The effects of demographic change on debt sustainability in European Union countries

Paper for the informal ECOFIN meeting on 14 September 2024

Zsolt Darvas, Lennard Welslau and Jeromin Zettelmeyer[1]

Bruegel

30 August 2024

Abstract

Population ageing is putting pressure on the public debt to GDP ratios of European Union countries both by raising net public expenditures and by lowering potential growth. To prevent ever-rising debt-to-GDP levels, EU countries will need to run higher structural primary balances – the difference between non-cyclical revenue and non-interest spending – than they would otherwise need.

Because the EU's new fiscal rules require member states to anticipate and offset the fiscal costs of ageing, both during the adjustment period and in the 10 years beyond, the impact of ageing on overall fiscal indicators, such as the structural primary balance, should be felt mostly during the initial four to seven year adjustment period that begins in 2025. After this period, structural primary balances will not need to rise further in most countries. However, in countries in which fiscal ageing costs are rising – all member states except Bulgaria, Croatia, Finland, France, Italy, Latvia and Sweden – fiscal adjustment in the *non-ageing* portion of the budget needs to continue, even if the structural primary balance does not need to increase.

Demographic risk factors could add an extra half point of GDP or more to required primary balances, while policies that alleviate demographic pressures – increasing immigration, raising fertility levels and labour force participation, and reducing the cost of long-term care for the elderly – could have the opposite effect. The European Commission's country-specific recommendations (CSRs) include many good ideas to raise labour force participation, reform pension and healthcare systems and raise productivity, but member state implementation of these recommendations has been poor. Furthermore, CSRs contain almost no advice on immigration policy or fertility-enhancing policies, despite a rich academic literature on both. EU countries need to act on existing CSRs to alleviate demographic pressures, while the Commission should go further in its advice on tackling demographic challenges.

1. Introduction

The European Union faces a dramatic demographic problem in the decades ahead. In the absence of immigration, the EU population will shrink significantly, from 451 million in 2022 to 406 million in 2050 – a 10 percent decline (Figure 1, panel A)[2]. 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 is projected to increase by 32 million over this period, and the number of children (under 20) is projected to decline by 21 million[3]. 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*
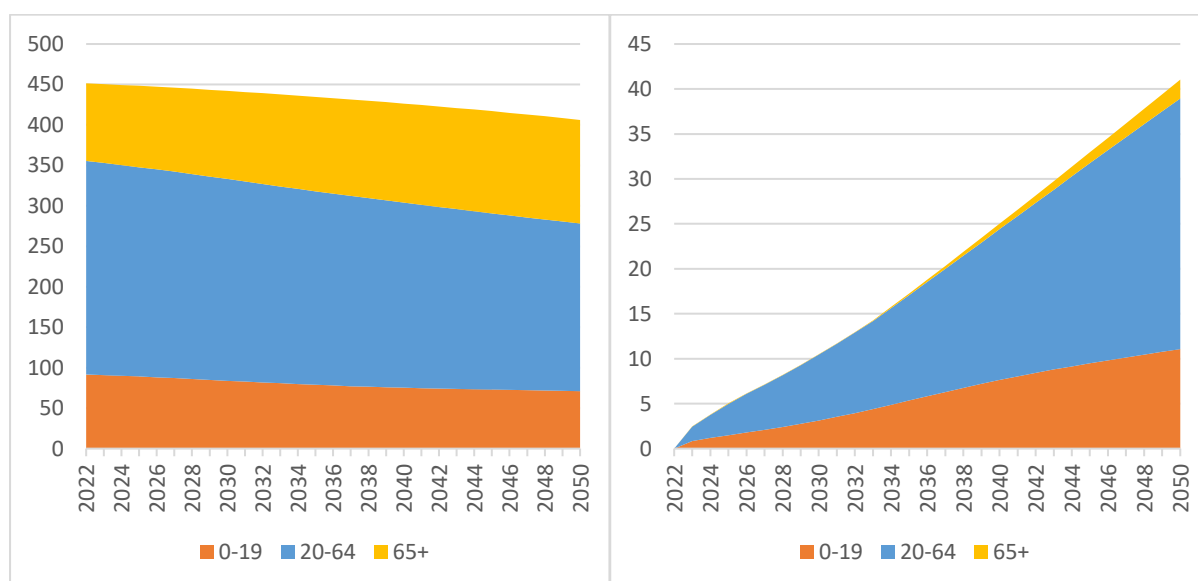
Source: Eurostat's 'Population on 1st January by age, sex and type of projection [proj_23np]' dataset. Note: instead of the beginning of year (1 January) values, we report the data for the end of the previous year (31 December), to be consistent with public debt data, which is also end-year data.

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). This would compensate for slightly less than half of the decline in the working-age population. When assessing these numbers, it should be

---

[2] 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.

[3] 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. The expected population decline is 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.

recalled that immigration projections are much less reliable than projections of natural population change[4].

Demographic change affects public debt sustainability through several channels: most obviously, by altering the labour force, in terms of 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 GDP 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. Population ageing might encourage working age people to save more for their retirements, reducing the real interest rate. But spending of savings by pensioners also reduces savings, which works in the opposite direction.

We use the European Commission'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) growth and care costs for the elderly[5]. While the medium-term implications (ie for the next four to seven years) of the EU's new fiscal framework are well understood (see Darvas *et al*, 2024b), its implications further into the future have not yet been explored. We consider the period up to 2052 (on the assumption that in each adjustment period, debt and deficits evolve as required by the DSA analysis embedded in the new rules, while also respecting the Treaty requirement of maintaining the deficit below 3 percent of GDP). This results in a sequence of structural primary balance targets. Given that ageing costs go up in many countries, the main question is how much adjustment pressure will be felt by the non-aging related portions of the budget (such as family support, defence, infrastructure investment, and public administration).

We next give a sense of 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), reduce the costs of caring for the elderly, increase immigration and raise fertility might significantly lower the fiscal adjustment that is required to offset higher aging costs. We examine both the extent to which the European Commission's country-specific recommendations include policy advice on these critical areas and the extent to which member states implement this advice. On both counts, there is substantial room for improvement.

2. Long-term fiscal pressures in the EU based on an application of the new EU fiscal framework

This section reports illustrative numerical simulations of the implications of the EU AWG's long-term assumptions for public debt sustainability. Public debt sustainability has alternative definitions. EU fiscal rules incorporate a debt sustainability requirement, under which fiscal policy must put the debt ratio onto a 'plausibly' declining path (that is, with at least 70 percent probability) within four to seven

---

[4] 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 more uncertain.

[5] 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 common 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.

years, 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 Treaty requirement that deficits must remain below 3 percent of GDP) under the EU's current demographic baseline scenario, as well as under alternative scenarios.

2.1 Using the European debt sustainability methodology to project long-term fiscal adjustment needs

The European Union's new fiscal framework entered into force in April 2024. It is based on country-specific debt sustainability analysis (DSA). It aims to ensure that whenever a country's public debt-to-GDP ratio is above 60 percent, it will decline towards the 60 percent benchmark throughout a ten-year period following the end of a four to seven year adjustment period under an unchanged fiscal policy, taking into account the expected future changes in the cost of ageing. Thus, calculations incorporate expected growth, interest rates and ageing cost developments for 14 to 17 years ahead. Countries with debt ratios below 60 percent must stay below this benchmark. The budget deficit, whenever it is larger than the Treaty-based 3 percent of GDP benchmark, must be reduced below that benchmark by the end of the first adjustment period.

