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Debt Sustainability Analysis in Reformed EU Fiscal Rules

The Effect of Fiscal Consolidation on Growth and Public Debt Ratios

Debt Sustainability Analysis (DSA) relies on macroeconomic and fiscal policy assumptions; it plays an essential role in providing an anchor for bilateral negotiations and surveillance in the context of reformed EU fiscal rules. While the European Commission assumes a constant short-run fiscal multiplier of 0.75, the literature highlights that there is no single fiscal multiplier for all countries and all times. Furthermore, the European Commission's DSA framework assumes a fast dissipation of the output effect of fiscal adjustment, and that fiscal consolidation efforts by trading partners do not spill over into domestic economic activity. This article presents DSA simulations that relax the official assumptions by focusing on the four largest euro area economies: Germany, France, Italy and Spain. The results suggest that the debt sustainability framework in reformed EU fiscal rules is sensitive to changes in assumptions and may underestimate the negative growth effects of fiscal adjustment. Hence, public debt ratios may turn out higher than expected.

Debt Sustainability Analysis (DSA) plays a key role in reformed EU fiscal rules, which came into force on 30 April 2024. For EU member countries with a fiscal deficit above 3% of GDP or a public debt ratio above 60%, the European Commission (EC) put forward a DSA-based "reference trajectory". This is supposed to ensure that, by the end of a multi-year fiscal adjustment period, the public debt ratio "is on a plausibly downward trajectory or stays at prudent levels, even under adverse scenarios" (Regulation (EU) 2024/1263).

This paper provides a quantitative assessment of the assumptions underlying the current DSA in reformed EU fiscal rules (EC, 2024a).[1] We show how the introduction of different assumptions concerning the impact of fiscal consolidation on economic growth may lead to different outcomes. The fiscal multiplier is a key concept to understand how changes in the fiscal stance may amplify or dampen economic activity (e.g. Batini et al., 2014; Gechert

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1   For an early assessment of assumptions underlying the DSA, see Annex 4 in Darvas et al. (2023). Paetz and Watzka (2024) assess changes to the DSA assumptions on ageing costs and interest rates.

et al., 2016; Ramey, 2019). We analyse how changes to the fiscal multiplier assumption in the current DSA framework affect economic outcomes in terms of inflation-adjusted GDP and public debt ratios. Furthermore, we highlight the importance of assumptions on how fast the negative short-run growth effects of fiscal adjustment dissipate and whether simultaneous fiscal adjustments in other EU countries magnify the domestic growth impact (e.g. in 't Veld, 2013; Goujard, 2017). When we deviate from the EC's baseline adjustment scenario by using plausible assumptions on the growth impact of fiscal adjustment based on the existing literature, growth rates turn out lower and public debt-to-GDP ratios develop more unfavourably.

The next section introduces the DSA framework and discusses the key assumptions of how fiscal consolidation affects growth and public debt ratios against the background of the relevant academic literature. This is followed by different scenarios of how changes to the key assumptions affect DSA outcomes in the four largest euro area economies (Germany, France, Italy and Spain).

Key assumptions of the DSA framework in reformed EU fiscal rules

The EC has been applying DSA for years to contribute to the monitoring and surveillance of fiscal policy under the Stability and Growth Pact to help inform country-specific recommendations in the European Semester and to support surveillance after adjustment programmes (EC, p. 36). However, DSA strongly gains importance with its new role of providing an anchor for bilateral negotiations and surveillance due to the reform of EU fiscal rules (Darvas et al., 2023; Heimberger, 2023).

