The 2012 Ageing Report:

Underlying Assumptions and Projection Methodologies

EUROPEAN ECONOMY 4 | 2011

Economic
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EUROPEAN COMMISSION

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ISBN 978-92-79-19298-2
doi: 10.2765/15373

European Commission
Directorate-General for Economic and Financial Affairs

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Joint Report prepared by the European Commission (DG ECFIN) and the Economic Policy Committee (AWG)

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ACKNOWLEDGEMENTS

This report has been prepared as part of the mandate the Economic and Financial Affairs (ECOFIN) Council gave to the Economic Policy Committee (EPC) in 2009 to update and further deepen its common exercise of age-related expenditure projections by 2012, on the basis of a new population projection by Eurostat.

The forthcoming projections, now reaching the fourth edition, of the budgetary impact of the ageing population in the 27 EU Member States over the period 2010–2060 will be calculated on the basis of the macroeconomic assumptions and the methodology described in this report and will be presented to the ECOFIN Council in May 2012.

In accordance with its normal practice, the EPC mandated a working group, the Ageing Working Group (AWG) under the chairmanship of Jens Granlund, to take forward the work needed to discharge this remit.

This report is presented by the EPC and the European Commission (Directorate General for Economic and Financial Affairs - DG ECFIN) after full discussion on the basis of the AWG's comprehensive work. The Directorate-General for Economic and Financial Affairs provided the necessary analysis and calculations used in the report. The demographic projections (EUROPOP2010) were carried out by Eurostat. Valuable contributions were also made by staff of the OECD, the IMF and the European Central Bank.

The report was prepared under the supervision of Lucio Pench (Director of DG ECFIN), Lorenzo Codogno (Chair of the EPC), Jens Granlund (Chairman of the AWG), Giuseppe Carone (Head of Unit-DG ECFIN). The main contributors were Per Eckefeldt, Joao Medeiros, Etienne Sail, Veli Laine, Luigi Giamboni, Ana Xavier, Barbara Lipscyz, Katia Berti and the members of the AWG (see list of Members below). The EPC and the Economic and Financial Affairs DG would like to thank all those concerned.

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The mandate and broad principles

Safeguarding the sustainability of public finances is a key policy objective in the EU. In order to achieve this objective, reliable and comparable information on possible challenges to fiscal sustainability is required, including the expected strains caused by the demographic changes ahead. In 2009, the ECOFIN Council gave a mandate to the Economic Policy Committee (EPC) to update and further deepen its common exercise of age-related expenditure projections by 2012, now reaching the fourth edition on the basis of a new population projection by Eurostat (EUROPOP2010), which was released in April 2011. In preparing the EUROPOP2010 population projection, Eurostat actively involved national statistical institutes via the “Population Projection” Interest Group. However, Eurostat acted in full independence when preparing the population projections.

In light of this mandate, the EPC and the Commission services (Directorate-General for Economic and Financial Affairs - DG ECFIN) agreed a work programme with broad arrangements to organise the budgetary projections and reach agreement on its assumptions and methodologies.

This report provides a description of the underlying macroeconomic assumptions and projection methodologies of the age-related expenditure projections for all Member States. On the basis of these underlying assumptions and methodologies, age-related expenditures covering pensions, health care, long-term care, education and unemployment benefits will be calculated and presented to the ECOFIN Council in spring 2012.

The work was carried out by the EPC Working Group on Ageing Populations (AWG), which gathers experts from the 27 Member States and Norway and the European Commission, represented by the Directorate-General for Economic and Financial Affairs (DG ECFIN). The European Central Bank, the OECD and IMF have also participated in the meetings of the AWG. DG ECFIN has played a central role by providing analysis and calculations. Eurostat has prepared demographic projections (EUROPOP2010). The EPC and its AWG coordinated the work with their counterparts in other Council formations, in particular the Social Protection Committee. In the preparation of the population projection, Eurostat actively consulted national statistical institutes in the Member States.

The EPC has reached agreement on underlying assumptions, projection methodologies and coverage by consensus on the basis of proposals prepared by DG ECFIN. The macroeconomic projections have been made by applying common assumptions and methodologies uniformly to all Member States.

Given the uncertainty surrounding the assumptions underpinning long-run budgetary projections, a number of sensitivity tests will be carried out in addition to the baseline scenario, so as to quantify the responsiveness of projection results to changes in key underlying assumptions.

Before being finalised, the pension projections will be peer-reviewed in the AWG. This will be done on the basis of country fiches provided by Member States describing the national pension model(s) used to make the projection, an analysis of the projection results and other relevant information on data sources and institutional factors which could be driving the pension projections.

