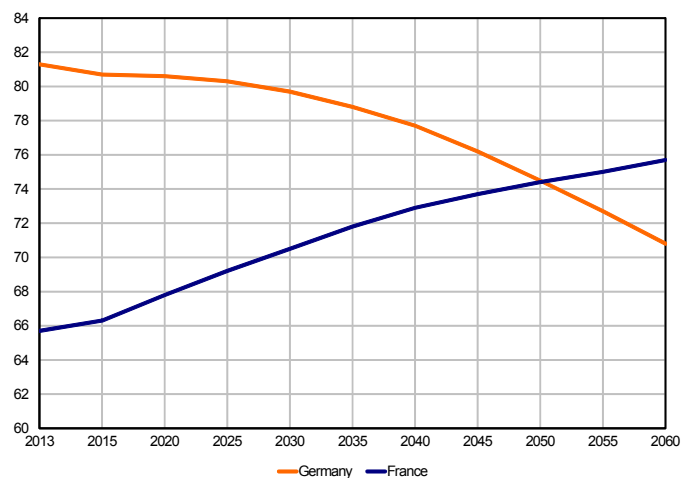


Will demography disrupt the German economic model?

- Germany's population decline has already begun, despite the short-term stabilisation provided by immigration. In 2013, Germany's total population of 81.3 million had already fallen by 500,000 since 2003. In very recent years, it has been stabilised by a strong wave of immigration, but whether that pattern will persist remains uncertain, as shown by alternating periods of positive and negative net flows in the past. Since 2008, Germany has again become a host country for immigrants. Despite increased flows from the southern part of the euro area due to the economic crisis, the main sources of inflows have been the Eastern European countries. Future annual net inflows of immigrants are projected to vary between 100,000 and 250,000, with differences depending on the time horizon and assumptions. In any event, however, those levels will be too low to stop Germany's population from shrinking.
- Over the long term, Germany's population decline should accelerate, with the total population set to be less than that of France as from 2050. The trend should intensify and Germany's population should continue to age owing to rising life expectancy at birth and low fertility. The total population is projected to contract by 13.5% between now and 2060, according to the European Commission. The working-age population is expected to shrink to an even greater extent, by roughly 30%. By 2050, Germany's population should have fallen to 75 million, the same level as France where the population should continue to climb to 75.7 million compared with 65.7 million in 2013.
- The simulations project a decline in the economically active population by 2060. The trend is expected to be quite pronounced in the period until 2035, before easing between 2035 and 2060. The German economy, already close to full employment, should experience a labour-force shortage, constraining the labour supply and therefore potential growth. International organisations see potential growth falling from 1.5% a year in 2015 to 0.7% around 2030, before rising to roughly 0.9% in 2050-2060.
- Population ageing should entail higher social spending for pensions, health and long-term care, rising from 18% of GDP in 2010 to 25% in 2060. If government revenue as a percentage of GDP remains unchanged, that could lead to a severe worsening of the general government fiscal balance, and then public debt.
- The authorities have taken action to deal with these issues, including efforts to raise the birth rate through a more generous family policy and broader access to day care for young children, easing of restrictions on the free movement of workers from Central and Eastern European countries, facilitating the immigration of skilled labour, and encouraging labour market participation by older people and women. The impact of these measures, however, remains uncertain.

Projected total population in France and Germany (million)



Source: European commission, *The 2015 Ageing Report*.

1. Germany's population decline has already begun, despite the influx of immigrants

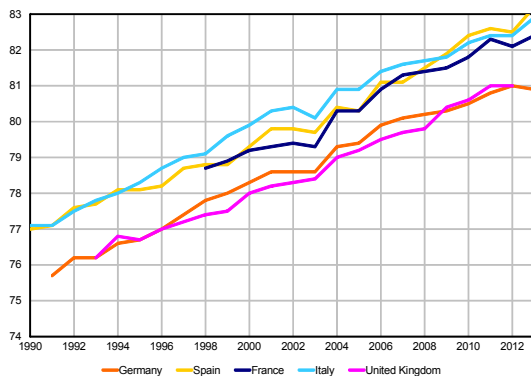
1.1 Germany's population is declining and ageing under the combined impact of increased life expectancy and low fertility

As in most European countries, the increased life expectancy at birth in Germany has led to population ageing. Between 1991 and 2013, life expectancy at birth rose from 75.2 to 80.9 years (see Chart 1). Ageing has been compounded by low fertility, as Germany's total fertility rate has remained below 1.4 since the 2000s (see Chart 2), far less than the 2.1 required for population replacement. The number of births has continued to fall, reaching

690,000 in 2013, compared with nearly 910,000 deaths, yielding a negative natural balance of 220,000.