Debt sustainability is a complex and contested concept. The literature does not provide a universally accepted definition (e.g. Wyplosz, 2011; Guzman, 2016). According to reformed EU fiscal rules, debt sustainability is ensured when the public debt ratio is on a plausibly downward trajectory even under adverse assumptions. To operationalise this, the EC applies a baseline scenario, three deterministic stress tests – one in which the structural balance deteriorates compared to the adjustment baseline, one in which the interest-growth differential worsens, and one in which market interest rates increase temporarily – and stochastic analysis, where the stochastic part is used to estimate the probability of a decline in the public debt ratio in the five years after the adjustment period.[2]

The DSA-based criteria for the reference trajectories, put forward by the EC for each member state with a fiscal deficit above 3% of GDP or a public debt ratio above 60%, require that without further fiscal consolidation: the public debt ratio declines or stays below the 60% threshold by the end of the multi-year fiscal adjustment period and over the ten years after the adjustment; the public debt ratio falls with a sufficiently high probability, which is set to at least 70% (stochastic analysis); and the fiscal deficit goes below 3% and remains there over the medium term.

The legislative texts do not regulate the DSA assumptions. The application of the DSA was left to the discretion of the EC, which used its existing DSA framework based on the latest Debt Sustainability Monitor (EC, 2024a) for the first round of "reference trajectories", submitted to member states in June 2024 but not yet published. For later rounds, a DSA working group will review the underlying methodology.

An in-depth analysis of all the assumptions in the EC's DSA framework is beyond the scope of this paper (see EC (2024a) and Darvas et al. (2023) for a detailed discussion). Beyond the multi-year fiscal adjustment period, the EC applies a no-fiscal-policy-change assumption, where the only changes considered are due to the costs of ageing as projected in the latest Ageing Report (EC, 2024b). On borrowing costs and inflation, the EC assumes convergence to financial market expectations. Regarding real GDP growth, the DSA framework relies on the latest EC forecast for the first two years and then, for the following years, it assumes that growth converges to the potential growth rate, estimated via the EC's potential output model.[3] The EC framework does consider feedback effects of fiscal policy on GDP growth: if there is a fiscal adjustment in a certain year, economic growth in the same year is revised downwards by 0.75 percentage points of GDP for every one percentage point in fiscal consolidation (EC, 2024a, p. 57).

In what follows, we assess the DSA assumptions regarding the impact of fiscal consolidation on growth. In so doing, we hold all other assumptions on interest rates, inflation, etc. constant. The EC (2024a, p. 57) assumes a fiscal multiplier of 0.75, referring to a paper published in its Economic Papers series (Carnot & de Castro, 2015), which presents a new way of measuring the fiscal stance by combining a narrative approach on tax revenues with a structural balance approach on expenditures. The main results are summarised as follows:

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2   The debt concept used refers to gross consolidated general government debt. This includes financial liabilities related to currency, deposits, debt securities and loans. Assets owned by the government vis-à-vis counterparts are not netted out (EC, 2022, p. 120).

3   For a critical discussion of the EC's potential output model, see Fatas (2019) and Heimberger et al. (2020).

[[W]e find point estimates of short-run output multipliers a bit below unity on average, of the order of 0.8-0.9, with a 95% uncertainty range of +/-0.3. Fiscal multipliers are known to depend largely on the composition of fiscal shocks and on circumstances…[W]e find… higher expenditure multipliers (of the order of 1.0 or above and up to 1.4) than revenue multipliers (around 0.5 or a bit below)… [W]e find some differentiation between good and bad times as defined by a positive (respectively negative) change in the output gap, with the average multiplier being significantly lower in the former case and the tax and spending multiplier being generally lower as well. (Carnot & de Castro, 2015, p. 4)

Yet, the EC (2024a) does not provide further justification for its DSA assumption on the fiscal multiplier. While 0.75 is a short-run average multiplier below unity, the results reported in Carnot and de Castro (2015) are more nuanced. They suggest that there is considerable uncertainty around point estimates, and that the short-run effect of a fiscal adjustment on growth may vary depending on how much of the adjustment is on the tax or expenditure side, and whether the adjustment is done when there is little or a lot of economic slack. While fiscal multiplier values reported in the literature vary considerably (e.g. Gechert, 2015; Leeper et al., 2017), the finding by Carnot and de Castro (2015) that multipliers depend on macroeconomic circumstances is broadly consistent with other papers showing that multipliers in downturns are significantly larger than in upswings, and recession multipliers can be well above unity, in particular on the spending side (e.g. Auerbach & Gorodnichenko, 2012; Caldara & Kamps, 2017; Canzeroni et al., 2016; Jorda & Taylor, 2016; Heimberger, 2017; Gechert & Rannenberg, 2018).

