How demographic change will hit public debt sustainability in European Union countries

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Abstract

By consecutively applying the EU's debt sustainability analysis through 2052, we find that EU countries must improve their primary balances during the initial four-to-seven-year adjustment period starting in 2025 and then maintain these balances at broadly stable levels. However, in most countries, fiscal adjustments in the non-ageing portion of the budget must continue and reach historically high levels. Risk factors may necessitate even greater adjustments, while policies could partially alleviate fiscal pressures. The implementation of EU country-specific recommendations related to labour markets, pension systems, and productivity has been limited, and these recommendations do not adequately address immigration and fertility-enhancing policies.

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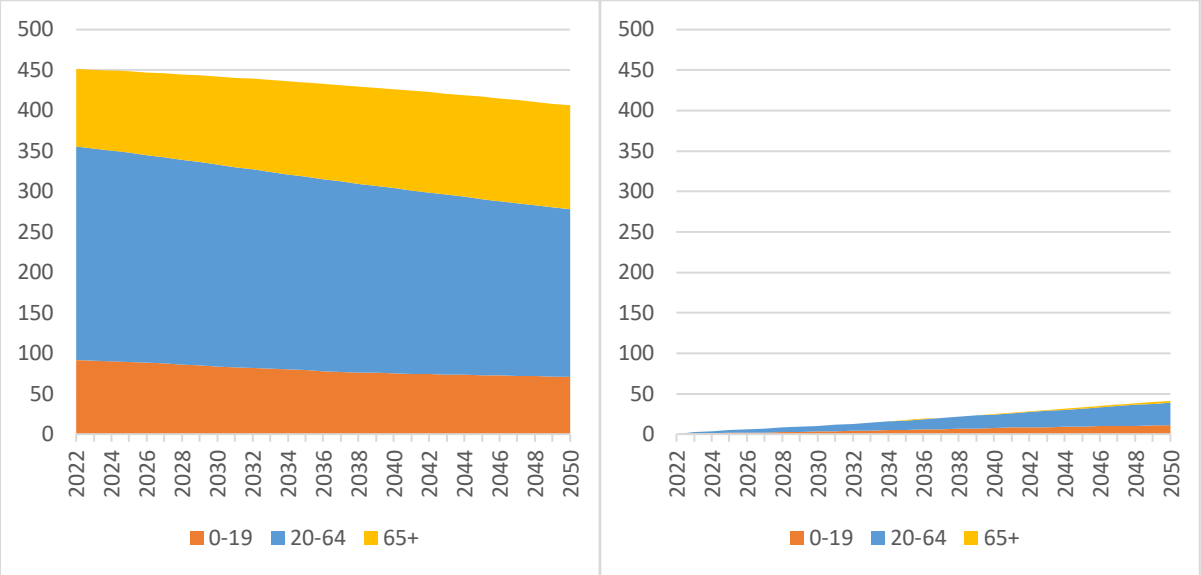
1. Introduction

The European Union (EU) faces a dramatic demographic problem in the decades ahead. In the absence of immigration, the EU population is projected to shrink significantly, from 451 million in 2022 to 406 million in 2050 – a 10 percent decline (Figure 1, panel A)[1]. The number of working-age people (defined here as those aged 20-64) is projected to decline even more, from 264 million to 207 million – a 21 percent decline. Meanwhile, the number of elderly people (65 or over) is projected to increase by 32 million over this period, and the number of children (under 20) is projected to decline by 21 million[2]. Such population changes (without immigration) would increase the old-age dependency ratio significantly and pose a major threat to the sustainability of European welfare systems and public finances.

Figure 1: Baseline population projections for the EU

A: Population in the absence of immigration *B: Impact of immigration*



Source: Bruegel based on Eurostat's 'Population on 1st January by age, sex and type of projection [proj_23np]' dataset.
Note: instead of the beginning of year (1 January) values, we report the data for the end of the previous year (31 December), to be consistent with public debt data, which is also end-year data.

The baseline net-immigration scenario from the same projection suggests that immigration from outside the EU will increase the EU population by 41 million over the same period, composed mostly of working-age people and their children (Figure 1, panel B). Immigration would compensate for only slightly less than half of the decline in the working-age population. When assessing these numbers, it

[1] Eurostat, 'Population projections in the EU – methodology', last updated 26 October 2023, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_projections_in_the_EU_-_methodology.

[2] EU countries have very different demographic outlooks. Ireland is the only EU country where the population is expected to increase from 2023 to 2050 in the absence of immigration. Expected population declines are about 1 percent for Cyprus, Luxembourg and Sweden. The largest population declines in the absence of immigration, of between 15 percent and 18 percent, are projected for Bulgaria, Greece, Croatia, Italy, Latvia, Lithuania and Portugal.

should be recalled that immigration projections are much less reliable than projections of natural population change[3].

Demographic change affects public debt sustainability through several channels. Most obviously, it alters both the number of people of working age and the labour force participation rates of various age cohorts. All else being equal, a shrinking labour force means lower real GDP and lower inflation (Papapetrou and Tsalaporta, 2020) and hence a higher debt ratio.

Population ageing also increases public spending on the elderly through higher pension, healthcare and long-term care costs. Finally, demography can influence real interest rates via the impact on savings (Pascual-Saez et al, 2020). Population ageing might encourage working age people to save more for their retirements, reducing the real interest rate. Spending of savings by pensioners also reduces savings, which works in the opposite direction. At the same time, ageing might reduce investments, which would exert a downward pressure on the real interest rate.

The main goal of this paper is to study the impact of demographic changes on public debt sustainability in EU countries and evaluate some policy options to remedy the adverse effects. Public debt sustainability can be defined in different ways (Berrittella and Zhang, 2015; Bystrov and Mackiewicz, 2020; Canofari et al, 2020). Wyplosz (2011) argues that debt sustainability is a forward-looking concept, with a very long horizon, and public debt projections are very sensitive to assumptions about growth, budget outcomes and interest rates. Moreover, he argues that that growth, budget outcomes and interest rates are endogenous to debts sustainability, which make debt sustainability assessments difficult. A particular concern is the market interest rate reaction to rising debt (Fournier and Falilou, 2017; Mackiewicz-Lyziak and Lyziak, 2019; Zenios et al, 2021), and the consequent reduction in GDP growth (Gómez-Puig and Sosvilla-Rivero, 2015).

EU fiscal rules incorporate a debt sustainability requirement for national governments, under which fiscal policy must put the debt ratio onto a declining path by at least the end of a four to seven years adjustment period, whenever it is above 60 percent of GDP. One way to study the impact of demographic scenarios on debt sustainability is hence to compute the fiscal adjustment that satisfies this debt sustainability requirement (as well as the EU Treaty requirement that deficits must remain below 3 percent of GDP), under the EU's current demographic baseline scenario and under alternative scenarios. The endogeneity problem highlighted by Wyplosz (2011) is less relevant for our work because it mainly concerns adverse interest rate and GDP growth impacts of rising debts. However, under our simulations, fiscal crises are avoided because high-debt countries are projected to reduce their debt ratios gradually, in line with EU fiscal rules.

We use the EU's debt sustainability methodology, embedded in its new fiscal framework, to examine how fiscal pressures in EU countries will evolve in the long run, depending on long-term projections by the EU's ageing working group (AWG) for fertility, the employment rate, life expectancy, immigration, total factor productivity (TFP) and GDP growth and total cost of ageing[4], and market expectations about inflation and interest rates.

[3] Natural population change is largely determined by demographic developments (fertility and mortality structure of different age cohorts). Historical developments in these indicators offer a solid basis for making projections. In contrast, the extent of immigration depends on external developments and domestic policy decisions and thus immigration projections are less certain.

[4] The Economic Policy Committee's Working Group on Ageing Populations and Sustainability is comprised of representatives from all EU countries, the Commission and the European Central Bank. Its job is to make long-term budgetary projections together with the Commission, based on population projections by Eurostat. The AWG provides input to the EU's Ageing Report, which is published every third year.

Our projections cover the period up to 2052 (assuming either four times seven-year fiscal adjustments after 2024 or seven times four-year adjustments) on the assumption that in each adjustment period, EU countries' debts and deficits evolve as required by the debt sustainability analysis (DSA) embedded in the new fiscal rules, while also respecting the EU Treaty requirement of maintaining the deficit below 3 percent of GDP[5]. This results in a sequence of structural primary balance targets.

There is a limited academic literature on the new EU fiscal rules, not least because they entered into force recently, in April 2024. Cronin and McQuinn (2023) analysed debt ratio forecasts errors in light of the European Commission's 2023 initial fiscal governance reform proposal. They found that there was an undue optimism in forecasting the debt ratio across 26 EU countries in 2012-2019, largely due to forecast errors of output growth and the structural budget balance ratio. While their results regarding the structural balance are not directly relevant to our work—since we compute the target structural primary balances to be achieved rather than making forecasts of the structural primary balance—their findings on output growth forecast bias are crucial. The EU's output growth forecasts and projections up to 2062 (2052 plus a ten-year post-adjustment period) are key inputs for our calculations. If these forecasts and projections are overly optimistic, then even greater fiscal adjustments will be necessary than what we have calculated.

Our paper contributes to the academic and policy literature in the following ways.

First, while the implications of the EU's new fiscal framework for the next four to seven years are well understood (see Darvas *et al*, 2024b, while the adjustment requirements are reflected in the countries' medium-term fiscal structural plans which are being prepared and published at the time of writing[6]), its implications further into the future have not yet been explored. We study the impact of demographic changes on public debt sustainability up to 2052.

Second, since ageing costs go up in many countries, we analyse how much adjustment pressure will be felt by the non-ageing related portions of the budget, including defence, infrastructure investment, public administration and social spending that is not sensitive to demographic change.

Third, we evaluate the sensitivity of these baseline projections both to a set of adverse demographic scenarios and to scenarios in which demographic pressures are lower. Some of the latter could be viewed as reflecting the impact of policy. We compare the adjustment requirements of these alternative scenarios with those of the baseline.

Finally, we discuss implications for policy. Our sensitivity analyses shows that reforms that raise labour force participation (including of older workers), boost productivity growth, reduce the costs of caring for the elderly, increase immigration and raise fertility, might together meaningfully reduce the fiscal adjustment required to offset higher ageing costs. We also examine both the extent to which the country-specific recommendations, issued as part of the annual European Semester economic surveillance cycle, include policy advice on these critical areas and the extent to which EU countries implement this advice. On both counts, there is substantial room for improvement.