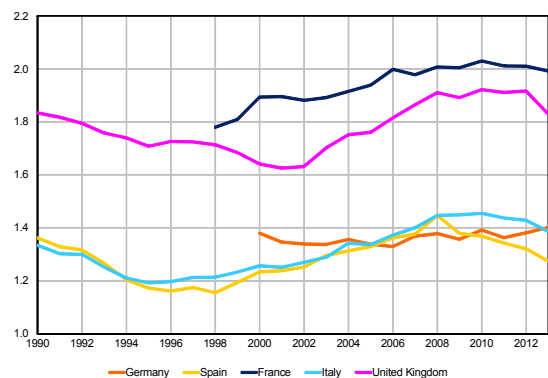
Germany's total population peaked at 82.5 million in 2003 but fell to 82 million in 2013 (see Chart 3). The decline in the working-age population began several years earlier. The proportion of the population aged 20-64 has fallen since the late 1990s. From 63.5% in 1991, it hit a low of 60.5% in 2008 and now stands at 61.5%. Moreover, this age group is itself ageing, with a growing percentage of 45-64 year olds (increasing from 25.4% of the total population in 1991 to 29.8% in 2013), and a declining percentage of 20-44 year olds (down from 38.0% to 31.4% of the total population).

Chart 1: Life expectancy at birth



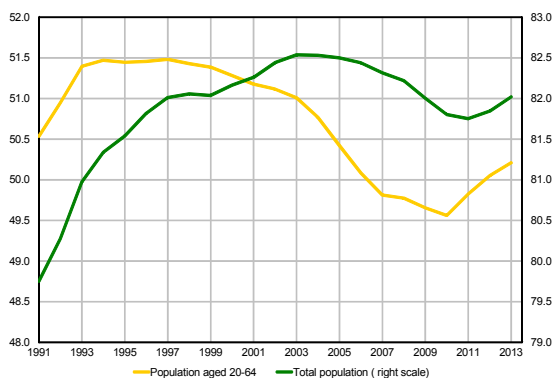
Source: Eurostat.

Chart 2: Trend in total fertility rate



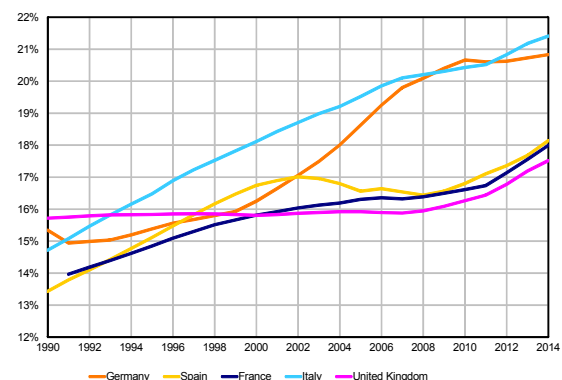
Source: Eurostat.

Chart 3: Germany's total population and population aged 20-64 (million)



Source: Eurostat.

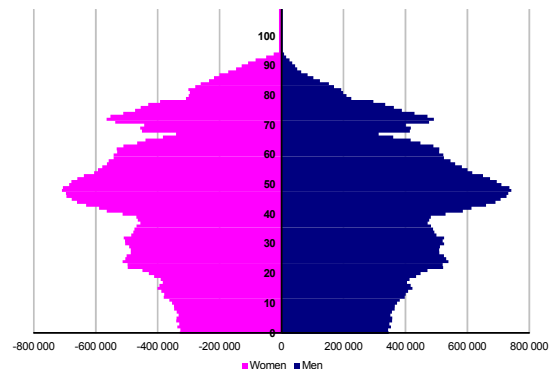
Chart 4: Proportion of total population aged 65+



Source: Eurostat.

Thus, the proportion of the population aged 65 and over has been rising faster in Germany than in most European countries since the start of the century. It exceeded 20% in 2014 (compared with 15% in 1990, see Chart 4), while the population pyramid is changing, narrowing at the base and widening towards the top (see Chart 5).

Chart 5: Population pyramid in Germany, 2013



Source: Eurostat.