The degree of openness matters too, as fiscal multipliers in small open economies may be substantially lower than in large, relatively closed ones, as much of the change in fiscal policy in open economies spills over into the economic activity of trading partners (e.g. Karras, 2012; Iltzetzki et al., 2013). Furthermore, the literature argues that it matters whether the central bank is constrained in using its monetary policy tools, as fiscal multipliers can be significantly above unity at the zero lower bound of nominal interest rates (e.g. Woodford, 2011; Bonam et al., 2022). More recent macroeconomic models with heterogeneous agents, bound by precautionary saving motives, find a smaller influence of the monetary policy stance on the multiplier (McKay et al., 2016), but a larger average multiplier effect, which does not peter out quickly, but is more persistent over time (Auclert et al., 2024).

How does the fiscal multiplier affect output over time in the DSA framework? To answer this question, let us as-

sume that a government starts to consolidate in 2025. In the DSA framework, the fiscal adjustment opens up a negative output gap – defined as the difference between actual and potential GDP – in the same year. The size of the output gap is determined by the size of the fiscal adjustment – measured as an improvement in the structural primary fiscal balance, in percentage points of GDP – multiplied by the constant short-run multiplier of 0.75. In the next year (2026), the EC assumes that two-thirds of the output gap from the previous year (2025) remain. The fiscal adjustment in 2026 then further increases the output gap based on the short-run fiscal multiplier. This pattern is continued until the adjustment period ends. Let us assume that this happens in 2028, i.e. after a four-year adjustment. The key assumption is that the output gap then closes within three years. For a four-year adjustment period over 2025-2028, the output gap would therefore close automatically over 2029-2031. In the first post-adjustment year (2029), the output gap falls to two-thirds of the output gap in the final consolidation year (2028); in the second post-adjustment year (2030), the output gap falls to one-third of the 2028 value; and then the gap closes completely in the third post-adjustment year (2031), i.e. actual output returns to potential output.

The EC does not justify its three-year output gap closure rule in any detail. This is particularly interesting since an earlier EC Discussion Paper (Mc Morrow et al., 2017) weighs the arguments in favour or against the then existing t+4-year closure rule (that could be extended to up to t+6 years by expert judgement in the case of a severe downturn). However, the output gap may prove stickier than assumed by the EC, i.e. it may take considerably longer to close the gap and return to potential output (e.g. DeLong & Summers, 2012; Jarocinski & Lenza, 2018; Auclert et al., 2024).

Finally, a key assumption in the DSA framework in reformed EU fiscal rules is that fiscal adjustment by a given government only affects domestic economic activity, but does not spill over to other countries, even in the presence of strong economic ties. This is an unrealistic assumption, as the EC itself has frequently emphasised the importance of accounting for how the individual fiscal stance affects the euro area aggregate as a whole (e.g. EC, 2016). No less relevant, fiscal policy spillovers were a main justification for why EU fiscal rules for all member countries were introduced in the first place (e.g. Buti & Giudice, 2002). The issue is particularly important in the EMU, as individual euro area countries cannot offset fiscal spillovers by using national monetary policy (e.g. Blanchard et al., 2021). Nonetheless, the EC currently performs the DSA separately for each country, without taking spillovers into account. However, recent empirical findings suggest

that cross-country spillovers from fiscal consolidation are sizeable, in particular in the euro area context (e.g. in 't Veld, 2013; Goujard, 2017; Alloza et al., 2019; Poghosyan, 2020; Ilori et al., 2022).

DSA simulations for the four largest euro area economies

The EC does not make DSA code and data files publicly available. To illustrate the impact of changes in the EC's assumptions of how fiscal consolidation affects growth, we use a DSA replication. Consistent with Darvas et al. (2024), we use the May 2024 forecast of the EC based on the replication of the relevant DSA framework as outlined in Darvas et al. (2023). The code files for the DSA simulations are freely available (Welslau, 2024).