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 that is more ambitious than the 3 percent benchmark. In the initial application of the framework, these safeguards will be binding only for a few countries (see Darvas et al, 2024b). Furthermore, the purpose of the safeguards could have been mainly to ensure that a minimum fiscal adjustment is undertaken even if the DSA is not implemented as intended. Since we assume that the DSA is implemented exactly as intended, and since the purpose of the paper is to investigate the long-term impact of demographic changes on debt sustainability, we ignore the safeguards in the analysis that follows and focus only on the fiscal adjustment that satisfies the debt sustainability requirement as well as the 3 percent of GDP deficit ceiling.[6] For the few countries for which the safeguards are binding, the results of fiscal adjustment that imposes all requirement of the new fiscal framework are very close in the long-run (and safeguards make no difference for countries for which they do not bind)[7].

For each EU country, we compute a long-term sequence of *minimum* structural primary balances that satisfy the debt sustainability requirement as well as the 3 percent of GDP deficit ceiling in every adjustment period up to 2052, conditional on long-term demographic, growth and interest-rate assumptions. For most countries, this implies a fall in the debt ratio toward 60 percent. For some low-debt countries, including Bulgaria, Denmark, Estonia and Sweden, these balances would lead to an increase in the debt ratio toward 60 percent of GDP, but sufficiently below that benchmark so that the ratio would remain below 60 percent, both with high probability and under the deterministic stress scenarios of the DSA.

2.2 Long-term assumptions

We computed the fiscal adjustment requirements under the baseline scenario for ageing costs and economic growth[8] presented in the 2024 Ageing Report (European Commission, 2024b). This report

---

[6] In addition, we assume that the ´no backloading´ condition is met, which states that the annual fiscal adjustment cannot increase during the adjustment period. In our simulations, this is condition is satisfied automatically, by assuming the same annual fiscal adjustment over the adjustment period.

[7] In the first seven-year adjustment period of 2025-2031, safeguards require significantly more adjustment for Finland, which is offset by smaller adjustments (compared to the DSA-only case) in later years.

[8] 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). The baseline projection for economic growth is summarised in Darvas *et al* (2024a).

quantifies the ageing costs and GDP growth implications of these alternative scenarios but doesn't consider impacts on interest rates. We incorporated the altered ageing cost and GDP development implications of the scenarios into our DSA calculations, and report the differences that these scenarios imply for fiscal adjustment.

Figure 2 shows the EU average (or sum in the case of the immigration scenario) of the fertility rate, labour force participation among 55–74-year-olds, life expectancy, immigration from outside the EU, total factor productivity growth and long-term care costs, for both the 2000-2023 period (where available) and as projected in the 2024 Aging Report. Baseline projections envisage:

- A modest rise in **fertility** from an average of around 1.5 live births per woman in 2022[9] to 1.62 by 2070, based on extrapolating country-specific fertility trends since fertility hit bottom in 2000, and based on the assumption 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 arising from Russia's invasion of Ukraine;
- The baseline for **TFP growth:** an initial rise of 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[10]. 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 on the part of 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 the unit cost 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*.

---

[9] 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.

[10] For the period up to 2032, the projection essentially extrapolates current trends. For 2032-2040, the TFP of countries with income *per capita* 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).

Figure 2: Baseline and alternative assumptions for six long-term debt drivers
(EU27 average or total)
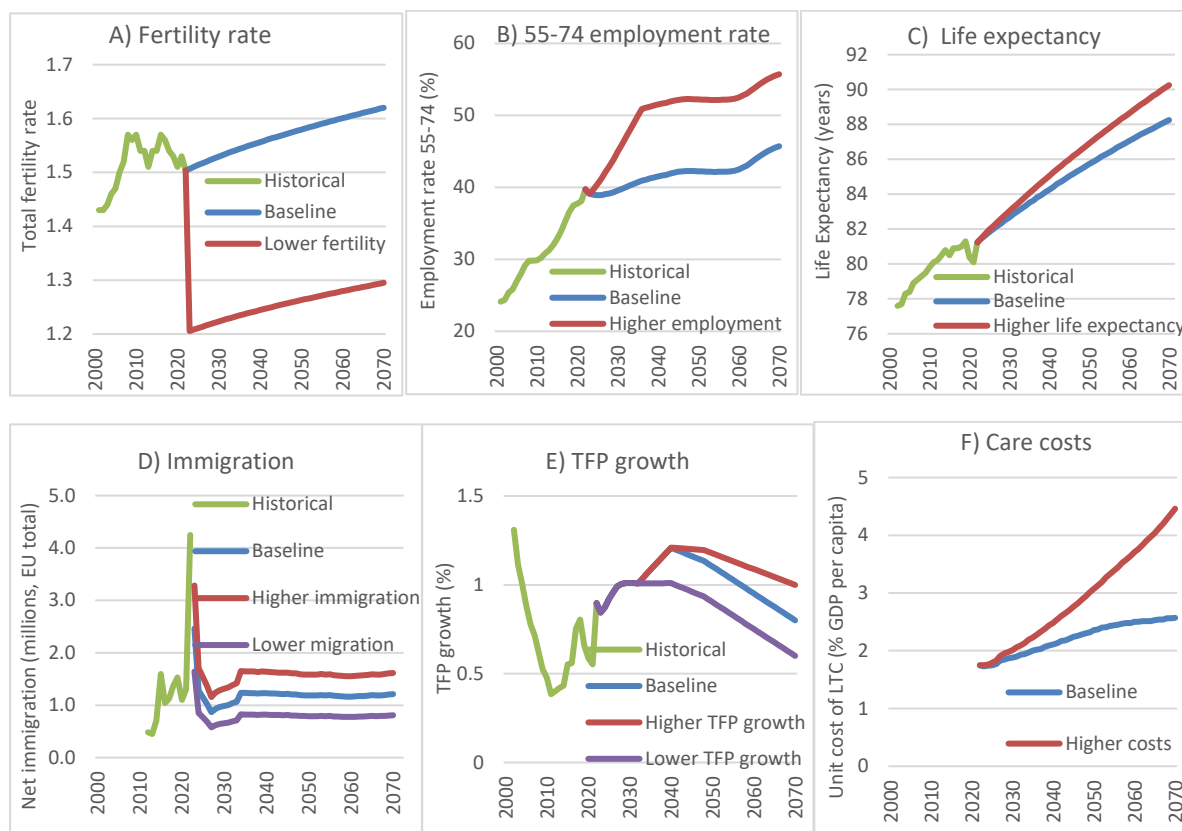
Source: EU27 average calculated based on country-specific data in European Commission (2024b) and Eurostat. Note: the alternative scenario corresponding to 'care costs' is called the *"risk scenario for health care and long-term care"* in European Commission (2024b). Panel F shows only the scenario for 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 Aging 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 rise if a society becomes younger, the expression 'aging costs' is something of a misnomer: a more accurate expression would be public spending that is sensitive to demographic change. For the purpose of demographic scenario analysis, however, this broad definition makes sense.