Box 1: Terms used in this paper

Working-age population: Population aged 20-64; this age group is preferred to the more conventional 15-64 group to preserve consistency with the projections of the German Federal Statistical Office (Destatis).

Life expectancy at birth: Mean length of life of a hypothetical cohort assumed to be exposed to the mortality rates observed in a given year.

Total fertility rate: A measure of the number of children a woman would have borne over her lifetime if the age-specific fertility rates observed in the year examined were to remain unchanged.

Age-specific fertility rate: Ratio of the number of live births to women in a particular age group during a year to the mean population of women in that same age group during the same year.

Birth rate: Ratio of the number of live births during a given year to the mean total population during the same year.

Old-age dependency ratio: Population aged 65 and over as a percentage of population aged 15-64.

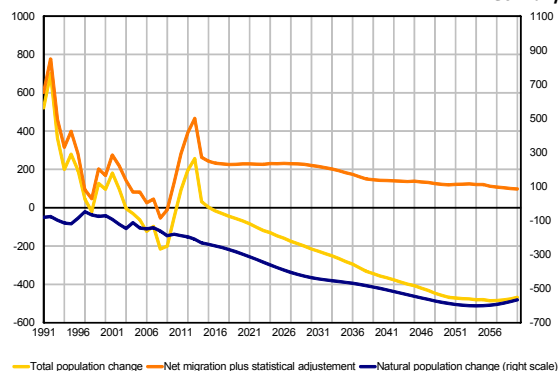
Debt brake: Amendment to the German constitution intended to ensure a balanced budget over the economic cycle. The measure have been adopted in 2009 to come into force in 2016. Except in case of natural catastrophe or severe recession, structural federal deficit must not exceed 0.35% of GDP, while Länder have to run budget surplus starting from 2020.

Sustainability gap: The permanent improvement to the primary balance (in points of GDP) required to satisfy a country's intertemporal budget constraint, assuming unchanged policy.

1.2 In the short term, continued high immigration should nevertheless mitigate the impact of demographic trends

Immigration has restored population growth since 2011. After reunification, the total population rose on the strength of high net migration, averaging 306,000 a year from 1991 to 2003 (see Chart 6). The increasing natural deficit between deaths and births then caused the population to fall from 2003 to the end of the decade. Immigration has since contributed to another rise in total population and could continue to partly offset the natural population decline in the future¹.

Chart 6: Total population, natural population change, and net immigration in Germany

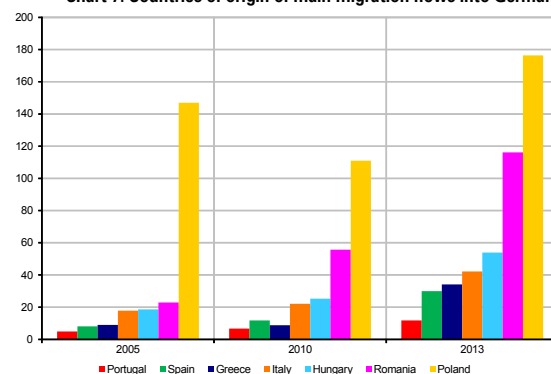


Source: Eurostat.

Whether high net immigration will continue in the long term remains uncertain. First, part of the increase is due to higher immigration from Italy (+52% between 2012 and 2013) and Spain (+19%), triggered by the economic crisis there. This trend could change with economic recovery. Second, a trend of migrants returning to their countries cannot be ruled out. Emigration to Bulgaria and Hungary, for instance, has increased strongly in recent years, reducing net migration from those countries in 2013 by 13% and 7% respectively. Third, migration trends are inherently highly volatile, as seen in the figures for the past 20 years (see Chart 6).

Net migration has risen sharply since 2010, making Germany the world's second most attractive country for immigration, after the United States. In 2013, net migration increased by 19% from the previous year to approximately 400,000, the highest level since 1993. Nearly 80% of migration flows into Germany are from other European countries. Despite a significant increase in flows from peripheral EU countries affected by the economic crisis since 2011, most inflows originate in the new EU Member States, particularly Poland and Romania, which appear to be a source of immigrant labour on which Germany should be able to rely for several years to come (see Chart 7).

Chart 7: Countries of origin of main migration flows into Germany



Source: Destatis.