Figure 1 shows the fiscal adjustment requirements for the four largest euro area economies, which account for close to three-quarters of euro area GDP. We compare the four-year adjustment according to the reference trajectories with a seven-year adjustment case. Member states can apply for the seven-year adjustment by submitting a set of investments and reforms, which are to be evaluated by the EC – in particular according to whether the measures are growth-enhancing and consistent with debt sustainability. The EC will only grant an extension if it comes to the conclusion that the investments and reforms meet the criteria. The adjustment requirements in terms of the annual improvement in the structural primary balance are 1.08 percentage points of GDP in the four-year case (2025-2028) versus 0.59 percentage points in the seven-year case (2025-2031) for Italy; 0.94 percentage points in the four-year case versus 0.54 percentage points in the seven-year case for France; 0.89 percentage points versus 0.52 percentage points for Spain; and 0.11 percentage points versus 0.02 percentage points for Germany (Darvas et al., 2024).[4] In the reformed EU fiscal rules, the so-called safeguards – which stipulate minimum fiscal adjustment requirements – are only applied if they are stricter than the DSA-based fiscal consolidation criterion. For all four of the largest euro area economies, the DSA-based fiscal consolidation requirement binds.[5]

Our simulations focus on the baseline adjustment scenarios of the EC with a four-year period over 2025-2028, after which the structural primary balance is assumed to remain unchanged at the 2028 level. We assume that the

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4 Reformed EU fiscal rules will translate the adjustment requirements based on the structural primary balance into a so-called net expenditure path (e.g. Darvas et al., 2024).

5 For the seven-year adjustment, the 3% deficit cap binds for Italy, and the deficit resilience safeguard binds for France.

Figure 1

Fiscal consolidation requirements to meet reformed EU fiscal rules

Annual improvement in the structural primary balance, percentage points of GDP
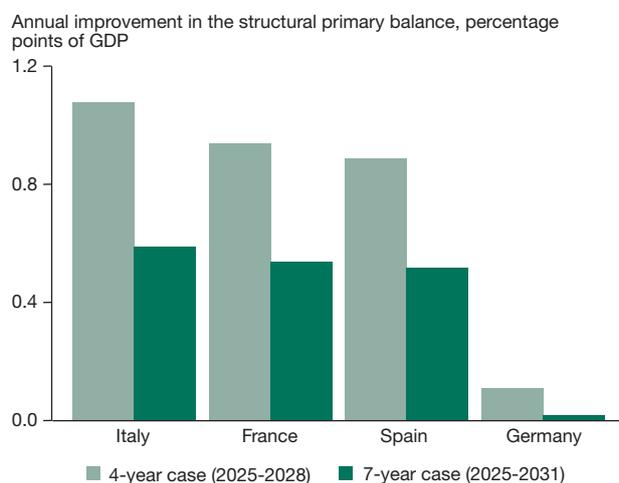
Notes: The four-year case is based on the baseline adjustment in the reference trajectories. The seven-year case will only be granted if member states submit an investment and reform plan that is accepted by the EC.

Source: Darvas et al. (2024).

fiscal consolidation is implemented by each government according to the EU fiscal rules requirements.

Figure 2 shows DSA simulations for real GDP levels. Figure 3 presents the results for public debt ratios. We compare the EC's baseline adjustment scenario (in black) with five alternative scenarios. We typically change one assumption at a time to highlight how changes to a single assumption affect the overall results, keeping everything else constant. The only exception is the combined scenario, which uses a combination of plausible assumptions along several dimensions. In what follows, we first discuss the *ceteris paribus* scenarios and then move to the combined one.