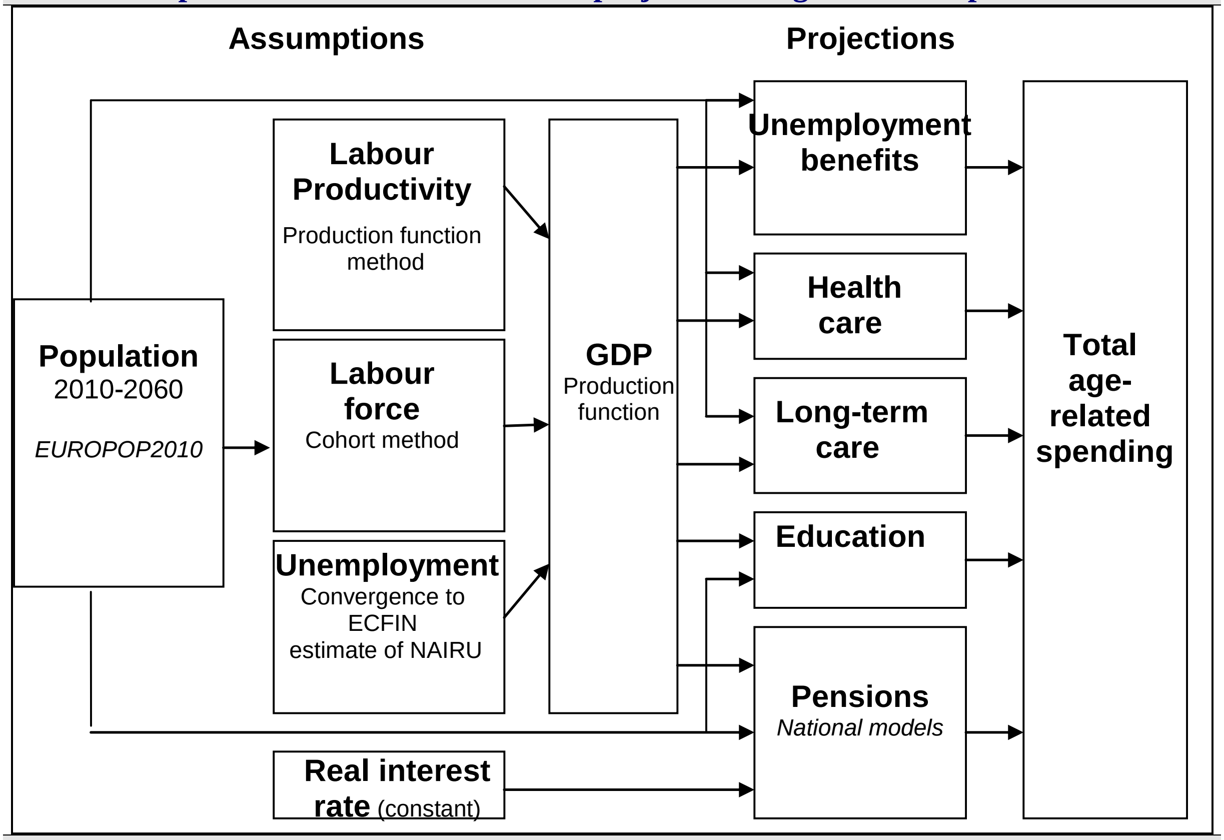
Coverage and general overview

Graph 0. 1 above presents an overview of the entire age-related projection exercise. The starting point is the EUROPOP2010 population projection for the period 2010 to 2060. The EPC agreed a common set of assumptions and methodologies in order to make projections on a set of exogenous macroeconomic variables, covering the labour force (participation, employment and unemployment rates), labour productivity and the real interest rate. These combined set of projections enabled the calculation of GDP for all Member States up to 2060.

On the basis of these assumptions, separate budgetary projections are being run for five age-related expenditure items. The projections for pensions are run by the Member States using their own national model(s). In this way, the projections benefit from capturing the country-specific circumstances prevailing in the different Member States as a result of different pension legislation, while at the same time consistency is ensured by basing the projections on commonly agreed underlying assumptions. The projections for health care, long-term care, education and unemployment are run by the European Commission (DG ECFIN), on the basis of a common projection model for each expenditure item. The results of this set of projections will be aggregated to provide an overall projection of age-related public expenditures.

This report is structured in two parts. The first one describes the underlying assumptions: the population projection, the labour force projection and the other macroeconomic assumptions as well as the sensitivity tests. The second part presents the methodologies for projecting future expenditure on pensions, health care, long-term care, education and unemployment benefits. A statistical annex gives an overview of the main assumptions by country.

Graph 0. 1 - Overview of the 2012 projection of age-related expenditure



Source: Commission services, EPC.

Main results

Long-term demographic and economic projections are helpful in highlighting the immediate and future policy challenges for governments posed by demographic trends. They show where (in which countries), when, and to what extent ageing pressures will accelerate as the baby-boom generation retires and average life span in the EU continues to increase. It should be recalled that the long-term projections are not forecasts, they are subject to increasing uncertainty over time, and the results are strongly influenced by the underlying assumptions. Moreover, in the current juncture, facing the largest crisis in many decades, there is also considerable additional uncertainty concerning medium-term economic developments, on top of the inherent uncertainty on longer term developments.

Demographic projections

Assumptions regarding fertility rates, life expectancy and migration are the key drivers of changes in the size and age profile of the population.

Fertility rates rise slightly…

The convergence scenario approach employed in the EUROPOP2010 projection entails a process of convergence in the fertility rates across Member States to that of the countries currently exhibiting the highest rates, the forerunners (Ireland, France, Sweden and the UK

Belgium, Denmark and Finland), over the very long-term.[1] For the EU as a whole, the total fertility rate (TFR) is projected to rise from 1.59 in 2010 to 1.64 by 2030 and further to 1.71 by 2060. In the euro area, a slightly lower increase is projected, from 1.54 in 2010 to 1.65 in 2060.

The fertility rate is projected to increase over the projection period in nearly all Member States, with the exception of Ireland, France, Sweden and the UK where it decreases (though remaining above 1.9), and in Belgium, Denmark and Finland it is projected to remain stable. Hence, in all countries the fertility rates are expected to remain below the natural replacement rate of 2.1 in the period to 2060. As a result of the convergence assumption, the largest increases in fertility rates are projected to take place in Latvia, Hungary and Portugal, which have the lowest fertility rates in the EU in 2010. The increase is projected to occur gradually, with fertility rates in these countries approaching but not reaching the current EU average fertility rate in 2060.

…and further life expectancy gains are projected…

In the EU, life expectancy at birth for males is projected to increase by 7.9 years over the projection period, from 76.7 in 2010 to 84.6 in 2060. Life expectancy at birth is projected to increase by 6.5 years for females, from 82.5 in 2008 to 89.1 in 2060, implying a slight convergence of life expectancy between males and females. The largest increases in life expectancy at birth, for both males and females, are projected to take place in the Member States with the lowest life expectancy in 2010. Life expectancy for males in 2010 is the lowest in Bulgaria, Estonia, Latvia, Lithuania, Hungary and Romania, ranging between 67 and 71 years. Some catching-up takes place over the projection period, with increases in life expectancy of more than 11 years up to 2060 for these countries. For females, gains in life expectancy at birth of 8 years or more are projected in Bulgaria, Latvia, Lithuania, Hungary, Romania and Slovakia. Female life expectancy in 2010 in all of these countries is below 80 years.

Given the assumed 'convergence hypothesis'[2], the projection compresses the spread of life expectancy at birth for males across the Member States, from 11.7 years in 2008 (Sweden 79.4 and Lithuania 67.7) to 4.8 years in 2060 (85.5 in Sweden and Italy compared with 80.7 in Lithuania). For females, the reduction of the differential in life expectancy at birth is lower, from 7.2 years in 2008 (84.7 in Spain and 77.5 in Bulgaria and Romania) to 3.4 year in 2060 (90 in France and 86.6 in Bulgaria).