1.3 All projections point to shrinking and ageing of the total population and the working-age population

In all its scenarios, irrespective of the assumptions, the Destatis survey published in 2009 projected a decline in Germany's total population and working-age population, as well as an increase in the old-age dependency ratio (see Table 1). Destatis set four population scenarios through 2060, combining various levels of fertility, life expectancy and immigration (see Table 2). The results of the Destatis projections should be seen in light of the data available in 2008; the current high level of immigration could alter the Destatis assumptions regarding net migration.

(1) The German authorities estimate net migration at 500,000 in 2014.

Table 1: Destatis and AWG combined assumptions and findings

		Population (million)		Life expectancy (years)		Fertility rate (%)
		Total	20-64	Women (years)	Men (years)	
DESTATIS	2008 data	82.0	45.4	82.4	77.2	1.38
	"Medium" population lower limit scenario	-15.6	-17.3	+6.2	+7.0	+/-0.0
	"Medium" population upper limit scenario	-10.7	-13.6	+6.2	+7.0	+/-0.0
	"Relatively young" population scenario	-6.3	-13.5	+6.2	+7.0	+0.2
	"Relatively old" population scenario	-16.9	-18.9	+8.2	+9.7	-0.2
EU	AWG 2010 data	81.7	49.7	82.7	77.6	1.36
	AWG 2012 baseline scenario	-15.6	-16.9	+5.4	+6.9	+0.2
	AWG 2013 data	81.3	49.7	83.2	78.5	1.4
	AWG 2012 baseline scenario	-11.0	-14.8	+6.1	+7.2	+0.2

Sources: Destatis and European Union.

Table 2: Assumptions in Destatis population projections for 2060

	Fertility	Life expectancy	Immigration
Upper limit	Rising slightly: • children per woman: 1.6 • increase in average age at birth: +1.1	High: • women: 91.2 years • men: 87.7 years	High (average net balance): • +200,000 per year
Mid-range	Nearly constant: • children per woman: 1.4 • increase in average age at birth: +1.6	Moderate: • women: 89.2 years • men: 85.0 years	Moderate (average net balance): • +100,000 per year
Lower limit	Declining slightly: • children per woman: 1.2 • increase in average age at birth: +2.0	Declining:	Decrease:

Source: Destatis

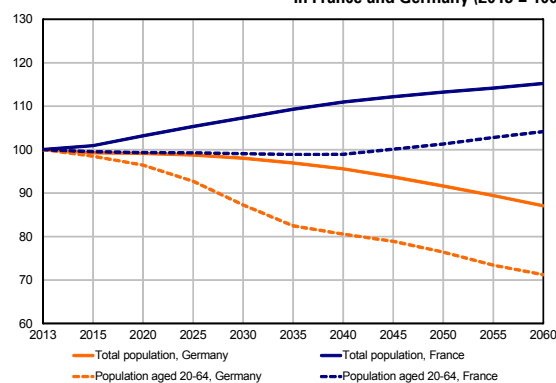
The preliminary studies by the European Commission's Ageing Working Group² project a decline in Germany's total population by 2060 on the order of 11 million, or close to 13%. Starting with an estimated population of 81.3 million in 2013, the AWG projections released in 2015 are similar to those of the Destatis "medium population upper limit" scenario. Without large migration flows, the working-age population should shrink by 29.8% in the long term. It is already estimated to have fallen from 49.7 million in 2013 to 48.9 million in 2015, and the decline is expected to accelerate until the mid-2030s, reaching 41.0 million in 2035 and 35.4 million in 2060.

These figures are revised from the previous AWG report, published in 2012 on the basis of 2010 data projections. The revised figures do not differ significantly from the early projections, except for a sharp upward revision of net migration³. The revised figures do, however, bring the AWG projections closer to the least adverse Destatis scenarios for total population and working-age population (see Table 2).

On the basis of the findings, the AWG projection period can be subdivided into two periods: 2013-2035 and 2035-2060. The population aged 20-64 is

projected to fall by 8.7 million in the first period and by 5.6 million in the second (see Chart 8). On the other hand, the total population is projected to fall less in the first period than in the second (by 2.5 million and 8.0 million, respectively). This appears consistent with Germany's population pyramid in 2013, as the narrow base moves up towards the top, replacing larger cohorts.

Chart 8: AWG projection of total population and working-age population in France and Germany (2013 = 100)



Source: European Commission, The 2015 Ageing Report.

(2) Complete report scheduled for release in 2015.

