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Sustainable long-term growth in advanced economies: the demographic challenge

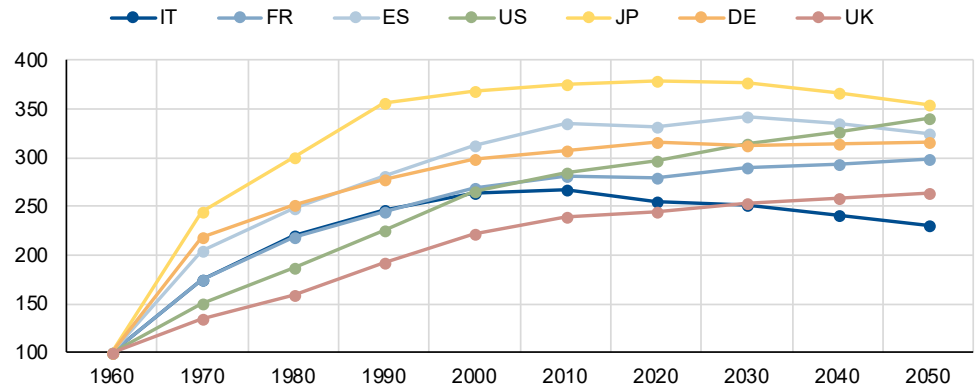
Scope Ratings

Demographics and labour-market inclusion are increasingly important determinants of growth in advanced economies where productivity is in structural decline. In this study, we look at the impact of demographic trends on future economic growth, assuming productivity growth and employment rates remain constant. GDP growth rates are likely to decrease in all countries in the coming decades, but large differences exist between advanced economies. Countries can not only enhance productivity to maintain positive long-term growth but also implement policies to address adverse demographic trends and employment trends – two key variables which are captured in Scope's ESG-risk pillar in its revised sovereign rating methodology.

Demographic factors explain a significant part of the downward trend in advanced economies' economic growth and are likely to remain an important factor in coming decades. In this study covering the period 1960-2050 for advanced economies, we focus on three drivers of GDP growth: the working-age population, productivity and the employment rate.

Our model holds productivity and employment rates constant at 2014-19 levels – which we recognise is a bold assumption as these can change significantly as a result of government policies – but it allows us to estimate a country's growth prospects based only on its demographic trends which are less likely to fluctuate.

Figure 1: Long term growth projections based on UN demographic forecasts*
Real GDP, index: 1960 = 100



* assuming constant average productivity growth and employment rate as in 2014-19, see Annex I for details on the model

Source: UN, World Bank, AMECO, FED, Scope Ratings GmbH

Growth prospects are structurally declining in all advanced economies, but significant differences exist across selected countries:

- **The US (AA/Stable), UK (AA/Negative)** and **France (AA/Stable)** are likely to continue to grow in the long term thanks to relatively favourable demographic trends.
- **Germany (AAA/Stable)** and **Spain (A-/Negative)** are likely to see GDP stagnate over the coming decades. Adverse demographic trends are likely to offset expected gains in productivity and employment (assuming these are sustained over the coming years).
- **Japan (A+/Negative)** and especially **Italy (BBB+/Negative)** are likely to experience a marked decline in their GDP levels in the next decades unless the adverse demographic trends are offset with productivity and employment gains not seen during recent years.
- **Rating implications**: policies that improve countries' productivity, demographic trends and employment rates are critical to ensure long-term sustainability of public debt.

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Sustainable long-term growth in advanced economies: the demographic challenge

Demographics are a key source of economic growth

Demographics as key driver of growth…

Demographic factors are a significant factor in the downward trend in advanced economies' economic growth in recent decades. Ageing populations are likely to remain an important factor constraining GDP growth in advanced economies, especially with the baby-boomer generation entering retirement over the next years[1].