In the EU as a whole, life expectancy at age 65 is projected to increase by 5.2 years for males and by 4.9 years for females over the projection period. In 2060, life expectancy at age 65 will reach 22.4 years for males and 25.6 for females and the projected difference (3.2 years) is smaller than the 4.5 year difference in life expectancy at birth. In 2060, the highest life expectancy at age 65 is expected in France for both males (23 years) and females (26.6 years), while the lowest is expected in Bulgaria for both males (20.6 years) and females (23.6 years)

[1] Member States are assumed to converge to a total fertility rate of 1.85 live births per woman. However, this is only a theoretical convergence level, which for most of the countries is not reached within the time horizon of the projections.

[2] Life expectancy increases are assumed to be greater for countries at lower levels of life expectancy and smaller for those at higher levels, thus following convergent trajectories. The countries converge towards a long-term theoretical age pattern of mortality following an exponential interpolation, thus mortality improvements take place at a decreasing pace. Those theoretical levels are not reached within the time horizon of the projections.

…together with continued, but decelerating inward net migration to the EU

For the EU as a whole, annual net inflows are projected to increase from about 1,018,000 people in 2010 (equivalent to 0.2% of the natural EU population) to 1,217,000 by 2020 and thereafter declining to 878,000 people by 2060.

The cumulated net migration to the EU over the entire projection period is 55 millions, of which the bulk is in the euro area (42 millions). Net migration flows are projected to be concentrated to a few destination countries: Italy (15.4 millions cumulated up to 2060), Spain (10.9 millions) and the UK (8.6 millions). According to the assumptions, the change of Spain and Italy from origin countries of migration in the past to destination countries would be confirmed in coming decades. For countries that are currently experiencing a net outflow (BG, EE, LV, LT, MT and RO), this is projected to taper off or reverse in the coming decades. [3]

The EU population is projected to increase up to 2040 and decline thereafter…

Due to the expected dynamics of fertility, life expectancy and migration rates, the age structure of the EU population is projected to dramatically change in coming decades. The overall size of the population is projected to be slightly larger in 50 years time, but much older than it is now. The EU population is projected to increase (from 501 millions in 2010) up to 2040 by almost 5%, when it will peak (at 526 million). Thereafter, a steady decline occurs and the population shrinks by nearly 2% by 2060. Nonetheless, according to the projections, the population in 2060 will be slightly higher than in 2010, at 517 millions.

While the EU population is projected to be larger in 2060 compared to 2010, there are wide differences in population trends until 2060 across Member States. Decreases of the total population are projected for about half of the EU Member States (BG, CZ, DE, EE, EL, LV, LT, HU, MT, PL, PT, RO and SK). For the other Member States (BE, DK, IE, ES, FR, IT, CY, LU, NL, AT, SI, FI, SE and UK) an increase is projected. The strongest population growth is projected in Ireland (+46%), Luxembourg (+45%), Cyprus (+41%), the United Kingdom (+27%), Belgium (+24%) and Sweden (+23%), and the sharpest declines in Bulgaria (-27%), Latvia (-26%), Lithuania (-20%), Romania and Germany (both -19%).

In 2010, the Member States with the largest population were: Germany (82 million), France (65 mn), the United Kingdom (62 mn), Italy (60 mn) and Spain (46 mn). In 2060, the UK would become the most populous EU country (79 mn), followed by France (74 mn), Germany (66 mn), Italy (65 mn) and Spain (52 mn).

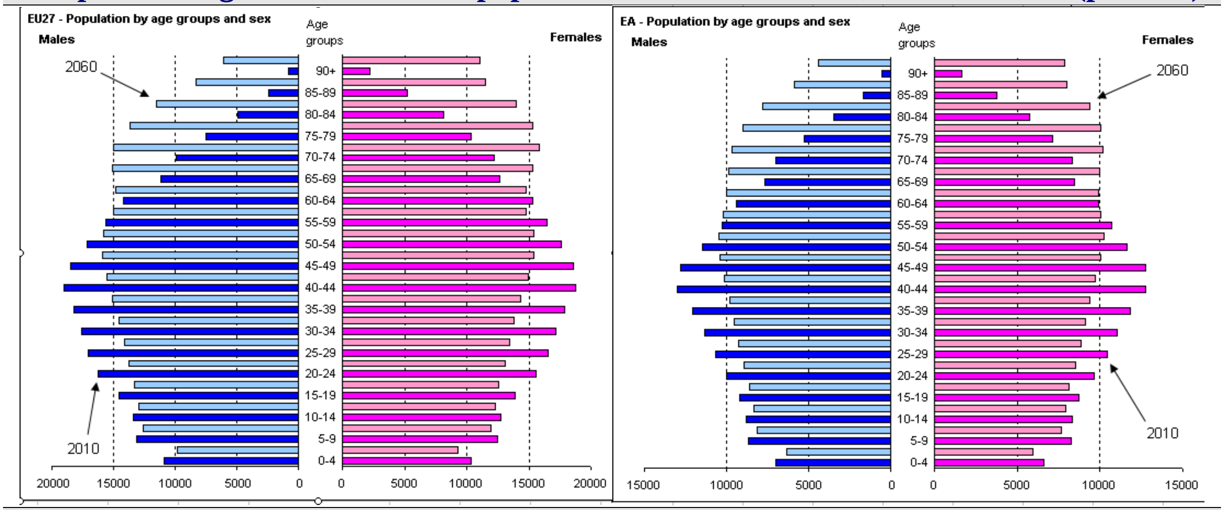
…and undergo significant changes in its age structure

The age structure of the EU population is projected to change dramatically, as shown in the population pyramids presented in Graph 0. 2. The most numerous cohorts in 2010 are around

[3] Migration flows are assumed to subside in the very long-term. The basic assumptions on migration is that immigration and emigration flows tend to converge towards a common level, which is different country by country and dependent from the latest observed values. Additional immigration flows are assumed to take place whether the projected age structure of the countries population reveals a shrinking of the number of persons in working age. The theoretical common point for the two flows is not assumed to be reached within the time horizon of the projections.

40 years old for men and women. Elderly people are projected to account for an increasing share of the population. At the same time, the middle of the age pyramid becomes smaller during the projection period due to below natural replacement fertility rates. As a consequence, the shape of the population pyramids gradually changes from pyramids to pillars. A similar development is projected for the euro area.