[5] Deviations from the required debt and deficit adjustments could result in financial sanctions. Meaningful sanctions have never been imposed, but there is some evidence that the EU's earlier fiscal frameworks created incentives to keep deficits below 3 percent of GDP (Caselli and Wingender, 2021).

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

2. Using the European Union's debt sustainability methodology to project long-term fiscal adjustment needs

The EU's new fiscal framework entered into force in April 2024. It is primarily based on country-specific debt sustainability analysis (DSA) and uses a single operational target for fiscal policy, a measure of public expenditure called 'net expenditure'.

Net expenditure is defined as government expenditures minus (1) interest expenditures, (2) changes in revenues attributable to discretionary revenue measures, (3) expenditures on EU programmes fully matched by EU funding, (4) national co-financing of EU programmes, (5) cyclical elements of unemployment benefit expenditures, and (6) temporary measures. While the new framework sets net expenditure growth trajectories, these are derived using an interim variable, the structural primary balance (SPB), which excludes interest payments, cyclical revenue and expenditure developments, as well as temporary measures from the budget balance. In our calculations, we report the required SPB values at the end of the four or seven year adjustment period because it has a straightforward interpretation: the change in SPB can be interpreted as the change in fiscal stance – an increase in SPB reflects fiscal consolidation, while a decline in SPB reflects fiscal expansion. European Commission (2024a) explains the translation of the SPB target into a net expenditure growth target[7].

Regulation (EU) 2024/1263 requires that the net expenditure path should be set to ensure that "*by the end of the adjustment period, assuming that there are no further budgetary measures, the projected general government debt ratio is put or remains on a plausibly downward path, or stays at prudent levels below 60 percent of GDP over the medium-term*". 'Plausibly downward' means that there is at least a 70 percent probability that debt ratio will decline, based on a stochastic DSA, and also that this can be expected to happen under pre-defined adverse assumptions about interest rates, GDP growth and the primary fiscal balance, based on a deterministic DSA. Countries with below 60 percent of GDP debt ratios are required to keep this ratio below 60 percent with at least a 70 percent probability (stochastic DSA) and under the adverse assumptions (deterministic DSA).

The DSA methodology is detailed in European Commission (2024a). The stochastic DSA is based on a five-year debt fan chart following the end of the adjustment period, using baseline projections for growth, interest rate and cost of ageing assumptions, as well as the historical variance-covariance of shocks to these variables, estimated on historical quarterly data. The deterministic DSA performs stress tests that adversely alter growth, interest rates and the primary fiscal balance assumptions of the baseline scenario, in a ten-year period following the end of the adjustment period. Thus, calculations incorporate expected growth, interest rates and ageing cost developments for 14 to 17 years ahead (a four or seven year-long adjustment period plus ten additional years).

The DSA requires nominal growth (inflation and real growth), interest rates, and ageing costs projections[8]. The EU has commonly agreed methodologies to project the components of real growth: labour, capital and total factor productivity. Ten-year ahead inflation projections are market-based,

[7] While the SPB is an unreliable operational target for fiscal policy due to estimation uncertainties of the output gap (Orphanides and van Norden, 2002) and of the output gap's impact on the budget balance, it is a conceptually useful indicator for ex ante budget planning. The net expenditure indicator is only marginally dependent on the output gap (due to cyclical adjustment of unemployment benefit payments) and thus is almost fully under control of the government, and thereby it is a proper operational indicator of fiscal policy.
[8] See Darvas et al (2023) for a summary of the EU methodologies used to make these projections.

and it assumed that central bank inflation targets will be reached in 30 years. Interest rate projections are market-based. Ageing cost projections also use a common methodology as described in European Commission (2023) and European Commission (2024b).

The assumption of "*there are no further budgetary measures*" is operationalised the following way. The SPB after the adjustment period is assumed to remain unchanged, except for ageing-related changes. As a result, countries for which the costs of ageing are projected to worsen in the 10 years after the adjustment period are required to create the fiscal space to absorb those costs by the end of the adjustment period (as opposed to adjusting as these costs arise later). Conversely, countries for which ageing-related fiscal costs are projected to decline in the 10 years after the adjustment period are allowed to adjust correspondingly less, rather than benefiting from the fiscal space that is freed up by declining ageing-related costs only at the time when the declines are realised. Hence, projected ageing costs in the 10 years after the adjustment period influence the SPB target at the end of the adjustment period. This turns out to be of first-order importance for the results, as there are large variations between EU countries both in the level of, and projected changes in, costs of ageing during the 10-year period that is relevant for the determination of fiscal adjustment path.

The EU's methodology assumes that fiscal consolidation temporarily depresses actual output, and conversely, a fiscal stimulus increases actual output, but consolidation and stimulus do not affect potential output. A uniform 0.75 fiscal multiplier is assumed for all countries, that is, a one percentage point of GDP increase in the structural primary balance reduces the output gap by 0.75 percentage points in the same year. This effect is gradually eliminated over three years.

Beyond the DSA-based adjustment requirement, the EU's fiscal framework requires that the budget deficit must be reduced to less than 3 percent of GDP by the end of the adjustment period whenever it exceeds that benchmark, and be kept below 3 percent throughout a ten-year period following the end of the adjustment period, assuming unchanged fiscal policy.

Moreover, the new framework also contains numerical 'safeguards' requiring a minimum pace of debt and deficit reduction, as well as a long-term deficit target for countries with above 60 percent debt ratios:

• No backloading safeguard: the annual fiscal adjustment cannot increase during the adjustment period;

• Debt sustainability safeguard: at least one percentage point of GDP per year decline in the debt ratio for countries with a debt ratio greater than 90 percent of GDP; and half a percentage point of GDP per year for countries with a debt ratio between 60 percent and 90 percent of GDP, from either the beginning of the adjustment period or from the correction of an excessive deficit[9] (whichever is later) by the end of the adjustment period;

• Deficit resilience safeguard: for countries with a structural overall budget deficit greater than 1.5 percent of GDP, an annual improvement in the structural primary balance of at least 0.4 percent of GDP when the adjustment period lasts for four years, and at least 0.25 percent of GDP when it lasts for seven years;

• Minimum annual adjustment for excessive deficits: countries with excessive deficits of more than 3 percent of GDP are required to adjust by at least 0.5 percent of GDP per year, measured in terms of

[9] A deficit is deemed excessive if it is larger than 3 percent of GDP, and the deviation is not small, not temporary, and not caused by exceptional circumstances.

the structural primary balance in 2025-2027 (that is, excluding interest payments) and in terms of the overall structural balance from 2028 on.

According to our simulations, these safeguards will have a non-negligible impact on a few countries, although in some of these, the impact could be huge. Where the safeguards (except the no backloading safeguard) are binding, fiscal adjustment requirements are typically insensitive to alternative demographic scenarios. For example, both in the baseline scenario and in all alternative demographic scenarios, Finland's fiscal adjustment in the 2025-2031 adjustment period is determined by the 'debt sustainability safeguard'. Therefore, we initially ignore three of the four safeguards (the exception is the no backloading safeguard[10]) in the analysis that follows, and focus only on the fiscal adjustment that satisfies the debt sustainability requirement and the 3 percent of GDP deficit ceiling. Results incorporating the safeguards are reported separately.

The various requirements – stochastic DSA, deterministic DSA, 3 percent of GDP budget deficit, safeguards, which impose restrictions on different time horizons, also depending on the level of public debt and budget balance in a particular year – result in a complex dynamic programming exercise. Optimisation leads to a sequence of minimum SPBs that satisfy the various requirements in every adjustment period up to 2052, conditional on long-term demographic, growth and interest-rate assumptions.

For high-debt countries, the various requirements imply a reduction in the debt ratio to 60 percent of GDP or lower. In contrast, for some low-debt countries, including Bulgaria, Denmark, Estonia, and Sweden, the minimum SPBs we calculate would lead to an increase in the debt ratio towards 60 percent of GDP, but still sufficiently below that benchmark to maintain a high probability of staying under 60 percent, even under the deterministic stress scenarios of the DSA. While lower-debt countries could choose to keep their debt ratios well below the 60 percent benchmark, we prefer not to speculate on their policy targets. Instead, we calculate the minimum SPB sequence that aligns with EU fiscal rules.

3. Long-term assumptions

We computed the fiscal adjustment requirements under the baseline scenario for ageing costs and economic growth[11] presented in the 2024 Ageing Report (European Commission, 2024b). This report quantifies the ageing costs and GDP growth implications of these alternative scenarios but doesn't consider the impacts on interest rates. We incorporated into our DSA calculations the altered ageing costs and GDP development implications of the scenarios, and report the differences that these scenarios imply for fiscal adjustment.

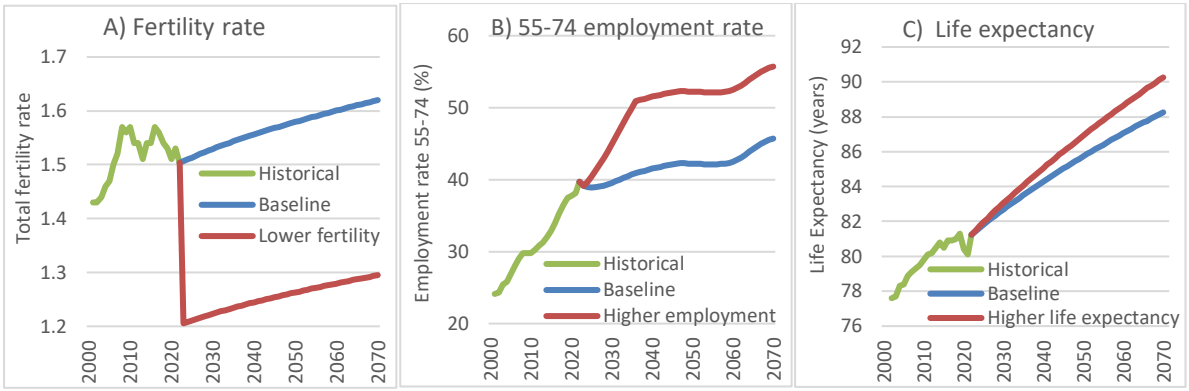
Figure 2 shows the EU averages for the fertility rate, labour force participation among 55–74-year-olds, life expectancy, total factor productivity (TFP) growth and long-term care costs, for both the 2000-2023 period (where available) and as projected in the 2024 Ageing Report. The immigration chart shows the sum of net immigrants assumed for each country. Baseline projections envisage:

[10] In our simulations, we assume the same annual fiscal adjustment over the adjustment period and thus the ´no backloading´ condition is satisfied.

