032	2032	2021	2021	2032	2021	2021	2032	2032	2032	2032	2021	2032	2023	2021	2021	2032	2032	2021	2021	2032	2032	2032	2032	2023	2021
Fiscal consolidation space (percentile rank avg SPB 2023-32)	86%	94%	81%	64%	71%	89%	65%	38%	92%	96%	48%	75%	42%	72%	35%	83%	67%	81%	92%	94%	69%	56%	100%	97%	48%	94%	60%
Financial stress scenario	HIGH	LOW	MEDIUM	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	LOW	LOW	LOW	LOW	MEDIUM	MEDIUM	LOW	LOW	HIGH	MEDIUM	HIGH	HIGH	LOW	LOW
Debt level (2032)	135.6	36.7	67.6	15.9	62.2	25.8	45.9	159.0	128.9	124.5	77.2	167.9	78.1	49.3	39.7	18.3	68.7	73.9	63.4	76.8	48.6	128.5	77.4	95.8	72.6	64.3	11.3
Debt trajectory (debt peak year)	2032	2032	2032	2021	2021	2032	2021	2021	2032	2032	2021	2032	2021	2022	2023	2021	2021	2032	2032	2021	2021	2032	2032	2032	2032	2022	2021
Fiscal consolidation space (percentile rank avg SPB 2023-32)	98%	94%	81%	64%	71%	89%	65%	38%	92%	96%	48%	75%	42%	72%	35%	83%	67%	81%	92%	94%	69%	56%	100%	97%	48%	94%	60%
Lower SPB scenario	HIGH	LOW	MEDIUM	LOW	MEDIUM	LOW	LOW	MEDIUM	HIGH	HIGH	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	LOW	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	MEDIUM	MEDIUM	HIGH	MEDIUM	LOW	LOW
Debt level (2032)	141.3	39.1	76.6	34.2	79.6	33.7	59.8	184.0	126.7	134.1	78.5	173.2	90.3	77.4	52.9	18.4	82.0	94.5	75.2	86.6	50.0	127.8	83.1	103.7	84.5	70.2	16.2
Debt trajectory (debt peak year)	2032	2032	2032	2023	2032	2032	2032	2021	2032	2032	2021	2032	2021	2032	2032	2021	2032	2032	2032	2032	2021	2021	2032	2032	2032	2023	2021
Fiscal consolidation space (percentile rank avg SPB 2023-32)	100%	95%	91%	96%	96%	98%	80%	51%	92%	100%	50%	95%	75%	100%	64%	83%	74%	99%	100%	98%	70%	58%	100%	100%	65%	97%	70%
Debt sustainability analysis - overall risk assessment	HIGH	MEDIUM	MEDIUM	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	LOW	LOW	LOW	MEDIUM	HIGH	MEDIUM	LOW	LOW	HIGH	MEDIUM	HIGH	HIGH	LOW	LOW
Overall MEDIUM-TERM risk category	HIGH	MEDIUM	MEDIUM	LOW	MEDIUM	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	LOW	LOW	LOW	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	HIGH	HIGH	HIGH	HIGH	MEDIUM	LOW

Source: European Commission.

Box I.2.1: Revising the inflation rate assumption: rationale, description and impact

This box presents the new baseline inflation assumption used in this report. This assumption relies on inflation market expectations, reflected in inflation-linked swaps, to set the projection path for the inflation rate. The previous assumption relied on a conventional assumption of convergence of inflation to a (monetary policy) target over the medium run. The revision of the assumption enhances plausibility by allowing it to reflect the evolving inflation environment. Yet, in practice, at the current juncture, the change in assumption implies broadly unchanged inflation paths for all EU countries, compared to those implied by the previous projection assumption. The rest of the box describes the rationale for reconsidering the inflation rate assumption (Section 1), the design of the new assumption (Section 2) and the impact of this revision (Section 3).

Rationale for reconsidering the inflation rate assumption

The previous inflation projections relied on a conventional assumption of convergence of inflation to the ECB's inflation target of 2% over the medium run ([1])**.** Other institutions (e.g. the US Congressional Budget Office and UK's Office for Budget Responsibility) also rely on such fixed targets for their inflation projections in their fiscal sustainability framework. The ECB follows a similar approach, assuming that euro area inflation converges to 1.9% by T+7, with country inflation converging to that common target by T+10, after first keeping spreads vis-à-vis the euro area constant until T+5 ([2]). The IMF relies on forecast judgement to set inflation projection paths in its country DSAs.

