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# Debt Sustainability Analysis: Assessing its Use in the EU's New Fiscal Rules


Economic Governance and EMU Scrutiny Unit (EGOV)
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# Debt Sustainability Analysis: Assessing its Use in the EU's New Fiscal Rules

**Abstract**

A large share of euro area member states is highly indebted. On average, their debt ratios have experienced a strong and continued upward trend that needs to be reversed. The debt sustainability analysis in the new fiscal rules provides great flexibility to member states but exhibits weaknesses with regard to transparency, robustness and credibility. Stress testing needs to be enhanced and applied to the adjustment period.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| **COM** | European Commission |
| **DSA** | Debt Sustainability Analysis |
| **DSM** | Debt Sustainability Monitor |
| **ECB** | European Central Bank |
| **EDP** | Excessive Deficit Procedure |
| **EU** | European Union |
| **ESM** | European Stability Mechanism |
| **GDP** | Gross Domestic Product |
| **IMF** | International Monetary Fund |
| **MTFS Plan** | Medium-Term Fiscal-Structural Plan |
| **PB** | Primary Balance |
| **SPB** | Structural Primary Balance |

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# EXECUTIVE SUMMARY

In a monetary union of fiscally largely sovereign member states, it is essential that member states act to maintain fiscal sustainability in light of adverse incentives. Yet, the euro area experienced a strong trend towards greater indebtedness that is particularly pronounced in a significant share of member states. In response, the fiscal rules have been revised to provide greater flexibility to national fiscal policy. It is hoped this would improve compliance and motivate highly indebted states to set policies that reduce debt-to-GDP ratios and bring them on course towards 60%. The debt sustainability analysis is key in providing member states with flexibility while ensuring debt sustainability. Yet, it is based on many unobservable inputs, seemingly complex and thus potentially subject to manipulation and bias.

In principle, the debt-sustainability analysis of the Commission is state-of-the-art, but key features and design choices in the context of the rules significantly weaken its potential to help guide member states on a path towards lower debt ratios or to help maintain debt below 60% of GDP. This study proposes the following modifications and procedures to remedy this situation.

- The Commission's prior guidance is presented in a transparent and replicable manner, but this does not extend to the national plans endorsed by the Commission. An appropriate calculation sheet with all the assumptions and forecasts from the endorsed analysis should be provided for a deeper public review and discussion that improves credibility.
- A regular assessment of the realism of key assumptions and resulting debt dynamics should be conducted by national independent fiscal institutions and funded accordingly.
- Scrutiny by the European Parliament can improve the credibility of the Commission's methodology and application. It should make use of independent expertise and a regular annual assessment.
- The debt sustainability analysis should be augmented with proper stress testing of the developments during the adjustment period. This is missing at this point. Stress testing after the adjustment period contradicts the timing assumptions underlying standard medium-term risk assessments.
- The European Parliament should request procedures for stress testing during the adjustment period with implications for the design of policy during the adjustment period. Proposals from independent sources can be requested to design a robust risk assessment.
- The timing of the stress testing after the adjustment creates incentives to choose an extension of the adjustment period, hence this should be accompanied by stress testing including an assessment of realism problems.
- The risk of reverting to the historical structural budget balance should be included in the stress testing and the stochastic debt sustainability analysis should also incorporate a variant based on a bootstrapping approach.

# 1. FISCAL RULES AND DEBT SUSTAINABILITY ANALYSIS: WHAT IS TO BE ACHIEVED?

## 1.1. The challenge

To assess the use of debt sustainability analysis (DSA) in the European Union's new fiscal rules, it is best to start by **reviewing the purpose of such rules** and, in particular, their function in a monetary union. I will then examine whether the debt sustainability analysis included in the EU's rules helps achieve the original objective or risks detracting from it. To this end, I will discuss the technical approach applied by the European Commission (COM), the weaknesses and strengths of their methodology as well as the transparency and replicability of their analysis.

In principle, it should be in the self-interest of states to set policies that result in sustainable government finances. Sometimes shocks may occur that overwhelm the fiscal capacity of the state. This risk is larger, the higher the government debt is prior to the shock. Furthermore, the perception of **threats to debt sustainability** can result in elevated and rising sovereign risk premia. Ultimately states may lose market access, that is, they may become unable to issue debt in the sovereign bond market due to lack of demand. Historically, some governments have turned to issuing money in order to pay debts thereby generating substantial inflation—in some cases even hyper-inflation. Other governments have simply defaulted on their debt. In either of these cases, the consequences involve major disruptions in the economy at large. This includes substantial income losses to households and businesses. Thus, states should have an interest to guard against fiscal instability and crises by holding the level of the debt-to-GDP ratio in a range that keeps the risk of a sovereign debt crisis very small.

Nevertheless, **many states have exhibited an increasing trend in debt-to-GDP ratios** in the last decades. And occasionally, sovereign debt crises occur. Political economy theories help explain the trend increase. Political decision-makers may have an incentive to incur additional debt even if it exceeds the level that would be optimal for society as a whole. As a result, there is a deficit and debt bias. Examples of distortions towards higher indebtedness include increases in expenditure or tax cuts prior to elections, or various stakeholder groups obtaining financing from a common pool.[1] Also, debt-financed fiscal crisis support may persist at least partly after the crisis and become permanent, because fiscal consolidation is politically more difficult to achieve.

Yet, a negative consequence of the upward trend in debt-to-GDP ratios is that an increasingly larger amount of resources has to be devoted to paying interest on this debt. If tax increases are necessary in order to pay interest and achieve debt sustainability, the higher tax rates cause distortions that reduce incentives to work, produce and invest. As a result, potential output is lower, which in turn raises risks for debt sustainability.[2]

To address the risks and negative effects of high government debt, many states have evolved **rules or institutions that help them overcome potential biases** and keep debt lower than it would be otherwise. Some states tie their governments' hands by including fiscal rules in their constitutions.[3] Such rules establish a safety margin that keeps debt limited and avoids threats to debt sustainability.

A **monetary union** of fiscally largely sovereign member states **induces additional incentives for excessive sovereign debt**. The common central bank has a significant influence over interest rates

[1] The different reasons for the deficit bias are empirically well documented (Alesina and Passalacqua, 2016, Petterson-Lidbom 2010).

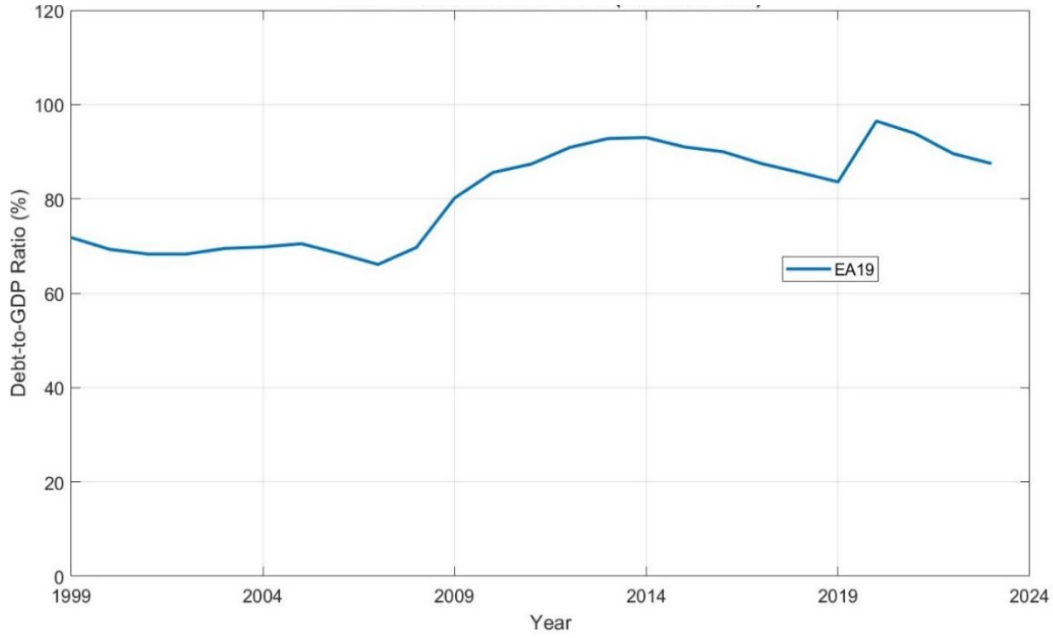
[2] See, for example, Cogan et al (2013) and Burgert and Wieland (2013) and the references therein.

[3] There is an extensive empirical evidence in the literature documenting the impact of fiscal rules on public deficits and debt. See for example, Feld and Kirchgässner (2008); Burret and Feld (2014, 2018a, 2018b); Eyraud et al. (2018), Heinemann et al. (2018).

and thus government financing costs. It might even serve as a quasi-lender of last resort to governments.[4] Thus, member states have an incentive to borrow excessively and rely on the central bank to keep interest rate costs low and support them in case of threats to debt sustainability. Similarly, they may gamble on other member states providing fiscal support via loans or even fiscal transfers in the case of a crisis. A crisis in one or several member states can have major external effects on the other members and endanger the stability of the whole monetary union. This may force the common central bank and other member states to support and possibly bail out those who have borrowed excessively. It also creates an incentive for member states with lower debt to increase borrowing.[5]

The **development of the debt-to-GDP ratio for the euro area exhibits a trend increase** as shown in **Figure 1**. It is driven primarily by two steep increases.

**Figure 1**: Euro area debt to GDP ratio: 1999 to 2023 (Eurostat, EA19)




*Source: Eurostat.*

First, the average ratio rose from about 66% before the global financial crisis of 2007/2009 to 93% after the euro debt crisis of 2010/2012. And then it rose again during the COVID-19 pandemic 2020/21 from about 84% in 2019 to 97% in 2020.[6] These two major increases were followed by partial consolidation in subsequent years. At first sight, one might conclude somewhat optimistically that the euro area debt-to-GDP ratio is now on a downward trend again. Yet, the reduction in 2022 and 2023 was primarily driven by the sharp and unexpected surge of inflation in 2021 and 2022. The GDP deflator rose by almost 12% between the fourth quarter of 2020 and the first quarter of 2023. Thus, nominal GDP grew more quickly than the nominal debt and the debt to GDP ratio declined from 2021 to 2023 primarily because of the unexpected surge of inflation. While the euro area average debt to GDP ratio, which is

[4] The Maastricht treaty and rulings by the European Court of Justice set some boundaries to such interventions in the euro area (see for example, Feld et al (2021).

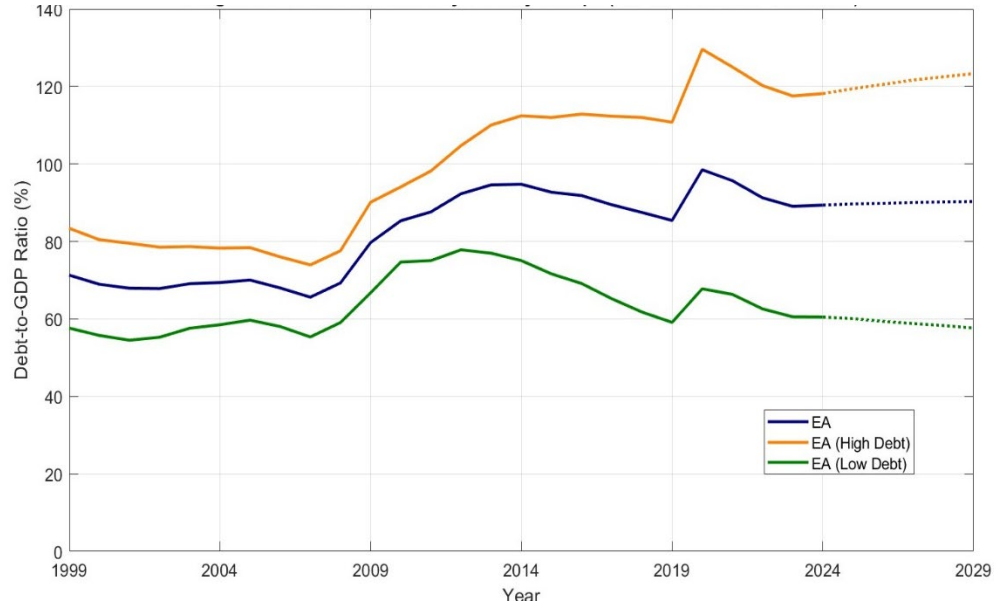
[5] See, for example, Feld et al (2023).

[6] For an overview of COVID-19 related fiscal measures and their impact in major economies, see Wieland (2022).

now somewhat below 90%, still appears quite manageable, it hides a very heterogeneous picture across member states.