Scenarios considered by the Aging 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.

2.3 Baseline 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-age people die) and hence GDP. It also raises spending on pensions, healthcare and long-term care due to longer retirement periods. 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 aging 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 on debt sustainability of these factors – 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 as well as 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[11]. Panel A, to the left, shows the overall SPB requirement. Panel B, to the right, shows the corresponding 'aging cost change-adjusted' SPB. This is defined as the structural primary balance plus changes in aging 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.

---

[11] EU members might switch between four and seven years long 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 Annex, are the same.

Box 1: Ageing cost change adjusted structural primary balance

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, so ageing cost changes after 2024 is considered and therefore the ageing cost change-adjusted SPB is the same as the unadjusted SPB in 2024. The increase in ageing costs by 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 in the next adjustment period, while the overall SPB requirement is unchanged, the ageing cost change-adjusted SPB will rise to 3 percent – that is, a one percentage point of GDP adjustment must be made in the non-ageing budget to keep the headline SPB unchanged.

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

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
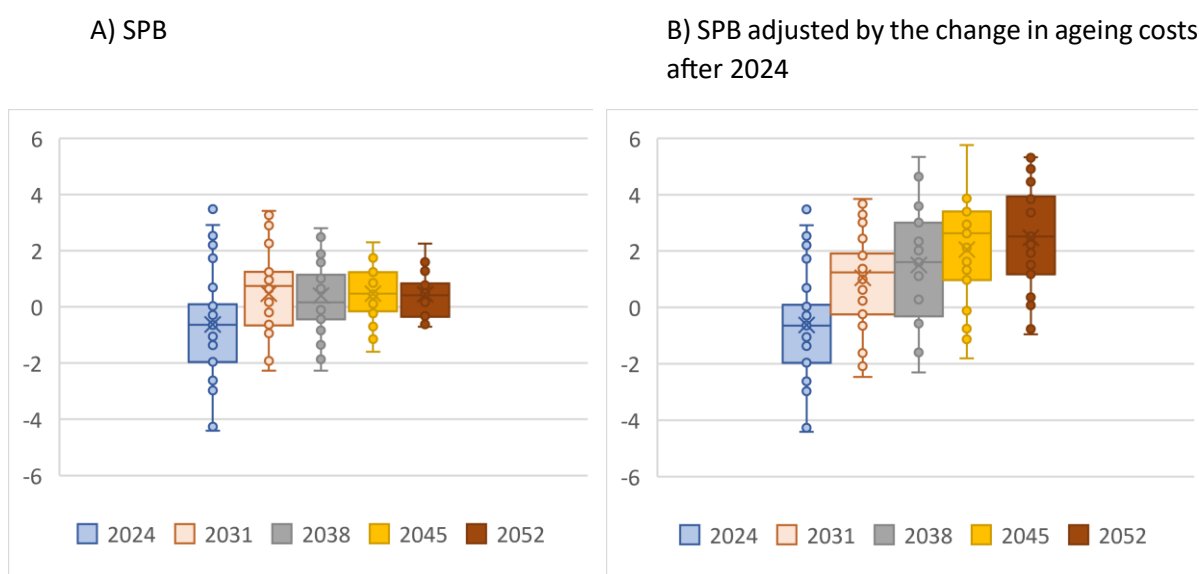
Source: Bruegel, European Commission forecast for 2024.

Figure 3.A shows that the debt sustainability requirements of the new framework would require a front-loaded adjustment, with the median structural primary balance rising by 1.39 percent of GDP, from -0.64 percent in 2024 to 0.75 percent in 2031 and then moderately declining, 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 is required to set debt on a trajectory toward 60 percent of GDP (or keep it there), given demographic, growth and real interest projections over a 17-year horizon (seven years of adjustment plus ten additional years; see Section 2.1 for explanation). As the exercise is repeated in the following seven years, *additional* adjustment is required only to the extent that these projections change at the outer (10 to 17-year) end of the projection horizon, while debt ratios falling below the 60 percent of GDP benchmark ease fiscal requirements further. 13 EU countries would face a persistently high SPB requirement, of about half a point 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.A also shows that the dispersion of SPBs would decline significantly. 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[12], while most countries with debt ratios well below 60 percent in 2024 are projected to raise their ratios and thereby the SPB that keeps the ratio below 60 percent, narrowing the dispersion from below[13].

Figure 3.B shows the combined effect of the structural balance requirements imposed by the fiscal framework and projected changes in ageing cost, that is, the changes needed in the non-ageing budget. The differences with respect to Figure 3.A are substantial. On average, and for most countries, aging costs are projected to rise throughout the projection period. This implies both that the required primary balances at the end of the first adjustment period are higher – with a median of 1.25 percent rather than 0.75 percent, implying an initial rise of 1.89 percent rather than 1.39 percent – and that the ageing cost change-adjusted SPB will 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 would be 3.16 percent of GDP, whereas the unadjusted SPB is required to rise by only 1.05 percent of GDP. This implies that the median EU country must offset rising ageing costs with fiscal consolidation in the non-ageing budget amounting to more than 2 percent of GDP, which is substantial.

Table 2 reports the country-specific values underlying Figure 3. As expected, there are major differences in the adjustment requirements of EU countries, driven mostly by the substantial differences in initial fiscal positions. In terms of the unadjusted SPB, Romania and Slovakia would need to adjust by more than 5 percent of GDP in total from 2024 to 2031, Italy and France would need to adjust by more than 4 percent of GDP, and the adjustment need in Spain, Poland, Belgium and Hungary would be 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.

---

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

[13] For example, Estonia's 21 percent of GDP debt ratio in 2024 is projected to increase to 50 percent by 2052, while its target SPB increases from -1.9 percent of GDP in 2031 to -0.5 percent in 2052.

For several countries, the adjustment requirements in the non-ageing budget will continue after 2031. By 2052, six countries must have an ageing-cost-adjusted SPB level over 4 percent of GDP and for another five countries between 3 percent and 4 percent. These are historically high values, illustrating the stress that population ageing puts on public finances.

At the same time, the DSA would allow Denmark and Sweden to reduce their ageing-cost-adjusted SPBs by about 2 percent of GDP from 2024 to 2052, because of their favourable 2024 starting fiscal positions and their only modest increase (Denmark) or fall (Sweden) of ageing costs over 2024-2052.