…through different channels

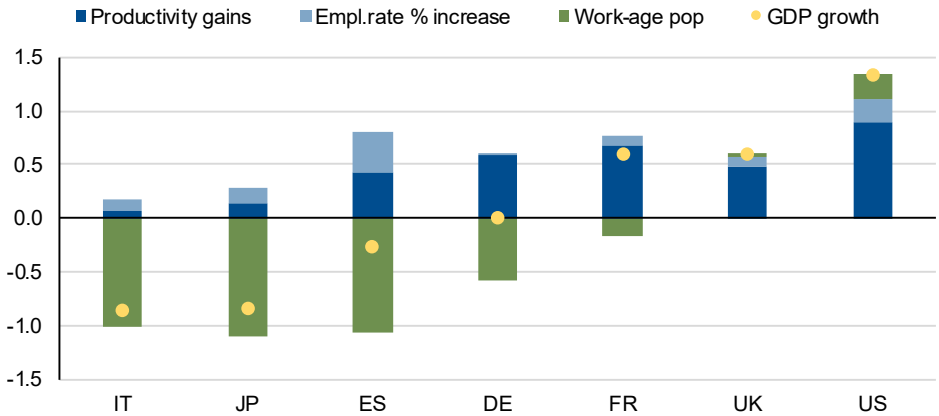
Demographics impact economic growth through different channels. First, an ageing population reduces the availability of labour inputs as the size of the working-age population declines. Secondly, ageing has an impact on whether a population tends to save or consume and how people balance work and leisure[2]. Thirdly, the changing structure of the population also affects productivity growth though the direction is not clear-cut: older workers may enjoy higher productivity due to the accumulation of work experience; younger workers may benefit from better health, the ability to adjust faster to technological changes and pursue entrepreneurial ventures leading to more innovation. These two countervailing forces may produce an inverted U-shaped pattern between age and productivity, with the age groups in their 40s being the most productive.[3]

Demographic trends and growth prospects vary widely across advanced economies

Our model

In this study covering the period 1960-2050 for advanced economies, we focus on three drivers of GDP growth: the working-age population, productivity and the employment rate. Our selected countries include advanced economies from among those for which we provide credit ratings, namely: Germany, France, Italy and Spain in the euro area, the UK, the US and Japan (details in Annex I).

Figure 2: Average annual growth rate* components for 2020-50



* Data in natural logarithm to ensure additivity. Employment rate and productivity gains are held constant at their 2014-19 levels.

Source: UN, WB, AMECO, FED, Scope Ratings GmbH

The model in two steps:

- First, we decompose growth rates between 1960 and 2020[4] into the three growth drivers;
- Secondly, we forecast economic growth between 2020 and 2050 based on the UN demographic projections, keeping the employment rate and productivity gains unchanged as observed during the period 2014-19.

[1] Kim, Jinill (2016). "The Effects of Demographic Change on GDP Growth in OECD Economies," IFDP Notes. Federal Reserve System, September 28, 2016
[2] VOX, Cooley and Henricksen, "Demographics and long-run growth", 2018
[3] IMF Working Paper, WP/16/237, Liu and Westelius, "The impact of demographics on productivity and inflation in Japan", 2016
[4] We used IMF WEO June 2020 forecast to compute GDP 2020 levels

Projecting long-term growth prospects, based on demographics

For this reason, our estimates account neither for the downside risks from shocks linked to the global financial, sovereign debt or Covid-19 crises, nor the upside potential from technological advances or the introduction of government policies that may affect productivity gains, demographic trends and employment rates.

While growth prospects decrease over time, large difference across advanced economies exist

Our model confirms that growth prospects are structurally declining in all advanced economies. However, it also shows very different prospects across selected countries, which we can divide into three groups based on their demographic impact:

- **Less affected:** The US, France and the UK are likely among those advanced economies to maintain a positive growth outlook over the coming decades driven by positive or only slightly negative demographic trends and robust productivity growth as experienced during the 2014-19 period.
- **Somewhat affected:** Germany and Spain are likely to be among the advanced economies with stagnant growth even assuming past productivity gains persist as these are, at best, enough only to offset adverse demographic dynamics. The case of Spain also highlights the importance of improvements in the employment rate, which, in the coming years is unlikely to be repeated given the Covid-19 shock.
- **Strongly affected:** Japan and especially Italy, face very unfavourable demographic dynamics leading to large decreases in their working age populations. To offset this drag on economic growth, important productivity gains are needed in the future.