Those member states with a debt to GDP ratio above 90% in 2024, on average, exhibited a very different development over time than those states with ratios below 90%. As shown in **Figure 2** the **trend towards greater indebtedness was particularly pronounced for the high-debt member states**. Their debt-to-GDP ratio rose from 76% before the financial crisis in 2006 to 113% at the peak following the debt crisis in 2014. On average, debt to GDP ratios in these states did not decline significantly after the euro debt crisis and before the COVID-19 crisis. The COVID-19 pandemic and support policies then drove the debt ratio in high-debt countries from 111% in 2019 to 130% in 2020. While there was a decline in 2021 and 2022 due to high inflation, the IMF forecasts for those countries suggest that the debt ratio will continue to increase, on average, beyond 120%.

**Figure 2**: High-debt vs low-debt member states: 1999 to 2028 (IMF, incl. forecast)



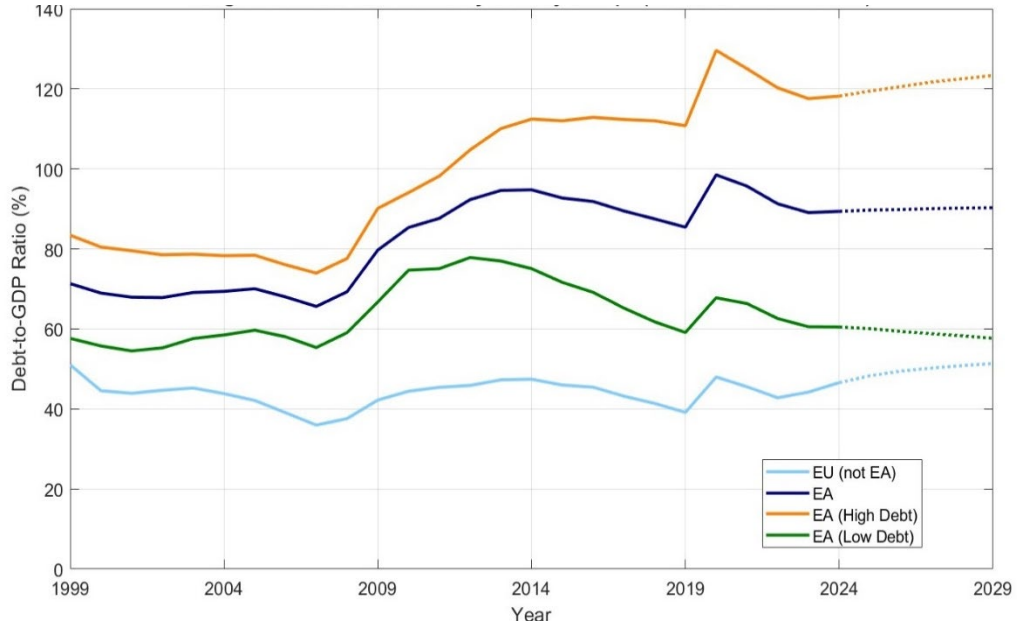

*Source: IMF World Economic Outlook, Forecast, 2024, own calculations.* Note, the EA average based on adding up debt and GDP of member states using IMF data is not exactly equal to the Eurostat EA19 average measure.

High debt countries with debt-to-GDP ratio above 90% include Belgium, France, Greece, Italy, Portugal and Spain. The other euro area member states with a debt ratio below 90% are grouped in the low debt category. Several of them, however, exceed the Maastricht level of 60%. These are Austria, Cyprus, Finland, Germany and Slovenia. Below 60% are Croatia, Estonia, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands and Slovakia.

The low-debt countries have, on average, largely offset the increases in debt to GDP ratios following the global financial and euro debt crisis as well as the COVID-19 crisis. After having increased from 55% in 2007 to 76% in 2012, the average debt-to-GDP ratio was back below 60% in 2019. After a jump to 67% in 2020, forecasts of the International Monetary Fund (IMF) imply a return below 60% again by next year. Taking all euro area member states together, the IMF forecast for the euro area average debt ratio does not exhibit any further decline.

Interestingly, member states of the European Union that have not adopted the euro, on average, exhibit even lower debt ratios than the low-debt states in the euro area as shown in **Figure 3**.

**Figure 3**: Euro area vs non-euro area members: 1999 to 2028 (IMF, incl. forecast)




*Source: IMF World Economic Outlook, Forecast, 2024, own calculations.*

The countries included in this group are Bulgaria, Czech Republic, Denmark, Hungary, Poland, Romania and Sweden. Except for Hungary, they exhibit debt-to-GDP ratios below 60%. Apparently, being a member of the **euro area** (eventually) **comes with higher government debt** relative to GDP.

## 1.2. The new rules

To counteract the above-mentioned debt bias, **fiscal rules have formed a central feature of European Monetary Union** since the Maastricht treaty. Simple numerical benchmarks such as the 3% deficit and 60% debt limit are still enshrined in European law today. They are meant to establish safety margins that help ensure sufficient fiscal capacity in the event of an unexpected shock and avoid the risk of being pushed into a sovereign debt crisis. Simple rules are easy to communicate, transparent and can help enforce appropriate behaviour.[7]

In the euro area, **the performance of the fiscal rules has been mixed**. Generally, member states have been able to use the emergency clause of the rules as intended to allow the debt ratio to increase during crises. However, only a subset of member states has consolidated government finances successfully during the recoveries following those crises. Others, have essentially experienced a ratcheting up of the debt ratio with each crisis with little or no subsequent consolidation as confirmed by the average of high debt countries in **Figures 2** and **3**. The **consolidation visible in the euro area** average debt ratio after the euro debt crisis was **largely achieved by the progress made in low-debt states**. In terms of economic size, Germany and the Netherlands are most prominent among the low debt states, while France, Italy and Spain are the largest economies among the high debt states.

This experience has led **some** to **argue** that the EU's fiscal **rules featured too many exceptions** and were not applied sufficiently rigorously. Hence they have made the case for simpler rules that are more transparent and offer less room for discretion.[8] **Others** have **considered** the EU's fiscal **rules** simply **too**

[7] See, for example, Badinger and Reuter (2017).

[8] See, for example, Feld, Schnabel, Schmidt and Wieland (2018), German Council of Economic Experts (2017) and Reuter (2020).

**inflexible** and excessively constraining the use of fiscal policy in member states.[9] They have argued that a more flexible system that gives more room to national fiscal policy while still ensuring debt sustainability would be more effective and improve compliance.

In April 2023, the European Commission presented a proposal for the reform of the EU's fiscal rules. Following extensive discussions and negotiations with member states and the European Parliament, a new framework was adopted in April 2024. As stated by the European Council, the **overall objective of the reform** is to reduce debt ratios and deficits in a gradual, realistic, sustained and growth-friendly manner, while protecting reforms and investments in strategic areas such as digital, green or defence. At the same time, the new framework will provide appropriate room for counter-cyclical policies and help address existing macroeconomic imbalances.

The **new framework** is claimed to be simpler, more transparent and effective, **with greater national ownership** and better enforcement. Importantly, it introduces **risk-based surveillance based on the debt sustainability analysis (DSA)** that differentiates between Member States according to their individual fiscal situations. National ownership is strengthened by providing Member States with greater leeway in setting their own fiscal adjustment paths and reform and investment commitments. (European Commission 2024). Key features of the new framework are summarised in **Box 1**.

Each state is required to commit to a net expenditure path for a 4- to 7-year period of adjustment. **Many reform proposals had suggested to use a net expenditure path** instead of the structural deficit, which was the operational target in the previous governance framework. Net primary expenditure include all public expenditure elements under direct government control, thus net of discretionary revenue measures and excluding interest, as well as cyclical unemployment expenditure. Its forecasts are less error-prone than for the structural deficit.[10] The **DSA is key in increasing flexibility** based on the national fiscal situation. It is central to the assessment that is supposed to make sure that government debt is put or remains on a plausibly downward path or stays at prudent levels over the medium-term.

In a recent direct comparison of the new governance framework with the earlier framework given the current fiscal situation of member states, Darvas et al (2024) conclude that the new rules are less restrictive. Proponents of this reform have argued that it will increase the efficiency of the system – in the sense of **giving countries maximum flexibility** to conduct fiscal policy while still ensuring debt sustainability – and to improve compliance, as **a more reasonable system is more likely to be respected**. (Darvas, Welslau, Zettelmeyer, 2024, Heimberger 2024).

In my view, this conclusion is **unrealistic and may result in complacency**. The incentives faced by governments that induce a debt bias are not alleviated by simply giving greater control and flexibility to the governments. Debt sustainability analysis is highly technical and relies on many assumptions regarding unobservable variables and parameters. Assumptions and estimates used in the DSA may themselves be overly optimistic. If the new framework together with the DSA were to be used with the

[9] See, for example, Blanchard, Leandro and Zettelmeyer (2021) and Pisani-Ferry, Ragot and Martin (2021).

[10] Cyclically adjusted measures such as the structural deficit involve variables outside the government's control and rely on cumbersome estimates that suffer from large margins of error, especially in real time and in forecasts. By contrast, government expenditures can be directly influenced by governments; they are largely independent of the business cycle, and forecast errors are relatively smaller (Christofzik et al. 2018). Expenditures on unemployment is the only spending category that deviates from this pattern; its cyclical component should therefore be subtracted. As interest payments are not under the direct control of the government, it makes sense to subtract them as well. A well-calibrated fiscal rule that is complied with and thereby induces a reduction in the debt-to-GDP ratio will automatically put interest expenditures on a downward path as well.

aim of providing "maximum" flexibility to member states, the risk of eroding sustainability would be large.

Given the adverse incentives, the role of judgement and possibility of manipulation, as well as the substantial degree of uncertainty about economic shocks, structural dynamics and political commitments, the **new governance framework** needs to be applied in a robust manner that guards effectively against adverse developments. It would need to result in sufficiently strong and sustained pressure to reduce debt-to-GDP ratios, in particular in high debt member states, in a determined fashion towards the 60% limit enshrined in the treaty. It **needs to guarantee a sustained decline in debt-to-GDP ratios** even **under unexpected and adverse developments**. The application of the framework should involve realism regarding the economic outlook and fiscal adjustment and not allow governments to base their plan on overly optimistic assumptions or backload fiscal adjustment.

**Box 1**: Key features of the EU's new fiscal rules

1) Member states have to prepare a national medium-term fiscal structural (MTFS) plan (4-5 years) and commit to a multi-year public net expenditure path. It should explain how they deliver investments and reforms that respond to the main challenges in the European Semester and the country-specific recommendations.

2) Prior to the MTFS plan, the Commission (COM) will submit a 'reference trajectory' for net expenditure developments, which takes into account each country's specific sustainability challenges and indicates how member states can ensure that by the end of a fiscal adjustment period of four years, government debt is put or remains on a plausibly downward path or stays at prudent levels over the medium-term. The debt sustainability analysis (DSA) plays a key role in this assessment.

3) The trajectory must satisfy two safeguards: the debt sustainability safeguard ensures a minimum decrease in debt and the deficit resilience safeguard provides a safety margin below the reference value of 3% of GDP.

4) Member states will incorporate a net expenditure path into their MTFS plans. Plans and paths are to be endorsed by the Council. Deviations from the country-specific path will be recorded in a control account.

5) Member states are allowed to extend the plan to up to 7 years, if they commit to a set of reforms and investments that improve resilience and growth potential, support fiscal sustainability and address common priorities of the EU.

6) The reform also updates the excessive deficit procedure (EDP). The debt-based EDP reflects the new multi-annual framework. A debt-based EDP is kick-started by the COM when the debt ratio exceeds the reference value, the budget is not close to balance and the deviations in the control account exceed 0.3 pp of GDP annually, or 0.6 pp cumulatively. As before, the Council and the COM will make a balanced overall assessment of factors affecting compliance.

7) When the EDP is opened on the basis of the deficit criterion, the corrective net expenditure path should be consistent with a minimum annual structural adjustment of at least 0.5% of the GDP. Non-compliance can trigger fines.

*Source: European Council.*

The DSA is supposed to differentiate the necessary fiscal adjustments based on each country's specific debt levels, economic growth prospects, and anticipated future budgetary burdens such as ageing-related expenses and interest payments. The **reference path** for net primary expenditures should be **ambitious enough such that high debt levels are reduced at a solid pace** reflective of these factors, while maintaining transparency and consistency across all member states. The previous framework included a debt rule that required member states to reduce the distance between the debt-to-GDP ratio and the 60% reference value by, on average, 1/20 per year. This rule was considered too ambitious and was not heeded. It remains to be seen whether the new framework defines a sufficient level of ambition.