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

|	Overall SPB (including ageing costs)					SPB adjusted by the change in ageing costs after 2024				
	2024	2031	2038	2045	2052	2024	2031	2038	2045	2052
AUT	-1.1	0.7	0.6	0.9	0.5	-1.1	1.9	2.0	2.1	2.0
BEL	-1.9	1.2	1.6	1.8	1.7	-1.9	1.9	3.0	3.9	4.5
BGR	-2.3	-1.8	-0.7	0.3	0.4	-2.3	-2.1	-1.6	-0.6	0.1
HRV	-2.0	0.8	0.0	0.1	0.3	-2.0	0.6	-0.5	-0.8	-0.8
CYP	3.5	0.3	-0.4	0.0	0.6	3.5	1.5	2.0	2.7	3.5
CZE	-0.1	0.8	1.0	0.4	-0.4	-0.1	1.0	2.3	3.4	3.8
DNK	2.9	-1.9	-2.3	-1.6	-0.7	2.9	-0.6	-0.4	-0.1	0.4
EST	-0.3	-1.9	-1.4	-1.0	-0.5	-0.3	-1.9	-1.6	-1.1	-0.5
FIN	-0.5	1.0	0.2	1.3	1.6	-0.5	1.4	0.3	1.0	1.5
FRA	-3.0	1.0	1.1	1.2	1.3	-3.0	1.0	1.2	1.2	1.2
DEU	0.0	0.2	-0.4	-0.1	0.2	0.0	1.1	1.1	1.5	1.8
GRC	1.7	2.3	2.1	1.9	1.3	1.7	1.6	2.4	3.0	2.5
HUN	0.0	3.4	2.5	1.0	0.8	0.0	3.3	3.6	3.9	4.5
IRL	2.5	-0.6	-0.1	-0.2	-0.5	2.5	0.2	1.6	2.6	3.4
ITA	-1.1	3.3	2.7	2.3	1.7	-1.1	3.8	3.9	3.2	1.5
LVA	-1.4	-0.7	0.0	0.7	0.8	-1.4	-0.7	-0.3	0.1	0.6
LTU	0.0	-0.2	-0.4	-0.2	0.2	0.0	1.2	2.0	2.9	3.9
LUX	0.1	-0.8	-0.8	-0.2	0.6	0.1	-0.2	1.2	3.0	5.3
MLT	-2.9	-0.9	0.1	1.3	2.2	-2.9	-1.6	-0.6	1.3	3.9
NLD	-0.6	-0.2	-0.7	-0.7	-0.3	-0.6	0.7	1.2	1.6	2.2
POL	-2.6	1.0	1.1	1.2	0.8	-2.6	1.6	1.4	1.7	1.9
PRT	2.2	2.3	1.9	-0.1	-0.5	2.2	3.7	4.6	3.9	2.7
ROU	-4.4	1.0	0.8	0.5	0.4	-4.4	2.4	2.3	2.7	2.7
SVK	-4.3	1.3	0.7	0.6	0.4	-4.3	3.0	3.3	4.1	4.9
SVN	-1.2	0.6	0.7	0.5	-0.4	-1.2	1.8	3.1	4.1	4.5
ESP	-0.8	2.9	2.8	1.7	0.4	-0.8	3.8	5.3	5.8	5.3
SWE	0.7	-2.3	-1.9	-1.1	-0.6	0.7	-2.5	-2.3	-1.8	-1.0
median	-0.6	0.7	0.2	0.5	0.4	-0.6	1.2	1.6	2.6	2.5

Source: Bruegel and European Commission forecast for 2024.

2.4 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 drop 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). Figure 5 shows our calculations for the difference in fiscal adjustment requirements under each of the alternative scenarios relative to the baseline, under baseline assumptions for the remaining variables, and assuming that only the DSA criteria, the deficit below 3 percent benchmark and the no-backloading safeguard are required [14].

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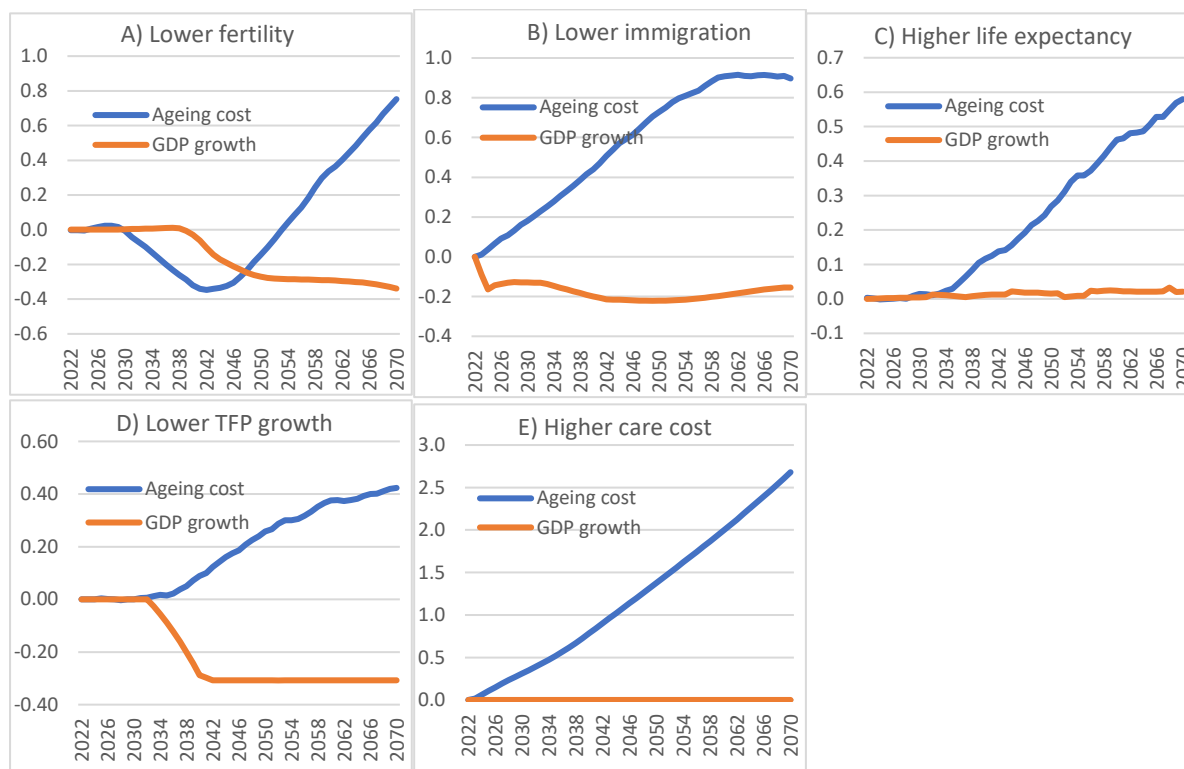
Source: Bruegel; EU average calculated based on country-specific data in European Commission (2024b). Note: Ageing cost is measured as percent of GDP; GDP growth is measured as percent annual growth. The difference between the alternative scenario and the baseline scenario is reported.

---

[14] There is no need for an ageing-cost change adjustment to Figure 5 (and also 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.