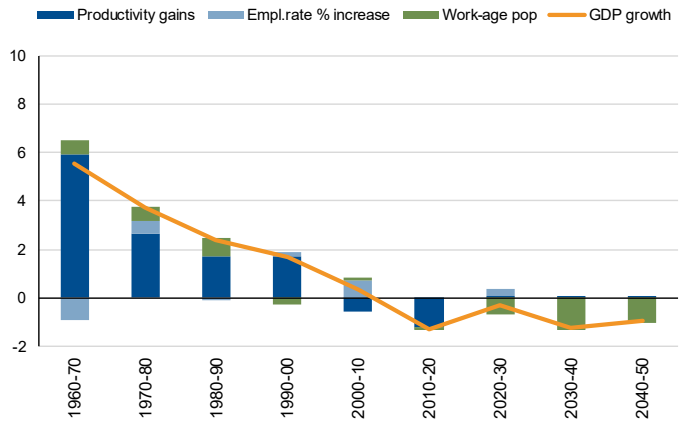
As productivity structurally declines across advanced economies, demographics drive diverging future growth prospects

Comparing the best (US) and the worst (Italy) performer over time highlights the magnitude of the problem: For 2050, US GDP could be as large as 115% of its 2020 level in real terms, while the projection for Italy suggest its GDP may be only around 90% of its 2020 level[5].

We also notice a varying importance of growth drivers over time. While productivity growth and demographics were positive before 2000 in both countries, now and in the future, productivity growth is structurally declining as is the growth contribution from the working-age population.

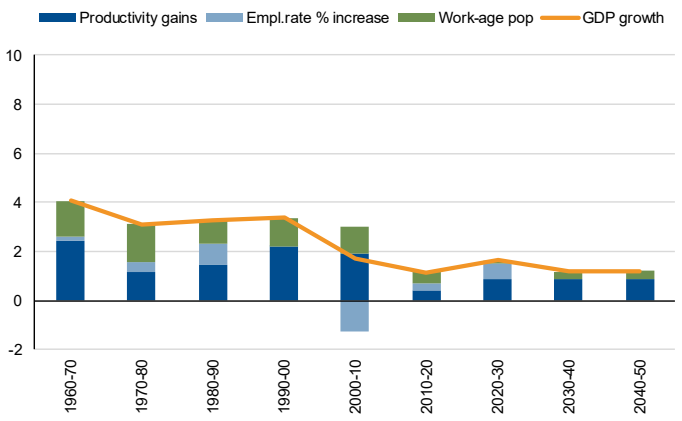
Overall, growth prospects are set to decline in both countries, but in the US the working age population is expected to continue to increase, though at a slower pace. Italy, on the other hand, saw a rapid – and to date irreversible – productivity decline after 2000, in addition to severe working age population reductions projected in the next decades.

Figure 3: IT: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

Figure 4: US: average annual growth rate, by component



Source: UN, WB, AMECO, FED, Scope Ratings GmbH

[5] Please refer to the annex as this is based on a logarithmic approximation.

Annex I: Our model of GDP decomposition

$$\text{GDP} = \frac{\text{Productivity}}{\frac{\text{GDP}}{\text{E}}} \times \frac{\text{Empl. Rate}}{\frac{\text{E}}{\text{WA}}} \times \frac{\text{Work.-age pop.}}{\text{WA}}$$

$$\text{gdp growth} = \Delta\ln \text{Productivity} + \Delta\ln \text{Empl. Rate} + \Delta\ln \text{W.A. pop.}$$

A simplified growth accounting model based on identities:

Growth accounting approaches can be based on a production function and/or a series of identities. We base our model on growth accounting identities only[6] in order not to depend on assumptions regarding behavioural and technology functions. Still, we recognize that, by adopting such simplifications, we cannot disentangle the interactions among the factors of growth, which is an important limitation of the model that can be used mainly as a starting point in quantifying sources of long-term growth.