[11] The baseline projection for the total cost of ageing is based on a general 'no policy change' assumption, taking into account country-specific legislated measures up to December 2023 (see European Commission, 2024b). Darvas et al (2024a) summarises the baseline projection for economic growth.

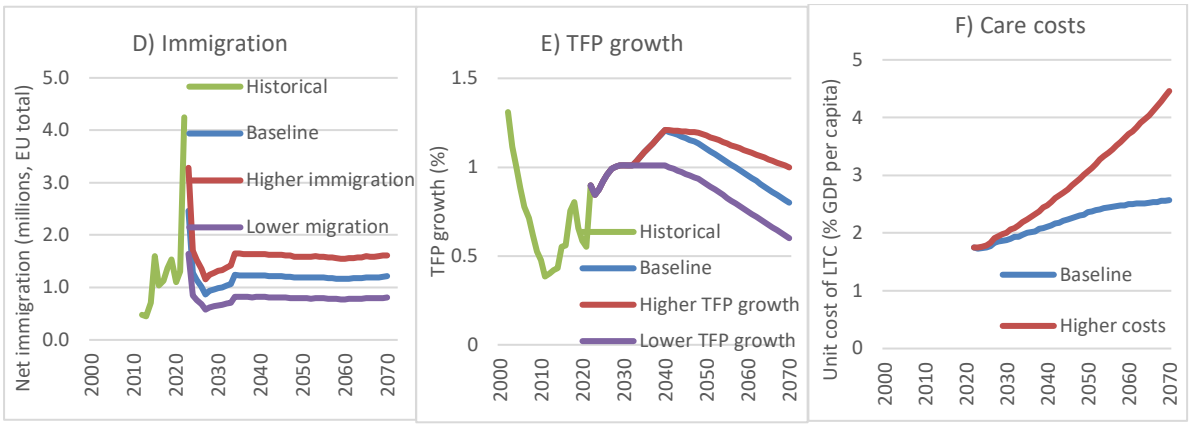
- A modest rise in fertility from an average of around 1.5 live births per woman in 2022[12] to 1.62 by 2070, based on extrapolating country-specific fertility trends since fertility hit bottom in 2000, and assuming that fertility will slowly converge towards 1.77, derived from projecting the total fertility rate for the seven most fertile EU countries. Note that this value is still significantly below the natural replacement rate of 2.1 births per woman.
- A gradual rise in the employment rate of older workers (aged 55-74) from currently around 40 percent to about 46 percent by 2070, on the assumption that recent pension and labour market reforms in many EU countries will incentivise workers to retire later.
- Continued gains in life expectancy, albeit at slower rates than in the past, reflecting the fact that mortality rates among younger individuals are already very low and reduction in mortality at older ages has a smaller effect on life expectancy at birth;
- A return of immigration into the EU to around 1.2 million people per year (0.2-0.3 percent of the EU population), following a large spike in 2022 caused by Russia's invasion of Ukraine;
- The baseline for TFP growth: an initial rise in TFP from its current average level of about 0.8 percent to 1.2 percent per annum by 2040, before falling again, to 0.8 percent by 2070, reflects the use of different methods and assumptions at various horizons of the projection[13]. A possible rationalisation for these assumptions is that current trends are transitory, reflecting a recovery from unusually low TFP growth in advanced EU countries and catching up for the EU's emerging economies. Eventually, this gives way to more subdued growth, in part because of rising income levels and slowing TFP growth in the EU's emerging economies.
- The baseline assumption for costs of healthcare and long-term care assumes that unit costs in the care sector evolve in line with GDP *per capita*, that (only) half of the extra years of life gained through higher life expectancy are spent in good health, that an income effect increases the demand for health services and that the share of formal and informal long-term care remains unchanged. The net result of these assumptions is to increase the cost of long-term care from about 1.8 percent to about 2.7 percent of GDP *per capita*.

Figure 2: Baseline and alternative assumptions for six long-term debt drivers (EU27 average or total)



[12] The 2024 Ageing Report, which was based on data available in 2023, used a 1.50 total fertility rate for 2022 on average in the EU. At the time of writing, Eurostat data shows that the fertility rate was 1.46 in 2022 in the EU. In this paper we base our calculations on the Ageing Report dataset for consistency with the scenarios presented in this report.

[13] For the period up to 2032, the projection essentially extrapolates current trends. For 2032-2040, the TFP of countries with *per-capita* income above the EU average is assumed to converge linearly to 1 percent, while that of the poorer countries converges to an upper limit between 1 percent and 1.5 percent. From 2040 onward, TFP growth in all countries is assumed to fall gradually to 0.9 percent by 2048 and to 0.8 percent by 2070 (see Annex 3 of European Commission, 2024b, and Annex 2 of Darvas *et al*, 2024a, for details).



Source: Authors, based on country-specific data in European Commission (2024b) and Eurostat. Note: the alternative scenario corresponding to 'care costs' is called the *"risk scenario for health care and long-term care"* in European Commission (2024b). Panel F shows only the scenario for the long-term care (LTC) component. Historical data is not available for this variable.

Figure 2 also shows a set of alternative scenarios for which the Ageing Report computes 'ageing costs', defined as the sum of public pensions expenditure, health care expenditure, long-term care expenditure and education expenditure, minus taxes on pensions. Because some of these components (notably, education expenditure) could decrease if a society becomes older, the expression 'ageing costs' is something of a misnomer: a more accurate term would be public spending that is sensitive to demographic change. For the purpose of demographic scenario analysis, however, this broad definition makes sense.

Scenarios included in the Ageing Report include lower fertility (down by 20 percent relative to the baseline), a faster rise in the employment rate of older workers, both higher and lower immigration (up or down by one third, ie about 350,000 immigrants relative to baseline), and an additional increase in life expectancy (by an additional two years by 2070 relative to the baseline). For higher TFP growth, the alternative scenario is identical with the baseline until 2040, while for lower TFP growth, this is the case until 2032. Subsequently, TFP growth converges to 1.0 percent in the higher TFP scenario, and just 0.6 percent in the lower TFP scenario. For higher healthcare and long-term care costs, there is a 'risk scenario' that assumes higher costs due to a higher income elasticity of demand for health services than assumed in the baseline, as well as a rising share of formal long-term care.

4. Baseline fiscal projection results

The projected changes in demographic variables, TFP growth and healthcare costs influence debt sustainability as follows:

- While fertility is projected to rise, it is assumed to remain below the replacement rate in all EU countries over the entire 2024-2070 projection period. This means that the working-age population would shrink, reducing employment and GDP, while healthcare and pension costs would rise as a share of GDP because of the growing share of old people.
- A rising employment rate for older workers raises growth directly through higher employment and reduces pension expenditure during the period of extra employment. The additional pension rights accrued increase pension costs later, but this effect is generally outweighed by the benefits of higher employment.
- Longer life expectancy increases the labour force (fewer working people die in all age cohorts) and hence GDP. Longer retirement periods also raise spending on pensions, healthcare and long-

term care. In the longer-term, the adverse cost effect dominates the positive effect from higher GDP.

- Immigration increases the workforce and GDP and reduces public expenditures.
- TFP growth raises GDP, thus generating more tax revenues and reducing deficit-to-GDP, ageing cost-to-GDP and debt-to-GDP ratios due to a higher denominator.
- Higher healthcare and long-term care costs directly increase ageing costs.

Hence, under baseline projections, three factors worsen debt sustainability: a fertility rate below the reproduction level, longer life expectancy, and higher healthcare and long-term care costs. Three other factors push in the opposite direction, benefiting debt sustainability: TFP growth, immigration and a rising employment rate.

The net impact of these factors on debt sustainability – given 2024 projected starting positions for debts and deficits – can be inferred from Figure 3, which shows the distribution of structural primary balance (SPB) targets required by the debt sustainability requirement and the 3 percent of GDP deficit ceiling if these criteria are applied repeatedly over the next 28 years, assuming four successive seven-year adjustment periods[14]. Figure 3 Panel A shows the overall SPB requirement. Panel B shows the corresponding 'ageing cost change-adjusted' SPB. This is defined as the structural primary balance plus changes in ageing costs. For example, if the required SPB is unchanged from one adjustment period to the next, but ageing costs rise as a share of GDP, the required ageing cost change-adjusted SPB will rise correspondingly (Box 1). In both charts, the distribution of required SPBs is indicated by the dots lined up on the vertical line corresponding to the end of one of the adjustment periods. The dash in the middle of the distribution indicates the median, the 'x' the mean and the box around the median the 25th and 75th percentiles of the distributions.

[14] EU members might switch between four and seven year adjustment periods. In our illustrative calculations, we assume either only four-year or only seven-year adjustment periods up to 2052. In Figure 3, we show the latter both because they are simpler to read and because they are likely to be more relevant to countries facing high adjustment needs, which will likely adopt additional reforms and investment plans to spread adjustment over time. However, the main insights from the equivalent chart showing results for the four-year adjustment periods, reported in the online appendix, are the same.

Box 1: The ageing cost change-adjusted structural primary balance

Let s_0 denote the SPB in the base period (eg 2024) and s_τ the required SPB in the final year of the τ-th adjustment period (for example, τ could refer to the second seven-year adjustment period, ending in 2038). Let c_0 denote ageing costs in the base period and c_τ ageing costs in the final year of the τ-th adjustment period. Then, we define the 'ageing cost change-adjusted structural primary balance' as $s_\tau^a = s_\tau + c_\tau - c_0$.

The rationale for this definition is that it allows us to decompose the required adjustment in the SPB into two terms: the required increase in the ageing cost change-adjusted structural primary balance minus the deterioration of the increase in ageing cost since 2024:

$$s_\tau - s_0 = (s_\tau^a - s_0) - (c_\tau - c_0)$$

Hence, we can interpret the required *change* in the ageing cost change-adjusted SPB as the adjustment in the 'non-ageing budget' that is required to offset an increase in ageing cost, such that the overall structural balance reaches the required amount. Similarly, we can interpret the *level* of the ageing cost-change-adjusted structural primary balance s_τ^a as the sum of the required structural primary balance s_τ and the adjustment in the non-ageing budget that is required to create room for higher ageing costs.

An example helps to clarify the relationship between the headline SPB and the ageing cost change-adjusted SPB (Table 1). Suppose that the SPB is -1 percent of GDP in 2024 and the fiscal rules require it to be raised to +1 percent by 2031. At the same time, AWG projections forecast a rise in the fiscal costs of ageing from 23 percent of GDP in 2024 to 24 percent of GDP in 2031. 2024 is the base year before the fiscal adjustment. The increase in ageing costs by 1 percentage point of GDP by 2031 must be offset by the same adjustment in the non-ageing budget, resulting in an ageing cost change-adjusted SPB of 2 percent. Thus, while the headline SPB increases by 2 percent of GDP from 2024 to 2031, a 3 percent adjustment is needed in the non-ageing budget to compensate for the rise in ageing costs.