Figure 5: Difference between structural primary balances required under the baseline and under scenarios leading to additional debt sustainability risks, 7-year adjustment periods (% of GDP)
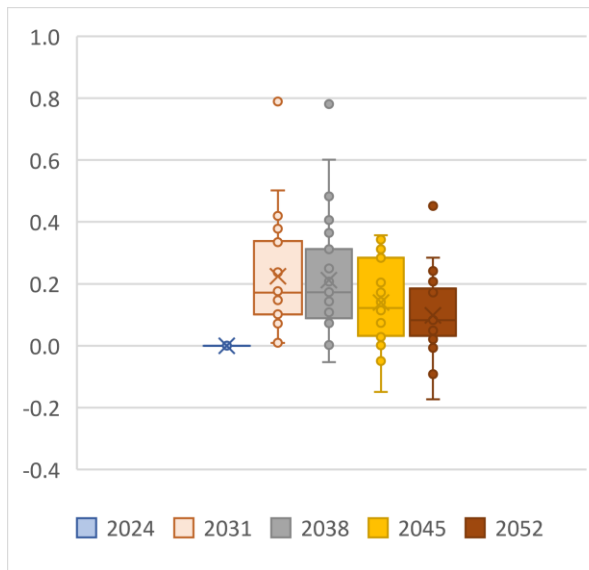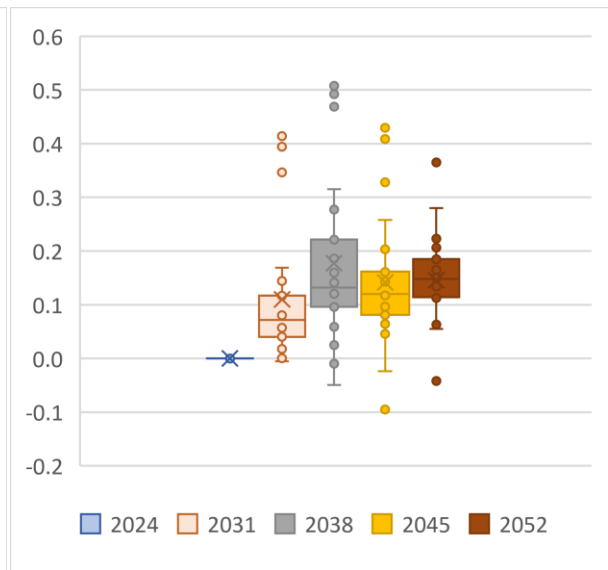
A) Lower fertility
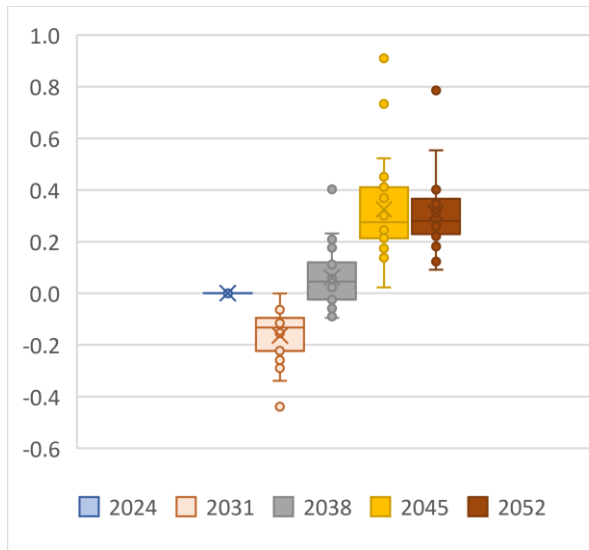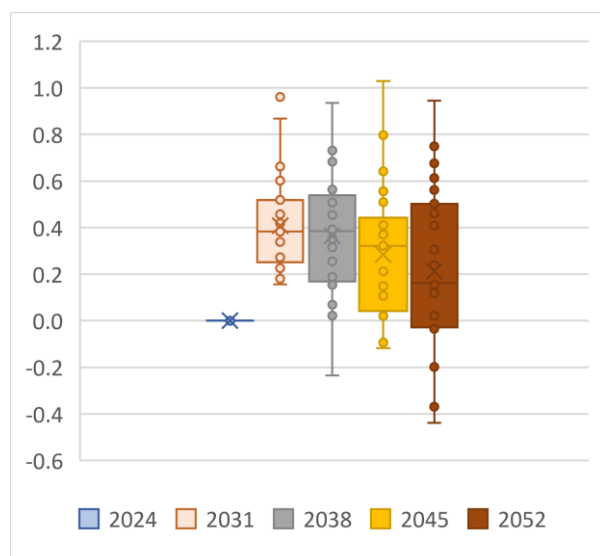
B) Higher life expectancy
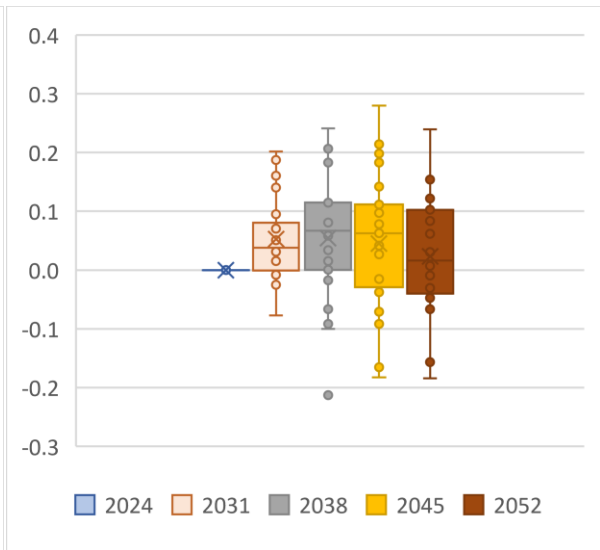
C) Lower immigration

D) Lower TFP growth

E) Higher care costs

Source: Bruegel.

The main results are summarised as follows:

- **Lower fertility** (Figure 5, panel A) initially <u>lowers</u> 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 due to the reduced workforce, while ageing costs as a share of GDP go up. From 2039, the required structural primary balance rises by about 0.3 percent of GDP per year on average.
- **Longer life expectancy** (Figure 5, panel B) has effects in both directions. On the one hand, pensions costs go up as people get older, raising ageing costs. On the other hand, 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** (panel C of Figure 5) requires higher 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** (panel D of Figure 5): 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 gradually increase 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 increases 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 (Figure 5, Panel D). 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, it has the most dramatic impact: an increase

in the required structural primary balance by 0.4 percent per year between 2025 and 2045 on average, although with wide dispersion. This major impact reflects the Ageing Report's assumption of long-term-care unit costs almost doubling relative to the baseline scenario by 2070 (Figure 2, Panel F).

3. 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 these literatures 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 member states 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 what is the implementation record by EU countries?