Comparing logarithmic approximation with actual growth rates:

The approach adopted in this paper builds on a multiplicative decomposition of real GDP. In order to analyse growth dynamics, the growth rates of all components, as well as that of real GDP itself, are expressed in natural logarithms. The natural logarithmic form allows us to express the components of growth, which compound on one another, in an additive form, to obtain real GDP growth, thereby facilitating easier interpretation and comparisons across countries. However, estimates using the natural logarithmic approach *approximate* precisely actual growth rates in the case of small changes, but larger discrepancies exist in the case of growth rates of larger magnitudes. Our focus is on interpreting comparative contributions between growth components and cross-country differences in growth dynamics, while the value on cumulative growth figures should not be interpreted as precise values.

Forecasting horizon assumptions:

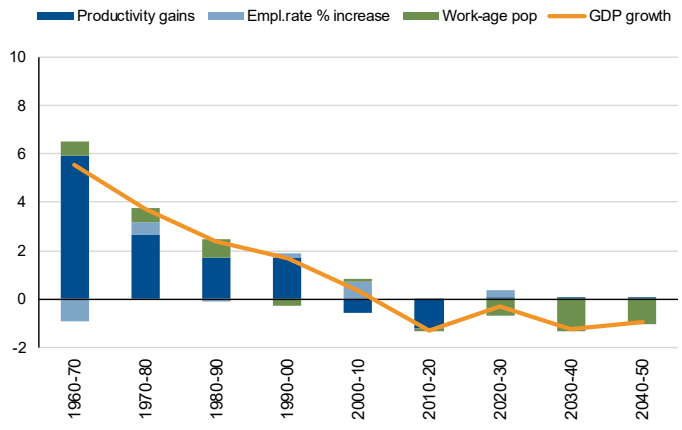
We cap the forecast by 2050 as: i) the main fiscal and economic impact from the baby boomer generation will have terminated by then, and ii) we have less certainty on the forecasts for demographics afterwards, with a share of the workforce not even born today.

In our forecasts, we keep employment rates and productivity gains constant at the 2014-19 average. This allows us to balance recent developments with a long forecast horizon as we i) smooth values over a five-year period, ii) avoid including cyclical effects related to the sovereign debt crisis, and iii) do not expect labour market reforms in advanced economies to reverse employment rates to their early 2000 levels nor do we expect more favorable productivity dynamics typical of the past decades going forward.

Annex II: Country-specific data

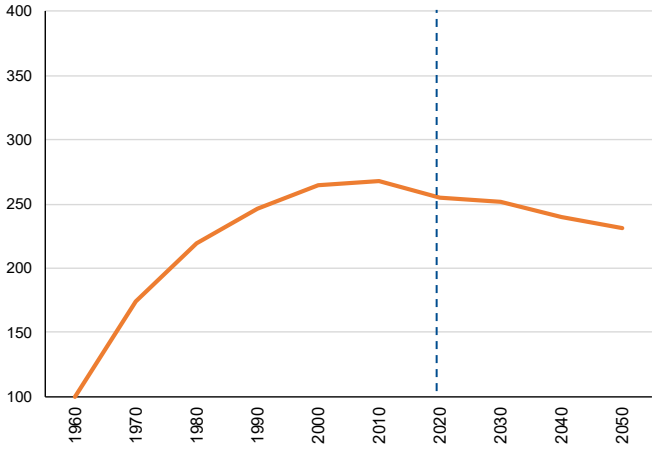
Italy

Figure 5: IT: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

Figure 6: IT: real GDP, long term projections, 1960=100

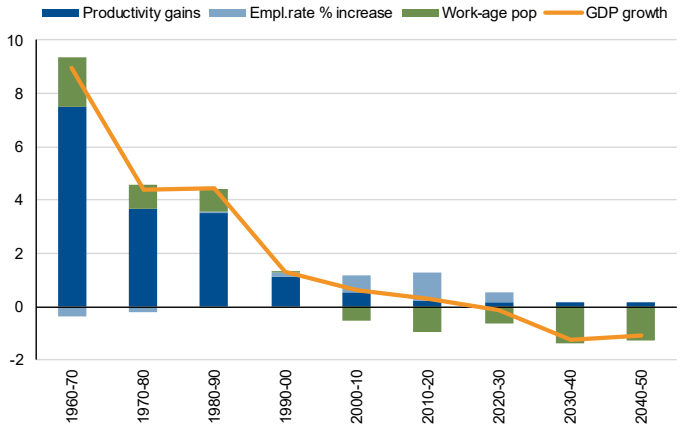


Source: UN, WB, AMECO, Scope Ratings GmbH

[6] A similar approach has been used by Maddaloni et al.," Macroeconomic implications of demographic developments in the euro area", ECB Occasional Papers, 2006