Graph 0. 2 - Age structure of the population in 2010 and 2060, EU27 and EA (persons)



Source: Eurostat.

The proportion of young people (aged 0-14) is projected to remain fairly constant by 2060 in the EU27 and the euro area (around 15%), while those aged 15-64 will become a substantially smaller share, declining from 67% to 56%. Those aged 65 and over will become a much larger share (rising from 18% to 30% of the population), and those aged 80 and over (rising from 5% to 12%) will almost become as numerous as the young population in 2060.

The projections point to a significant reduction in the population aged 15-64 …

The population aged 15-64 will start to decline as of 2010 in the EU and, over the whole projection period, it will drop by 14 per cent. This is however not a uniform phenomenon across the EU; it is projected to increase in 7 Member States (Belgium, Ireland, France, Cyprus, Luxembourg, Sweden and the UK).

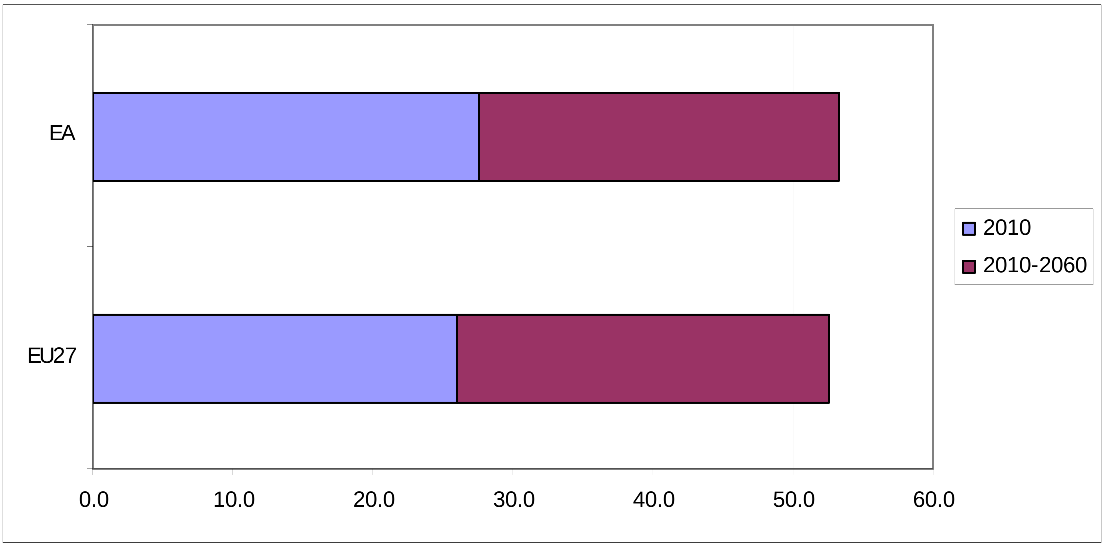
… and an increase in persons aged 65 or more…

The population aged 65 and above will increase very markedly throughout the projection period. This group will almost double, rising from 87.5 million in 2010 to 152.6 million in 2060 in the EU. The number of older people (aged 80 years and above) is projected to increase by even more, almost tripling from 23.7 million in 2010 to 62.4 million in 2060.

… leading to a doubling of the old-age dependency ratio in the EU

As a result of these different trends among age-groups, the demographic old-age dependency ratio (people aged 65 or above relative to those aged 15-64) is projected to increase from 26% to 52.5% in the EU as a whole over the projection period (see Graph 0. 3). This entails that the EU would move from having four working-age people for every person aged over 65 years to two working-age persons. The increase in the total age-dependency ratio (people aged 14 and below and aged 65 and above over the population aged 15-64) is projected to be even larger, rising from 49.3 in 2010 to 77.9 in 2060. The difference is noticeable among individual EU Member States. A relatively small increase in the total age-dependency ratio (less than 20 p.p.) is projected in Belgium, Denmark, Ireland and the UK, while in Poland, Slovakia, Romania and Latvia an increase of 40 percentage points or more is projected by 2060.

Graph 0. 3 - Old-age dependency ratios (65+/15-64), EU27 and EA



Source: Eurostat.

Labour force projections

Overall participation rates are projected to increase …

Using recent trends in labour market behaviour, the total participation rate[4] (for the age group 20 to 64) in the EU27 is projected to increase by 3.1 percentage points (from 75.6% in 2010 to 78.7% in 2060). For the euro area, a similar increase is projected (from 75.9% in 2007 to 79.2% in 2060). For the age group 15-64, the projected increases in participation rates are smaller, with 80% of the total improvement occurring in the period up to 2020.

In the EU27, the biggest increase in participation rates is projected for workers aged 55-64 (around 20 pp for women and 10 pp for men), leading to a substantial narrowing of the gender gap in terms of participation rates up to 2060.

… but labour supply will decline because of the projected population trends

[4] The Cohort Simulation Method (CSM) is used to project participation rates (see Carone, 2005). The CSM makes the following four main assumptions: i) the starting year for the projections is 2010; ii) labour market participation rates are calculated by gender and single age, using average entry/exit rates in the labour market observed over the last ten years (2001-2010); iii) a correction mechanism is applied for young generations (15-24), in order to avoid that any increase in enrolment rates (and the corresponding decline in participation rates) feeds into future declines of participation rates for prime age workers; and iv) the impact of pension reforms is modelled through their estimated impact on the labour market exit rates of older workers (aged 50-74). Specifically, exit rates of older workers (50-74) are adjusted relatively to average historical values (2001-2010) in order to incorporate the expected future effects of legislated pension reforms.

Total labour supply in the EU27 is projected to increase by 1.4% from 2010 to 2020 (age group 20 to 64). In terms of persons, this represents an increase in labour force of roughly 3.3 million. In the euro area, the labour force is projected to increase by 2.0% in the same period. The increase in labour supply over the period 2010 to 2020 is mainly due to the increase in women's labour supply, as men's labour force is projected to remain substantially unchanged.

The positive trend in labour supply up to 2020 is expected to be reversed during the period 2020 to 2060 when the total labour force is projected to contract by 11.8%, equivalent to 27.7 million people (24.5 million compared with the 2010 level). In the euro area, the projected fall in labour supply between 2020 and 2060 is 11.5%, which represents 17.9 million people (14.9 million compared with the 2010 level).