(3) According to the AWG 2012 report, Germany's population, which was 82 million in 2010, is expected to shrink by 15.5 million between now and 2060; meanwhile, the working-age population, now 50 million, is expected to fall by 16.4 million, after factoring in annual net inflows varying between 40,000 and 130,000.

2. Demographic trends could affect the German economic model in three ways: through potential GDP growth, public finances, or the current-account balance

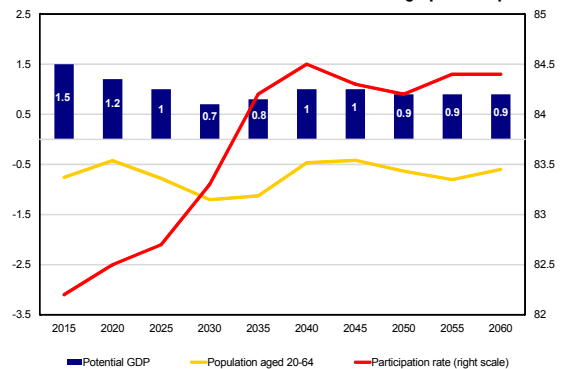
2.1 On a constant-productivity basis, population ageing would compromise Germany's potential growth and the standard of living

Assuming productivity remains constant, the decline in Germany's population, and particularly its working-age population, would be significant enough to reduce potential GDP growth from roughly 1.5% in 2015 to approximately 0.7% around 2030; it would then rise to 0.9% by 2060, the end of the AWG's projection period. With a lower working-age population, Germany would face a labour supply shortage, even assuming a rise in the labour force participation rate for the 20-64 age group, followed by stabilisation (see Chart 9). The trend would be particularly pronounced between now and 2035, before weakening until 2060 (see section 1.3).

The AWG projects that this would take Germany's potential GDP growth below the euro area and the French, starting in 2020; the downtrend would

persist until 2060. Between 2020 and 2060, German potential growth would average 0.9%, versus 1.4% for the euro area and 1.6% for France⁴.

Chart 9: Projected growth of Germany's potential GDP and its demographic components



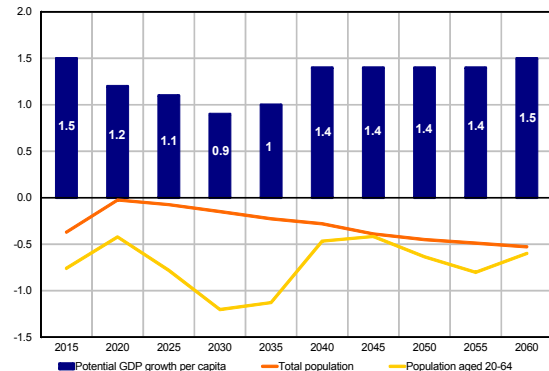
Sources: European Commission, The 2015 Ageing Report.

Box 2: GDP per capita

Germany's GDP per capita is also expected to undergo major variations in the coming decades. In national accounting, GDP per capita can be broken down into labour productivity, the employment rate, and the proportion of the working-age population in the total population. GDP per capita is projected to decline sharply from 2015 to 2030, before rising back to its initial level at the end of the period (see Chart 10). The trends in the three factors are as follows:

- The shrinking working-age population as a percentage of the total population is projected to have a particularly negative impact through 2030, and then a more limited effect.
- Employment is projected to decline sharply around the 2030s, even under the assumption of a rise in the participation rate, which is already very high in Germany.
- The trend in labour productivity is more uncertain, but there appears to be a consensus in the literature that workers over age 55 would have lower productivity. In Germany, the relative proportion of workers aged 55-65 years is already increasing, and Eurostat projects that they will outnumber workers aged 30-49 by the end of the current decade. A higher retirement age would intensify this trend.

Chart 10: Projection of GDP growth per capita, total population, and working-age population



Source: European Commission, The 2015 Ageing Report.

2.2 The decline in the economically active population poses a risk to the sustainability of public finances

Germany's old-age dependency ratio will rise as the population ages, increasing from 32% in 2013 to 59% in 2060 in the AWG projection, or to either 53.3% or 64.9% for the Federal Ministry of Finance (BMF)⁵ under its optimistic and pessimistic scenarios, respectively⁶.

Whatever the actual extent of population ageing, it will inevitably lead to higher social spending on pensions, health and long-term care⁷. The Federal Ministry of Finance projects that these outlays could rise from roughly 18% of German GDP in 2010 to 22% or even 25% of GDP in 2060, depending on the scenario, with an acceleration starting in 2030. Both the optimistic and pessimistic projections see pensions as the main factor in rising

(4) See details in The 2015 Ageing Report published by the European Commission.