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

3.1 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. Three can be taken from the eight scenarios for which the Ageing Report has identified implications for ageing costs and growth (see Figure 2): (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 of three alternative scenarios presumed to reduce debt sustainability risks on ageing costs and GDP growth (EU average, relative to baseline)
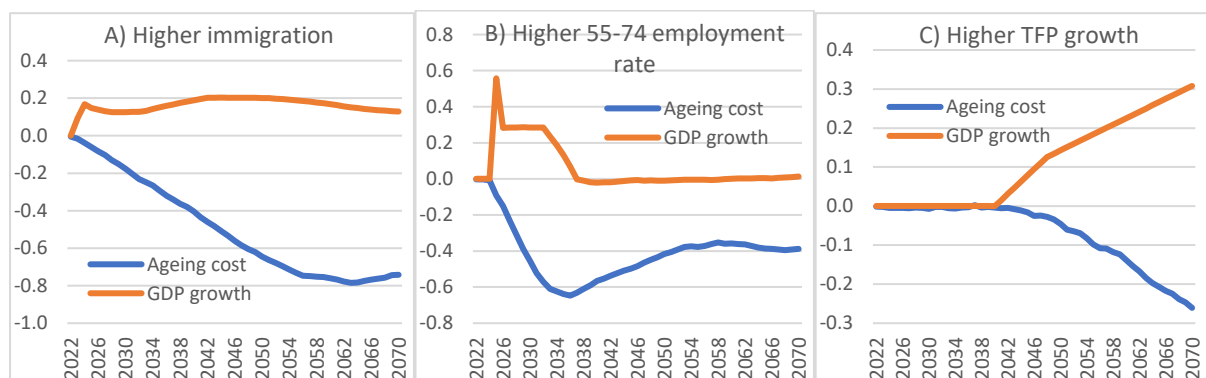
14

Higher net immigration leads to a permanent rise in GDP growth because of the increase in the 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 is widening relative to the baseline (assumed to occur between 2024 and 2036; see Figure 2, panel B). 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 Aging Report lacks 'positive' counterparts of 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[15]. However, a 20 percent jump in fertility analogous to the 20 percent drop assumed in the Aging 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 has 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 B 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

---

[15] 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.

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.

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

A) Higher immigration

B) Higher 55-74 employment rate

C) Higher TFP growth

D) Higher fertility
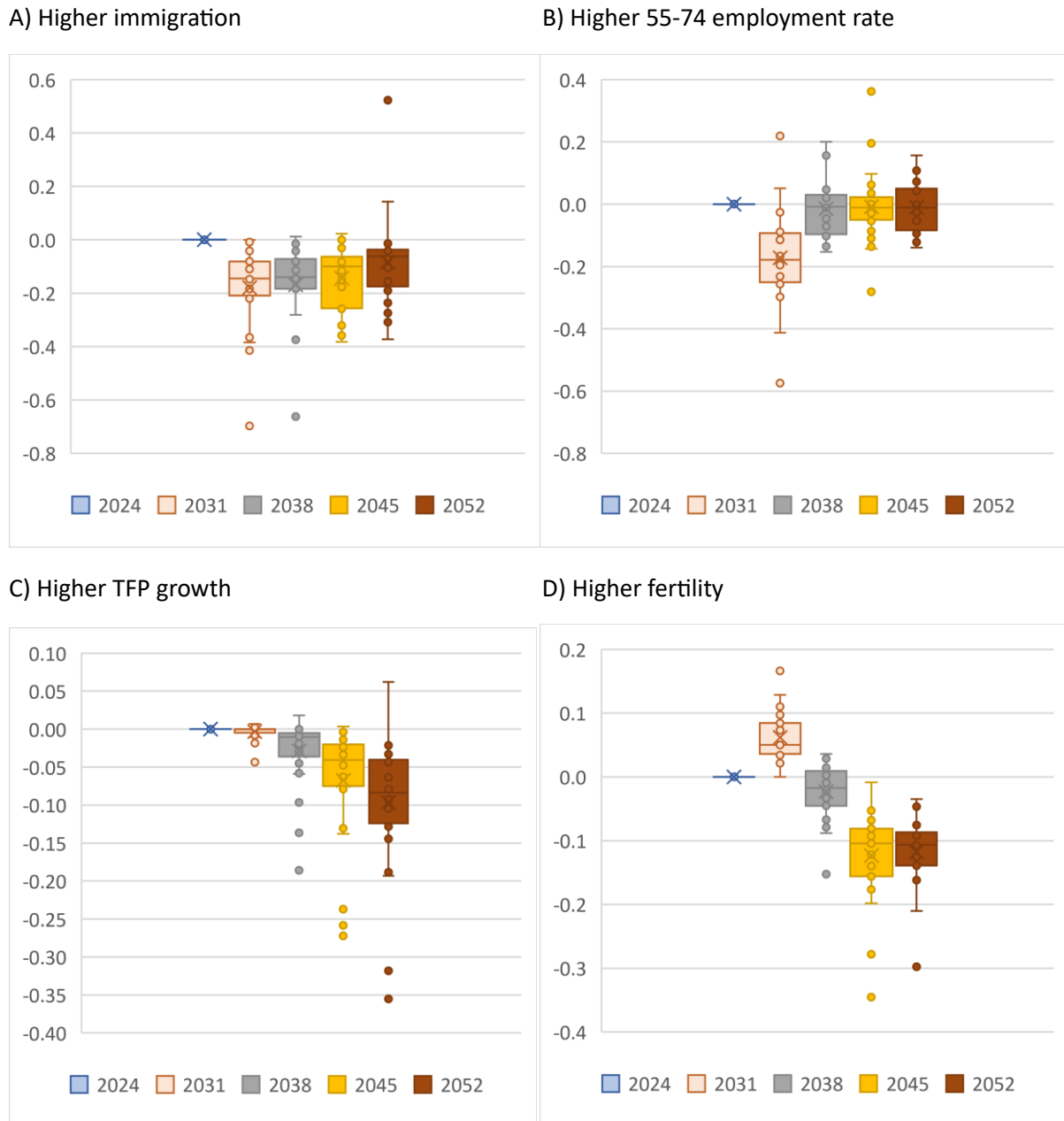
Source: Bruegel.

3.2 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 regularly included 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 increase 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 a system to forecast skills and needed competencies, 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.

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 skills 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, accelerate the harmonisation of the statutory retirement age for women and men, unifying the rules of the different pension regimes, reviewing the pension indexation mechanism, 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: reduced income, 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. They 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 seemed 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, they argue 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[16], 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; both aimed at better targeting and not at influencing fertility levels[17].

Despite the crucial demographic challenge EU countries face and low productivity growth, the implementation of demography, TFP, and pension-related CSRs in the context of the European Semester is modest. The average implementation score across all EU countries ranges between 'limited progress' and 'some progress' (Table 1). For demography, among the altogether 852 related recommendations made 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 1, panel B). Only seven of the altogether 605 recommendations were fully implemented after one year, and substantial progress was achieved for 51. The implementation of pension-related CSRs is even weaker.

---

[16] 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*".
[17] 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 1: 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: Bruegel 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 following policy area classifications of the European Commission: 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 policy area classifications of the European Commission: Access to finance, Growth financing (incl. 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 of the European Commission: Long-term sustainability of public finances, inc. pensions; Pension systems and active ageing.

4. Conclusion

Demographic change will continue to add significantly to the fiscal pressures facing EU countries. But 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 member states to anticipate and offset increases in ageing costs. 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 structural primary balance 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 structural primary balance. In fact, the increase in the structural primary balance required over the entire horizon studied in this paper, 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 the EU – fiscal adjustment in the non-ageing budget must continue after the initial four to seven year long adjustment period to provide resources for rising ageing costs, even if the structural primary balance

does not need to increase further. The reason for this is that even when the structural primary balance 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. Our simulations show that this effect could be very significant: for the median EU country, rising ageing costs require an extra 2 percent of GDP adjustment in the non-ageing budget from 2024 to 2052.