If there is a further increase in ageing costs by 1 percent of GDP in the next adjustment period while the overall SPB requirement remains unchanged, a further one percentage point of GDP adjustment must be made in the non-ageing budget to keep the headline SPB at 1 percent. This brings the ageing cost change-adjusted SPB in 2038 to 3 percent.

Table 1: Illustrative example of the impact of ageing costs changes on the fiscal adjustment in the non-ageing budget

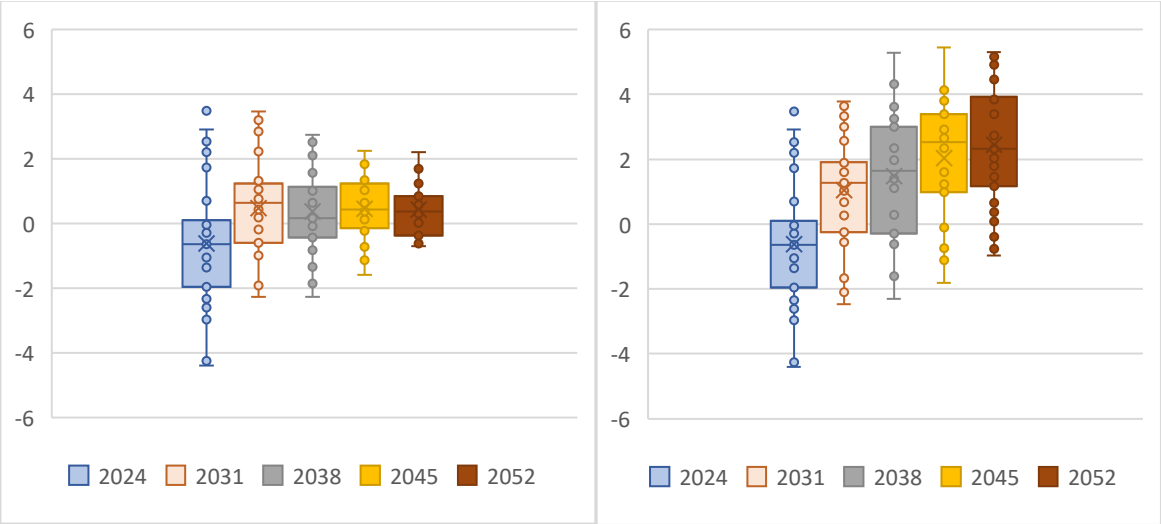
	Levels			Changes	
	2024	2031	2038	2031-2024	2038-2031
SPB	-1	1	1	2	0
Ageing cost	23	24	25	1	1
Ageing cost change-adjusted SPB	-1	2	3	3	1

Source: Bruegel. Note: Units are in percent of GDP.

Figure 3: Baseline fiscal balance paths to meet EU DSA requirements and maintain the deficit below 3% of GDP, 7-year adjustment periods (structural primary balance, % of GDP)

A) SPB

B) SPB adjusted by the change in ageing costs after 2024



Source: Bruegel, European Commission forecast for 2024.

Figure 3 Panel A shows that the debt sustainability requirements of the new framework would require a front-loaded adjustment, with the median SPB rising by 1.28 percent of GDP, from -0.64 percent in 2024 to 0.64 percent in 2031, and then declining moderately to a long-term level of about 0.4 percent of GDP. The initial increase reflects the fact that fiscal adjustment during 2025-2031 must push the current median structural balance from a deficit to the fiscal balance that sets debt on a trajectory toward 60 percent of GDP (or keeps it there), given demographic, growth and real interest projections over a 17-year horizon (the seven years of adjustment plus ten additional years; see section 2.1). As the exercise is repeated in the following seven years, additional changes in the overall SPB are required only to the extent that the projections change at the outer (10 to 17 year) end of the projection horizon. Furthermore, debt ratios falling below the 60 percent of GDP benchmark in some countries lower the required SPB in those countries and shift the SPB distribution down. This said, 13 EU countries are projected to face a persistently high SPB requirement of at least half a percent of GDP, in 2038 and 2045. One quarter of countries face a persistent structural primary surplus requirement of more than 1.2 percent of GDP.

Figure 3 Panel A also shows that the dispersion of SPBs would decline significantly over time. This reflects the fact that the DSA requirements imply that large deficits must be reduced in the initial adjustment period, while some countries with high initial primary surpluses would be allowed to reduce those surpluses. In later decades, debt ratios falling below 60 percent of GDP would reduce adjustment requirements, narrowing the dispersion from above[15]. Conversely, countries with debt ratios well below 60 percent in 2024, are assumed to reduce their SPBs to the lowest level that keeps the ratio below 60 percent, narrowing the dispersion from below[16].

[15] Among the twelve countries with debt ratios above 60 percent in 2024, only five are projected to have ratios above 60 percent in 2052.

[16] For example, Estonia's 21 percent of GDP debt ratio in 2024 is projected to increase to 51 percent by 2052, while its target SPB increases from -1.9 percent of GDP in 2031 to -0.4 percent in 2052.

Figure 3 Panel B shows the evolution of the SPB adjusted by the change in ageing cost, that is: the sum of the structural primary balance shown in Figure 3 Panel A and the adjustment in the non-ageing related items of the budget – for example, lower investment or higher taxation – that is required to create room for higher ageing costs. The differences with respect to Figure 3 Panel A are substantial. Because ageing costs are projected to rise throughout the projection period for most countries (and on average), the required adjusted primary balances at the end of the first adjustment period are higher in Figure 3 Panel B than the required primary balances in Figure 3 Panel A, with a median of 1.26 percent rather than 0.64 percent. This implies an initial adjustment in the non-ageing related items of the budget of 1.91 percent rather than 1.28 percent. Furthermore, the ageing cost change-adjusted SPB must continue to rise even when the unadjusted SPB does not. The total required increase in the median ageing cost change-adjusted SPB between 2024 and 2052 is 2.83 percent of GDP. In contrast, the unadjusted SPB is required to rise by only 0.80 percent of GDP, reflecting the net impact of rising ageing costs and the required fiscal adjustment in the non-ageing portions of the budget.

Table 2 gives the country-specific values underlying Figure 3. As expected, there are major differences in EU countries' adjustment requirements, driven by substantial differences in initial fiscal positions and in projected ageing costs. Romania and Slovakia would need to raise their (unadjusted) SPBs by more than 5 percent of GDP in total from 2024 to 2031, Italy and France by at least 4 percent of GDP, and Spain, Poland, Belgium and Hungary by more than 3 percent. However, since ageing costs will increase in most countries already from 2024 to 2031, the adjustment requirements in the non-ageing budgets are even larger for many countries: around 7 percent of GDP for Romania and Slovakia, and between 4 and 5 percent for France, Italy, Poland and Spain. Austria and Slovenia join the group of countries with more than 3 percent adjustment.

For several countries, ageing cost increases are projected to continue after 2031. Unless countries manage to mitigate these increases, they will need to offset them through further adjustments to their non-ageing budgets to stay above the overall structural primary balances required by the EU framework. This means that by 2052, the sum of required unadjusted structural primary balances and the required adjustment in the non-ageing budget will amount to over 4 percent of GDP for six countries and above 3 percent of GDP for another five countries. On average, the required change in the ageing cost change-adjusted structural primary balance over the entire projection period is 2 percent of GDP higher than the unadjusted change, illustrating the stress that population ageing will put on public finances.

Table 2: Baseline structural primary balance (SPB) paths to meet EU DSA requirements and maintain the deficit below 3% of GDP, 7-year adjustment periods, by country (% of GDP)

	EC SPB forecast	SPB (unadjusted, including ageing costs)				change SPB (unadjusted)		SPB adjusted by change in ageing costs after 2024				change SPB (adjusted)	
	2024	2031	2038	2045	2052	2031-24	2052-24	2031	2038	2045	2052	2031-24	2052-24
Austria	-1.1	0.8	0.6	1.1	0.5	1.9	1.6	1.9	2.0	2.3	2.0	3.0	3.2
Belgium	-1.9	1.2	1.6	1.8	1.7	3.1	3.6	1.9	3.0	3.9	4.5	3.8	6.3
Bulgaria	-2.3	-1.8	-0.7	0.2	0.4	0.5	2.7	-2.1	-1.6	-0.7	0.1	0.2	2.4
Croatia	-2.0	0.4	-0.1	0.1	0.3	2.4	2.3	0.3	-0.5	-0.7	-0.8	2.3	1.2
Cyprus	3.5	0.2	-0.4	0.0	0.6	-3.3	-2.9	1.5	2.0	2.7	3.5	-2.0	0.0
Czechia	-0.1	0.8	1.0	0.4	-0.3	0.9	-0.3	1.1	2.3	3.4	3.8	1.1	3.9
Denmark	2.9	-1.9	-2.3	-1.6	-0.7	-4.8	-3.6	-0.6	-0.4	-0.1	0.4	-3.5	-2.5
Estonia	-0.3	-1.9	-1.3	-0.9	-0.4	-1.6	-0.1	-1.9	-1.6	-1.1	-0.4	-1.6	-0.1
Finland	-0.5	1.1	0.2	1.3	1.7	1.6	2.2	1.4	0.3	1.0	1.6	1.9	2.2
France	-3.0	1.0	1.1	1.2	1.3	4.0	4.3	1.0	1.2	1.2	1.2	4.0	4.1
Germany	0.0	0.2	-0.4	-0.1	0.2	0.2	0.2	1.1	1.1	1.5	1.8	1.1	1.8
Greece	1.7	2.2	2.1	1.9	1.2	0.5	-0.5	1.6	2.3	2.9	2.5	-0.1	0.8
Hungary	0.0	3.5	2.5	1.0	0.8	3.4	0.7	3.3	3.6	3.9	4.5	3.3	4.4
Ireland	2.5	-0.6	-0.1	-0.1	-0.5	-3.1	-3.0	0.3	1.6	2.7	3.4	-2.3	0.9
Italy	-1.1	3.2	2.6	2.2	1.7	4.2	2.7	3.8	3.8	3.1	1.5	4.8	2.5
Latvia	-1.4	-0.5	0.0	0.7	0.8	0.9	2.2	-0.5	-0.3	0.1	0.7	0.9	2.0
Lithuania	0.0	-0.2	-0.4	-0.1	0.2	-0.1	0.2	1.3	2.1	3.0	3.9	1.3	4.0
Luxemburg	0.1	-0.8	-0.8	-0.2	0.6	-0.9	0.5	-0.2	1.2	3.0	5.3	-0.3	5.2
Malta	-2.9	-1.0	0.0	1.2	2.2	1.9	5.1	-1.7	-0.6	1.3	3.9	1.2	6.8
Netherlands	-0.6	-0.2	-0.7	-0.7	-0.4	0.5	0.3	0.7	1.2	1.6	2.2	1.3	2.8
Poland	-2.6	1.1	1.1	1.3	0.8	3.7	3.4	1.7	1.4	1.7	1.9	4.3	4.6
Portugal	2.2	2.3	1.6	-0.2	-0.5	0.1	-2.7	3.6	4.3	3.8	2.7	1.4	0.5
Romania	-4.4	1.1	0.6	0.4	0.0	5.5	4.4	2.6	2.2	2.5	2.3	7.0	6.7
Slovakia	-4.3	1.3	0.7	0.6	0.4	5.6	4.6	3.0	3.3	4.1	4.9	7.3	9.2
Slovenia	-1.2	0.6	0.7	0.5	-0.4	1.9	0.8	1.8	3.1	4.1	4.5	3.1	5.8
Spain	-0.8	2.9	2.8	1.4	0.2	3.7	1.1	3.8	5.3	5.4	5.2	4.6	6.0
Sweden	0.7	-2.3	-1.9	-1.1	-0.6	-3.0	-1.3	-2.5	-2.3	-1.8	-1.0	-3.2	-1.7
median	-0.6	0.6	0.2	0.4	0.4	0.9	0.8	1.3	1.6	2.5	2.3	1.3	2.8