(5) See monthly report dated 25 March 2014.

(6) In its March 2014 monthly report, the Federal Ministry of Finance examines the long-term sustainability of public finances in Germany. It takes the two Destatis population scenarios referred to above as "relatively young population" and "relatively old population" to construct macroeconomic scenarios through 2060, adding assumptions regarding average retirement age (rising 1 year or 2 years between 2012 and 2035), the unemployment rate (falling to 3.4% in 2030 and then holding constant, or rising to 5.8% in 2030 and then holding constant), total factor productivity growth (0.96% per year from 2019, or 0.71% per year from 2019), and the inflation rate (1.9% per year from 2019).

(7) The baseline scenario in the 2012 AWG report sees a rise in these public expenditures from 20% of German GDP in 2010 to 26% in 2060. In line with the trends in working-age population and potential growth, most of the increase in public expenditure related to Germany's ageing population occurs between 2010 and 2035 (3.5 percentage points, compared with 2.2 between 2035 and 2060). The most significant factors are healthcare spending (up 1.1 points in 2010-2035, followed by 0.3 in 2035-2060) and pensions (up 1.6 points, followed by 1.0). The revised figures for the 2015 AWG report had not been released at the time of writing.

age-related social spending, ahead of health and long-term care.

In this case, the general government fiscal balance, which is currently running a surplus, would worsen. The Federal Ministry of Finance simulates the trajectory of public finances assuming that policies continue unchanged and therefore that revenue remains constant as a percentage of GDP; the simulation also includes interest payments on debt. In its pessimistic scenario, the general government fiscal balance turns negative in 2020 and attains a deficit of 12% of GDP in 2060. In its optimistic scenario, deficits first appear in 2030 and reach approximately 3% of GDP in 2060.

As a consequence, the Federal Ministry of Finance projects that the general government debt ratio, as a percentage of GDP, will decline at a speed depending on the scenario examined before rising again, on the assumption that current policies continue unchanged. Under the pessimistic scenario, public debt would reach the 60%-of-GDP threshold at the end of the 2020s, then rise from the early 2030s to 180% in 2060. Under the optimistic scenario, the debt would stay below the 60% threshold, even in the long term. It would continue to decline to under 40% around 2040, before rising slightly to about 50% in 2060. Between these two extremes, the Ministry considered the potential impact on the debt ratio of alternative assumptions. Changes in the assumptions for purely demographic factors (fertility rate and life expectancy) would have a relatively modest impact compared with factors relating to socio-economic policy (duration of labour force participation and immigration of skilled labour) and to the business cycle (unemployment rate)⁸.

The Federal Ministry of Finance uses these simulations to compute the "sustainability gap," an indicator of the amount by which the primary surplus would have to be increased immediately and permanently in order to stabilise the public

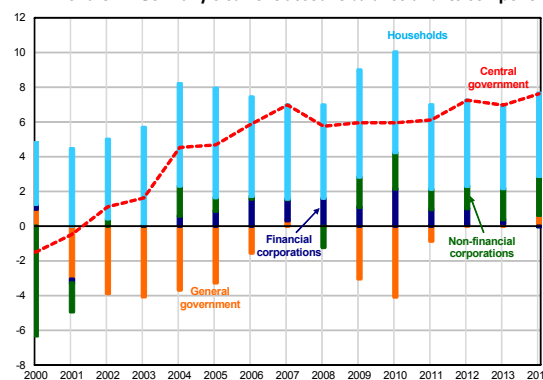
debt ratio over the long term (roughly between 0.6% and 3.1%, depending on the scenario). It concludes that the ratio of debt to GDP would decline steadily, in either scenario, if Germany were to comply with the debt brake and fiscal objectives between now and 2019.

2.3 Population ageing could reduce the current-account surplus by lowering the household savings ratio

Germany's ageing population could reduce the macroeconomic savings ratio. According to the Federal Ministry of Finance, households' propensity to save declines from age 40 to 70, after which it increases, but not enough to counter the decline in the macroeconomic savings ratio due to a cohort effect, as the 55-70s outnumber the 70+ group.

Up until the present time, households have been a major contributor to the current-account surplus (see Chart 11), but a fall in their savings ratio could help push the balance into deficit.

Chart 11: Germany's current-account balance and its components



Source: Destatis.