There is however a wide diversity across Member States, ranging from an increase in the labour force of 24.9% in Ireland to a decrease of 38.5% in Romania. The initially positive trend across most countries in the period 2010-2020 is projected to be reversed after 2020, when a large majority of countries is expected to record a decline (21 Member States in total).

In the eight largest (in terms of labour force) EU Member States, representing about 78% of the total EU labour force in 2020, their prospective evolution in the period 2020-2060 is strikingly dissimilar, mostly due to differences in the projected dynamics in the working-age population given by te demographic projection. As a result, projected differences in the annual growth rate of the total labour force are very significant, because they are "compounded" over forty years. DE, PL and RO are projected to register average annual declines of close to 1% or in excess during a period of forty years, while IT, ES and the NL are projected to register declines of around 0.2%-0.3%, which are equivalent to the EU average. Conversely, the UK and France are expected to register small expansions in the total labour force. Consequently, country rankings (in terms of labour force sizes) are expected to change significantly during the period 2020-2060.

Assumptions on unemployment

As a general rule, actual unemployment rates are assumed to converge to structural unemployment rates (the 'NAWRU' rates) by 2015,[5] and thereafter gradually decline towards country-specific historical minima. For countries where the best historical rates are high, the structural unemployment rates are capped at 7.3%, which corresponds to the EU27 NAWRU average (based on the spring 2011 DG ECFIN's Economic Forecasts).[6] In the EU27, the unemployment rate is assumed to decline by 3.2 pp (from 9.7% in 2010 to 6.5% in 2060). In the euro area, the unemployment rate is expected to fall from 10.1% in 2010 to 6.7% in 2060.

[5] Convergence by 2015 corresponds to a general rule for closing the output gap. Convergence by 2017 represents a two years extension for those countries with initial (2012) large output gaps (more than double the EU average, applied to Greece).

[6] For some Member States with high estimated structural unemployment rates currently, the assumed decline of the unemployment rate has a large positive effect on GDP growth over the projection period.

Employment projections

As a result of the population projection, the unemployment rate assumptions and the labour force projection, the total employment rate (for individuals aged 20 to 64) in the EU27 is projected to increase from 68.6% in 2010 to 71.3% in 2020 and to 73.8% in 2060. In the euro area, a similar development is projected, with the employment rate attaining 74.0% in 2060.

The crisis has made the construction of cross-countries comparable employment rates projections more difficult. The projected decrease in the unemployment rates is dramatic – and much stronger than in previous projection exercises – for Member States where unemployment has been severely affected by the crisis, whereas the projected decrease is limited – and in some cases even weaker than in the 2009 exercise[7] – for Member States where the unemployment rate was only marginally or even not negatively affected by the crisis (see Table 0. 3, last column).

As a result, the projected increase in employment rates tend to be very strong (weak) – and stronger (weaker) than in the 2009 exercises – for Member States where unemployment was the most (the less) affected by the crisis. In a few cases where labour market performed well during the crisis, the projected increase in the employment rate is even weaker than in the 2009 exercise.

The employment rate of women is projected to rise from 62.1% in 2010 to 65.9% in 2020 and to 69.4% in 2060. The employment rate for workers aged 55-64 years is expected to increase by even more, from 46.3% in 2010 to 56.1% in 2020 and to 62.7% in 2060, reflecting the expected impact of recent pension reforms in many Member States, aimed at increasing the retirement age. For the euro area, the increase in the employment rate of older workers (55-64) is higher than in the EU27, rising by 18.1 p.p. compared with 16.4 p.p. in the EU27.

In the EU27, the number of persons employed (using the LFS definition) is projected to record an annual growth rate of only 0.3% over the period 2010 to 2020 (compared to 0.9% over the period 2000-2009), which is expected to reverse to a negative annual growth rate of a similar magnitude over the period 2020 to 2060. The outcome of these opposite trends is that employment will peak at 228.3 million in 2026 and go down to 208.7 millions in 2060. This implies a decline of about 10.5 million workers over the period 2010 to 2060. The negative prospects for population developments, including the rapid ageing of the population, will only be partly offset by the increase in (older workers) participation rates and migration inflows, leading to a reduction in the number of people employed during the period 2020 to 2060 (about 18.2 millions).

Projection of labour input (total hours worked)

These trends in employment trends and compositional effects, namely the rising share of part-time work, will bring about a medium-to long term decline in average hours worked. Nevertheless, total hours worked are projected to increase by 3.3% in the period 2010 to 2020 in the EU27. However from 2020 onwards, the rising trend is projected to be reversed and total hours worked are expected to fall by 8.4% between 2020 and 2060. Over the entire projection period (i.e. 2010-2060), total hours worked are projected to fall by 5.3% in the EU27. For the euro area, the projected fall is less marked (-3.8% between 2010 and 2060). In terms of annual average growth rates, hours worked are projected to decline slightly over the period 2010-2060 in the EU27 and in the euro area.

[7] This is notably the case for Belgium.

There are major differences across Member States, reflecting different demographic outlooks. A reduction in total hours worked of 20% or more between 2010 and 2060 is projected for DE, LT, LV, PL, SK, BG and RO. In contrast, for some Member States an increase of 10% or more is projected over the same period, namely for BE, ES, FR, IE, LU, SE, UK, and CY.

Macroeconomic assumptions: labour productivity and potential growth rates

Total Factor Productivity drives labour productivity growth in the long-term

In the long run, the growth in labour productivity (output per hour worked) broadly coincides with TFP growth divided by the labour share (set at 0.65). The EPC has decided on the following assumption for TFP: country-specific TFP growth rates would converge to a long-term historical average TFP growth rate recorded in the EU[8], of 1% (which represents a downward revision of 0.1 pp relative to the assumption made in the previous round).[9] As a result of this assumption, the growth rate in labour productivity is projected to be 1.5% in the long-term.

The speed of convergence to this long-run TFP growth rate has been determined by the relative country-specific income position in the different Member States. Specifically, it is assumed that the lower the GDP per capita of a country compared to the EU average at present, the higher its catching up potential.