First, the green lines in Figures 2 and 3 assess the impact of a larger average fiscal multiplier of 1.4 – which is the upper range of expenditure multipliers reported in Carnot and de Castro (2014) and broadly consistent with average multipliers for the euro crisis (e.g. Heimberger, 2017). For all countries except Germany, which does not adjust much domestically to meet reformed EU fiscal rules (see Figure 1), a larger short-run multiplier reduces real GDP compared to the baseline over the course of the adjustment period 2025-2028. However, from 2029 onwards the negative output gap (actual GDP below potential GDP) caused by the fiscal adjustment closes within three years due to the output gap closure rule. Nevertheless, the larger multiplier scenario leads to significantly higher public debt ratios in 2038 than under the baseline: by 4.5 percentage points of

Figure 2
DSA simulations of real GDP levels under different assumptions
Real GDP, billion euros
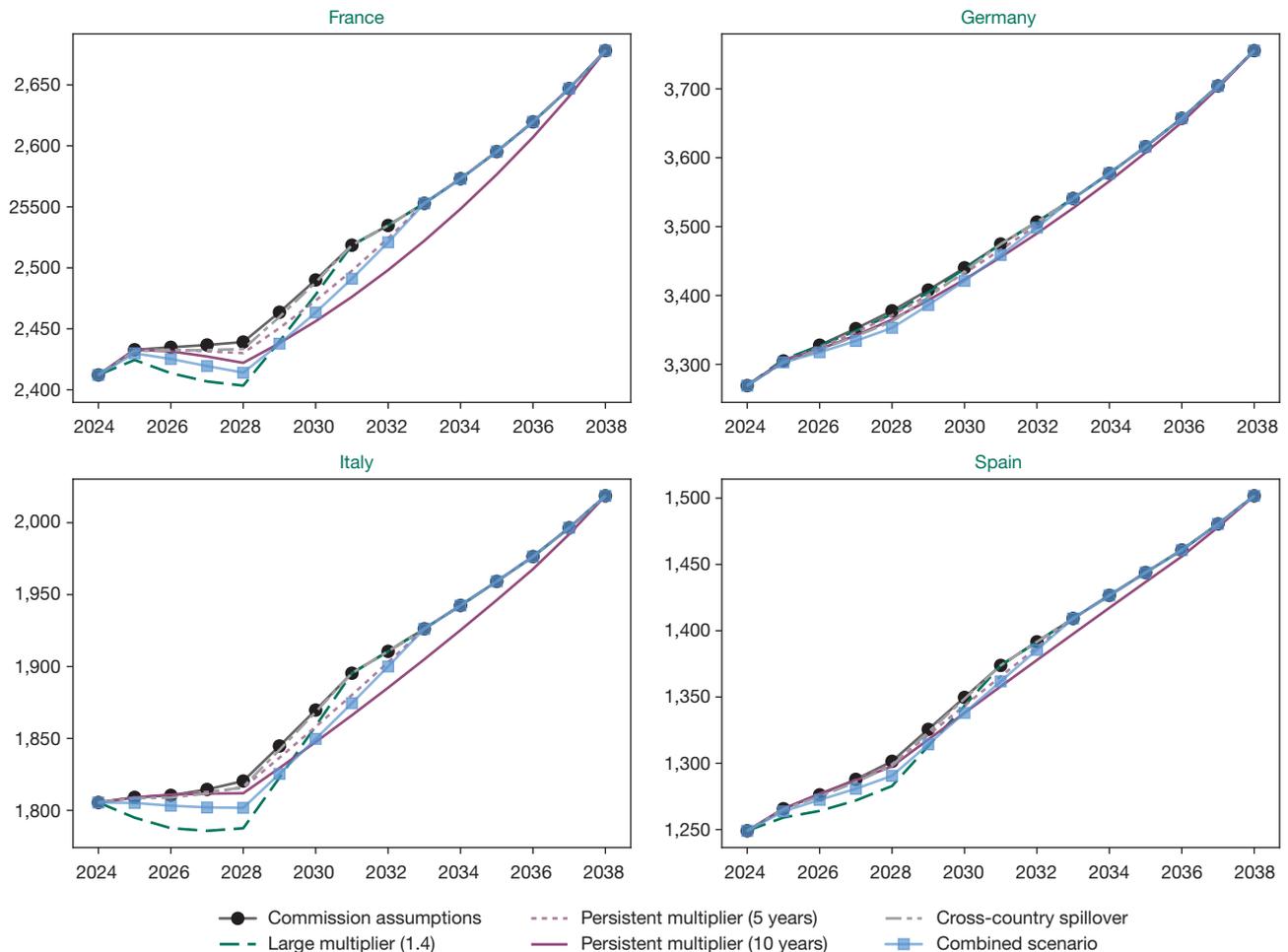
Notes: Baseline methodology based on European Commission (2024a) and requirements of the reformed fiscal framework. The large multiplier scenario increases the size of the contemporaneous fiscal multiplier from 0.75 to 1.4. The persistent multiplier scenarios assume linear phase out of contemporaneous multiplier effects over five or ten years instead of the three-year baseline. The cross-country spillover scenario assumes that consolidation affects trading partner's real GDP proportional to GDP weighted export shares. The combined scenario features a 0.9 fiscal multiplier, five-year persistence and cross-country spillovers.