Furthermore, it is essential that the procedure for assessing the plausibility of whether a member state's projected government debt ratio is on a downward path or remains at a prudent level is transparent, replicable, predictable, and credible. I will address this question in detail in the following. Similarly, I will discuss in detail whether the Commission's approach takes sufficient account of the sensitivity with regard to key assumptions and risks of adverse developments. In doing so, I discuss strengths and limitations, changes with regard to the approach taken in the Debt Sustainability Monitor and differences with regard to other approaches.

# 2. THE TECHNICAL APPROACH TO DEBT SUSTAINABILITY ANALYSIS IN THE REVISED FISCAL RULES

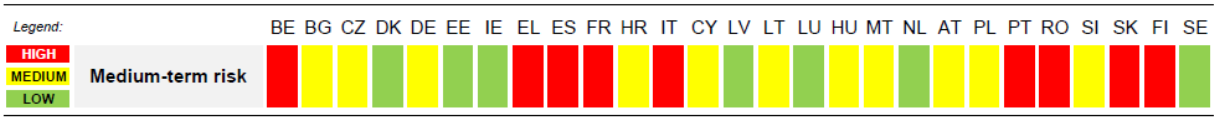
## 2.1. Using the debt accumulation equation with exogenous drivers

The European Commission's **Debt Sustainability Monitor** (DSM) provides a comprehensive analysis of debt dynamics and sustainability risks for all EU Member States on an annual basis since 2017. Before that, the Commission published a Fiscal Sustainability Report. The FSR 2015 introduced a **standard textbook definition**: *"Fiscal sustainability is generally meant to consider "solvency" of the public sector. A public entity is considered as solvent if the present discounted value of its current and future primary expenditure is smaller than (or equal to) the present discounted value of its current and future path of income, net of any initial debt level."*

The Commission also characterises fiscal sustainability as a situation where fiscal policy can be maintained unchanged over the post-forecast horizon (without changes in public spending, nor taxation, that would affect the government primary balance), without causing public debt to rise continuously as a share of GDP. In other words, there are no Ponzi games, that is, situations in which a government keeps on indefinitely accumulating debt faster than the increase in its capacity to service it, which would lead to debt and interest being systematically paid by issuing new debt. Institutions such as the **IMF and the ECB use similar definitions** (e.g. IMF 2014; Bouabdallah et al. 2017).

The annual DSM translates several quantitative exercises and measures of sustainability risks into traffic-light signals concerning governments' situations. The resulting **risk map for medium-term sustainability risks** from the report published in spring 2024 is shown in **Figure 4**. The 2023 report concludes that 9 member states exhibit high medium-term sustainability risks as signalled by the colour red in the risk classification in Figure 4.

**Figure 4**: Medium-term risk classification from the Debt Sustainability Monitor 2023




*Source: European Commission, Debt Sustainability Monitor 2023.*

Eight of these countries are in the euro area. Specifically, these are France (FR), Italy (IT), Spain (ES), Belgium (BE), Finland (FI), Portugal (PT), Greece (EL), and Slovakia (SK). Together, these countries comprise 56% of eurozone real GDP as of the first quarter of 2024. Their debt constitutes 70.2% of the debt of euro area sovereigns (in nominal terms).

Clearly, **such signals should be of great concern** to European policy makers. But what does it mean in terms of a call for action? What does the traffic light analogy imply with regard to policy practice? In simple terms, does the colour red mean "Stop!" or does it mean "Slow down a bit and watch out for cross traffic!", or what else? The use of formal debt sustainability analysis in order to derive a reference path for a single operational indicator—net primary expenditure—provides an answer to this question. The quantitative path is to serve as the basis for fiscal surveillance and provide guidance to member states to prepare their plans. At least in the underlying DSA, this path will ensure that debt is put on a plausibly downward path or stays at prudent levels.

It remains to be seen **how effective this approach is in practice**. Importantly, its success depends on the assumptions that enter the DSA, including the robustness, transparency, replicability and predictability of these assumptions. A related concern is that the necessary calculations might be easy to manipulate and open to gaming. A further political economy aspect of the new rules concerns the willingness and ability of the European Commission and the European Council to enforce an effective downward path on highly indebted member states. Even the best system is not going to deliver a reduction in debt if not monitored and enforced effectively. **Ownership** of the process by Member States **does not automatically result in compliance** that ensures effective implementation. If it did, there would be no need for European rules. This study will focus primarily on the above-mentioned technical aspects but keep in mind the problems concerning effective enforcement.

The application of the **Commission's DSA** as a component of the new fiscal rules is **described in the 2023 DSM)** under the title "The DSA Methodology in the New Economic Governance Framework" (section II.1 of the DSM). The associated technicalities are described in great detail in Annex A3 of the DSM that is titled "Debt dynamics' projections: decomposition, interest rates and property incomes".

In principle, the mathematics are not complicated. They revolve around a **single dynamic equation** that determines the **change of the debt-to-GDP ratio**. All other inputs such as interest rates, real GDP growth, inflation, primary budget balance, exchange rates etc. are estimated separately and then fed into this equation. A **simple approximate version** of this equation can be expressed **in words** as follows:

*The annual change of the debt to GDP ratio (approx.) equals the product of the interest-growth differential and the debt ratio from the preceding year minus the primary budget balance.*

To give **a numerical example**, let's assume the initial debt ratio is 100%, the difference between the interest rate and the growth rate is 2 percentage points and the primary budget balance is zero. Then the debt ratio rises from 100% to 102% in the next year. After 10 years it is 122%. This effect is called the snowball effect. Picture a snowball rolling down the hill and growing bigger as it catches more

snow. Furthermore, if you add in a budget balance of -1% each year, the debt ratio stands at 133% after 10 years and at 174% after 20 years.

Clearly, this is the kind of **trend that would need to be avoided**. If not, it might quickly lead to a loss of credibility, a buyers strike in the sovereign bond market and a rapid rise of the sovereign bond premia. Already the anticipation that the government fails to react to the rising trend can accelerate the process and could even trigger a crisis. One could call this a "Liz Truss moment". Debt sustainability analysis can help signal the risk of such instabilities.

Modern macroeconomic models that take into account forward-looking behaviour of households, firms and financial market participants, have built in a **fiscal reaction function** according to which the government cuts government expenditure or increases tax revenue in response to an increase in the debt ratio. Such a reaction function avoids destabilising trends and ensures debt sustainability. The **fiscal rules** of the European Monetary Union should help ensure that governments act in such a manner.

The more detailed procedure applied by the European Commission is summarised in **Box 2**. To project or simulate the dynamic process forward into the future, it is necessary to obtain estimates of the various drivers. At that point it gets more complicated quickly, because quantifying each of these drivers is not a simple exercise.

Observers such as the European Parliament correctly raise questions concerning the rationale behind the assumptions or estimates, the sensitivity or robustness of these estimates, and to what extent the Commission follows standard procedures or deviates from them. Furthermore, the **estimates of the key drivers are obtained separately from the debt dynamics**. In technical language, they are determined exogenously. Hence one may ask whether there are other approaches available. Furthermore, a relevant question is whether the Commission's approach is transparent, replicable, and predictable. We will return to these questions further below.

**Box 2:** The debt dynamics equation with exogenous drivers

To give a more detailed exposition of the debt accumulation equation used by the European Commission, I refer to equation (2)' on page 131 of the Debt Sustainability Monitor 2023:

$$\Delta d_t = d_{t-1}.\frac{i_t}{(1+g_t)} - d_{t-1}.\frac{gr_t}{(1+g_t)} - d_{t-1}.\frac{\pi_t(1+gr_t)}{(1+g_t)} + \alpha^f.d_{t-1}.\varepsilon_t.\frac{(1+i_t)}{(1+g_t)} - pb_t + f_t$$

The debt-to-GDP ratio in quarter *t* is denoted by $d_t$. Delta or Δ refers to the change between quarter *t-1* and quarter *t*. Thus, the change in the debt-to-GDP ratio on the left-hand-side of the equation is determined by the various factors on the right hand-side. These are the key drivers of the debt-ratio dynamics.

First, there is the so-called snowball effect. It is decomposed into four terms on the right-hand side of the equation. All four terms multiply with $d_{t-1}$, that is the debt-to-GDP ratio from the preceding quarter t-1. The first term that forms part of the snowball effect is driven by the interest rate $i_t$. This is the average interest rate the sovereign pays in period *t* on the outstanding debt issued in the domestic currency. The higher the interest rate, the bigger the snowball effect, i.e. the faster the debt grows. The interest rate is divided by the growth rate of nominal GDP *(1+g)*. Generally, if nominal GDP grows faster than the nominal debt, the ratio must decline.

The other three terms or components of the snowball effect are related to real GDP growth, $gr_t$, inflation, $\pi_t$, and the rate of depreciation of the national currency, $\varepsilon_t$. The higher the real growth rate (all else equal), the smaller the snowball effect. The debt-to-GDP ratio grows more slowly or declines. Similarly, the higher the rate of inflation, the smaller the snowball effect. Typically, however, nominal interest rates rise with inflation because lenders want to be compensated for the anticipated rate of inflation. The inflation effect has the most power to reduce the debt ratio when the debt and interest rate are denoted in nominal terms and inflation comes by surprise. The rate of depreciation matters only if the sovereign issues debt in foreign currency. The share of such foreign-currency debt is denoted by $\alpha^f$. An example would be if a non-euro area member such as Poland issues debt denominated in euro. If the zloty depreciates relative to the euro, then this debt becomes more costly and the snowball effect gets bigger.

Finally, there are two more key drivers of the debt motion, the primary budget balance, $pb_t$, that is the surplus (or deficit) prior to interest expenses, and stock flow adjustments, $f_t$. A budget deficit provides an additional push, a budget surplus a braking effect. The primary balance can be broken down into a structural primary balance (*spb*) before the cost of ageing, the cost of ageing, the cyclical component and one-offs or other temporary measures.

*Source: European Commission, Debt Sustainability Monitor 2023.*

## 2.2. From the DSA to the reference trajectory

The debt dynamics equation is used to project the path of the government debt ratio given inputs concerning interest rates, growth, inflation, exchange rates, the primary balance including the cost of ageing populations and stock flow adjustments. For member states whose debt-to-GDP ratio is above 60%, the aim is to put general government debt on a plausibly downward path by the end of a four-year adjustment period.

The plausibility of the downward path is established on the basis of certain adverse scenarios and a stochastic analysis that takes into account uncertainty about the inputs. Under certain conditions the

adjustment period may be extended to 7 years. As a result of this adjustment, the government also ought to bring down and maintain the budget deficit below 3 % of GDP over the medium term. Member states with debt below 60% of GDP are expected to set polices so as to remain at such prudent levels. Additionally, the adjustment path has to satisfy the debt sustainability safeguard and the deficit resilience safeguard. If the member state is in an EDP, there is also the requirement of a minimum adjustment of the structural deficit. The DSA criteria and safeguards are summarised in **Box 3**.

**Box 3**: DSA criteria and safeguards

*DSA Criteria*

1) By the end of the adjustment period at the latest, and over the 10 following years, debt declines or stays below 60% of GDP under all three (deterministic) stress tests.
2) In the 5 years following the adjustment period, debt declines with a probability of at least 70%, in line with the threshold used in the Commission's standard DSA.
3) The deficit is brought and remains below 3% of GDP over the medium term.
4) In case a smaller adjustment than implied by 1) and 2) is sufficient s.t. debt is brought or remains below 60% of GDP under the adjustment scenario and stress tests, while ensuring that 3) is met, then the 'eased-up' adjustment is chosen.

*Safeguards*

1) *Debt sustainability safeguard:* This requires the debt-to-GDP ratio to decrease, on average, by at least 0.5 percentage points per year in countries where it is over 60% but under 90%, or at least 1 percentage point in countries where it exceeds 90%. The average decrease is calculated from the year before the start of the adjustment period or from the year in which the EDP is projected to be abrogated, whichever occurs last, until the end of the adjustment period. In the simulations, the year of abrogation of the EDP is interpreted as the year after the deficit comes below 3%.
2) *Deficit resilience safeguard*: This requires an adjustment of at least 0.4 pp of GDP (0.25 pp. in case of extension) in structural primary terms until the structural balance is above or equal to -1.5%.
3) *Deficit benchmark:* a minimal adjustment of 0.5 pp of GDP is required if the deficit exceeded 3% in the previous year.