Source: Bruegel, and European Commission forecast for 2024.

Table 3 shows the impacts of the safeguards for the four countries for which they make a difference of more than 0.1 percent of GDP in the terms of the SPB.

- For Finland, the so-called 'debt sustainability safeguard' is binding, which requires a fall in the (gross) debt-to-GDP ratio from 2024 to 2031. Ironically, this partly reflects fiscal prudence: Finland does not use the 1-2 percent of GDP annual surpluses on public pensions to pay down gross debt, but to accumulate pension assets, leading to a comparatively higher gross debt ratio. As a result, Finland will face a significantly higher upfront fiscal adjustment requirement (by 3.1 percent of GDP) than required by the debt sustainability criteria. This front-loaded adjustment improves the debt dynamics, allowing a lower structural primary balance in subsequent adjustment periods.
- France and Italy will face about 1 percent of GDP higher structural primary balance requirements in the second (2031-2038) and third (2039-2045) adjustment periods, and somewhat less in the fourth (2046-2052) adjustment period, as the 'deficit resilience safeguard' – which requires a deficit of less than 1.5 percent of GDP – becomes binding.
- Greece would face a 0.8 percent of GDP higher SPB requirement in the 2046-2052 adjustment period, also as a result of the deficit resilience safeguard.

Table 3: Baseline fiscal balance paths: the impact of safeguards on the structural primary balance (% GDP)

	2024	2031	2038	2045	2052
			Finland		
Full framework	-0.5	4.2	0.0	0.4	0.6
DSA+3%	-0.5	1.1	0.2	1.3	1.7
difference		3.1	-0.1	-1.0	-1.1
			France		
Full framework	-3.0	0.9	2.1	1.8	1.6
DSA+3%	-3.0	1.0	1.1	1.2	1.3
difference		-0.1	1.0	0.6	0.3
			Italy		
Full framework	-1.1	3.2	4.0	3.2	2.4
DSA+3%	-1.1	3.2	2.6	2.2	1.7
difference		0.0	1.3	1.0	0.7
			Greece		
Full framework	1.7	2.2	2.1	2.0	2.0
DSA+3%	1.7	2.2	2.1	1.9	1.2
difference		0.0	0.0	0.1	0.8

Source: Bruegel and European Commission forecast for 2024. Note: the table includes all countries for which three safeguards (the 'debt sustainability safeguard', the 'deficit resilience safeguard', and the minimum 0.5 percent annual adjustment under a deficit-based excessive deficit procedure) result in at least 0.1 percent of GDP deviation of the SPB from the requirements of the EU DSA and to maintain the deficit below 3 percent of GDP.

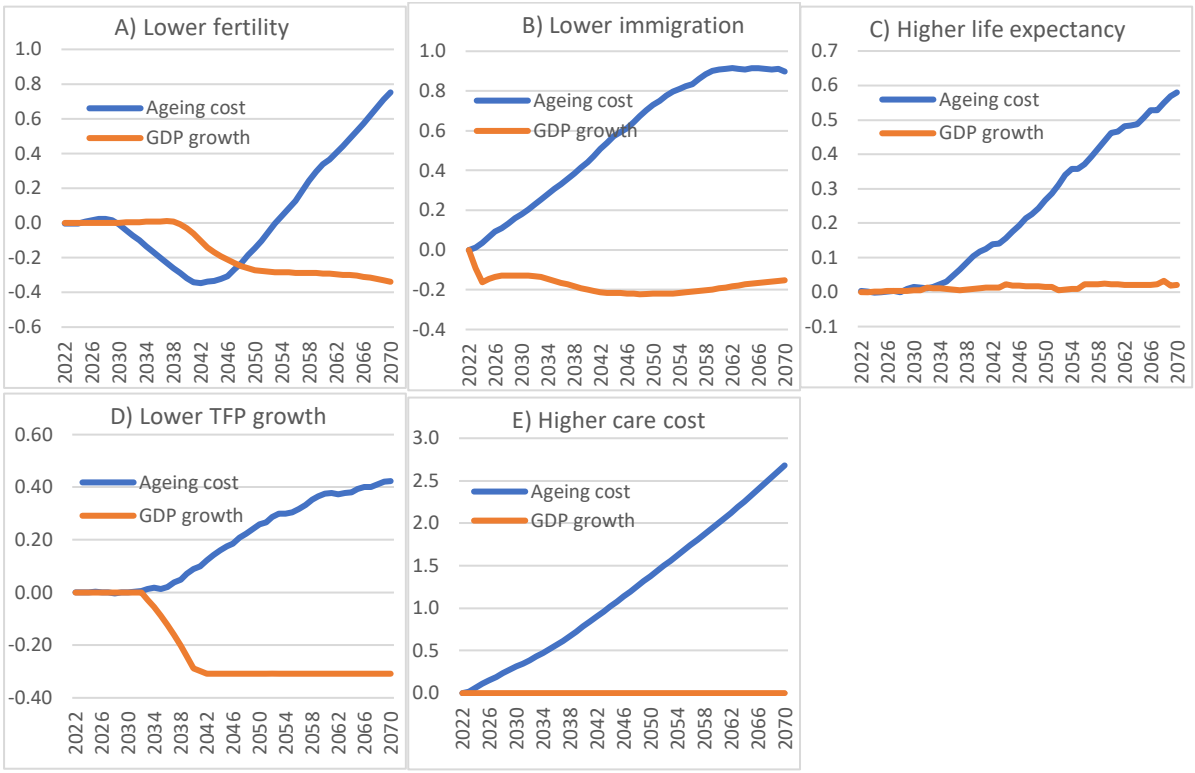
5. Alternative scenarios presumed to lead to increased sustainability risks

As shown in Figure 2, the Ageing Report also contains results for five alternative scenarios that lead to worse debt sustainability outcomes than under the baseline. The five scenarios are: (1) a decline in fertility by 20 percent relative to the baseline, (2) a lower immigration scenario (down by one third); (3) an additional increase in life expectancy, (4) modestly lower TFP growth (converging to just

0.6 percent rather than 0.8 percent from 2040 onward), and (5) higher costs of healthcare and long-term care.

Figure 4 depicts the implications of the scenarios for GDP growth and ageing costs, as calculated by European Commission (2024b). The first five panels of Figure 5 show how each of the alternative scenarios impact the fiscal adjustment requirements relative to the baseline (under baseline assumptions for the remaining variables), assuming that the DSA criteria, the deficit below 3 percent benchmark and the no-backloading safeguard must be observed[17]. The last panel of Figure 5 shows the combined impacts of these five scenarios[18].

Figure 4: The impact on ageing costs and GDP growth of five alternative scenarios presumed to increase debt sustainability risks (EU average, relative to baseline)



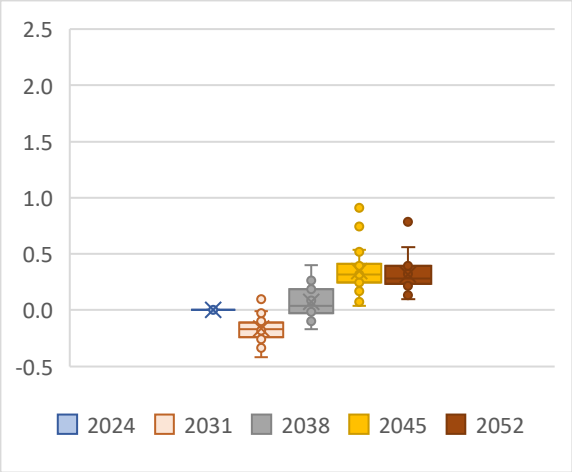
Source: Authors; EU average calculated based on country-specific data in European Commission (2024b). Note: Ageing cost is measured as percent of GDP; GDP growth is measured as percent annual growth. The difference between the alternative scenario and the baseline scenario is reported.

[17] There is no need for an ageing-cost change adjustment to Figure 5 (or to Figure 7), similarly to Figure 3, because the gap between the unadjusted SPB paths reflects the ageing cost-change differences in the baseline and the alternative scenarios.