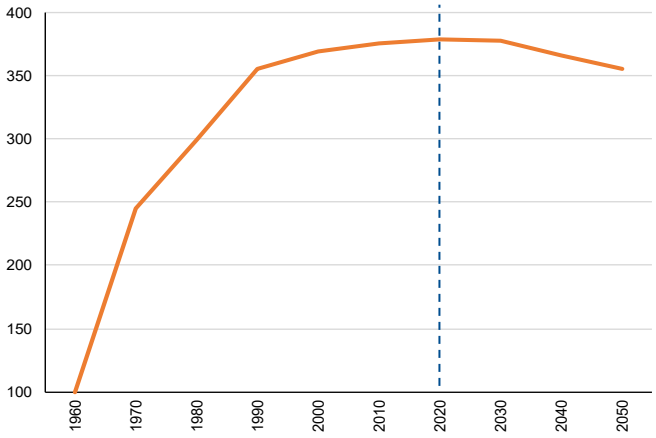
Japan

Figure 7: JP: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

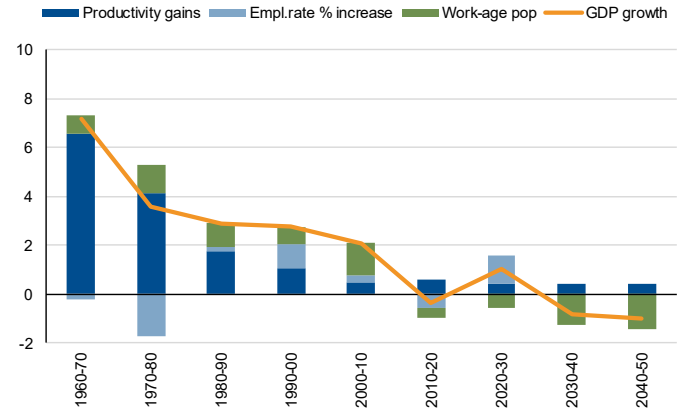
Figure 8: JP: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, Scope Ratings GmbH

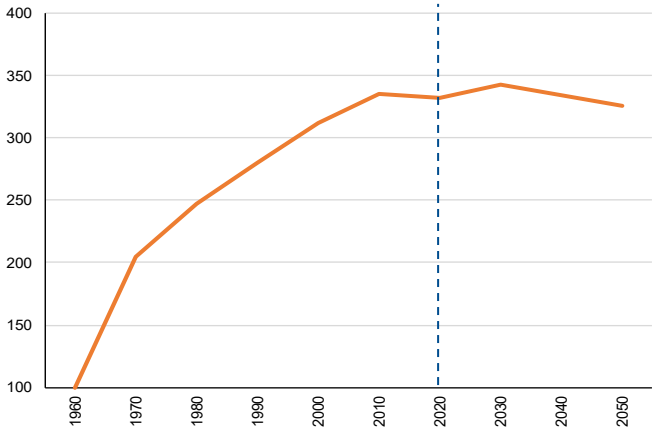
Spain

Figure 9: ES: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

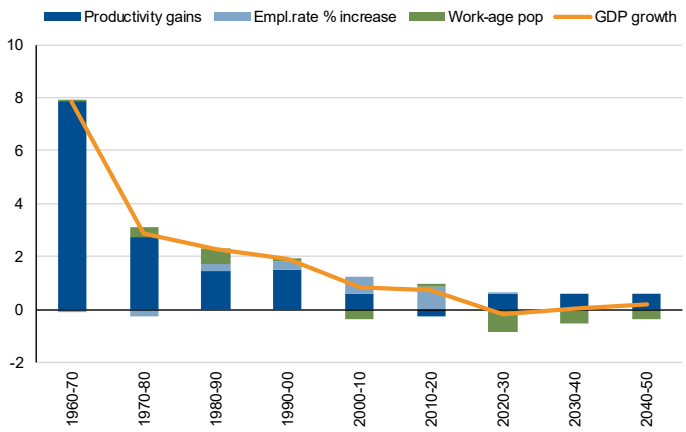
Figure 10: ES: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, Scope Ratings GmbH