*Source: European Commission, Debt Sustainability Monitor 2023.*

The key **operational annual target for the fiscal surveillance**, however, is the **net primary expenditure path**. Net primary expenditure includes all spending under direct government control. To this end, interest expenditure and cyclical unemployment expenditure is excluded. The previous version of the EU's fiscal rules, instead, relied on the structural primary balance as the operational target. Under the new rules, the structural balance from the DSA is translated into the reference path for the net primary expenditure as explained in **Box 4**.

**Box 4:** From the DSA's structural primary balance to the net primary expenditure path

Since the COM DSA is based on the structural primary balance (*SPB*) as noted in Box 2, the reference trajectories are first computed in terms of change in the SPB and then translated in terms of net primary expenditure growth. The translation follows this formula:

*Nominal net primary expenditure growth equals (yearly) potential GDP growth plus inflation (as measured by the GDP deflator) – required change in the SPB / primary expenditure-to-GDP ratio*

The formula uses yearly potential growth. This ensures consistency with the DSA framework where, in the absence of fiscal effort, the SPB is held constant as a share of yearly potential GDP. It is translated into net expenditure growth evolving in line with yearly potential growth.

***S**ource: European Commission, Debt Sustainability Monitor 2023.*

Recently, the Commission has started to publish its **prior guidance on the reference trajectory** from June 2024 together with member states' MTFS plan on this website.[11] The prior guidance typically consists of two pages with three tables that cover benchmarks and assumptions for a 4-year adjustment and an extension to 7 years.

**Figure 5** shows **two examples** of reference trajectories for **Portugal and Italy** respectively. For Portugal, it shows a plan with a 4-year adjustment path. This plan prescribes net expenditure growth of 3.6% per year from 2025 to 2028. For Italy, it shows the plan with extension to 7 years. In this case, average net expenditure growth is set at 1.5% on average, over the 7-year period. For Italy, the *deficit benchmark* with regard to the change of the structural balance (0.5% under an Excessive Deficit Procedure) is binding in years 2028 to 2030 (yellow background).

**Figure 5** also reports the inputs that are used in the case of the guidance for Italy such as the **initial conditions** for 2023 and 2024 and the **main assumptions**. For example, real GDP is assumed to grow by 0.7% per year, on average, from 2025 to 2041. By comparison, the four-year plan for Portugal assumes real GDP growth of 1% per year from 2025 to 2038. This may partly explain the higher admissible net expenditure growth in Portugal.

Once the national MTFS plan is submitted by the respective member state, the Commission is supposed to assess the plan within six weeks. This involves the net expenditure path, the safeguards and conditions, and in case of a 7-year adjustment the set of reforms and investment commitments underpinning the extension. Given a recommendation of the Commission, the Council then adopts a recommendation, as a rule six weeks later. When the plan is judged not to comply with the rules, a revised plan shall be requested.

[11] https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/national-medium-term-fiscal-structural-plans_en

**Figure 5**: Examples of prior guidance on reference trajectories: Portugal and Italy

| For a plan without extension (4 years)<br>Portugal | Average 2025-2028 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|
| Net expenditure growth (%) | 3.6 | 4.1 | 3.6 | 3.4 | 3.3 |
| Structural primary balance (% of GDP) | 2.4 | 2.3 | 2.4 | 2.4 | 2.5 |
| Annual change in the structural primary balance (pp. of GDP) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| *of which* | | | | | |
| *DSA-based criteria* | *0.08* | *0.08* | *0.08* | *0.08* | *0.08* |
| *Impact of the benchmark and safeguards* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* |

| For a plan with extension (7 years)<br>Italy | Average 2025-2028 | Average 2025-2031 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|---|---|---|
| Net expenditure growth (%) | 1.5 | 1.5 | 1.6 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.4 |
| Structural primary balance (% of GDP) | 0.5 | 1.4 | -0.5 | 0.1 | 0.7 | 1.4 | 2.1 | 2.7 | 3.3 |
| Annual change in the structural primary balance (pp. of GDP) | 0.62 | 0.62 | 0.60 | 0.60 | 0.60 | 0.67 | 0.66 | 0.64 | 0.60 |
| *of which* | | | | | | | | | |
| *DSA-based criteria* | *0.60* | *0.60* | *0.60* | *0.60* | *0.60* | *0.60* | *0.60* | *0.60* | *0.60* |
| *Impact of the benchmark and safeguards* | *0.02* | *0.02* | *0.00* | *0.00* | *0.00* | *0.07* | *0.06* | *0.04* | *0.00* |

*Note: The colour code for the annual change in SPB is as follows:*
*- Black normal: requirements complying with the DSA-based criteria;*
*- Red bold: the deficit benchmark as measured in terms of change in the structural primary balance is binding;*
*- Yellow background: the deficit benchmark as measured in terms of change in the structural balance is binding;*
*- Black bold: the debt sustainability safeguard is binding;*
*- Blue italics: the deficit resilience safeguard is binding.*

| Budgetary variables: initial conditions | 2023 | 2024 |
|---|---|---|
| Government budget balance (% of GDP) | -7.4 | -4.4 |
| Government debt (% of GDP) | 137.3 | 138.6 |
| Net expenditure growth (%) | 5.7 | -2.8 |
| Structural primary balance (% of GDP) | -4.5 | -1.1 |

| Main assumptions for a plan with extension (7 years) | Assumption | Period |
|---|---|---|
| Change in the cost of ageing (pp. of GDP) | 0.5 | 2031-2041 |
| Stock-flow adjustment (% of GDP) | 0.1 | 2025-2041 average |
| Real GDP growth (%) | 0.7 | 2025-2041 average |
| Inflation (change in the GDP deflator, %) | 2.3 | 2025-2041 average |
| Nominal implicit interest rate (%) | 3.8 | 2025-2041 average |

As of 26 November 2024 the Commission has concluded its assessment for 21 out of the 22 submitted plans:

- The **Commission judges that 20 plans** meet the requirements of the new framework and **set out a credible fiscal path** to ensure that the respective member states' debt level is put on a sustainable downward path or kept at prudent levels.
- The **Commission has recommended that the Council endorses the net expenditure path** included in these plans. This includes Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Ireland, Greece, Italy, Latvia, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.
- Only the **plan submitted by the Netherlands**, which has currently a debt-to-GDP ratio of around 47%, **has not been endorsed** by the Commission. Instead, the Commission calls for a reference path consistent with its prior guidance for the Netherlands. The assessment of the Hungarian plan is not yet finished.
- **Five out of the 20 MTFPs include an extension** of the adjustment period from four to seven years. These are Finland, France, Italy, Spain and Romania. These plans include a set of reform and investment commitments.

It remains to be seen to what extent the member states deliver on their plans and commitments in coming years.

## 2.3. Transparency, replicability, predictability and credibility

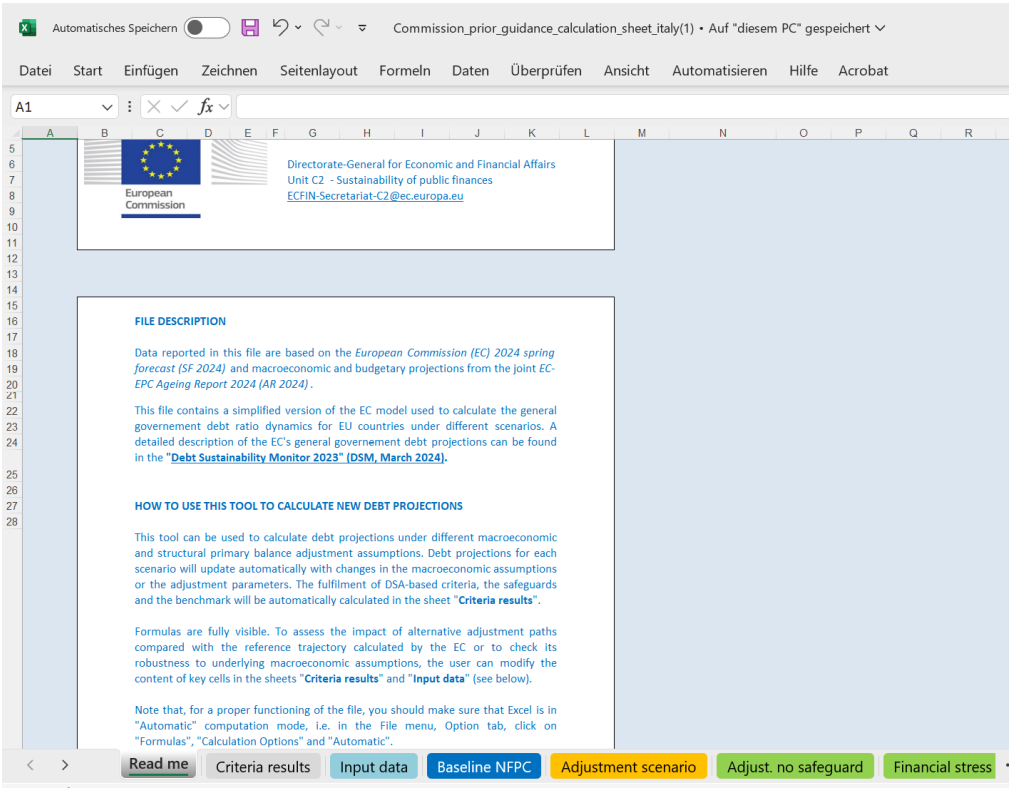
Given the technically involved procedure of calculating the operational target or reference trajectory, it is a distinct possibility that the numbers will be manipulated and assumptions chosen that help minimise any constraints the surveillance imposes on governments' decision making. To avoid gaming of the system, it is key to **make sure** that the **procedures are transparent, replicable, predictable and credible**.

First, the DSM already provides extensive and detailed analysis of medium-term risks for each member state. These include deterministic scenarios of debt dynamics based on the previously outlined approach as well as stochastic simulations that take into account historical shock uncertainty. The DSA in the new governance incorporates a number of technical changes relative to the scenarios that have been considered in regular DSM's in the past (see section 3.2. below). The **DSM 2023** (Section II.1 and Annex A3) **provides a detailed exposition of the DSA applied in the new rules**. In particular, Annex A3 discusses all the relevant mathematical equations, parameters, and variables in detail. It also discusses how the Commission arrives at the estimates of the various parameters and variable inputs and the relevant sources for the data. There are also regular country reports available.

Thus, the Commission's DSA is **presented in a** quite **transparent manner** in these publications. Earlier this year, Darvas et al (2024) from Bruegel provided calculations of the impact of the new rules but refer to input from economists who had previously worked at the Commission in the Directorate responsible for the DSA. In any case, it is a complex undertaking requiring substantial staff work by experienced economists to replicate DSAs for particular countries and then show how the analysis depends on parameter values and assumptions regarding exogenous variables. This is not because the mathematics is difficult, but because the construction of the various input variables from different sources is rather involved. Thus, the **information available from the DSM 2023 is not sufficient** to render the DSA used in the derivation of the Commission's reference trajectories for net primary expenditures easily replicable and predictable. Instead, this would require direct access to the software programs and data used to calculate the trajectory.

Importantly, the **Commission has recently made available excel files** that include all the data and equations to calculate the reference paths in the prior guidance. They are titled "Commission prior guidance calculation sheet" followed by the name of the respective country and are made available at the same website as the prior guidance and the member states MTFS plans. **Figure 6** below shows a screen shot of the first *read me* section of the calculation sheet for Italy.

**Figure 6**: Example of prior guidance calculation sheet: Italy




As stated there, the file contains a simplified version of the Commission model used to calculate the general government debt ratio dynamics for EU countries under different scenarios. As noted further in the *read me* section, this **tool can be used to calculate debt projections** under different macroeconomic and structural primary balance adjustment assumptions. Debt projections for each scenario will update automatically with changes in the macroeconomic assumptions or the adjustment parameters. The fulfilment of DSA-based criteria, the safeguards and the benchmarks will be automatically calculated in the sheet "*Criteria results*".

**Formulas are** fully **visible**. To assess the impact of certain assumptions the user can modify the content of key cells in the sheets "*Criteria results*" and "*Input data*".

By clicking on the yellow tab "*Adjustment Scenario*" one can view the DSA underlying the pre-set regular four-year adjustment. **Figure 7** reports the implied debt dynamics. The debt-to-GDP ratio rises for two more years, peaks at 143.2% in 2026 and then declines. In 2030, it stands at 137.3%. The rows below decompose the change in debt due to the change of the primary balance with seven sub-components, the snowball effect with the four sub-components discussed previously in **Box 2** and stock-flow adjustments.