Some of this adjustment could be avoided. Our sensitivity analyses show that reforms that raise labour force participation (including of older workers), reduce the costs of caring for the elderly, increase immigration and raise fertility could significantly lower the fiscal adjustment that is required to offset higher ageing costs.

Yet, member-state implementation of European Semester CSRs on labour force participation and pension reform – as well on increasing productivity growth – remains poor. At the same time, 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 it tackles in its recommendations.

References

Bergsvik, Janna, Agnes Fauske and Rannveig Kaldager Hart (2021) 'Can Policies Stall the Fertility Fall? A Systematic Review of the (Quasi-) Experimental Literature', Population and Development Review (74), p. 913-964, available at: https://doi.org/10.1111/padr.12431

Deroose, S. and J. Griesse (2014) 'Implementing economic reforms – are EU Member States responding to European Semester recommendations?' ECFIN Economic Brief 37, European Commission, available at https://ec.europa.eu/economy_finance/publications/economic_briefs/2014/eb37_en.htm

Darvas, Z., L. Welslau and J. Zettelmeyer (2024a) 'Incorporating the impact of social investments and reforms in the European Union's new fiscal framework', Working Paper 07/2024, Bruegel, https://www.bruegel.org/working-paper/incorporating-impact-social-investments-and-reforms-european-unions-new-fiscal

Darvas, Z., L. Welslau and J. Zettelmeyer (2024b) 'The implications of the European Union's new fiscal rules', Policy Brief 10/2024, Bruegel, https://www.bruegel.org/policy-brief/implications-european-unions-new-fiscal-rules

European Commission (2023) 2024 Ageing Report: Underlying Assumptions & Projection Methodologies, Institutional Paper 257, Directorate General of Economic Affairs, available at https://economy-finance.ec.europa.eu/publications/2024-ageing-report-underlying-assumptions-and-projection-methodologies_en

European Commission (2024a) Debt Sustainability Monitor 2023, Institutional Paper 271, Directorate General of Economic Affairs, available at https://economy-finance.ec.europa.eu/publications/debt-sustainability-monitor-2023_en

European Commission (2024b) 2024 Ageing Report, Institutional Paper 279, Directorate-General for Economic and Financial Affairs, available at https://economy-finance.ec.europa.eu/publications/2024-ageing-report-economic-and-budgetary-projections-eu-member-states-2022-2070_en
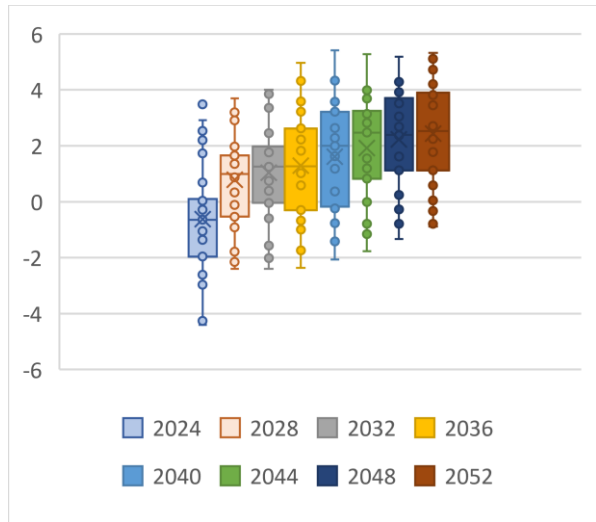
Appendix

Figure A3: Baseline fiscal balance paths to meet EU DSA requirements and maintain the deficit below 3% of GDP, 4-year adjustment periods (structural primary balance, % of GDP)
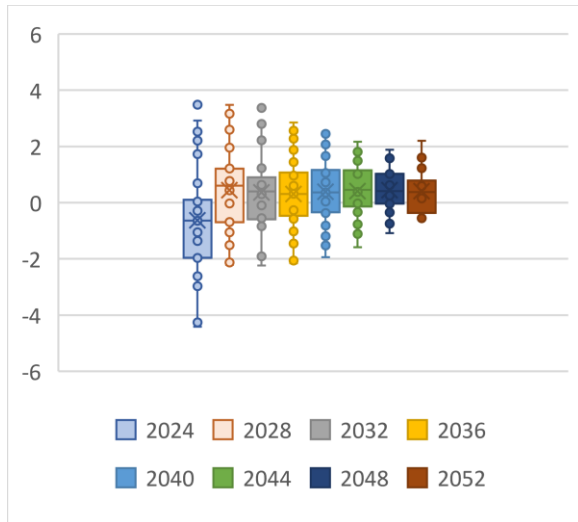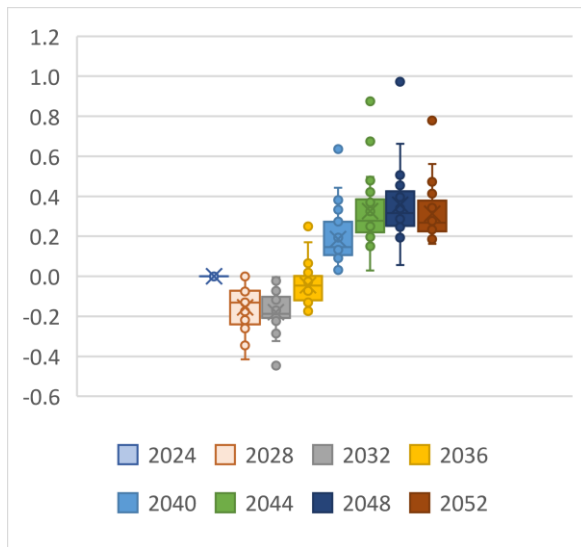
A) SPB

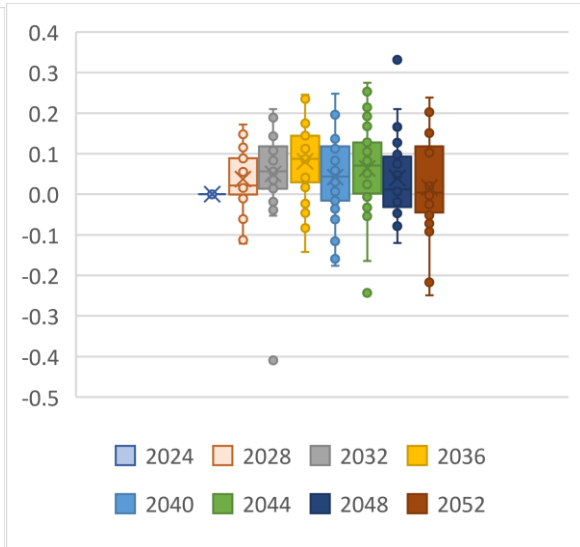B) SPB adjusted by the change in ageing costs after 2024

Source: Bruegel, European Commission forecast for 2024.