In the Commission's DSA, two aspects suggest the need to revise such a conventional assumption. *Firstly*, inflation has remained subdued until recently, notably lower than the assumed 2% target. Assuming a return to this target over the medium run, as done under the previous conventional assumption, overlooks on-going and foreseeable inflation developments in DSA computations. In particular, not reflecting a persistent change in the inflation environment could potentially be a source of systematic debt projection errors. *Secondly*, following a recent similar change to the interest rate projection assumption ([3]), changing the inflation assumption allows improving consistency across these variables over the projection horizon. Specifically, the new interest rate assumption relies on market-based expectations ([4]), implying that the inflation component of the nominal interest rate reflects market-based expectations. Fostering consistency between the interest and the inflation projections calls for relying on up-to-date (e.g. market-based) expectations for the inflation projection.

Description of the new inflation rate assumption

Inflation-linked swaps provide a way of gauging market-based inflation expectations. Such financial contracts are commonly used to hedge inflation risks. Inflation-linked swaps are typically zero-coupon contracts. At maturity, the contract implies payment of a compensation for average realised inflation over the lifespan of the contract. Ex ante, the value of the contract thus reflects the expected average inflation over its lifespan, plus a premium for bearing the uncertainty associated with the path of future inflation – i.e. the inflation risk premium. Trading ensures that the value of these contracts tracks the evolution of inflation expectations, with market quotes providing a direct measure of inflation expectations (plus the inflation risk premium). A liquid euro area inflation-linked swap market was set up in 2002 and grew rapidly.

Inflation expectation can be computed for specific future periods. For instance, the expected average inflation between T+10 and T+20 can be computed by combining quotes on 10-year and 20-year swap contracts. Such computations yield the so-called 10-year forward (inflation-linked) swap rate 10 years ahead ([5]). Formally, the formula below describes such computations. It relies on a

([1]) In three countries, inflation is assumed to converge to a higher level, reflecting different national central banks' targets. This concerns Poland and Romania (2.5%) as well as Hungary (3%).
([2]) See Bouabdallah et al. (2017).
([3]) See Box 3.2 in the 2019 Debt Sustainability Monitor.
([4]) The ECB also relies on such market forward interest rates to set its interest rate projection path in its DSA framework, see Bouabdallah et al. (2017).
([5]) An alternative horizon, the 5-year forward (inflation-linked) swap rate 5 years ahead, has become a widely used measure to assess euro area long-term inflation expectations - see ECB (2018).

(Continued on the next page)

Box (continued)

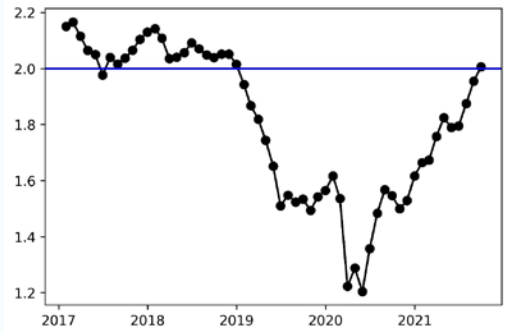
spot zero-coupon 10-year maturity swap, s_t^{20y}, which reflects average expected inflation over the next 20 years, and on a spot 10-year maturity swap s_t^{10y}. Together, these swaps allow computing the 10-year forward swap rate 10 years ahead, f_t^{10y10y}, which reflects the expected average inflation between 10 and 20 years ahead (or over 10 years, starting 10 years ahead).

$$\left(1 + f_t^{10y10y}\right)^{10} = \frac{\left(1 + s_t^{20y}\right)^{20}}{\left(1 + s_t^{10y}\right)^{10}}$$

Some caveats should however be borne in mind when interpreting financial indicators of inflation expectations. They are imperfect measures of inflation expectations, biased by an inflation (and liquidity) risk premium. Statistical techniques (e.g. affine models) may provide more accurate market-based inflation expectation measures by accounting for the presence of the risk premium. However, the use of plain computations as described in the equation above remains commonplace and the gain in accuracy provided by more advanced statistical techniques need to be weighed against the uncertainty still prevailing at the modelling stage as well as against the reduced transparency that the use of sophisticated modelling techniques generates. Finally, the method proposed needs to anchor the inflation assumption of all countries to the euro area swap-based inflation expectation as country level swap-based inflation expectation data is available for only a very limited set of EU countries ([6]).

Graph 1 shows the evolution of market-based expectations for euro area inflation, computed for the 10-year window 10 years ahead. That is, the graph shows the evolution of the indicator f_t^{10y10y}, described in the formula above. It points at some significant de-anchoring of inflation expectations from the 2% ECB monetary policy target in 2019-20. Such fluctuations in inflation expectations over time underpin the rationale for moving away from a static target. Yet, the graph also shows that more recently inflation expectations have converged back to the 2% mark. Going forward, however, recent inflation pressures may push market-based inflation measures beyond that level.