The annual **adjustment** (improvement) **of the structural primary balance** (SPB) under this plan is 1.1% of GDP. Instead, the Italian government has opted for an extension of the adjustment period to 7 years in its recently published MTFS plan.

**Figure 7**: Debt dynamics underlying the prior guidance: Italy – 4 year adjustment

**Debt projections**

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Gross debt** | **147,1** | **140,5** | **137,3** | **138,6** | **142,2** | **143,2** | **143,1** | **142,1** | **139,7** | **137,3** |
| *Change in debt (-1+2+3)* | | *-6,6* | *-3,2* | *1,3* | *3,6* | *0,9* | *0,0* | *-1,0* | *-2,4* | *-2,4* |
| **(1) Primary balance (1.1 + 1.2 - 1.3 -1.4 -1.5 - 1.6 -1.7)** | | **-4,3** | **-3,6** | **-0,5** | **0,2** | **0,7** | **1,5** | **2,4** | **2,7** | **2,9** |
| (1.1) Structural primary balance (before ageing cost) | | -5,3 | -4,5 | -1,1 | 0,0 | 1,1 | 2,2 | 3,3 | 3,3 | 3,3 |
| (1.2) Cumulated budgetary effort (in terms of primary balance) | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.3) Cyclical component | | -0,7 | -0,6 | -0,6 | -0,1 | 0,4 | 0,7 | 0,9 | 0,6 | 0,3 |
| (1.4) One-off and other temporary measures | | -0,3 | -0,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.5) Cost of ageing | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,2 |
| (1.6) Property incomes | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.7) Revenues | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(2) Snowball effect (2.1 + 2.2 + 2.3)** | | **-6,3** | **-4,5** | **-0,2** | **1,4** | **1,7** | **1,5** | **1,4** | **0,3** | **0,5** |
| (2.1) Interest expenditure | | 4,2 | 3,8 | 4,0 | 4,2 | 4,5 | 4,6 | 4,8 | 4,8 | 4,9 |
| (2.2) Growth effect | | -5,4 | -1,2 | -1,2 | -0,3 | -0,1 | -0,3 | -0,5 | -1,5 | -1,3 |
| (2.3) Inflation effect | | -5,1 | -7,0 | -3,0 | -2,5 | -2,6 | -2,8 | -2,9 | -3,0 | -3,1 |
| (2.4) Exchange rate effect linked to the interest rate | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(3 ) Stock flow adjustments (3.1 + 3.2)** | | ***-4,6*** | ***-2,3*** | ***1,1*** | ***2,3*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** |
| (3.1) Base | | -4,6 | -2,3 | 1,1 | 2,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (3.2) Adjustment due to the exchange rate effect linked to debt value | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |

The prior guidance of the Commission also includes a reference trajectory for a 7-year adjustment as shown previously in **Figure 5.** The calculation sheet can be modified to replicate this trajectory. To do so, I have entered 7 years and 0.62% annual adjustment of the SPB in the worksheet titled *Criteria Results* (grey tab, table 1 in worksheet). This is the annual adjustment required in the prior guidance for the 7-year extension as indicated in Figure 5. The calculations are then automatically updated in the worksheet. **Figure 8** shows the **debt dynamics for Italy under the less ambitious 7-year adjustment period** from the prior guidance. In this case, the debt-to-GDP ratio peaks at 144.3% by 2028 and only then starts to decline.

**Figure 8**: Debt dynamics underlying the prior guidance: Italy – 7 year adjustment

**Debt projections**

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Gross debt** | **147,1** | **140,5** | **137,3** | **138,6** | **142,0** | **143,2** | **144,0** | **144,3** | **144,2** | **143,6** |
| *Change in debt (-1+2+3)* | | *-6,6* | *-3,2* | *1,3* | *3,4* | *1,2* | *0,8* | *0,3* | *-0,1* | *-0,6* |
| **(1) Primary balance (1.1 + 1.2 - 1.3 -1.4 -1.5 - 1.6 -1.7)** | | **-4,3** | **-3,6** | **-0,5** | **-0,1** | **0,1** | **0,5** | **1,0** | **1,6** | **2,1** |
| (1.1) Structural primary balance (before ageing cost) | | -5,3 | -4,5 | -1,1 | -0,4 | 0,2 | 0,8 | 1,5 | 2,1 | 2,8 |
| (1.2) Cumulated budgetary effort (in terms of primary balance) | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.3) Cyclical component | | -0,7 | -0,6 | -0,6 | -0,3 | 0,1 | 0,3 | 0,5 | 0,6 | 0,6 |
| (1.4) One-off and other temporary measures | | -0,3 | -0,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.5) Cost of ageing | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.6) Property incomes | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.7) Revenues | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(2) Snowball effect (2.1 + 2.2 + 2.3)** | | **-6,3** | **-4,5** | **-0,2** | **0,9** | **1,3** | **1,3** | **1,3** | **1,4** | **1,5** |
| (2.1) Interest expenditure | | 4,2 | 3,8 | 4,0 | 4,2 | 4,5 | 4,6 | 4,8 | 5,0 | 5,1 |
| (2.2) Growth effect | | -5,4 | -1,2 | -1,2 | -0,8 | -0,5 | -0,6 | -0,6 | -0,5 | -0,4 |
| (2.3) Inflation effect | | -5,1 | -7,0 | -3,0 | -2,5 | -2,6 | -2,8 | -2,9 | -3,1 | -3,2 |
| (2.4) Exchange rate effect linked to the interest rate | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(3 ) Stock flow adjustments (3.1 + 3.2)** | | ***-4,6*** | ***-2,3*** | ***1,1*** | ***2,3*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** |
| (3.1) Base | | -4,6 | -2,3 | 1,1 | 2,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (3.2) Adjustment due to the exchange rate effect linked to debt value | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |

To emphasise the importance of the adjustment, it is useful to take a look at the *no-fiscal-policy-change scenario* that is also included in the prior guidance calculation sheet. The resulting debt dynamics for Italy are shown in **Figure 9.** In this case, the debt-to-GDP ratio keeps on rising. By 2030 it already stands at 153.5%. This would be 15 percentage points higher than in 2024. By comparison, the IMF forecast for the Italian debt-to-GDP ratio (also included among the high-debt member states forecast shown in **Figure 2**) also rises every year, but it does so more slowly, reaching 145% by 2029, up 7 percentage points from 2024. Apparently, the **IMF forecast** incorporates some policy change but one that is not sufficient to stop the rise of the debt relative to economic activity.

**Figure 9**: Debt dynamics with no fiscal policy change: Italy

**Debt projections**

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Gross debt** | **147,1** | **140,5** | **137,3** | **138,6** | **141,7** | **143,3** | **145,7** | **148,2** | **150,6** | **153,5** |
| *Change in debt (-1+2+3)* | | *-6,6* | *-3,2* | *1,3* | *3,1* | *1,6* | *2,4* | *2,4* | *2,5* | *2,9* |
| **(1) Primary balance (1.1 + 1.2 - 1.3 -1.4 -1.5 - 1.6 -1.7)** | | **-4,3** | **-3,6** | **-0,5** | **-0,5** | **-0,7** | **-1,1** | **-1,2** | **-1,3** | **-1,4** |
| (1.1) Structural primary balance (before ageing cost) | | -5,3 | -4,5 | -1,1 | -1,1 | -1,1 | -1,1 | -1,1 | -1,1 | -1,1 |
| (1.2) Cumulated budgetary effort (in terms of primary balance) | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.3) Cyclical component | | -0,7 | -0,6 | -0,6 | -0,5 | -0,3 | -0,1 | 0,0 | 0,0 | 0,0 |
| (1.4) One-off and other temporary measures | | -0,3 | -0,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (1.5) Cost of ageing | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,1 | 0,1 | 0,2 | 0,3 |
| (1.6) Property incomes | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,1 | 0,1 |
| (1.7) Revenues | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(2) Snowball effect (2.1 + 2.2 + 2.3)** | | **-6,3** | **-4,5** | **-0,2** | **0,3** | **0,9** | **1,3** | **1,2** | **1,2** | **1,4** |
| (2.1) Interest expenditure | | 4,2 | 3,8 | 4,0 | 4,1 | 4,4 | 4,7 | 4,9 | 5,1 | 5,4 |
| (2.2) Growth effect | | -5,4 | -1,2 | -1,2 | -1,4 | -0,9 | -0,6 | -0,7 | -0,8 | -0,6 |
| (2.3) Inflation effect | | -5,1 | -7,0 | -3,0 | -2,5 | -2,6 | -2,8 | -3,0 | -3,2 | -3,3 |
| (2.4) Exchange rate effect linked to the interest rate | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(3 ) Stock flow adjustments (3.1 + 3.2)** | | ***-4,6*** | ***-2,3*** | ***1,1*** | ***2,3*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** | ***0,0*** |
| (3.1) Base | | -4,6 | -2,3 | 1,1 | 2,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| (3.2) Adjustment due to the exchange rate effect linked to debt value | | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |

The **actual Italian MTFS plan is more optimistic** regarding the dynamics of government debt **than the 7-year adjustment in the prior guidance.** The Italian plan features essentially the same reference path for net primary expenditure as the prior guidance, but the implied debt dynamics are more favourable.

As shown in **Figure 10** the-debt to-GDP ratio peaks at 137.8% in 2026 and declines to 133.9% by 2030. This is **10 percentage points below** the value shown in **the prior guidance** on the 7-year adjustment, which is a rather big difference. Many of the assumptions on inputs used in the Italian plan are different from those in the prior guidance.

Unfortunately, it is **not** directly **possible** to enter all the different assumptions into the prior guidance calculation sheet in order **to replicate the Italian plan**. If one uses some of the changes in the Italian plan, i.e. the lower initial condition for the debt-ratio in 2023 and 2024, the much improved SPB for 2024 and the higher potential growth rate for 2024 to 2031, the prior guidance calculation sheet produces more favourable debt dynamics with the debt ratio reaching 139% in 2030, which is 5 percentage points lower than in the original prior guidance.

The Commission judges the changes in assumptions that deliver the faster decline of the debt ratio in the Italian plan plausible and has endorsed the plan. However, it does not provide an updated calculation sheet.

In order to ensure transparency and replicability, it is very useful if all the national plans are also provided in English.[12] More importantly, the calculations and data that support the **ultimately endorsed adjustment and debt dynamics should be made available in form of an excel file** that allows replication similar to the prior guidance calculation sheet of the Commission.

[12] Portugal, is one of several member states that have submitted their MTFS plan right away in English language. This makes it easier to obtain insights regarding differences between the Commission's prior guidance and the calculations in the MTFS plan. The Italian plan was first published in Italian but was made available in English some weeks later.

**Figure 10:** General government debt developments in Italy's plan (COM Assessment)

| | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2041 |
|---|---|---|---|---|---|---|---|---|---|---|
| Government debt (% of GDP) | 134.8 | 135.8 | 136.9 | 137.8 | 137.5 | 136.4 | 134.9 | 133.9 | 132.5 | 113.7 |
| Government balance (% of GDP) | -7.2 | -3.8 | -3.3 | -2.8 | -2.6 | -2.3 | -1.8 | -1.7 | -1.5 | -1.9 |

*Source: Medium-term fiscal-structural plan of Italy*

The publication of the guidance and plans allows **monitoring by private sector analysts**. This type of analysis can have important implications for sovereign debt markets. Thus, effective and credible guidance and plans can be helpful in maintaining favourable market conditions. An example of recent market commentary on Italy's MTFS plan is Deutsche Bank (2024).

The analysts who prepared the report write "*Italy's recently submitted Medium-Term Fiscal Plan outlines its commitment to fiscal responsibility, a crucial step in maintaining market confidence and ensuring continued eligibility for the ECB's Transmission Protection Instrument (TPI). While the plan demonstrates positive strides, concerns remain.*" It is **worrisome that market observers immediately link** the process of **fiscal surveillance to the possibility of ECB interventions** in sovereign debt markets in the case of adverse developments. With regard to concerns, the Deutsche Bank analysts listed on the report, Mark Wall and Clemente DeLucia, note "*Uncertainty persists regarding the specific measures Italy will implement to achieve its fiscal targets*" and "*The plan's growth projections for 2024 and 2025 appear overly optimistic, given the challenging economic environment and potential headwinds.*"

In sum, I would conclude regarding transparency, replicability, predictability and credibility as follows:

- The Commission's **prior guidance is presented in a transparent and replicable manner**, in particular thanks to the prior guidance calculation sheet. In this worksheet the input data, parameters and data sources are reported. The sheet also includes the necessary formulas. In principle, one can add in other forecasts of the key drivers of the debt dynamics and hence predict how the reference trajectory would then change.
- Transparency and replicability does not extend in the same way to the actual national plans that are endorsed by the Commission. It would be important to **make a calculation spreadsheet available** that includes the inputs and assumptions that allow **for direct replication and variation of the endorsed national plan.**
- Further steps should be taken to improve the predictability and credibility of the debt dynamics resulting from the plans. For example, an **assessment of the national independent fiscal institutions (IFIs)** on the replicability and credibility of key assumptions of the national plans and resulting debt dynamics **should be requested**.
- Furthermore, **oversight and scrutiny** of the Commission's methodology for assessing debt sustainability **by the European Parliament** as foreseen by Article 28 of the revised preventive arm of the Stability and Growth Pact **can improve the credibility** of the process. In particular, the Parliament should make use of independent expertise to question methodology and assumptions of the Commission and the national plans and, on this basis, request concrete improvements. A regular annual assessment of progress should be conducted.