Figure A5: Difference between structural primary balances required under the baseline and under scenarios leading to higher debt sustainability risks, 4-year adjustment periods (% GDP)
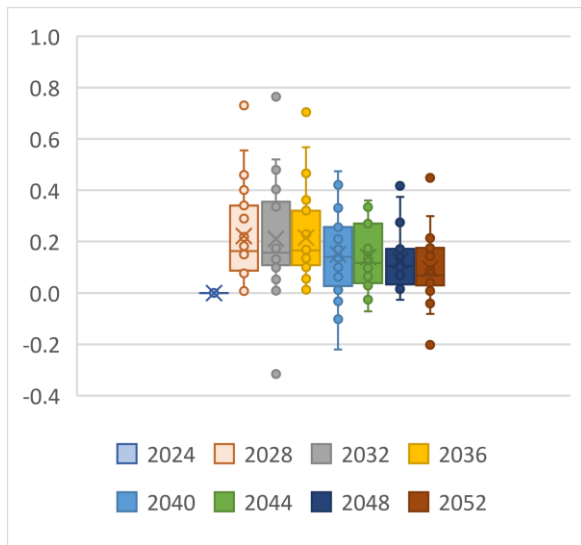
A) Lower fertility

B) Higher life expectancy

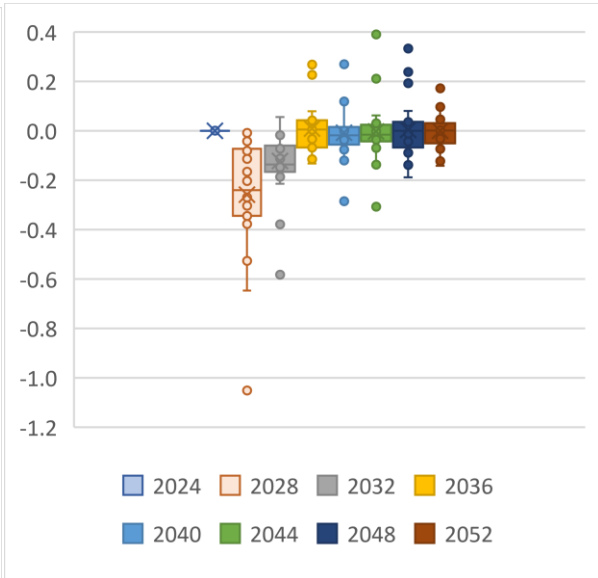C) Lower immigration

D) Lower TFP growth
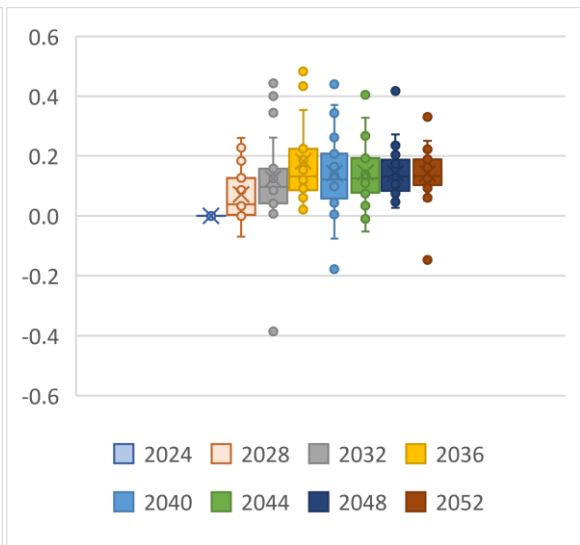
E) Higher care costs
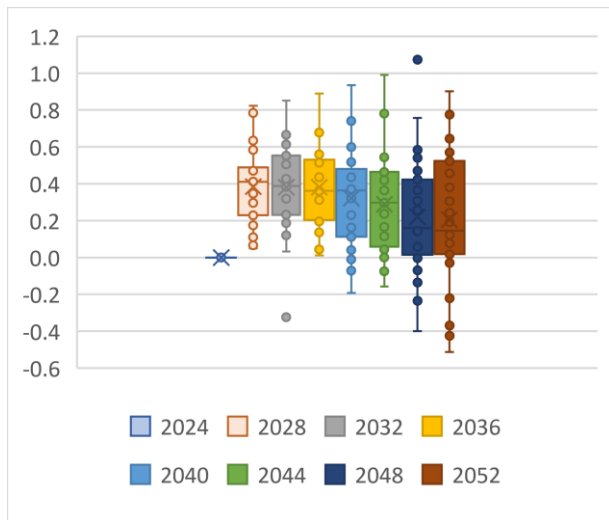
Source: Bruegel.

Figure A7: Difference between structural primary balances required under the baseline and under scenarios presumed to lower to debt sustainability risks, 4-year adjustment periods (% GDP)
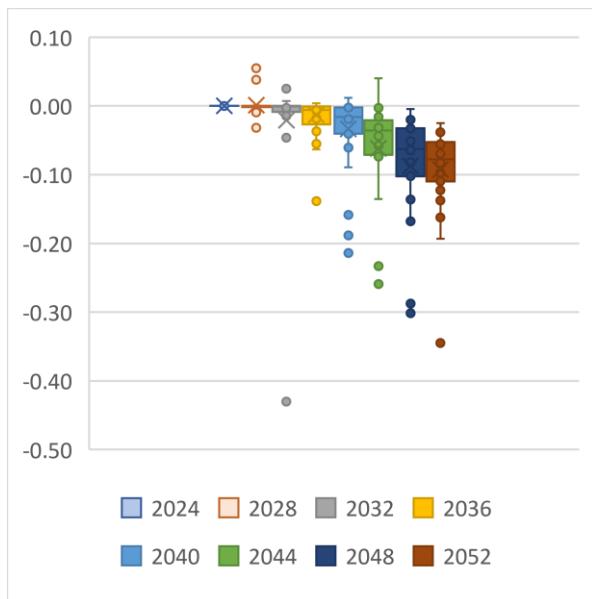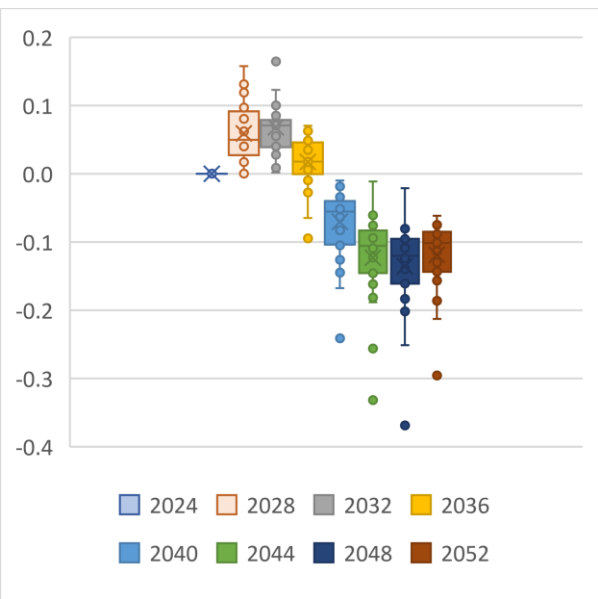
A) Higher immigration

B) Higher 55-74 employment rate

C) Higher TFP growth

D) Higher fertility

Source: Bruegel.