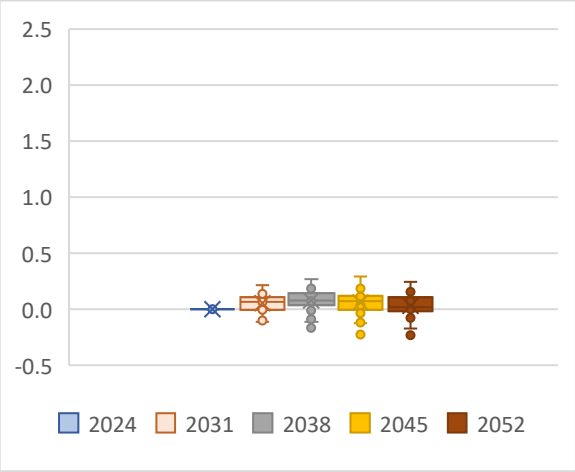
[18] To calculate this combined scenario, we assumed that the GDP and ageing-cost impacts of the five scenarios are cumulative, which we think is a reasonable assumption. For example, we assume that if lower immigration reduces the GDP growth rate by 0.2 percent and lower TFP growth reduces the GDP growth rate by 0.1 percent, then these two scenarios together reduce the GDP growth rate by 0.3 percent. After adding up the marginal impacts of the five scenarios on GDP growth and ageing costs, we ran the DSA model to obtain the corresponding fiscal adjustment path, while also imposing the 3 percent benchmark for the budget deficit. In contrast, the individual fiscal adjustment implications of the five scenarios are not cumulative, because the DSA and the 3 percent deficit requirements represent a non-linear system.

Figure 5: Difference between structural primary balances required under scenarios leading to additional debt sustainability risks and under the baseline, 7-year adjustment periods (% of GDP)

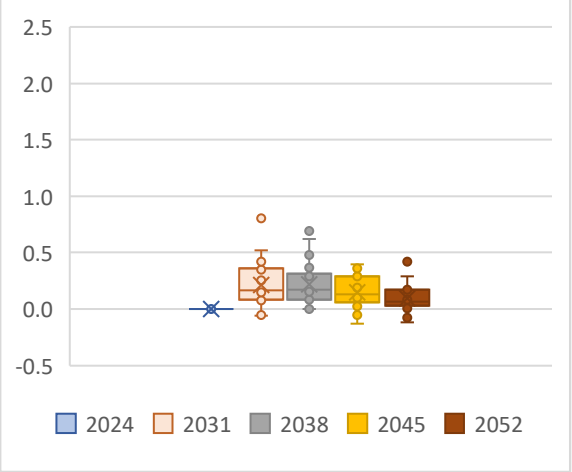
A) Lower fertility



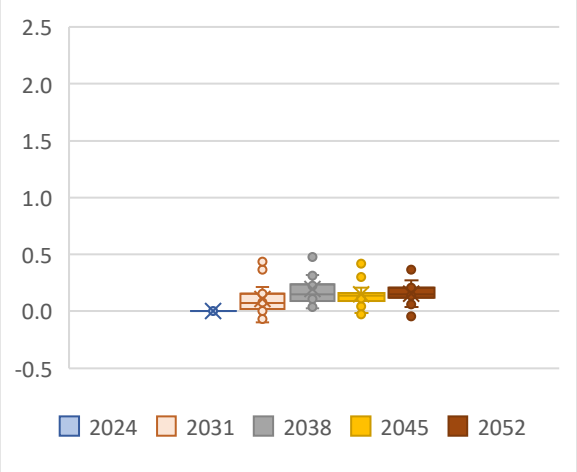
B) Higher life expectancy



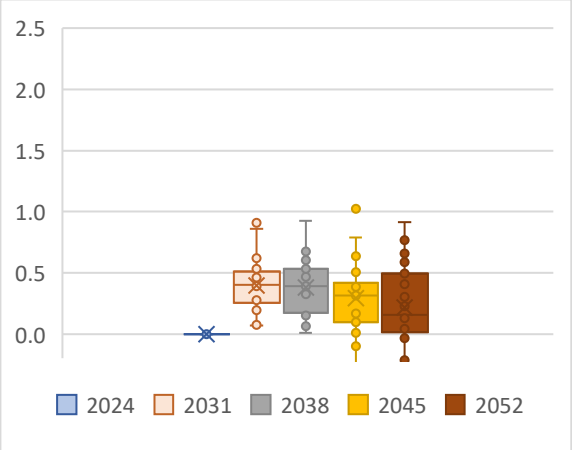
C) Lower immigration



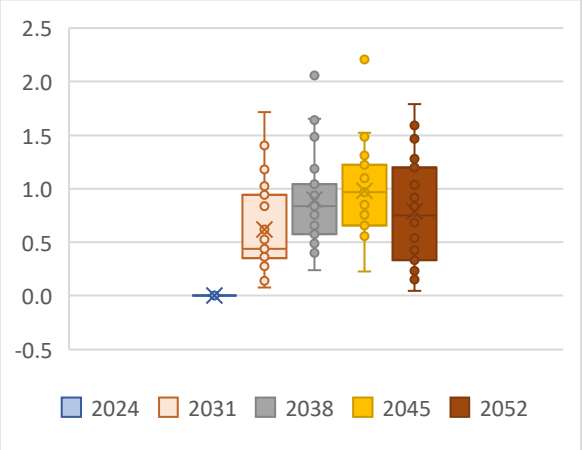
D) Lower TFP growth



E) Higher care costs



F) Combined fiscally adverse scenario



Source: Authors. Note: the combined fiscally-adverse scenario in panel F simultaneously incorporates the GDP growth and ageing cost impacts of the preceding five scenarios. See footnote 15 for an explanation.

The main results can be summarised as follows:

- Lower fertility (Figure 5 Panel A) initially lowers the fiscal adjustment requirement, due to lower healthcare and education costs related to fewer children. But these fiscal benefits are far outweighed by greater fiscal pressure in later decades, when GDP growth is permanently lower because of the reduced workforce, while ageing costs as a share of GDP go up. From 2039, the required SPB rises by about 0.3 percent of GDP per year on average.
- Longer life expectancy (Figure 5 Panel B) has effects in both directions. Pension costs go up as people get older, raising ageing costs. But longer life expectancy marginally increases GDP as fewer workers die and because some countries automatically raise the retirement age, leading to a larger labour force. In most countries, the pension effect dominates and therefore more fiscal consolidation is needed, yet there are some countries for which this scenario implies less fiscal adjustment. On average, the required structural primary balance rises, but by less than 0.1 percent of GDP.
- Lower immigration (Figure 5 Panel C) requires more fiscal adjustment because of lower GDP. The average impact is in the order of 0.2 percent of GDP per annum until 2038, after which it declines to about 0.1 percent of GDP.
- Lower TFP growth (Figure 5 Panel D): Since TFP growth is assumed to decline relative to the baseline only after 2032 (Figure 2 Panel E), GDP growth starts to fall only after that year. Ageing costs as a share of GDP increase gradually due to lower GDP. Since the DSA incorporates ageing cost changes for ten years after the end of the adjustment period, the expected future ageing costs increase fiscal adjustment years much earlier. As a result, the fiscal adjustment need will go up already in 2025-2031 and the extra adjustment need relative to the baseline remains throughout the period, with very few exceptions in some decades. The average impact is between 0.1 percent and 0.2 percent of GDP.
- Higher long-term care and healthcare costs increase ageing costs but do not impact GDP growth (Figure 4 Panel E). Thus, this scenario requires more fiscal consolidation (Figure 5 Panel E). Among all scenarios considered so far, this has the most dramatic impact: an increase in the required SPB by 0.4 percent per year between 2025 and 2045 on average, although with wide dispersion. This reflects the assumption that long-term care unit costs almost double in the adverse scenario relative to the baseline scenario by 2070 (Figure 2 Panel F).
- The combined fiscally adverse scenario (Figure 5 Panel F) would require an extra fiscal adjustment between half and one percent of GDP for most countries, and more than one percent (by 2038) for seven countries. Such extra fiscal adjustments would notably render the already very demanding non-ageing budget adjustment more difficult.

6. Policies

There are vast literatures on policies that could help to offset the adverse effects of demographic change on fiscal sustainability, including on structural reforms that would raise TFP growth, increase labour force participation, increase the sustainability of pension and healthcare systems, increase fertility and manage higher immigration flows. Summarising this literature is beyond the scope of this paper. We therefore limit this section to answering two questions.

1. What is the trade-off between structural reforms to achieve improvements in these variables and future fiscal adjustment requirements? That is, assuming that EU countries were to implement

relatively modest improvements in demographic determinants of long-term sustainability and TFP growth, how much would this lighten their fiscal burdens?

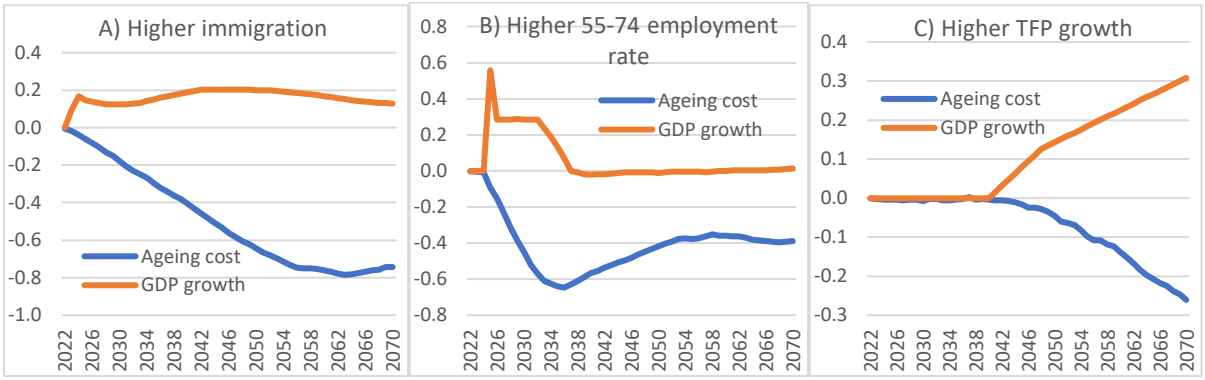
2. What kind of demography, TFP and pension-related country-specific recommendations have been made in the EU's European Semester process, and how well have EU countries implemented these recommendations?

The answers might point to reforms that are both worthwhile and have already been identified.

6.1 The quantitative impact of some stylised policies to reduce ageing costs

To answer the first question, we analysed changes in fiscal adjustment requirements under the new fiscal framework in response to alternative scenarios involving improvements in TFP growth and demographic fundamentals, which are in principle amenable to policy. From the eight scenarios for which the Ageing Report has identified implications for ageing costs and growth (see Figure 2), three can be taken: (1) higher immigration by about 350,000 immigrants relative to baseline starting from 2023; (2) a higher employment rate for older workers than assumed in the baseline, modelled as a gradual increase by 10 percentage points by 2036; (3) moderately higher TFP growth in the long run (converging to 1.0 percent rather than 0.8 percent), which gradually takes effect after 2040. Figure 6 shows the impacts of these scenarios on ageing costs and GDP growth.