Taking account of the cyclical position of the economy in the long-term projections

Over a short-to-medium term horizon, there is a need to take account of the cyclical position of the economy, so as to bridge the current situation and the longer-term prospects. This is of particular importance at the current juncture, where nearly all Member States have large output gaps.

In order to produce actual, as opposed to potential, growth rate projections, the following operational rules are applied for closing the output gap. Firstly, the default rule is that the output gap is closed at the end of the medium term (i.e. 2015 based on the spring 2011 Commission forecast). Secondly, in circumstances where the output gap is small at the end of the short term forecasts, the gap could be closed by 0.5 p.p. a year until the gap is closed. Finally, when an output gap is particularly large (i.e. more than double the EU average), a longer period of closure would be allowed, up to a maximum of two additional years. Specifically, on the basis of the Commission's spring 2011 forecast, all Member States are assumed to close the output gap in 2015 except Greece, where it is assumed to be closed in 2017.

Markedly lower potential growth rates projected for the EU

In the EU as a whole, the annual average potential GDP growth rate is projected to remain quite stable over the long-term. After an average potential growth of 1.5% up to 2020, a slight rebound to 1.6% is projected in the period 2021-30 on account of the assumption of the

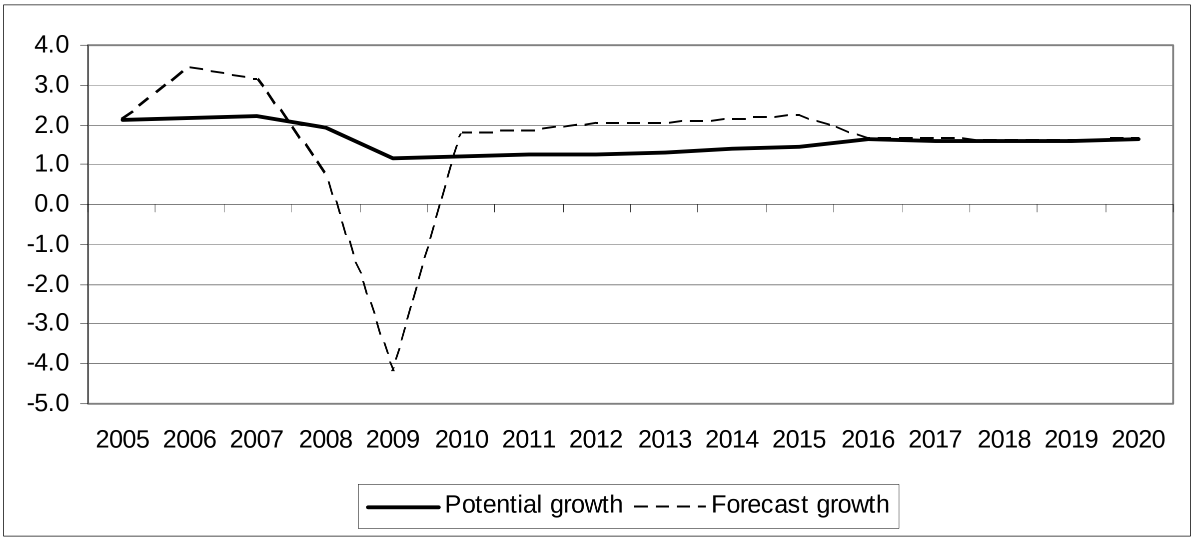
[8] Annual average TFP growth in the EU, proxied by EU-15, over 1971-2010.

[9] For some Member States, a 1% TFP growth rate entails an acceleration in growth compared with recent trends, while for others it would imply a deceleration. It should be stressed that TFP growth in many countries, notably in the euro area, has been on a falling trend, with a declining TFP growth rate to around 0.6-0.7% already well before the financial crisis in 2008-09. The baseline therefore assumes a significant increase in TFP growth over the forecast horizon.

catching up potential in terms of labour productivity in those EU Member States where it currently is relatively low, while over the remainder of the projection period (2031-2060) a slowdown to 1.3% emerges. Over the whole period 2010-2060, output growth rates in the euro area are very close to those in the EU27, as the former represents more than 2/3 of the EU27 total output. Notwithstanding this, the potential growth rate in the euro area is projected to be consistently slightly lower (by about 0.1 percentage point) than for the EU27 throughout the entire projection period.

Taking account of the negative output gaps prevailing in the EU Member States, GDP growth is assumed to be higher than the potential growth rates until the output gap is closed (generally in 2015). For the EU as a whole and the euro area, annual GDP growth is assumed to be 0.7 p.p. higher than the potential growth rates over the period 2010-2015.

Graph 0. 4 - Potential and forecast growth, EU27



Source: Commission services, EPC.

The sources of potential growth are also projected to change

For the EU and for the euro area, labour input acts as a drag on growth over the projection period (2010-2060)., as the working-age population is projected to decline. As a result, labour input contributes negatively to annual output growth on average over the projection period (by 0.15 p.p. and 0.1 p.p., respectively in the EU and in the euro area). Hence, labour productivity growth becomes the sole source for potential output growth in both the EU and the euro area starting from 2028. There are however significant differences across Member States. Since projected migration flows, for example, are heavily influenced by the latest observed values (be it on the low side or on the high side) and will only subside over the very long term, these continue to exert a sizable influence not just on population figures and labour input, but on the evolution of potential output and GDP growth as well.

Comparison with the previous long-term projection exercise

In the EU as a whole, the population in 2010 was 2.4 million larger compared with the EUROPOP2008 projection. By 2030, the population is projected to be about 2.6 million larger and by 2060 about 10.7 million larger (+2.1%). The higher population in 2060 is mostly concentrated in the working-age population (15-64), and both more young and old persons are projected as well (see Table 0. 2).

As a result of the differences between the two rounds of population projections, the increase in the old-age dependency ratio (persons aged 65 and over in relation to persons aged 15-64) is slightly lower in the EUROPOP2010 projection (rising by 26.5 percentage points between 2010 and 2060, compared with 27.6 p.p. in the previous projection). Due to diverging changes of assumptions, the projected increase in the old-age dependency ratio is significantly lower in LT, IE, SK, and CZ and significantly higher in LU, LV, CY, and PT.