Graph 1: **Evolution of euro area market-based inflation expectation**



(1) The graph shows the evolution of market-based expectations for euro area inflation, for the 10-year window 10 years ahead.
(2) Monthly data, latest observation: September 2021.
Source: Bloomberg.

As regards the evolution of the inflation risk premium, recent evidence points at a shrinkage of this component ([7]). Since the global financial crisis (GFC), the inflation risk premium appears less significant. This supports the use of simple measures of inflation expectations directly based on inflation-linked swaps (i.e. measures that do not attempt to identify and adjust for the existence of a risk premium). Yet, various studies also point to fluctuations in the risk premium, including occasional negative values for this component, in the US and the euro area since the GFC ([8]). Such movements in the inflation risk premium are argued to be linked to shifts in the balance of risks of future high(er) inflation and risks of future deflation. When the latter prevails, the inflation risk premium turns negative. A negative inflation risk premium implies that market participants pay a premium when buying swaps, as those contracts provide them with a hedge against deflation risks. In contrast, in 'normal' times, swap-holders receive a positive premium (i.e. pay less for the swap) as compensation for the risk they bear that inflation may turn out to be higher than currently expected. When deflationary and inflationary risk are broadly balanced, the inflation risk premium is small, seemingly the situation in the euro area, up to recently. Yet, if this balance of risk would be

([6]) More specifically, inflation-linked swaps at the country level at the maturity needed (10-year and 20-year) to compute the target are not available and/or have low liquidity.

([7]) See ECB (2021).
([8]) See e.g. Camba-Mendez, G. and T. Werner (2017).

(Continued on the next page)

Box (continued)

shifting towards prevailing inflationary risks, the risk premium would tend to increase. This would yield some overestimation of inflation expectations when relying on direct measures based on inflation-linked swaps as those described in the above formula. Close monitoring and potential further methodologically work may be warranted if such risks of over- or under-estimation of inflation expectations become apparent.

To ensure that the inflation assumption reflects up-to-date long-term inflation expectations, a new approach is developed. To project inflation in the DSA framework, the following steps are used under the new inflation assumption:

1. We set country inflation **up to T+10** by assuming that all countries converge to the (swap-based) euro area inflation expectation over the 10-year window starting 10 years ahead (i.e. the same forward window used to set market-based interest rate T+10 projection targets). For Poland, Romania and Hungary, we assume that half of the spread vis-à-vis euro area inflation observed in T+2 remains by T+10, to assume gradual compression of that spread over that horizon ([9]).

2. We set country inflation **between T+10 and T+30** by assuming gradual convergence to 2% for all countries by T+30 (except for Poland (2.5%), Romania (2.5%) and Hungary (3%) reflecting national central banks' targets), reverting to the simpler conventional targets, acknowledging large uncertainties at longer horizon.

Implications of changing the inflation projection assumption

Table 1 compares the inflation projection paths under the new and previous assumptions. Importantly, at this juncture, the two sets of assumptions point to broadly similar results, reflecting the fact that September 2021 market-data ([10]) for the euro area 10-year in 10-year inflation expectation points to a 2% inflation expectation as was also shown in Graph 1, which is identical to the T+10 target that was used under the previous assumption ([11]). This implies that this change in assumption has virtually no impact on debt projections. Romania is the only country for which the new inflation path differs slightly, with a noticeably higher T+10 inflation target. This implies a slightly more favourable debt projection path for that country, due to a more favourable snowball effect than under the previous assumption.

Overall, the change in assumption implies broadly unchanged inflation paths at the current juncture. Yet, it ensures more plausible inflation projections under future potential changes in the inflation environment.