Source: Welslau (2024), EC Spring 2024 forecast; authors' own calculations.

GDP in Italy, 3.4 percentage points in France, 3.4 percentage points in Spain and 0.2 percentage points in Germany.

Second, we assume that the negative short-run growth effects of fiscal adjustment dissipate more slowly, using a five-year output gap closure rule instead of three years (dashed purple lines in Figures 2 and 3). This choice is within the range of the EC's previous output gap closure rules between four and seven years (Mc Morrow et al., 2017). For France, Italy and Spain – countries that deliver much larger domestic fiscal adjustments than Germany – we can see that real GDP levels revert more slowly back to the potential GDP path. This implies that public debt ratios turn out somewhat higher – although the differences

compared to the EC's baseline are not as pronounced as in the larger fiscal multiplier scenario. Third, the solid purple lines in Figures 2 and 3 show the impact of assuming an even longer drag of the negative growth effects of fiscal adjustment by setting a ten-year output gap closure. This is motivated by the literature suggesting that it may take at least ten years before hysteresis effects wash out (e.g. DeLong & Summers, 2012). Under this scenario, real GDP only reverts back to the potential GDP path by the end of the projection horizon. Hence, public-debt-to-GDP ratios in 2038 turn out significantly higher than under the baseline: by 6.7 percentage points in France, 5.4 percentage points in Italy, 4.0 percentage points in Spain and 1.9 percentage points in Germany.