# 3. STRENGTHS, LIMITATIONS AND ALTERNATIVES

## 3.1. Robustness of assumptions

The output generated by the DSA depends crucially on the assumptions regarding the various inputs. There is **uncertainty about the projections** for growth, inflation, aging costs and deficits. These uncertainties in turn translate into uncertainty about the direction and magnitude of the above-discussed snowball effects that are key drivers of the debt dynamics. Furthermore, there are key parameters that govern the impact of fiscal adjustments on some of these variables. To give an example, there is a parameter called the fiscal multiplier that measures the impact of a particular adjustment of the structural primary balance on GDP.

The new EU fiscal rules require that fiscal policy must put the debt ratio onto a 'plausibly' declining path within four to seven years, whenever it is above 60 percent of GDP. To **assess plausibility**, several deterministic **scenarios are computed**. They take into account alternative assumptions to check whether the sustainability requirement remains satisfied. Additionally, stochastic DSA is conducted to assess whether the probability of a continued declining path is sufficiently high, with at least 70 percent. In principle, such deterministic and stochastic simulations could go a long way towards accounting for sensitivity of the DSA to key assumptions, and in particular, to adverse developments.

The Commission uses three standard deterministic scenarios or **stress tests**:

1) *Lower SPB scenario:* In this case, the structural primary balance is assumed to be reduced by 0.5 pp. of GDP in total, with a reduction of 0.25 pp. each year over the first two years, and to remain at that level afterwards, plus changes in the cost of ageing. The 0.5 pp. shock corresponds to half of the historical standard deviation of the SPB over all EU countries.
2) *Adverse r-g scenario*: the interest/growth-rate differential is assumed to be permanently higher by 1 pp. over the projection horizon;
3) *Financial stress scenario:* market interest rates are assumed to temporarily increase for one year by 1 pp., plus a risk premium for high-debt countries.

These three scenarios are indicative of some key risks that may well prevent governments from achieving the planned turn-around in debt dynamics over the medium term. To illustrate the impact of such a stress scenario, **Figure 11** compares **the adverse r-g scenario for Italy** from the prior guidance with the adjustment scenario, in the case of a 7-year adjustment period.

**Figure 11**: Adjustment versus Adverse R-G Scenario for Italy - 7 years adjustment

Adjustment scenario

Debt projections

| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross debt | 138,6 | 142,0 | 143,2 | 144,1 | 144,4 | 144,4 | 143,8 | 142,7 | 141,1 | 139,3 | 137,3 | 135,7 | 133,9 | 132,0 |
| *Change in debt (-1+2+3)* | *1,3* | *3,4* | *1,2* | *0,8* | *0,4* | *-0,1* | *-0,6* | *-1,1* | *-1,7* | *-1,7* | *-2,0* | *-1,6* | *-1,8* | *-1,9* |

Adverse r-g scenario

Debt projections

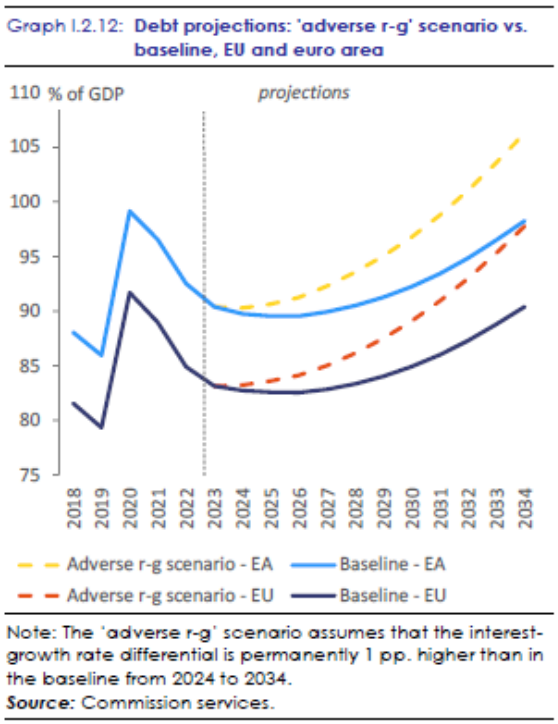
| | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross debt | 138,6 | 142,0 | 143,2 | 144,1 | 144,4 | 144,4 | 143,9 | 143,0 | 142,4 | 141,9 | 141,1 | 140,7 | 140,2 | 139,6 |
| *Change in debt (-1+2+3)* | *1,3* | *3,4* | *1,2* | *0,8* | *0,3* | *0,0* | *-0,4* | *-0,9* | *-0,6* | *-0,6* | *-0,8* | *-0,4* | *-0,5* | *-0,6* |

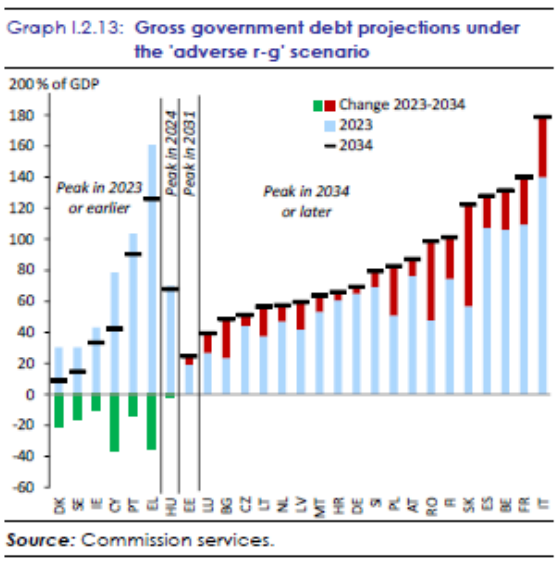
Perhaps surprisingly at first sight, the path of the debt-to-GDP ratio is essentially the same in both scenarios from 2024 to 2030. Only by 2031 the debt-to-GDP is higher under the adverse scenario. From that point onwards, the rise in the interest rate of 0.5pp and the reduction of the growth rate by 0.5

kicks in. As a result, the snowball effect is reduced. The debt-to-GDP ratio declines more slowly from 2031 to 2037 than under the adjustment scenario. In 2037 it remains still 1 pp above the 2024 value.

This **adverse risk is simulated far in the future. It is hard to see how it constitutes much of a stress test of fiscal policy decisions** for the current or even the next government. Importantly, this design of the adverse scenario analysis is very different from its earlier use in the Debt Sustainability Monitor 2023. As shown in **Figure 12**, the adverse r-g scenario in the DSM 2023 applies from 2024 onwards.

**Figure 12**: Adverse R-G Scenario from DSM 2023 for all Member States




These are the risk analyses that underlie the traffic light style medium-term risk assessment previously shown in **Figure 4**. However, when applied as part of the new governance, each of the three **deterministic stress tests as well as the stochastic analysis start only after the adjustment**. This is year five in case of a four-year adjustment and year eight in case of a seven-year adjustment.

The **stochastic simulations** are meant to account for wide-ranging uncertainty. The 10 000 shocks affecting governments' budgetary positions, economic growth, interest rates and exchange rates are generated based on the historical distribution of shocks of each country. In principle, such simulations would enhance the robustness of assumptions substantially. However, these simulations are also conducted only for the years following the adjustment period.

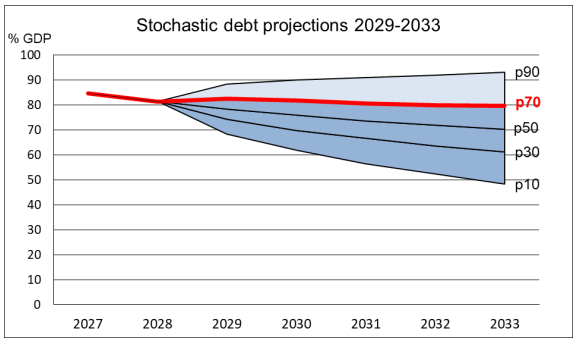
**Figure 13** compares the stochastic simulations for the case of Portugal, which has opted for the standard four year adjustment period, with those for the case of Italy, which has opted for the extension to a seven year adjustment period.

In both cases, the stochastic simulations indicate that the debt-to-GDP ratio will continue to decline following the adjustment period with a probability greater or equal to 70 percent. Thus, the "*plausible decline*" requirement is fulfilled. However, **by appending the simulation period to the (extended)**

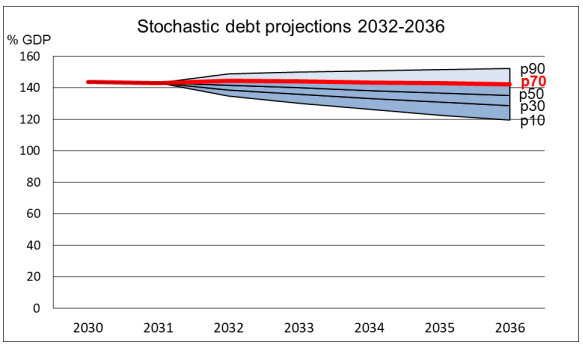
**adjustment period, the extension becomes even more favourable**. It simulates three more years of certainty without accounting for potential adverse risks.

**Figure 13**: Stochastic DSA for Portugal (4-year adjustment) and Italy (7-year adjustment) from the Prior Guidance

Portugal



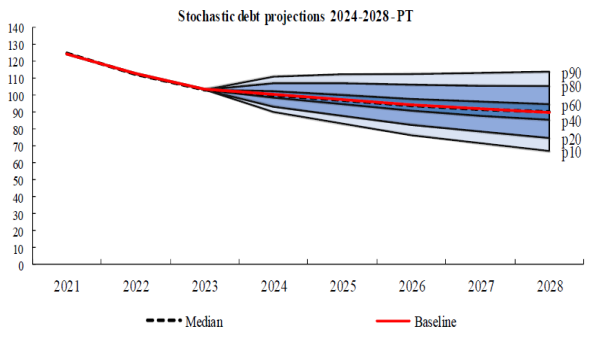

Italy



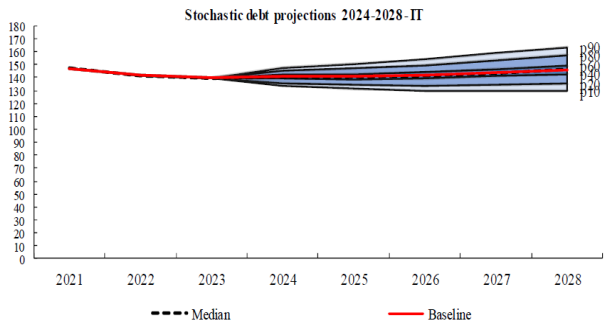

The use of the stochastic DSA in the DSM 2023 and earlier DSM's has been quite different. **Figure 14** reports the results from the DSM 2023 published in spring 2024. Here, the stochastic simulations start in 2024, which I consider much more appropriate to capture the consequences of uncertainty and adverse shocks on the planned trajectory.

**Figure 14**: Stochastic DSA for Portugal and Italy from the Debt Sustainability Monitor 2023

Portugal




Italy




Instead, the new fiscal rules use the following criteria based on the DSA:

1) By the end of the adjustment period at the latest, and over the 10 following years, debt declines or stays below 60% of GDP both in the adjustment scenario and under all three deterministic stress tests;
2) In the 5 years following the adjustment period, debt declines with a sufficiently high probability, i.e. at least 70%, in line with the threshold used in the Commission's standard DSA;
3) The deficit is brought and remains below 3% of GDP over the medium term.

Essentially, the **new fiscal rules shift the regular medium-term sustainability risks** analysis from the Debt Sustainability Monitor **far into the future**, s.t. it is not about the medium term any more at all.