Table 1: **New versus previous inflation projection assumptions**

	New assumption					Previous assumption					Impact: New minus Previous				
	T+2	T+5	T+10	T+20	T+30	T+2	T+5	T+10	T+20	T+30	T+2	T+5	T+10	T+20	T+30
	2023	2026	2032	2042	2052	2023	2026	2032	2042	2052	2023	2026	2032	2042	2052
BE	1.6	1.8	2.0	2.0	2.0	1.6	1.8	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
BG	3.5	3.0	2.0	2.0	2.0	3.5	3.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
CZ	2.5	2.3	2.0	2.0	2.0	2.5	2.3	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
DK	1.5	1.6	2.0	2.0	2.0	1.5	1.6	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
DE	1.8	1.9	2.0	2.0	2.0	1.8	1.9	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
EE	2.4	2.3	2.0	2.0	2.0	2.4	2.3	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
IE	1.4	1.6	2.0	2.0	2.0	1.4	1.6	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
EL	0.4	1.0	2.0	2.0	2.0	0.4	1.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
ES	0.9	1.3	2.0	2.0	2.0	0.9	1.3	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
FR	1.4	1.6	2.0	2.0	2.0	1.4	1.6	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
HR	1.9	1.9	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
IT	1.4	1.6	2.0	2.0	2.0	1.4	1.6	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
CY	1.0	1.4	2.0	2.0	2.0	1.0	1.4	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
LV	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
LT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
LU	2.2	2.1	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
HU	3.7	3.5	3.0	3.0	3.0	3.7	3.5	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0
MT	1.5	1.7	2.0	2.0	2.0	1.5	1.7	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
NL	1.5	1.7	2.0	2.0	2.0	1.5	1.7	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
AT	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
PL	2.7	2.7	2.6	2.6	2.5	2.7	2.7	2.5	2.5	2.5	0.0	0.0	0.1	0.1	0.0
PT	1.4	1.6	2.0	2.0	2.0	1.4	1.6	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
RO	4.1	3.8	3.3	2.9	2.5	4.1	3.5	2.5	2.5	2.5	0.0	0.3	0.8	0.4	0.0
SI	1.7	1.8	2.0	2.0	2.0	1.7	1.8	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
SK	2.2	2.1	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
FI	2.3	2.2	2.0	2.0	2.0	2.3	2.2	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
SE	1.6	1.8	2.0	2.0	2.0	1.6	1.8	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
EA-19	1.5	1.7	2.0	2.0	2.0	1.5	1.7	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0

Source: Commission services.

([9]) This is also in line with the fact that a long-term spread vis-à-vis euro area inflation is assumed to prevail, given that the Central Bank's target of these countries differ from 2% (see step 2).

([10]) Market data as of September 2021 are used in this report for the inflation projection target (and the interest rate projection targets).

([11]) As explained above, the T+10 target for Romania, Hungary and Poland is the market-based target applied to the other countries (i.e. the euro area inflation expectation based on the 10Y10Y swap) retaining on top of this half of the spread vis-à-vis euro area inflation that was observed in T+2.

Box I.2.2: Streamlined decision trees for the DSA risk classification

This box explains how three methodological changes to the DSA methodology have streamlined the analysis and made it more relevant for the post-COVID environment. This box focuses on presenting these revisions, while Annex A1 gives a thorough overview of the approach used in this report. The changes are as follows. First, the decision tree for the risk classification based on deterministic scenarios has been simplified and refocused: while remaining anchored on the projected debt *level*, it gives more prominence to the debt *trajectory* and to the plausibility of fiscal assumptions. Second, this plausibility and the feasibility of potential corrective measures (as measured by the available 'fiscal consolidation space') is now assessed against country-specific rather than EU-wide observations, making the analysis more relevant for individual countries. Third, the decision tree guiding the overall DSA risk classification has been streamlined and gives more weight to stochastic projections in stress-testing the baseline.

The DSA decision tree: general presentation

The DSA risk classification feeds into the medium-term risk assessment and is established in two steps. As explained in Annex A1, the DSA is the basis for the assessment of medium-term sustainability risks, along with the S1 indicator. The DSA risk classification is done in two steps. The first step assigns a risk category to the country under consideration for each of the deterministic projections and for the stochastic projections. For the deterministic projections, the risk category depends on three criteria. These are (1) the projected debt *level* in 10 years' time, (2) the debt *trajectory* (as summarised by the year in which debt is projected to peak), and (3) the 'fiscal consolidation space' (as measured by the level of the structural primary balance relative to the track record in the country, as discussed below) ([1]). The second step of the DSA classification then combines the risk categories derived from the various deterministic scenarios and from the stochastic projections, to conclude on the overall DSA risk category.

([1]) For the stochastic simulations, which provide a range of debt paths rather than a single path, specific criteria are used (see below).

A simplified decision tree giving more weight to the debt trajectory and its plausibility

This report makes the first step of the analysis easier to read and more consistent. Unlike in previous reports, a unique decision tree applies to all deterministic scenarios, and this decision tree has been streamlined and refocused (see Graph 1). The projected debt level still provides the main signal; however, this signal can be notched up or down by signals from the debt trajectory and the available 'fiscal consolidation space' in a more influential and consistent manner than in past reports.

By stressing the importance of the debt path and of its feasibility, this approach is consistent with the definition of public debt sustainability. While a 'high risk' signal remains linked to a high debt level, a risky trajectory and the lack of realistic policy space to correct it are decisive for the final classification. This approach is anchored to the definition of public debt sustainability used by international institutions such as the IMF and the ECB. According to this definition, debt can be considered unsustainable only in cases when there is *no politically and economically feasible fiscal path that can at least stabilise debt over the medium term* ([2]).