Figure 3

DSA simulations of public-debt-to-GDP ratios under different assumptions

Public debt, % of GDP
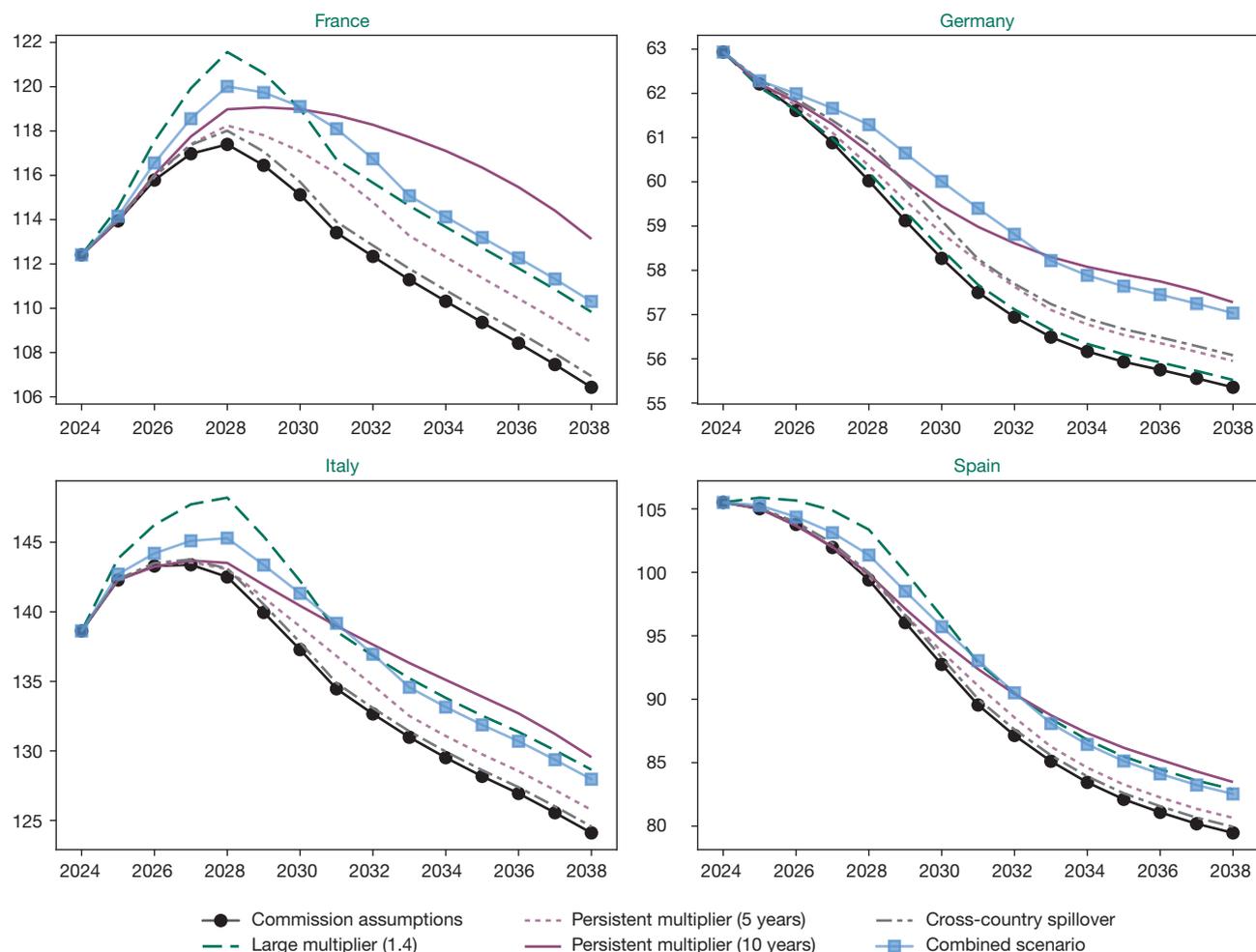
Note: Baseline methodology based on EC (2024a) and requirements of the reformed fiscal framework. The large multiplier scenario increases the size of the contemporaneous fiscal multiplier from 0.75 to 1.4. The persistent multiplier scenarios assume linear phase out of contemporaneous multiplier effects over five or ten years instead of the three-year baseline. The cross-country spillover scenario assumes that consolidation affects trading partner's real GDP proportional to GDP weighted export shares. The combined scenario features a 0.9 fiscal multiplier, five-year persistence and cross-country spillovers.

Source: Welslau (2024), EC Spring 2024 forecast; authors' own calculations.

Fourth, we assume that fiscal consolidation by trading partners spills over into domestic economic activity (grey lines). This scenario is coherent with the literature that finds cross-country spillovers of fiscal adjustment, especially in the euro area context (e.g. in 't Veld, 2013; Poghosyan, 2020). We model spillover effects based on GDP-weighted export links with other countries. Hence, a fiscal consolidation in country B affects country A's real GDP proportional to the share that exports to country B make up in its GDP.[6] If consolidation reduces growth

in country B, its import demand is assumed to decline proportionally, which in turn affects real GDP in country A. Because reductions in growth that spill over to other countries in this way are themselves a function of spillovers from all other countries, we iteratively calculate the equilibrium effect of all spillovers.

Due to the negative impact of spillovers on domestic GDP growth, public debt ratios in 2038 are higher than under the EC's assumptions for all countries: by 0.7 percentage points of GDP in Germany, and by 0.5 percentage points in France, Italy and Spain. The results suggest that spillovers have a slightly larger impact on

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6   Export/GDP shares are calculated as annual averages from 2001 to 2019 and are assumed to remain constant over time.