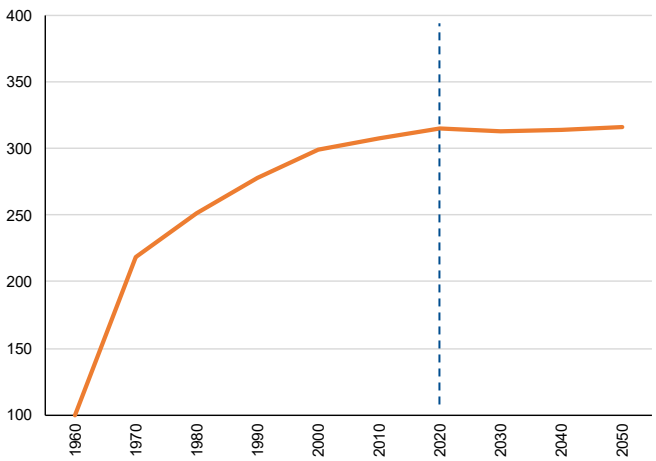
Germany

Figure 11: DE: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

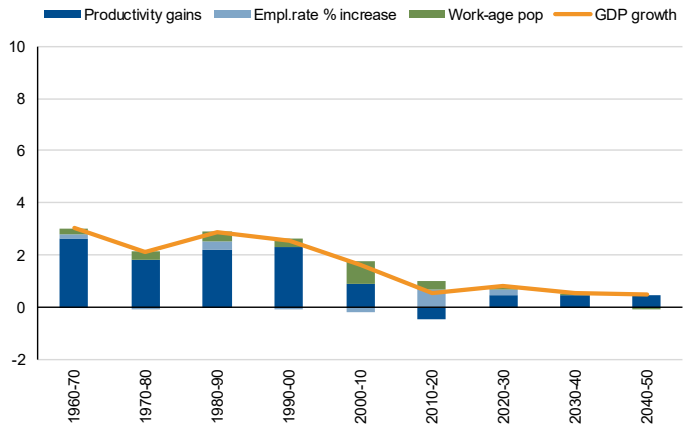
Figure 12: DE: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, Scope Ratings GmbH