Figure 6: The impacts on ageing costs and GDP growth of three alternative scenarios presumed to reduce debt sustainability risks (EU average, relative to baseline)



Source: Bruegel; EU27 average calculated based on country-specific data in European Commission (2024b). Note: Ageing cost is measured as percent of GDP; GDP growth is measured as percent annual growth. The difference between the alternative scenario and the baseline scenario is reported.

Higher net immigration leads to a permanent rise in GDP growth because of the increase in working-age population growth. Since only a few immigrants are over 64, ageing costs as a share of GDP decline (Figure 6 Panel A). Higher employment rates raise GDP while the employment rate widens relative to the baseline (assumed to occur between 2024 and 2036; see Figure 2 Panel B). The spike in GDP growth in 2025 results from a jump in the employment rate from 2024 to 2025 in this scenario, after which the employment rate increases linearly from 2025-2036. Higher employment also reduces the number of pensioners, reducing ageing costs both in euro terms and as a share of GDP. In later years, pension costs go up, since longer careers enable employees to accrue more pension rights, so the 2025-2036 reduction in ageing costs is partially corrected, while GDP growth stops rising relative to the baseline (Figure 6 Panel B). The effects of higher TFP growth are opposite to those of lower TFP growth discussed earlier. There is a difference in timing: while the lower TFP scenario deviates from the baseline after 2032, the higher TFP scenario deviates from the baseline only after 2040 (Figure 2 Panel E). Consequently, the GDP-increasing and ageing-cost-reducing impacts of the higher TFP scenario materialise after 2040 (Figure 6 Panel C).

Unfortunately, the Ageing Report lacks 'positive' counterparts for the adverse scenarios involving lower fertility and higher care costs. To partly fill this gap, we constructed our own scenario for higher fertility, by assuming that the impact of higher fertility on ageing costs and growth is symmetrical to the impact of the lower fertility scenario shown in Figures 2 and 4[19]. However, a 20 percent jump in fertility analogous to the 20 percent drop assumed in the Ageing Report scenario would clearly be unrealistic, as it would imply an increase in the fertility rate by almost 0.3 points (ie from the EU average total fertility rate of about 1.5 to 1.8 in 2023). In contrast, the standard deviation of fertility rates from 2000 to 2023 ranged from 0.05 (Austria) to 0.21 (Czechia), with an average of 0.11. We hence assume a one standard deviation (0.11, ie from a rate of 1.50 to 1.61 in 2023) permanent jump in fertility, while keeping the subsequent gradual increase in the fertility rate the same as in the baseline scenario.

Figure 7, analogous to Figure 5, shows the impact of these scenarios on the fiscal burden relative to the baseline scenario:

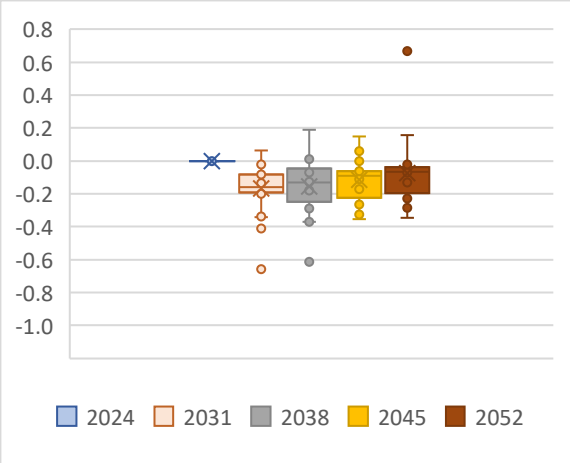
- Increasing immigration by about 350,000 immigrants relative to baseline would lower the required structural primary balance by about 0.2 percent of GDP per year on average during 2025-28.
- Increasing the employment rate by 10 percentage points by 2036 would have a large initial impact, coinciding with the high short- and medium-term growth impact shown in Figure 6, lowering the fiscal adjustment requirement by almost 0.2 percent during the initial adjustment period.
- The impact of the faster TFP growth scenario is small, especially at the beginning. This has to do with the way in which this scenario is modelled, with higher TFP assumed only from 2041. Thus, the higher TFP scenario would have practically no impact on the 2025-2031 adjustment period; small exceptions are due to ageing cost/GDP ratio reductions in 2041, since the EU's DSA consider ageing costs for 10 years after the end of the adjustment period.
- The higher fertility scenario in Figure 7 Panel D shows the values of Figure 5 Panel A multiplied by -0.11/0.29, which, as we noted, is an approximation, since the impacts of the higher and lower fertility scenarios do not mirror each other. A standard deviation increase in fertility would lower long-term fiscal adjustment needs by about 0.1 percent of GDP on average.
- Finally, Figure 7 Panel E shows the potential combined impact of all preceding policy scenarios. Over the longer term, this could lower the required fiscal adjustment by 0.2 to 0.5 percent of GDP relative to the baseline.

Note that the quantitative impacts of these scenarios are not necessarily representative of the underlying type of reform because the scenarios are *ad hoc* in terms of the timing and magnitude of the assumed change. For example, the Ageing Report assumes immediate fertility and immigration effects from 2023, while the TFP changes are assumed to materialise only after 2040. There is no justification for a selection of 0.2 percentage points higher TFP growth in the long-run, nor why immigration is assumed to be one-third higher. A comparison or ranking of the results of the alternative scenarios would make sense if the scenarios were equally likely, but there is no reason to assume that this would be the case. The only argument that can be made for the plausibility of the scenarios is that they resulted from the institutional process of the Ageing Working Group, in which all EU member countries and the European Commission are represented.

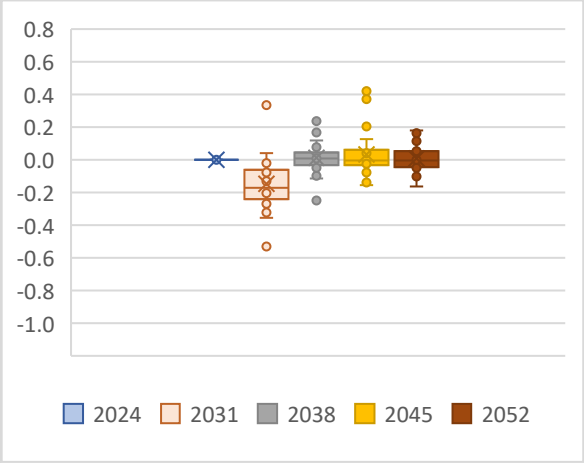
[19] This is an approximation, because higher fertility likely impacts the female labour force differently than lower fertility, so the impacts of the higher fertility scenario are not simply the mirror image of the impacts of the lower fertility scenario.

Figure 7: Difference between SPBs required under scenarios presumed to lower debt sustainability risks and under the baseline, 7-year adjustment periods (% GDP)

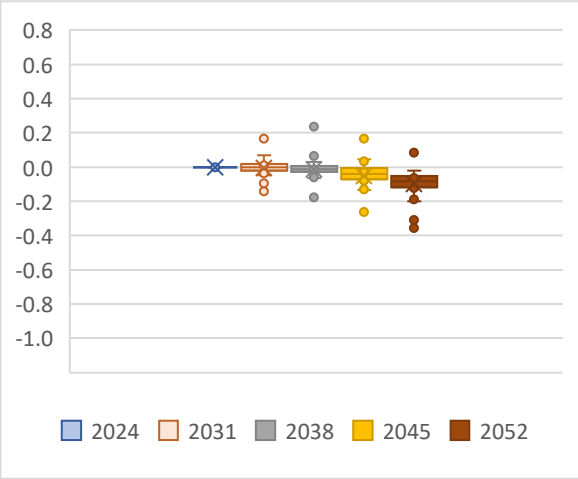
A) Higher immigration



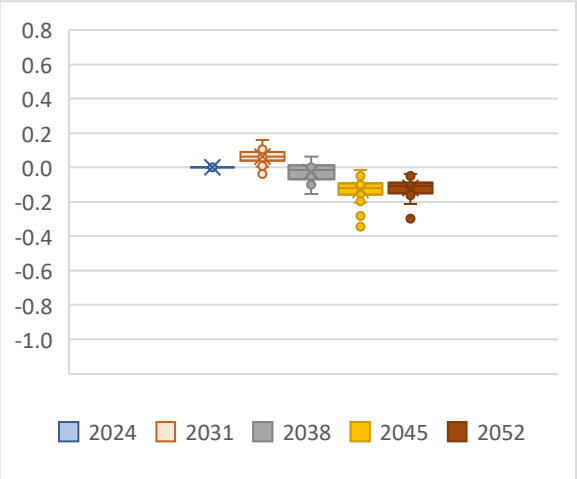
B) Higher 55-74 employment rate



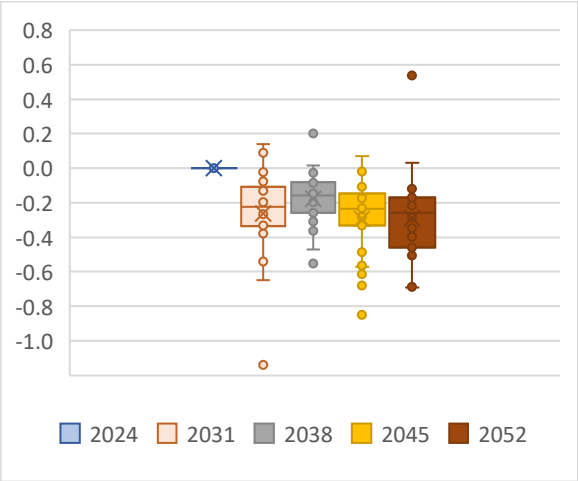
C) Higher TFP growth



D) Higher fertility



E) Combined policy scenario



Source: Bruegel. Note: the 'Combined policy scenario' in Panel E simultaneously incorporates the GDP growth and ageing cost impacts of the preceding four scenarios.

6.2 Country-specific recommendations to address demographic challenges

We now turn to the second question, about recommendations and their implementation. Measures to address certain aspects of demographic challenges, TFP and pensions are included regularly in European Semester country-specific recommendations (CSRs), which are proposed by the European Commission and endorsed by the Council of the EU after possible amendments.

The most prevalent recommendation to address demographic challenges is to increase labour force participation, often referring to one or more of five specific target groups: women, the old, the young, disadvantaged people and people with a migrant background. CSRs also specify regularly the tools to achieve this goal. They include improving access to childcare and long-term care, raising skill levels, improving the quality of vocational education and training, encouraging access to lifelong learning, improving access to distance working, removing disincentives to work, encouraging increases in the working hours of part-time employees, limiting early retirement, strengthening public employment services for target groups, providing career guidance at all education levels, setting up systems to forecast skills and needed competences, shifting taxes away from labour to sources less detrimental to inclusive and sustainable growth, improving tax incentives to increase hours worked and reducing high tax wedges.