In terms of drivers of population changes, total EU fertility rates are higher in the EUROPOP2010 projection compared with the previous projection, and in particular in the beginning of the projection period (up by 0.05 in 2010). This pattern is especially the case in BG, CZ, IE, EL, PL, SI, SK and the UK (higher by 0.1 or more in 2010). By contrast, the total fertility rate is lower in 2010 compared with EUROPOP2008 in DK, LV, LU, HU, AT and PT. Over the projection period to 2060, the increase is now expected to be slightly lower in the EU (see Table 0. 1).

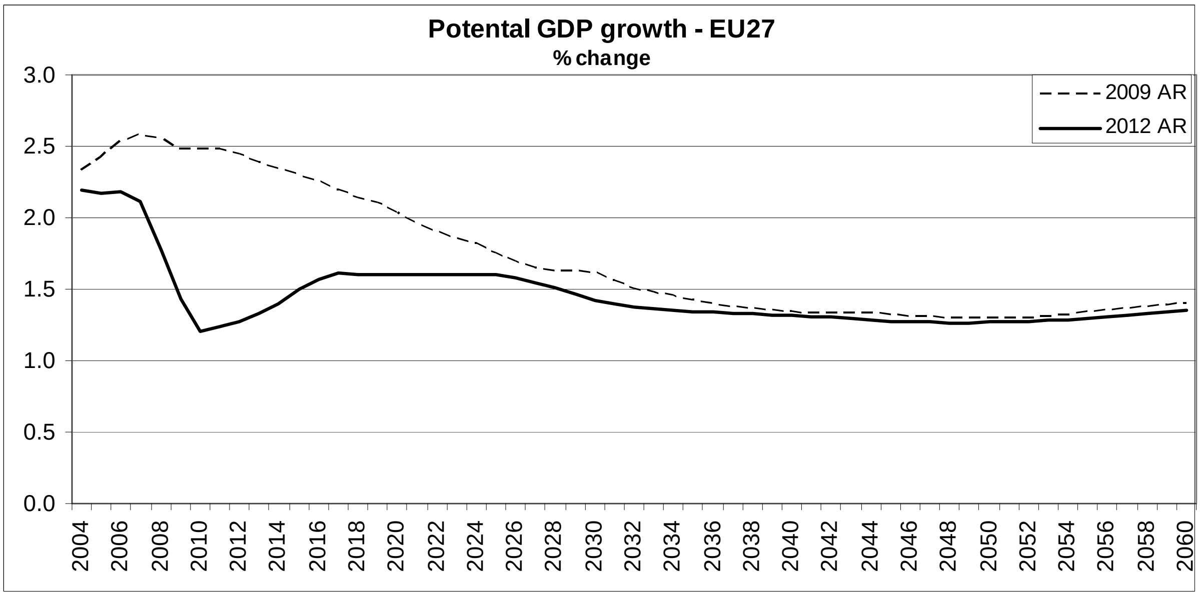
Life expectancy at birth in 2010 is assumed to be higher in EUROPOP2010 compared with EUROPOP2008 in the EU as a whole for both males (+0.2 years) and females (+0.1 years). The largest increases in 2010 (of 0.5 years of more) for males occurs in EE, ES, LV, LT, LU, MT, SI, and UK and for females in EE, ES, CY, LV, LT, LU, MT and UK. Over the projection period by 2060, the increase is now expected to be slightly lower in the EU, with a rise of 0.1 years less for both males and females.

In light of the recent observed decreases in net migration inflows to the EU, especially in some Member States (ES, DE, IE), net migration flows in the EU in 2010 are lower in the EUROPOP2010 projection compared with EUROPOP2008 by about 545 thousand. Overall, by 2060 EU net inward migration is projected to be 4.4 million lower in EUROPOP2010 compared with EUROPOP2008.

The impact of the 2008-2009 economic recession is clearly present in the downward revision of the 2010 employment rate. Compared with the 2009 projections, the structural unemployment rate in the EU27 is projected to be 0.7 pp higher by 2060, the employment rate in 2060 is also lowered by 1.2 pp. In contrast, the participation rate of older workers (55-64) is increased by 2.9 pp by 2060, reflecting the positive effect of (further) legislated pension reforms in a number of Member States (see Table 0. 3).

Following the largest economic crisis in many decades, potential GDP growth has been revised downwards in 2010 and the surrounding years, compared with the baseline projection in the 2009 Ageing Report (see Graph 0. 5). The current projections indicate that potential growth in the EU as a whole should only very gradually approach the growth rates projected in the 2009 Ageing Report, just before the economic and financial crisis.

Graph 0. 5 - Potential GDP growth, 2012 and 2009 reports compared



Source: Commission services, EPC.

Annual average potential GDP growth over the period 2010-2060 in the EU27 is projected to be 1.4%, compared with 1.6% in the 2009 projection. A similar picture emerges for the euro area (with slightly lower potential growth of 1.3% currently being projected, i.e. 0.3 p.p. lower compared with the projection in the 2009 Ageing Report). The lower average potential growth rate in the EU can mainly be attributed to the new more prudent assumption of convergence to a labour productivity growth rate of 1.5%, compared with an assumption of 1.7% in the 2009 Ageing Report. As regards labour input, although there are differences between Member States, the different trends cancel out at the EU aggregate level. This entails that, on average, the projected labour input trends over the entire projection period do not change significantly compared with the 2009 Ageing Report. The less favourable projections for structural unemployment and employment are counterbalanced by more favourable projections of participation rates of older workers due to pension reforms implemented in several Member States since 2008.

There are however significant differences in average potential GDP growth across Member States (see Table 0. 4) but it should be borne in mind that in GDP per capita terms, differences in average growth rates across countries are smaller. Large revisions in potential growth prospects (of 0.4 p.p. or more per year) over the period 2010-2060 are noted in Germany, Greece, Cyprus, Luxembourg, Hungary, Portugal and Romania. The lower projected productivity growth is the main reason for the lower potential GDP growth rates for all these countries, influenced by both lower initial values points and the lower long-term convergence assumption for TFP growth. This is compounded by lower labour input growth (due to downward revision of demographic projections for the working age population) in all cases, with the exception of Greece and Hungary. By contrast, a very limited downward revision of potential growth (of no more than 0.1 p.p.) is projected in the Czech Republic, Poland, Slovenia, Slovakia, Finland and Sweden. For all of these countries, labour input growth is projected to be higher (with the exception of Poland and Finland where it is zero) than in the 2009 projections.