As a result, the risk classification may be more favourable than suggested by the debt level alone. A country with a debt level projected to remain above 90% of GDP in 10 years' time can still be considered only at medium risk provided that the debt trajectory is plausibly declining (this corresponds to case 3 in Graph 1). Similarly, a country with a debt level projected to remain above 60% of GDP at the end of the projection horizon may be deemed at low risk if the debt trajectory is plausibly declining (case 8).

([2]) The full definition clarifies that this is to be considered under the baseline and realistic shock scenarios, and that it should be consistent with both keeping rollover risk at an acceptably low level and preserving potential growth.

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Box (continued)

Graph 1: **The new decision tree for all deterministic projections**

Case	Debt level	Debt path	Consolidation space	Overall
1	HIGH	HIGH/MEDIUM	ANY	HIGH
2	HIGH	LOW	HIGH/MEDIUM	HIGH
3	HIGH	LOW	LOW	MEDIUM
4	MEDIUM	HIGH	HIGH/MEDIUM	HIGH
5	MEDIUM	HIGH	LOW	MEDIUM
6	MEDIUM	MEDIUM	ANY	MEDIUM
7	MEDIUM	LOW	HIGH/MEDIUM	MEDIUM
8	MEDIUM	LOW	LOW	LOW
9	LOW	HIGH	HIGH/MEDIUM	MEDIUM
10	LOW	HIGH	LOW	LOW
11	LOW	MEDIUM/LOW	ANY	LOW

Notes: The table is to be read as a decision tree starting from the debt level then moving on to the debt path and the fiscal consolidation space. The risk category derived from the debt level in T+10 is notched up if the debt path points to high risk and the consolidation space points to medium or high risk (cases 4 and 9). Indeed, in these cases, countries have an increasing debt and limited consolidation space, meaning that there is a chance that there is no feasible adjustment path to curb the debt path. Conversely, the risk is notched down if both the debt path and the consolidation space indicator point to low risk (cases 3 and 8). In these cases, the projected debt level is high or medium, but the debt path is decreasing and the country has enough space to take measures in case of adverse shocks.
Source: European Commission.

The decision tree leads to signalling a high risk in three cases:

- Debt is projected to exceed 90% of GDP in 10 years' time and to stabilise only late (or not at all) (case 1 in Graph 1);
- Debt, although declining, is projected to remain above 90% of GDP, and the projected decline rests on a demanding fiscal position by historical standards (case 2); or
- Debt is projected to increase steadily (or peak late), reaching a level of 60% to 90% of GDP, despite a fairly demanding fiscal position by historical standards that leaves only moderate to limited room for additional policy correction (case 4).

A country-specific indicator to gauge the plausibility of fiscal assumptions

The 'fiscal consolidation space' tells how often more stringent fiscal positions than assumed in the projections were observed in the past. Technically, it starts from the structural primary balance (SPB) assumed on average over the projection period and measures the percentile rank of that SPB within the distribution of all SPBs observed in past decades. This gives an indication of whether the fiscal assumption is plausible by historical standards and whether the country credibly has available fiscal room for manoeuvre to take corrective measures if necessary.

The fiscal consolidation space is now assessed against each country's own track record. In previous reports, this indicator was based on the distribution of SPB observed in all EU Member States. In this report, it relies on country-specific observations, improving its relevance. This means that it is considered more plausible to assume a structural primary surplus in a country that has often recorded surpluses in the past than for a country that has recorded deficits most of the time ([3]). For example, a percentile rank of 10% associated with an average SPB of 1% of GDP for a given country would indicate that this is an ambitious fiscal assumption, given the low frequency with which the country recorded SPBs of at least 1% of GDP in the past.

As a side revision, the thresholds associated with the percentile ranks have been adjusted. In previous reports, a percentile rank of less than 15% was interpreted as indicating a demanding fiscal assumption, while the assumption was deemed plausible when it was associated with a percentile rank of more than 30%. As public finances strongly deteriorated during the COVID-19 crisis (and although they are assumed to improve in the baseline), the projected SPBs are particularly low for most countries, which would point to low risk according to those thresholds. To reflect risks more accurately, the thresholds have therefore been increased to 25% and 50% respectively.

A more consistent role for stochastic projections and stress-test scenarios

The second step of the DSA consists in stress-testing the results from the baseline, possibly notching up the risk category. In line with state-of-the-art practices, additional deterministic scenarios and stochastic simulations complement

([3]) A country with a history of weak fiscal positions may well record stronger positions in the future, however this assumption would need to be backed by credible policy measures to be considered plausible.