Germany, because Germany has strong trade links with many EU countries, including those that have to implement sizeable fiscal adjustments to meet EU fiscal rules. While these findings suggest that spillovers can have an impact, the assumption on a larger fiscal multiplier and a longer output gap closure rule are quantitatively more important for the countries that implement sizeable fiscal adjustments to meet EU fiscal rules at home. Germany is the only country where the spillover assumption has a larger impact on the projected public debt ratio than in the larger fiscal multiplier scenario and the five-year output gap closure scenario. This is because Germany only has to adjust little domestically to meet EU fiscal rules (see Figure 1).

Finally, the blue lines in Figures 2 and 3 refer to the combined scenario where we assume: a short-run fiscal multiplier of 0.9, motivated by empirical findings of average multipliers just below unity (e.g. Carnot & de Castro, 2015; Gechert, 2015); a five-year output gap closure rule, arguably a conservative choice based on the literature pointing to slow dissipation of negative output effects (e.g. DeLong & Summers, 2012); and cross-country spillover effects of fiscal adjustment modelled based on export links (e.g. Goujard, 2017), where we take the same approach as in the previous spillovers scenario. Our assumptions do not involve any extreme choices, as we refrain from assuming multipliers above one, very slow dissipation of growth effects of fiscal adjustment during downturns, or magnified spillovers due to interactions with domestic growth slumps. The results point to lower real GDP levels during the adjustment period 2025-2028 than under the EC's baseline assumptions. Although GDP reverts back to the path of potential GDP in 2033 by assumption, the stronger growth drag from fiscal adjustment up to that point leads to significantly higher public debt ratios. Public debt ratios consistently turn out higher than under the adjustment baseline, albeit the difference varies across countries – with 3.9 percentage points of GDP in France, 3.9 percentage points in Italy, 3.1 percentage points in Spain and 1.7 percentage points of GDP in Germany.

Conclusions

Reformed EU fiscal rules will have a major impact on the fiscal policy stance in EU member states, with potentially negative implications for economic growth. DSA plays a pivotal role, as it serves as the key analytical tool to calculate how much fiscal adjustment is required to keep the public debt ratio on a plausibly downward trajectory (or at "prudent" levels). This paper contributes by providing a quantitative assessment of key assumptions in the underlying DSA framework.

We have shown that the EC's DSA projections for real GDP levels and public debt ratios are sensitive to the assumptions of how fiscal consolidation affects economic growth. We have presented simulations under different scenarios, in which we vary the short-run fiscal multiplier, assume a slower dissipation of negative output effects and introduce cross-country spillovers that make fiscal adjustment by trading partners spill over into domestic economic activity. Our results suggest that the EC's baseline adjustment scenario may be too optimistic: under realistic alternative DSA assumptions of how fiscal adjustment affects growth, real GDP levels turn out significantly lower during the adjustment, so that public debt ratios do not fall as expected by the EC. Although public debt ratios do decline in the medium run, Germany, France, Italy and Spain could face public debt levels that are, on average, 3.1 percentage points of GDP higher at the end of the projection horizon (2038) than under the EC's assumptions.

What are the policy implications? The large euro area economies with high public debt ratios (France, Italy and Spain) – which will have to adjust significantly more than their EU peers – may experience more adverse domestic growth effects than currently expected. In particular, this will be the case if average fiscal multipliers turn out larger and/or if the negative short-run growth effects from fiscal adjustment dissipate more slowly than assumed by the EC. Although a level shift in public debt ratios need not endanger debt sustainability in the medium run, economic stagnation and a larger-than-expected increase in public debt ratios in the short run may erode the confidence of voters and bond investors. Should cross-country spillovers materialise, Germany and other EU countries with strong intra-EU trade links will experience lower growth due to the restrictive fiscal policy stance by important trading partners. Compensating for the drag on growth due to lower import demand from EU trading partners may not be an easy task in the current environment.

Our simulations suggest that pursuing public debt reduction across the EU's member states by going for simultaneous fiscal consolidation could prove counterproductive in the short run if the negative growth effects of simultaneous adjustments are underestimated. The end result could be significantly higher public debt ratios than expected and growing divergence between EU member states.

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