The new rules only look at the endpoint of a medium-term adjustment that is simulated under certainty and then check whether the debt ratio continues to decline.

The prior guidance calculation sheets supplied by the Commission provide some options to change assumptions entering the DSA under the input data tab. This allows a limited set of robustness assessments. However, the spreadsheets do not offer an option to shift the timing of stress tests. To provide an **example with an earlier timing of a stress test** one needs to hard-code changes for a particular scenario, which is not easily done and not error-proof. **Figure 15** provides an example that starts the adverse r-g scenario already in 2025. In this case, the debt ratio rises during the adjustment period to 147% in 2030. It declines fairly slowly afterwards.

**Figure 15**: Adverse r-g scenario shifted to start in 2025: Italy

Adverse r-g scenario starts 2032 as in prior guidance

| Debt decomposition and IIR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Auxiliary variable identifying whether debt is increasing | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Auxiliary variable identifying whether some debt is rolled over | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** |
| **Gross debt** | **138,6** | **142,0** | **143,2** | **144,1** | **144,4** | **144,4** | **143,9** | **143,0** | **142,4** | **141,9** |
| *Of which* Outstanding debt | 103,2 | 105,0 | 107,8 | 108,6 | 109,2 | 109,5 | 109,5 | 109,2 | 108,6 | 108,2 |
| Rolled over long-term debt | 12,5 | 12,6 | 12,9 | 12,9 | 12,9 | 12,9 | 12,9 | 12,8 | 12,6 | 12,5 |
| Rolled over short-term debt | 17,5 | 17,7 | 18,2 | 18,3 | 18,4 | 18,4 | 18,4 | 18,3 | 18,2 | 18,1 |
| New long-term debt | 4,8 | 5,8 | 3,8 | 3,6 | 3,4 | 3,1 | 2,8 | 2,4 | 2,6 | 2,7 |
| New short-term debt | 0,7 | 0,9 | 0,6 | 0,5 | 0,5 | 0,5 | 0,4 | 0,4 | 0,4 | 0,4 |
| Share of short-term debt in total government debt | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Share of long-term debt in total government debt | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 |
| **IIR** | **3,0** | **3,1** | **3,2** | **3,3** | **3,4** | **3,5** | **3,6** | **3,7** | **4,0** | **4,1** |
| Long-term implicit interest rate | 2,9 | 3,1 | 3,3 | 3,4 | 3,5 | 3,7 | 3,8 | 3,9 | 4,1 | 4,2 |
| Nominal implicit interest rate on debt (**Excel approximation**) | 3,0 | 3,1 | 3,2 | 3,3 | 3,4 | 3,5 | 3,6 | 3,7 | 4,0 | 4,1 |
| Diff. STATA | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(i - g)** | **-0,2** | **0,7** | **0,9** | **0,9** | **0,9** | **1,0** | **1,0** | **1,1** | **1,4** | **1,5** |

Adverse r-g scenario starts in 2025

| Debt decomposition and IIR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Auxiliary variable identifying whether debt is increasing | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Auxiliary variable identifying whether some debt is rolled over | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** |
| **Gross debt** | **138,6** | **142,0** | **144,1** | **145,7** | **146,9** | **147,8** | **147,3** | **146,3** | **145,6** | **145,0** |
| *Of which* Outstanding debt | 103,2 | 105,0 | 107,8 | 109,3 | 110,5 | 111,4 | 112,1 | 111,8 | 111,1 | 110,6 |
| Rolled over long-term debt | 12,5 | 12,6 | 12,9 | 13,0 | 13,1 | 13,1 | 13,2 | 13,1 | 12,9 | 12,8 |
| Rolled over short-term debt | 17,5 | 17,7 | 18,2 | 18,4 | 18,6 | 18,7 | 18,8 | 18,7 | 18,6 | 18,5 |
| New long-term debt | 4,8 | 5,8 | 4,5 | 4,4 | 4,2 | 3,9 | 2,8 | 2,4 | 2,6 | 2,7 |
| New short-term debt | 0,7 | 0,9 | 0,7 | 0,6 | 0,6 | 0,6 | 0,4 | 0,4 | 0,4 | 0,4 |
| Share of short-term debt in total government debt | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Share of long-term debt in total government debt | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 |
| **IIR** | **3,0** | **3,1** | **3,2** | **3,3** | **3,4** | **3,6** | **3,7** | **3,8** | **4,0** | **4,1** |
| Long-term implicit interest rate | 2,9 | 3,1 | 3,3 | 3,4 | 3,5 | 3,7 | 3,8 | 3,9 | 4,1 | 4,2 |
| Nominal implicit interest rate on debt (**Excel approximation**) | 3,0 | 3,1 | 3,2 | 3,3 | 3,4 | 3,6 | 3,7 | 3,8 | 4,0 | 4,1 |
| Diff. STATA | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| **(i - g)** | **-0,1725416** | **1,26991893** | **1,54981829** | **1,50525520** | **1,48432840** | **1,58202444** | **1,06226747** | **1,13269621** | **1,35568572** | **1,450429** |

The earlier timing provides a proper stress test for the adjustment period. In my view, **stress testing the developments in the adjustment period** should become a key element of the DSA in the new fiscal rules.

In addition to the DSA criteria illustrated above, the DSA also needs to satisfy the deficit benchmark, the debt sustainability safeguard and the deficit resilience safeguard previously described in **Box 3**. These **safeguards and benchmarks** are important. They **help ensure a minimum adjustment independent of** the DSA **assumptions**.

## 3.2. Other changes relative to the DSA in the DSM

The Commission has adapted the standard DSA approach from the earlier DSM's for its use in the fiscal surveillance framework. This adapted methodology includes three changes:

1. Adjustment of Time Horizon
2. Lower Structural Primary Balance (SPB) Scenario
3. Exclusion of Historical SPB Scenario

Clearly, the **shift of the time horizon** to the period after the 4- or 7-year adjustment period completely changes the role and nature of the original medium-term risks analysis. In my view, the medium-term

risks should start at the latest in the second year of the adjustment in order to assess the risk of subsequent adverse developments.

The **other two changes** are perhaps **less drastic** in nature.

In the "*lower SPB scenario*", an **exogenous shock** is applied to the SPB rather than one that depends on the planned adjustment. The Commission argues that if the shock on the SPB depended on the planned adjustment, a larger adjustment would imply a larger shock and therefore require an even larger adjustment. Therefore it decided to avoid such circularity by assuming an exogenous magnitude. I think this **is reasonable**. If one wishes a stronger stress test, one can simply simulate a larger exogenous shock.

The "*historical SPB scenario*" from the DSM is dropped. It was supposed to assess the risks linked to reverting to past fiscal behaviour. The Commission claims this is not relevant in a context of member states setting (and committing to) adjustment paths. I am not convinced this is correct. One should **consider the risk of member states reverting to "their old ways"** after the adjustment period and check whether debt-to-GDP ratios would rise again or not. It is more important, however, to include the risk of adverse developments during the adjustment period.

## 3.3. Exogenous assumptions vs model-based endogeneity

One should recognise that the need for the above-mentioned assumptions on growth, inflation, interest rates and the fiscal multiplier is a direct result of the chosen methodology, namely the use of the debt dynamics equation with exogenous drivers. An **alternative approach**, would be to use a larger model of the economy that determines the magnitude and dynamics of economic output, inflation and interest rates jointly with government policies. This is the purpose of any **macroeconomic model**. In such a model **government debt, budget deficit, economic growth, inflation and interest rates are all determined endogenously**. In principle, macroeconomic models with a detailed fiscal sector can be used to evaluate the economic effects of particular fiscal adjustment programs together with the resulting debt dynamics.

An **example** of such a model is the European Central Bank's New Area-Wide Model based on Coenen et al (2007). Cogan et al (2013) used a two-country version of this model to study the impact of a particular fiscal consolidation strategy on U.S. GDP and government debt. Burgert and Wieland (2013) explored the role of tax policy also with an earlier version of the Commission's QUEST model.[13] The German Council of Economic Experts used similar models to evaluate the most effective policy mix for fiscal consolidation in Europe and the impact of the U.S. Tax Cuts and Jobs Act (GCEE 2013, GCEE 2017). In recent years, ECB staff has developed the modelling framework further and still uses it for evaluating the impact of monetary policy and other policies.

The European Commission also has a strong team of macroeconomic modellers, who have developed an impressive suite of models. DSA based on such structural macroeconomic models would render the determination of growth, inflation, interest rates and government debt over the medium term endogenous. In other words, such **models properly take into account interactions between** these **macroeconomic aggregates**. This would reduce the number and importance of assumptions regarding medium-term growth, inflation, interest rates and budget deficits. Also, factors such as the size of the fiscal multiplier emerge endogenously from those models and need not be set ex ante. In

[13] Note, these models have been made publicly available along with many other models in the Macroeconomic Model Database www.macromodelbase.com. See also Wieland et al (2016).

fact, in those models the fiscal multiplier depends importantly on the mix of policy decisions and household and firm responses to changed incentives.

However, such models require making assumptions about the behaviour of households and firms and certain deeper structural parameters. Thus, they do not do away with the problem of robustness of assumptions. The bigger issue is that DSA with such models requires a lot more staff work than the DSA based on the single debt dynamics equation with exogenous drivers. It would be quite a challenge to put together a model and DSA for every EU member state. Thus, DSA with **structural models** can be an important quantitative input in the policy making process. But, at least at this point, they **do not yet offer a straightforward and systematic alternative to the DSA** published in the DSM or the DSA underlying the new governance framework. A good recent example of using such models for particular practical questions on debt sustainability in the EU is given by Motyovszki, Pfeiffer and in't Veld (2024) with regard to the implications of public investment for debt sustainability.

## 3.4. Comparison to other institutions' DSA

A number of other institutions regularly conduct DSA's including, for example, the **IMF**, the European Stability Mechanism, the ECB, other central banks, rating agencies and other market observers. In the following I compare the Commission's approach to the DSA conducted by the IMF in its Article IV Consultation Staff Reports and described in IMF (2022).

The particular deterministic scenario simulations of adverse developments that are considered by the Commission are not regularly computed by the IMF missions. However, they consider a number of so-called realism tools. This suite of tools aims to assess the realism of the baseline macroeconomic scenario and guard against excessively optimistic projections that might mask looming stress. The above-mentioned IMF staff note states that baseline realism is critical in assessing sovereign risks and debt sustainability credibly. There are **nine realism tools**. They are supposed to scrutinise key drivers of public debt using a mixture of cross-country and historical performance. They are expected to **flag problems of optimism or pessimism** and they are conducted automatically. Examples concern forecast track records of key drivers, output gap revision, or comparisons of projected changes in debt-to-GDP ratios to historical performance.

The IMF also conducts **stochastic DSA**s. Methodologically, it uses a block-bootstrap approach which aims to capture historical correlations and persistence of the drivers such as the real implicit interest rate, real GDP growth rate, primary balance to GDP ratio, domestic and foreign (US) inflation rates and the real exchange rate. It selects randomly the drivers from a historical year. The process is repeated until many trajectories have been calculated and a fan chart is derived (standard choice 10,000 draws). It uses annual data for 2000 to 2022.

By contrast the **Commission's approach** is to simulate a large number (10,000) of annual nominal debt-to-GDP trajectories based on Gaussian (Monte-Carlo) random draws of the drivers of the debt dynamic equation (short- and long-term interest rates, nominal GDP growth rate, primary balance to GDP ratio and exchange rate). These shocks are drawn from the empirical variance-covariance matrix computed over quarterly data from 2000Q1 to 2023Q3 assuming that shocks are normally distributed (see Annex 4 in the DSM 2023, European Commission 2024).

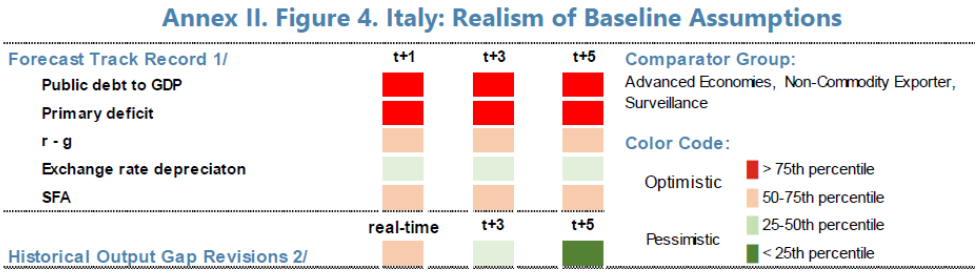
Both approaches have their merits and their drawbacks. Either could be considered state-of-the-art and they could be used in parallel. The Commission uses information on quarterly, within-year variation, while the IMF only takes the annual average. The historical draws via bootstrap estimate historical

persistence or correlation without imposing a particular distribution. Thus, it would be useful to **use bootstrap approach to stochastic DSA** together with the current approach **in the new fiscal rules**.