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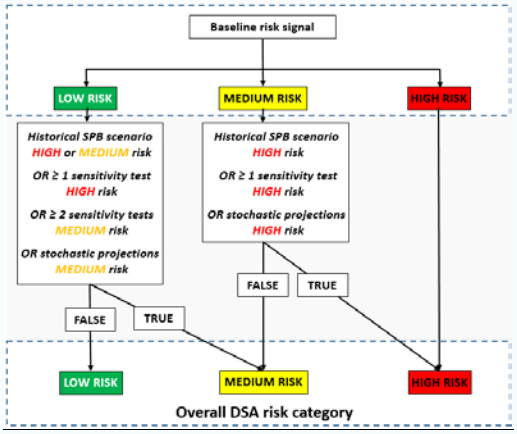
Box (continued)

the baseline. The results from each deterministic scenario are summarised into a risk signal, as described above. For the stochastic simulations, whose outcome is not a single debt path but a distribution of debt paths, specific criteria are used to establish the risk signal, namely the probability that debt will not stabilise over the next 5 years and the magnitude of uncertainty. Under the second step of the DSA, all the risk signals are combined to conclude on the overall DSA risk category. This combination either confirms the baseline risk signal or worsens it by one notch, as described in Graph 2. If the baseline points to high risk, this conclusion cannot be downgraded: the aim of stress-testing is to take into account more adverse conditions than under the baseline.

The new decision tree for this second step makes the approach more effective and homogenous, as stochastic projections are sufficient to notch up the risk category. The revised decision tree adjusts the preliminary risk category derived from the baseline in a more consistent manner than in previous reports (see Graph 2). If the baseline points to low or medium risk, this signal may now be notched up by the complementary deterministic scenarios *or* the stochastic simulations alone. This corrects two weaknesses of the previous approach: the decision tree was relatively complex and, in practice, countries were reclassified from low to medium risk in only very few cases. This was because, when the baseline pointed to low risk, stochastic projections could modify the classification to medium risk only if a deterministic scenario also supported this conclusion.

Graph 2: **The new decision tree for the overall DSA risk classification**



Source: European Commission.

Giving a higher weight to the stochastic approach is important, especially in the current environment. It reflects the uncertainty surrounding the baseline in the wake of the COVID-19 crisis. It also mirrors recent academic thinking (for instance, Blanchard et al. (2021) and Martin et al. (2021)) and it is in line with the latest advances in DSA frameworks of other institutions such as the IMF.

Box I.2.3: Possible paths to review the SFA projection assumptions

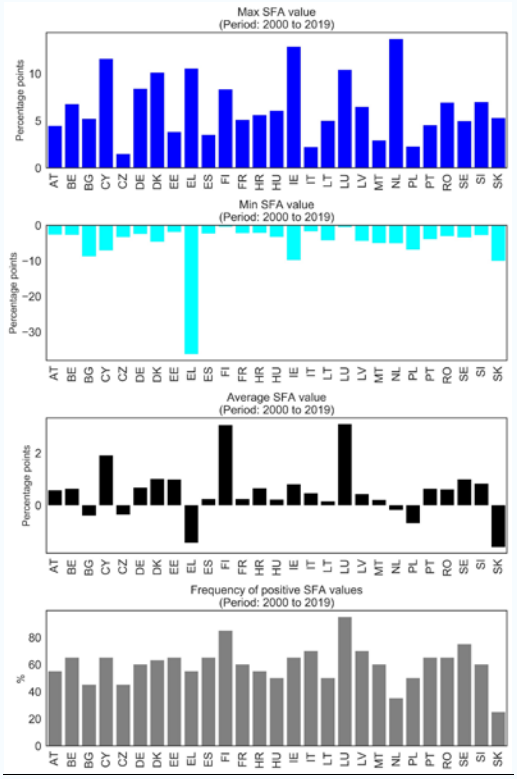
This box reviews the potential need to amend the stock-flow adjustment (SFA) projection assumptions for some countries. SFA measures the difference between the change in government debt and the government budget balance. Historical SFA patterns reveal that assuming zero SFA over the projection horizon ([1]), as is commonly done, may need reviewing for Finland and Luxembourg. The key factors underpinning systematically positive SFAs for these two countries are discussed and the implications of assuming non-zero SFAs for their debt projections are reviewed.

SFA stylised facts

The Commission's DSA assumes that SFAs are equal to zero over the projection horizon (i.e. beyond T+2). This common assumption, also in line with other institutions' practices (e.g. ECB, 2019) reflects the fact that this variable is highly volatile and seen as not showing any clear tendency to be either systematically positive or negative. In turn, this reflects the fact that SFA combines a wide range of equally (potentially) volatile sub-items, each prone to be affected by various events, and therefore difficult to project over the medium term ([2]).