These suggestions are generally sensible and align with the recommendations made by other institutions, such as the OECD and the International Monetary Fund, as well as think tanks and academic researchers. Depending on the overall impact on labour force participation, they could substantially reduce longer-term fiscal burdens. For example, Bação et al (2024) finds that active labour market policies have a positive impact on growth in OECD countries, while Heylen and Van de Kerckhove (2019) conclude that a reduction in the labour tax rate on older workers and on all low-wage earners (financed by an overall reduction in non-employment benefits or increases in consumption taxes) is an effective tool to raise the employment rate of older and low-educated people and boost potential growth.

Additional CSRs that impact long-term debt sustainability relate to healthy ageing, TFP growth and pensions. Some are directed at policies that would improve both demography and TFP (eg improving skill development, which improves both employability and productivity directly). Other TFP-increasing CSRs relate to research, innovation, digitalisation, competition, business environment, the single market, quality of economic and judicial institutions, and access to finance. Pension-related recommendations include limiting early exit possibilities from the labour market and increasing the employment rate of older workers, linking the statutory pension age to life expectancy, accelerating the harmonisation of the statutory retirement age for women and men, unifying the rules of different pension regimes, reviewing pension indexation mechanisms, improving the adequacy of minimum pensions, reducing the share of pensions in public spending, and improving the second pillar of the pension system and encouraging private pension savings.

However, there are no specific CSRs that aim directly to increase immigration and the fertility rate. The likely reason is that both are controversial issues. Immigration is politically divisive. Childbearing is a personal choice, and views differ on whether and how the state should interfere with this choice. This said, it is uncontroversial that women who want to have more children should be able to do so without suffering substantial material disadvantage, such as reduced incomes, job loss or inability to re-enter the labour market after extended maternity leave.

There is a large academic literature on policies to boost fertility rates. Bergsvik *et al* (2021) reviewed 17,000 papers analysing policy measures to boost fertility since 1970 in Europe, the United States, Canada and Australia and concluded that family-friendly policies can indeed contribute to higher fertility. They found that policies that help to alleviate the conflict between the roles of women as workers and mothers – specifically, public childcare and parental leave – can have lasting and substantial effects on both fertility and the labour supply. The effects differ depending on socio-economic status, with higher-earning couples benefiting particularly from expanded parental leave, while expanded childcare programmes have greater impact on lower-income families. Subsidised assisted reproductive treatments seem to have increased birth rates for women over the age of 35, which is becoming more important as the age of the first childbirth has increased over the past decades. Cheaper healthcare reduces the monetary cost of childbearing, and there is evidence that it had a positive effect on fertility in the United States, while Bergsvik *et al* (2021) noted that further empirical research is needed to examine this issue in other regions.

Bergsvik *et al* (2021) also concluded that increased cash transfers have only temporary effects on fertility. In contrast, high-quality health services and childcare early in life have long-term positive effects on health, educational attainment and earnings, particularly for children from poorer families. To the extent that reducing inequality is a goal in addition to increasing fertility, in-kind services such as childcare and healthcare are preferable to universal cash transfers. Finally, Bergsvik *et al* (2021) argued that the symbolic and/or signalling impact of announcing pronatalist policies should not be underestimated.

Among the many policies discussed by Bergsvik *et al* (2021), improving childcare facilities is regularly included in CSRs. However, there was only one recommendation between 2011 and 2024 on parental leave[20], even though presumably there is scope to improve parental-leave systems in more countries. Recommendations related to parental benefits have been made only twice over the past fourteen years, on both occasions aimed at better targeting and not at influencing fertility levels[21].

Despite the crucial demographic challenge EU countries face and their low productivity growth, the implementation of demography, TFP and pension-related CSRs in the context of the European Semester has been modest. The average implementation score across all EU countries ranges between 'limited progress' and 'some progress' (Table 4). For demography, among the 852 related recommendations made altogether between 2011 and 2023, only three were implemented fully after one year. Substantial progress was achieved on 41, while some progress was made for 412, limited progress for 334 and no progress for 62. The implementation scores are similarly mediocre for TFP (Table 4 Panel B). Only seven of the total of 605 recommendations were implemented fully after one year and substantial progress was achieved for 51. The implementation of pension-related CSRs is even weaker (Table 4 Panel C).

[20] Estonia's CSR no. 1.2 in 2017 recommended "*reviewing the parental leave system*", a recommendation classified by the Commission into the policy area "*Incentives to work, job creation, labour market participation*".

[21] For Estonia, CSR no. 2.1 in 2012 suggested "*streamlining parental benefits, while ensuring adequate social protection*", and for Romania, CSR no. 2.2 in 2012 recommended "*better targeting* [of] *family and parental benefits*".

Table 4: Implementation of European Semester CSRs related to demography, TFP and pensions

A) Demography

Year of recommendation	Number of evaluated recommendations	Implementation score 1 year later	Implementation score 3 years later
2011	7	0.14	
2012	80	0.45	
2013	133	0.39	
2014	163	0.37	0.46
2015	66	0.38	0.44
2016	65	0.39	0.42
2017	55	0.39	0.43
2018	56	0.35	0.38
2019	76	0.35	0.38
2020	74	0.38	0.45
2021	0		
2022	26	0.35	
2023	51	0.36	
All years	852	0.38	0.43

B) TFP

Year of recommendation	Number of evaluated recommendations	Implementation score 1 year later	Implementation score 3 years later
2011	6	0.00	
2012	41	0.46	
2013	70	0.36	
2014	88	0.38	0.42
2015	33	0.42	0.45
2016	54	0.31	0.38
2017	43	0.41	0.42
2018	47	0.32	0.35
2019	65	0.34	0.44
2020	90	0.47	0.55
2021	0		
2022	31	0.37	
2023	37	0.44	
All years	605	0.39	0.44

C) Pension reform

Year of recommendation	Number of evaluated recommendations	Implementation score 1 year later	Implementation score 3 years later
2011	7	0.43	
2012	22	0.36	
2013	41	0.36	
2014	53	0.32	0.40
2015	19	0.28	0.38
2016	16	0.22	0.26
2017	17	0.24	0.30
2018	20	0.25	0.28
2019	18	0.18	0.22
2020	4	0.31	
2021	0		
2022	8	0.31	
2023	5	0.25	
All years	230	0.30	0.33

Source: Authors based on the European Commission's CSR database. Note: qualitative scores assigned by the Commission are converted to numerical scores, following Deroose and Griesse (2014): full implementation = 1; substantial progress = 0.75; some progress = 0.5; limited progress = 0.25; and no progress = 0. The averages across all countries for all evaluated CSRs are reported. We classify as demography-related the European Commission's following policy-area classifications: active labour market policies; incentives to work & labour market participation; childcare; early childhood education & care; long-term care; healthcare; incentives to work, job creation, labour market participation; non-discrimination and equal opportunities; reduce the tax burden on labour; skills & life-long learning; skills, vocational education and training & adult learning. We classify as TFP-related the following Commission policy-area classifications: access to finance, growth financing (including CMU), business environment, competition & regulatory framework, competition in services, digital connectivity, infrastructure & market functioning, digitalisation of public administration and public services, digitalisation of businesses, research & innovation, single market, competition & state aid. We classify as pension-related the following policy-area classifications: long-term sustainability of public finances, inc. pensions; pension systems and active ageing.

7. Conclusion

Demographic change will continue to add significantly to the fiscal pressures facing EU countries. But by how much, and what can be done about it? In response to these questions, this paper brings good news and bad news.

The good news is that the impact of ageing on the headline indicators of fiscal adjustment, such as the structural primary balance or expenditure growth, is already included in the initial adjustment requirement under the EU's fiscal rules, which aim to bring public debt ratios below the Treaty-based 60 percent of GDP benchmark. This is because the rules require EU countries to anticipate and offset increases in ageing costs in the 10 years following the adjustment period. While the fiscal adjustment that must be undertaken in the initial application of the rules is substantial – about 1.4 percent of GDP in terms of the SPB for the EU's median country, more than 3 percent of GDP for nine countries and more than 4 percent of GDP for four countries – subsequent adjustment rounds will generally not require an *additional* increase in the SPB. In fact, the increase in the SPB required over the entire period from 2024 to 2052 is a bit lower (1.05 percent of GDP) than in the initial period.

The bad news is that in countries with rising ageing costs – including almost three-quarters of EU members – fiscal adjustment in the non-ageing budget would need to continue after the initial four to seven year adjustment period to provide resources for rising ageing costs, even if the SPB does not need to increase further. The reason for this is that even when the SPB does not change, non-ageing

spending (items such as infrastructure, social spending not related to ageing, defence and public administration) gets squeezed if the portion of the budget that is related to ageing expands – or alternatively, taxation must be increased. Our simulations show that this effect could be very significant, making the fiscal outlook look bleak: for the median EU country, rising ageing costs as assumed under the baseline would require an extra 2 percent of GDP adjustment in the non-ageing budget from 2024 to 2052.

It is important to remember that the projections referring to fiscal adjustment in the non-ageing budget assume that ageing costs are not mitigated, ie that they evolve as assumed in the current baselines of the Ageing Working Group. In fact, the adjustment that countries would undertake in response to rising ageing costs would likely occur in *both* the non-ageing and ageing budgets – for example, by lowering education spending, reducing care or care costs for the elderly, raising the retirement age or making pensions less generous. From a policy perspective, what is important is that these adjustment needs are anticipated, so that disruptive and inefficient adjustment is avoided. Good adjustment policies would seek to address both the drivers of demographic change – via policies that raise fertility and good immigration policy – and through efficient responses of labour markets, pension and care systems to such change: raising labour force participation, encouraging later retirement when people are healthy and able to work, and making care more efficient. Our simulations show that the combined effect of such policies on projected increases in ageing costs could be meaningful.

Yet, implementation by EU countries of European Semester CSRs on labour force participation and pension reform – as well as increasing productivity growth – remains poor. And the CSRs themselves are lopsided in the sense that they almost entirely avoid recommendations relating to immigration and fertility, notwithstanding rich academic literatures in these areas. To avoid squeezing critical spending while also keeping debt sustainable, EU countries will need to get more serious about reform, and the Commission and the Council must become more fearless in expanding the perimeter of policy areas they tackle in their recommendations.

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