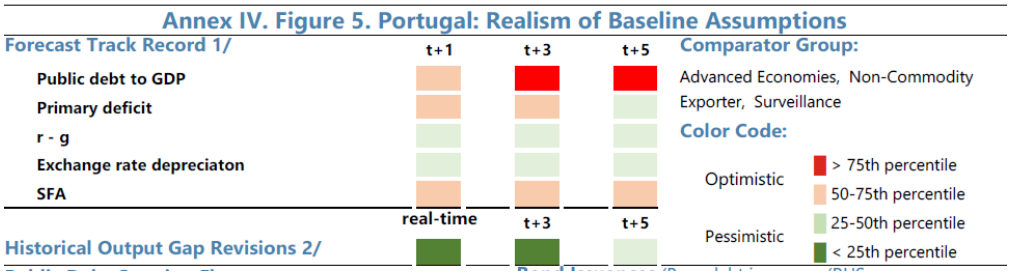
I consider the realism tools of the IMF quite useful including the pro-active approach to signal dangers of excessive optimism. **Figure 16** compares the IMF's realism of assumptions analysis from the staff reports (see IMF 2024a and IMF 2024b).

**Figure 16**: IMF's realism of assumptions analysis for Portugal and Italy as of 2024

Italy




Portugal




The accompanying commentaries are quite illuminating. With regard to the assumptions and projections of the key drivers in Italy, the IMF country report states:

> *The realism analysis shows a large median forecast error for medium-term primary deficit and debt, suggesting optimism bias, and a more moderate one for r-g projections and stock-flow adjustments. Key public debt creating flows in the next five years are identified as higher interest payments and residual items representing the stock-flow adjustments from the past issuance of tax credits. The projected debt increases are within norms. The fiscal adjustment is above average, reflecting the unwinding of the large fiscal responses to shocks in 2020-22, and the phasing out of the superbonus and other housing-related tax credits.*

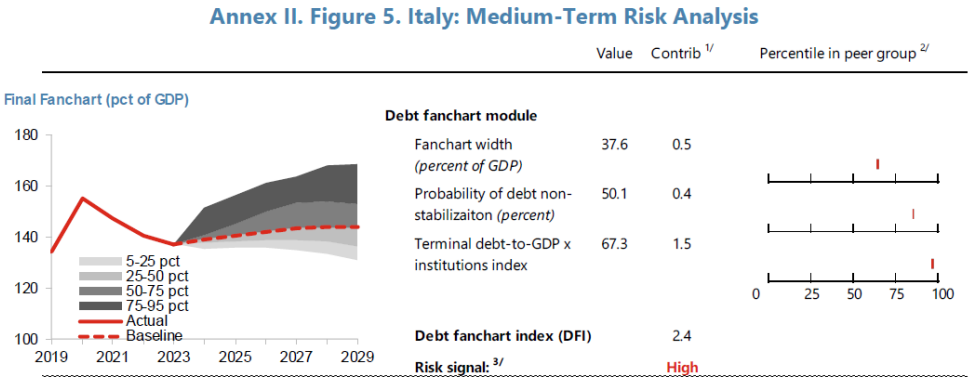
With regard to the estimates of drivers in Portugal, the respective recent IMF country report states:

> *Realism analysis shows that the public debt forecast is shown to be optimistic mainly due to the past two deep recessions Portugal experienced. Primary balance and r-g projections are well within norms. Public debt reduction in the past five years was supported by real GDP growth, real interest rate (inflation), and primary deficit. Over the next five year horizon, real GDP growth and primary deficit are projected to continue reducing the public debt. Three year debt reduction has been faster than other peers and is above the 80th percentile.*

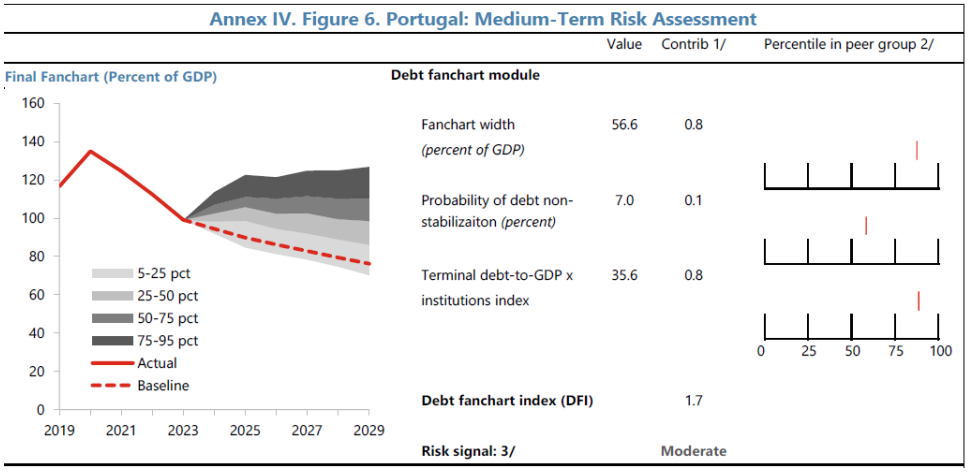
To illustrate the use of the DSA by the IMF, **Figure 17** compares the stochastic DSA's from the country reports.

**Figure 17**: Stochastic DSA for Portugal and Italy from the IMF Country Reports

Italy




Portugal




In sum, the IMF's realism tools work to highlight potential risks of adverse developments and overly optimistic assumptions. The use of the adverse scenarios by the Commission could benefit from a stronger focus on highlighting potential lack of realism. In any case, the DSA analysis of the IMF look at medium-term risks for the next 5 years. The risk at this horizon is completely ignored in the DSA's used in the EU's new fiscal rules. There, the risk analysis is appended only following a four- or seven-year adjustment period.

**Other European institutions** such as the ECB and the European Stability Mechanism (ESM) also use debt sustainability analysis. A strategy for debt sustainability analysis is laid out in the **ECB**'s Occasional Paper Series by Bouabdallah et al (2017). There are some interesting differences. Among the deterministic stress tests, they also add a disinflation or deflation shock. Furthermore, they propose a particular stochastic DSA. It is based on a quarterly Vector Autoregression (VAR) Model. Importantly, they use the bootstrap method with historical shocks rather than imposing a normal distribution.

The **ESM** performs debt sustainability and repayment capacity assessments for member states requesting financial assistance together with the Commission and in liaison with the ECB. The repayment capacity assessment is the main focus of the ESM in order to analyse the beneficiary member state's ability to manage its overall payment obligations, or liabilities, in a way ensuring the repayment to the ESM over the entire horizon of the lending relationship. The institutions are expected to come to a common view and present the assessments to the ESM decision making bodies. If they do

not agree, then the ESM assesses the repayment capacity and the Commission the overall debt sustainability. Thus, COM is in the driver seat with regard to the DSA.

In the context of its oversight over the DSA in the fiscal rules, the **European Parliament** could request experts from the three European institutions as well as international institutions to propose procedures for assessing risks of lack of realism or adverse developments **during the adjustment** period. This should be particularly important in the context of an extension to 7 years.

Finally, **Box 5** summarises the limitations of the EU's use of stress tests as discussed in section 3.

**Box 5:** Limitations of the stress tests in the EU's new fiscal rules

The current set of stress tests that are part of the DSA under the new rules exhibit the following limitations and drawbacks that should be remedied.

1) The timing of the deterministic stress tests and stochastic DSA following a 4- or 7-year adjustment constitutes a stark deviation from the usual medium-term-risk analysis and severely limits their usefulness.

2) The timing of the stress testing after the adjustment also creates incentives to shift towards a 7-year adjustment. The credibility of the rules is negatively affected.

3) The medium term risk analysis by the COM in the DSM and by other institutions typically applies to the next 4 to 6 years. Furthermore, other institutions highlight realism problems of DSA assumptions more effectively than the DSA in the new rules.

4) The "historical SPB" scenario from the DSM is useful and would provide information on downside risks emanating from a "reversion to old ways" after the adjustment period or during the adjustment period.

5) The stochastic DSA relies on the normality assumption. This limits their usefulness. It restricts the use of information on historical shocks and correlations. It would be useful to compare it to the correlations and shock magnitudes occurring under a bootstrapping approach.

# 4. CONCLUSIONS AND RECOMMENDATIONS

In a monetary union of fiscally largely sovereign member states, it is essential that member states act to maintain fiscal sustainability in light of adverse incentives. This is needed to ensure the independence and credibility of monetary policy to achieve low inflation and the cohesion of the union itself. Yet, the euro area is characterised by a **strong trend towards greater indebtedness**. This trend is particularly pronounced among those member states with high debt to GDP ratios as of 2024. On average, the debt ratio in these states did not decline after the large rise during the global financial crisis and the euro debt crisis. The increase during the COVID-19 crisis was only partially offset by unanticipated inflation and forecasts suggest that, on average, the debt ratio in that group of states will rise further in coming years.

The performance of the previous fiscal framework is mixed. The aim of the revised fiscal rules, in my view, should be to generate strong and sustained pressure to reduce debt-to-GDP ratios, in particular in high debt member states, in a determined fashion towards the 60% limit enshrined in the treaty. The **new rules substantially increase member state flexibility** in fiscal policy making **in the hope** that such ownership of decision-making **improves compliance**. This hope is not based on strong empirical evidence. In this sense, the new rules constitute an experiment.

The **debt sustainability analysis** is key in providing member states with this flexibility. At the same time, it is supposed to ensure that their policies remain consistent with debt sustainability. The DSA is based on many unobservable inputs and constitutes a seemingly complex technical procedure. Hence, the DSA and thereby the rules themselves **can be subject to manipulation and bias**. Effective implementation, transparency, replicability, predictability, credibility and importantly, proper accounting for adverse risks and biases are essential to ensure that the goal of debt sustainability is achieved.

In principle, the **DSA** of the Commission is state-of-the-art. However, a number of features and **design choices** in the context of the rules significantly **weaken its potential** to be helpful in guiding member states towards decisions that are consistent with debt sustainability. This study proposes the following modifications and procedures to remedy this situation.

**Transparency, replicability and credibility**

- The Commission's prior guidance is presented in a transparent and replicable manner, in particular thanks to the prior guidance calculation sheet, but this does not extend to the actual national plans endorsed by the Commission. An appropriate calculation sheet with all the assumptions and forecasts used in the endorsed DSA should be made available to allow a deeper public review and discussion of the plans. This would help enhance the credibility of the plans.
- Further steps to improve the predictability and credibility of the debt dynamics resulting from the plans should involve requesting a regular assessment of the national independent fiscal institutions on the replicability and credibility of key assumptions of the national plans and resulting debt dynamics. This would require that national parliaments provide sufficient budgets for professional staff at these institutions.
- Scrutiny of the Commission's methodology and its application by the European Parliament can improve its credibility. Parliament should make use of independent expertise to question the

methods and request concrete improvements strengthening incentives for reducing debt to GDP ratios following increases resulting from crisis responses. To this end a regular annual assessment should be scheduled.

**Stress testing and robustness analysis**

- The debt sustainability analysis should be augmented with proper stress testing of the developments during the adjustment period. This is completely missing at this point and contradicts standard medium-term risk assessments.
- In the context of its scrutiny, the European Parliament should request procedures for stress testing during the adjustment period with implications for the design of policy during the adjustment period. Proposals from independent sources and European and international organisations can be requested to design a robust risk assessment for the adjustment period.
- As the timing of the stress testing after the adjustment also creates incentives to shift towards a 7-year adjustment, a decision for a 7-year adjustment should be accompanied by stress testing of the adjustment period.
- The stress testing should be augmented by an assessment of realism problems as conducted by other organisations. This could involve independent institutions.
- The "historical SPB" scenario from the Commission's DSM should also be used in the context of the new rules. It can inform on downside risks emanating from a "reversion to old ways" after the adjustment period or in the second half of the adjustment period.
- The stochastic DSA used in the fiscal rules relies on the normality assumption. In addition and for comparison, a bootstrapping approach should also be applied.

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A large share of euro area member states is highly indebted. On average, their debt ratios have experienced a strong and continued upward trend that needs to be reversed. The debt sustainability analysis in the new fiscal rules provides great flexibility to member states but exhibits weaknesses with regard to transparency, robustness and credibility. Stress testing needs to be enhanced and applied to the adjustment period.
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