Net acquisition of financial assets tends to be the main driver of SFA developments ([3]). For the EU as a whole, this SFA sub-item posted a sharp increase in 2020, reflecting a sharp increase in the accumulation of cash and deposits. This is because many countries accumulated cash, mainly through the issuance of bonds, to boost their liquidity positions during the crisis, a strategy also supported by persistently low (even sometimes negative) interest rates. Borrowing from the EU (e.g. SURE) also contributed to an increase in the 'currency and deposits' SFA item. Loans also showed a sharp increase, explained by the provision of loans by the public sector to corporations in the context of the pandemic ([4]).

Graph 1: **Historical stylised facts on stock-flow adjustment across the EU**



Source: AMECO (Autumn 2021).

Graph 1 summarises overall historical patterns for SFAs across the EU countries. It shows that all countries occasionally post large positive or negative SFA values, confirming the high volatility of this variable. Yet, in the case of Finland and Luxembourg, the average SFA level is significantly above zero, standing at close to 3% of GDP in both countries on average before the Covid-19 crisis – i.e. over 2000-2019 (Graph 1, third panel). These two countries also stand out as posting more

([1]) Aside from potential (limited) impacts of NGEU implementation on SFA projected levels, see Part II, Section 1.

([2]) Eurostat collects statistics on SFA and its sub-components, distinguishing 17 sub-items and grouping them into three main categories: (i) net acquisition of financial assets, (ii) debt adjustment effects and (iii) statistical discrepancies. The data are available for general government and its sub-sectors including social security funds.

([3]) Eurostat reports information on net acquisition of financial assets of the general government on a consolidated basis.

([4]) For details, see Eurostat's "Stock flow adjustment note", October 2021.

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Box (continued)

systematically positive SFA values than other countries (Graph 1, bottom panel) ([5]).

A change in the SFA projection assumption for Finland and Luxembourg may thus be warranted. In contrast, for the other countries significant SFA values and/or outliers are observed but, on average, SFAs show less clear tendencies to be systematically positive or negative.

Pension funds: a key driver of positive SFAs

The constitution of pension fund reserves is an important driver of systematically positive SFAs in Luxembourg and Finland. In practice, fiscal surpluses used to accumulate these pension funds are reflected in the budget balance of the general government, though they do not contribute to reducing public debt but instead feed into the funded pension schemes. This causes a systematic increase in the SFA level (notably via the 'net acquisition of financial assets' SFA sub-item) ([6]).

Both Finland and Luxembourg have constituted such funded pension schemes. The accumulated assets of the pension funds of Finland and Luxembourg amounted to 90% and 35% of GDP, respectively, by the end of 2019. Going forward, the amount of accumulated assets may remain stable or even increase further over the medium term, but over the long term, the size of the funds would decline in both countries, reflecting pension spending and contribution trends, notably affected by population ageing as evidenced ([7]).

([5]) In the other countries, temporary large SFA values include a large negative SFA in 2012 in Greece, as a result of the agreed debt write-off, a large positive SFA in Ireland in 2011 linked to the government response to the global financial crisis, while developments during that crisis also caused large positive SFAs in 2013 in Cyprus and in 2008 in the Netherlands.

([6]) In other words, the surplus of pension schemes is not used to pay off general government debt, but to acquire financial assets (other than government debt instruments, which would be netted out from government debt). This is reflected in positive SFA, which results in offsetting the effect of the surplus on the change in the debt ratio.

([7]) See Ageing Report 2021.

SFA projections based on pension fund information

Projecting SFAs by directly accounting for the accumulation of pension funds is challenging. Conceptually, SFA projections could rely on projections for the surplus that is used to accumulate the pension fund. Similarly, projections could account for the projected change in the size of the pension fund. Yet, such approaches present some practical challenges. They require assumptions on the future return on property income received on accumulated pension assets. Relying on the projected (net) variation of the pension fund to adjust SFA projection faces the challenge of missing information on the source of such variations and on the use of the funds withdrawn from the pension funds. In particular, while a projected drawing up of the pension fund may justify adjusting upwards the SFA projection, a projected drawing down of the fund may justify projecting systematically negative SFAs levels, if the drawn out funds are used – as intended – to finance pension spending ([8]). In practice, however, the impact of the drawing down of the pension funds on debt is surrounded by uncertainty, as alternative uses for the accumulated funds may eventually be envisaged over the long term. For instance, funds could be reinvested to maintain or even further increase reserves, for similar (i.e. pension) or other purposes, such as climate change. Given such uncertainty, it appears warranted to refrain from setting strong assumptions for SFA dynamics over the (very) long term, e.g. beyond 10 years.