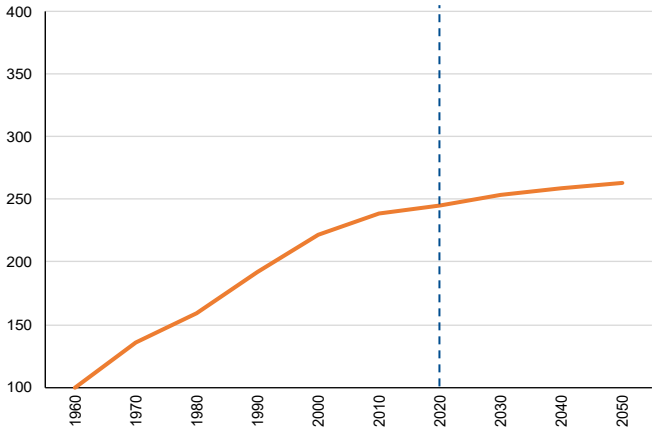
United Kingdom

Figure 13: UK: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

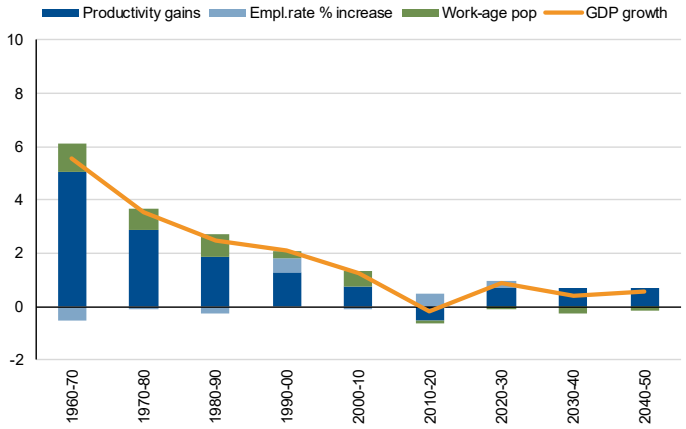
Figure 14: UK: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, Scope Ratings GmbH

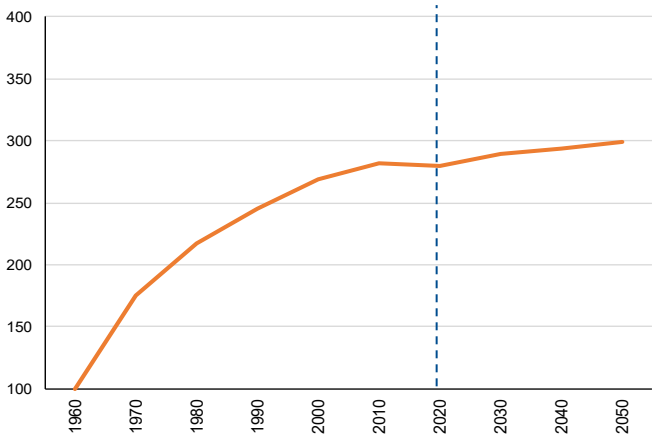
France

Figure 15: FR: average annual growth rate, by component



Source: UN, WB, AMECO, Scope Ratings GmbH

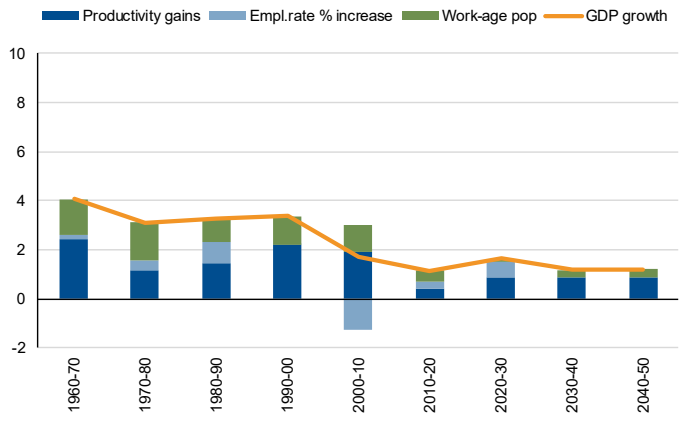
Figure 16: FR: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, Scope Ratings GmbH

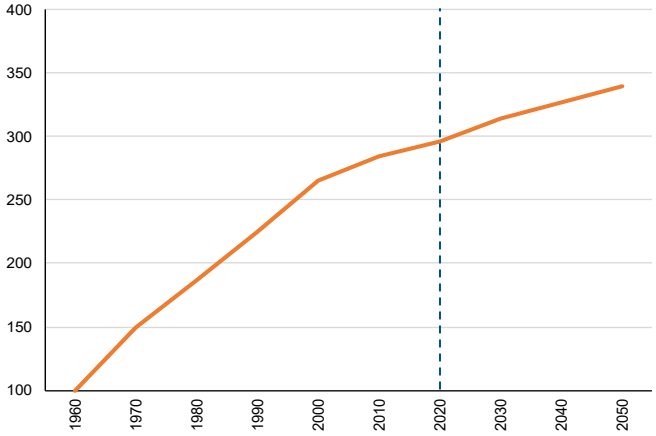
United States

Figure 17: US: average annual growth rate, by component



Source: UN, WB, AMECO, FED, Scope Ratings GmbH

Figure 18: US: real GDP, long term projections, 1960=100



Source: UN, WB, AMECO, FED, Scope Ratings GmbH

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