3. The government has taken numerous measures to mitigate the impact of demographic change

3.1 While pro-immigration measures appear to have been successful, the birth rate is still constrained by work-life balance issues

Germany has tried to stimulate the birth rate, particularly through a more generous family policy and the gradual extension of facilities to care for young children. On 1 January 2007, the government introduced the parental allowance (*Elterngeld*) for parents who take parental leave. It is paid for up to one year (or 14 months if both parents share the parental leave), and is roughly proportional to the parent's previous income. Child benefit (*Kindergeld*) was significantly raised in 2009 and 2010, and the child deduction was increased. In 2007, Germany also committed to expanding childcare capacity by creating the legal right for children between the age of one and three to early childhood support in a day care centre or day nursery, with a major €12-billion investment programme. While the number of children under three in these facilities has risen considerably, from 286,000 in 2006 to 597,000 in 2013, Germany failed to achieve the initial objective of capacity for 750,000 children by 1 August 2013. Moreover, as a result of a €4-billion federal government investment between 2003

and 2009, more children of primary-school age are enrolled in all-day schools (rather than morning-only schools). Nearly one-third of children now attend all-day primary schools, up from only 6.8% in 2004. Capacity still lags behind demand, as 70% of families would like their children to attend all-day schools, according to a study by DIW Berlin, the economic research organisation⁹.

Measures to encourage the arrival of skilled immigrants help to explain the increase in immigration. Germany removed restrictions on the free movement of workers on 1 May 2011 for eight Central and Eastern European countries, and on 1 January 2014 for Bulgaria and Romania. Legal procedures have also been simplified for skilled workers and the short-supply occupations. Recognition of foreign degrees (provided for under the Recognition Act that came into effect in April 2012) is advancing slowly, and concerned only about 11,900 people in 2013; this was 8% higher than 2012, but quite low in relation to the year's total immigration flows. Germany has also introduced a programme to help young people, especially from Southern Europe, who wish to become apprentices.

(8) The monthly report of the Federal Ministry of Finance on which this study is based does not discuss the range of the alternative assumptions.

(9) DIW Wochenbericht 27/2013.

3.2 Labour market participation by women and older people has considerably increased, but a significant proportion of the population remains underemployed

Germany has favoured an "extensive" or economy-wide approach to increasing hours worked, particularly by increasing incentives for women and older people to work. Early retirement programmes co-financed by the Federal Employment Agency (Bundesagentur für Arbeit: BA) have been gradually phased out and legislation was enacted in 2007 to raise the statutory retirement age from 65 to 67 by 2029. The employment rates for older people (aged 55-64) have thus risen sharply in the past decade (by 22 points to 63.5% and by 10 points to 68.8%, respectively, in 2013, according to Eurostat figures).

With the focus on getting people back to work (even on a part-time basis), nothing has been done to date to increase hours worked (the "intensive" or individual approach). The rise in payroll employment is accordingly explained by the large increase in part-time jobs primarily occupied by women (with nearly half of women working part-time), as full-time jobs have shown limited growth in the past decade (up 140,000 to 24.5 million). All told, total hours worked by employees rose by just 4.7% in the past decade.

3.3 Pension, health and unemployment benefits have been reduced

With the 2001 and 2004 pension reforms, Germany shifted its focus from stabilising the net replacement rate to stabilising the contribution rate. The priority is now to stabilise the contribution rate (capped by law at 22%), primarily through the 2005 introduction of a demographic criterion that reduces pension adjustments if the ratio of the number of older persons to the number of workers increases. This followed the 2001 reform of the early retirement/disability pension, which has also sharply reduced the scope of government programmes.

Germany has also acted on healthcare and unemployment expenditures. Healthcare reform included the introduction of a long-term care insurance scheme in the mid-1990s and a significant increase in contributions under the 2003 reform. Unemployment benefits were reduced under the Agenda 2010 programme¹⁰.

The reduction in social benefits has sparked a debate on the risk of poverty potentially facing a portion of Germany's population. As the OECD points out, the less generous public pension system could raise issues in the long term, in an environment of greater career instability and poor income growth in low-wage jobs.

Laure BAQUERO, Florence GOMEZ, Laurence RAMBERT, Nicolas STUDER

(10) Bouvard, F., Rambert, L., Romanello, L. and Studer, N. (2013), "How have the Hartz reforms shaped the German labour market?", *Trésor-Economics* no. 110, March.

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