Eurostat's granular data on SFAs helps track the impact of pension fund developments related to pension funds but establishing a direct link remains challenging. Specific sub-items such as the 'equity and investment fund shares/units' item captures portfolio investments made by asset-rich social security funds countries, such as Finland and Luxembourg. However, investigating this impact is complicated by the fact that this and other relevant sub-items of Eurostat's SFA data are reported in net (rather than gross) terms. Increases in the 'currency and deposits' item may also capture

([8]) The disposal / sell off of the accumulated financial assets – used in principle to finance pension spending – would give rise to negative SFA, offsetting impact on debt that would be caused by the increase in pension spending (all else being equal).

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Box (continued)

some of the impact of the surplus (eventually) meant to contribute to pension fund accumulation, as those surpluses occasionally (temporarily) accumulate in the form of cash; this was for instance the case for Finland in 2020.

SFA projections based on historical patterns

By way of illustration, we rely on the last year of the SFA forecast (i.e. 2023) to adjust SFA projections for Luxembourg and Finland. This approach accounts for the fact that key drivers of SFA developments, such as the degree of accumulation of the pension funds, vary over time, an aspect reflected in SFA forecasts ([9]). In practice, the SFA forecast for 2023 is 1.6% and 1.3% of GDP for Finland and Luxembourg, respectively. In turn, we assume that these values linearly converge to zero within 10 years, i.e. from 2023 to 2032. This assumption of a gradual return to the common assumption reflects the uncertainty surrounding the evolution of key drivers of SFA over the long term, as discussed above.

Table 1 presents the adjusted SFA projection for Finland and Luxembourg, based on the 'last forecast year' approach. The adjusted SFA projection would imply, by 2032, a cumulative impact on the projected debt-to-GDP level of 6.4 pps. in Finland and 5.2 pps. in Luxembourg. The impact on the projected debt profile is shown in Graph 2.

The results presented in this box confirm the need, in view of past SFAs, and the merit, in view of the impact on debt projections, of adjusting SFA projections for Finland and Luxembourg. Relying on recent SFA forecasts (or recent historical averages) is useful to highlight the issue at stake. Going forward, however, baseline SFA projections could be adjusted for these countries in relation to the projected evolution of their pension funds accumulation, if the practical challenges described above can be addressed.

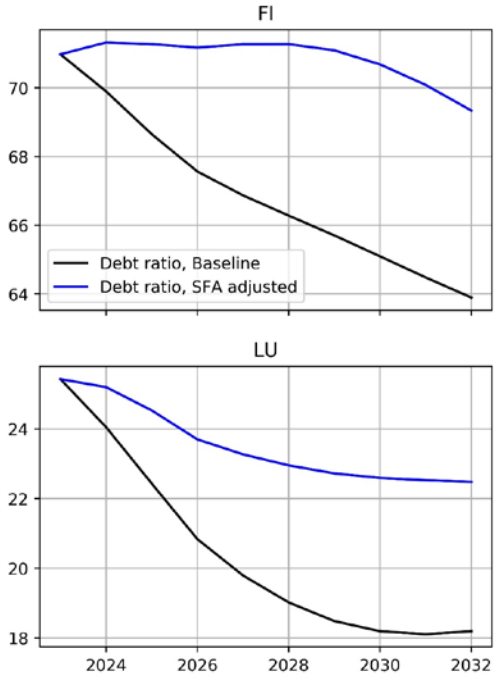
([9]) Evidence suggests that relying on moving averages of recent observations (over e.g. 3 or 5 years) would yield a similar starting point for the adjusted SFA projection as using the last forecast year. This is because both forecasts and moving averages tend to reflect mostly structural/stable factors.

Table 1: **SFA projection based on the last forecast year (% of GDP)**

	Finland	Luxembourg
2023	**1.6**	**1.3**
2024	1.4	1.1
2025	1.2	1.0
2026	1.1	0.9
2027	0.9	0.7
2028	0.7	0.6
2029	0.5	0.4
2030	0.4	0.3
2031	0.2	0.1
2032	0.0	0.0
Cumulative	**6.4**	**5.2**

(1) The projected SFA converges linearly to zero by 2032, starting from the (autumn 2021) forecast value for 2023.
(2) The cumulative figure is the sum of the values over the 2024-2032 projection path, yielding the total debt-to-GDP impact that such an adjusted SFA assumption would imply on the baseline debt-to-GDP projection for Finland and Luxembourg.
Source: Commission services.

Graph 2: **Debt-to-GDP projection, baseline and with SFA adjustment (% of GDP)**



(1) Debt ratio with SFA adjusted refers to debt ratio projections relying on the adjusted SFA paths shown in Table 1.
Source: Commission services.