Table 0. 1 - 2012 and 2009 projections compared, demographic assumptions

	Projection exercise 2012 (EUROPOP2010)												Projection exercise 2012 - Projection exercise 2009										
	Fertility rate			Life expectancy at birth						Net migration (1000's)			Fertility rate			Life expectancy at birth						Net migration (1000's)	
				Males			Females									Males			Females				
	2010	2060	change	2010	2060	change	2010	2060	change	2010	2060	cumulated 2010-2060 as % of total pop. in 2010	2010	2060	change	2010	2060	change	2010	2060	change	2010	2060
BE	1.84	1.84	0.00	77.3	84.6	7.3	82.6	89.0	6.4	61	32	18.5%	0.08	0.05	-0.03	0.3	0.2	-0.10	0.0	0.1	0.09	14	9
BG	1.56	1.67	0.10	70.3	81.7	11.4	77.5	86.6	9.1	-10	1	-1.6%	0.17	0.12	-0.06	0.0	0.1	0.08	0.3	0.1	-0.21	-10	2
CZ	1.49	1.62	0.13	74.3	83.2	8.8	80.4	87.8	7.4	30	18	12.5%	0.15	0.10	-0.05	0.1	0.0	-0.06	-0.1	0.0	0.03	5	2
DK	1.84	1.84	0.00	77.0	84.4	7.4	81.1	88.4	7.3	12	9	9.2%	-0.01	-0.01	0.00	0.2	0.2	-0.06	-0.2	0.0	0.20	2	3
DE	1.36	1.54	0.17	77.6	84.8	7.2	82.7	88.9	6.2	41	72	6.2%	0.01	0.01	-0.01	0.0	-0.1	-0.07	-0.2	-0.2	0.00	-106	-44
EE	1.62	1.70	0.08	69.8	81.6	11.8	80.1	88.0	7.9	-1	0	0.2%	0.07	0.04	-0.03	1.2	0.8	-0.44	1.0	0.4	-0.50	0	0
IE	2.07	1.99	-0.08	77.0	84.5	7.5	82.0	88.9	6.9	-22	16	15.7%	0.17	0.11	-0.06	-0.9	-0.7	0.21	-0.2	-0.3	-0.08	-75	7
GR	1.52	1.64	0.12	77.8	84.9	7.1	82.8	88.3	5.5	26	25	14.5%	0.11	0.07	-0.04	0.0	0.1	0.11	-0.1	-0.4	-0.32	-13	-1
ES	1.40	1.56	0.16	78.6	85.4	6.8	84.7	89.9	5.3	79	185	23.4%	0.01	0.00	-0.01	0.9	0.5	-0.42	0.5	0.3	-0.24	-461	55
FR	2.00	1.95	-0.05	77.9	85.1	7.2	84.6	90.0	5.5	72	63	6.0%	0.02	0.02	0.00	0.1	0.0	-0.09	0.0	0.0	-0.03	-26	0
IT	1.42	1.57	0.15	78.9	85.5	6.6	84.2	89.7	5.6	361	244	25.3%	0.03	0.02	-0.01	0.1	0.0	-0.04	-0.3	-0.3	0.09	105	70
CY	1.50	1.62	0.13	78.3	85.1	6.8	82.8	89.0	6.2	2	4	27.8%	0.04	0.02	-0.01	-0.2	0.0	0.17	0.8	0.3	-0.46	-7	-2
LV	1.31	1.51	0.19	68.3	81.1	12.8	78.0	87.2	9.2	-3	1	1.2%	-0.05	-0.03	0.01	1.7	0.6	-1.06	0.8	0.4	-0.44	-3	1
LT	1.55	1.66	0.11	67.7	80.7	12.9	78.7	87.1	8.4	-13	1	-2.7%	0.20	0.12	-0.08	1.2	0.2	-0.97	0.8	0.2	-0.61	-11	1
LU	1.59	1.68	0.09	77.8	84.9	7.1	82.9	89.5	6.6	6	3	31.2%	-0.06	-0.04	0.02	1.1	0.4	-0.70	1.3	1.0	-0.36	2	0
HU	1.32	1.51	0.19	70.4	81.9	11.5	78.4	87.4	9.0	23	19	12.1%	-0.03	-0.02	0.01	0.2	0.1	-0.14	-0.1	0.1	0.13	3	4
MT	1.44	1.59	0.15	77.6	84.9	7.3	82.3	88.9	6.6	-1	0	3.4%	0.05	0.04	-0.01	1.2	0.6	-0.68	0.9	0.3	-0.58	-2	0
NL	1.79	1.81	0.02	78.7	85.2	6.5	82.8	89.1	6.3	36	6	3.3%	0.07	0.04	-0.03	0.4	0.2	-0.17	0.3	0.2	-0.12	28	-2
AT	1.39	1.56	0.16	77.6	84.8	7.2	83.0	89.1	6.1	19	26	17.9%	-0.03	-0.01	0.01	-0.2	-0.1	0.10	-0.2	-0.1	0.11	-14	3
PL	1.40	1.56	0.16	71.7	82.4	10.7	80.1	87.9	7.8	12	14	2.5%	0.12	0.07	-0.05	-0.2	-0.1	0.03	-0.2	-0.1	0.08	27	6
PT	1.32	1.51	0.19	76.5	84.2	7.7	82.5	88.6	6.1	19	28	15.6%	-0.05	-0.03	0.02	0.4	0.2	-0.21	-0.2	-0.2	-0.01	-33	-7
RO	1.38	1.55	0.17	70.0	81.8	11.8	77.5	86.7	9.3	0	8	2.7%	0.05	0.03	-0.02	-0.3	-0.1	0.21	0.4	0.2	-0.22	5	4
SI	1.54	1.65	0.11	75.8	84.0	8.1	82.3	88.8	6.5	11	4	14.2%	0.21	0.13	-0.08	0.7	0.2	-0.48	0.1	0.0	-0.11	6	2
SK	1.41	1.57	0.16	71.6	82.2	10.6	79.1	87.4	8.3	11	7	8.6%	0.15	0.10	-0.05	0.2	0.2	-0.05	0.0	0.1	0.02	7	3
FI	1.86	1.86	0.00	76.6	84.4	7.7	83.2	89.2	6.0	15	7	9.1%	0.02	0.02	0.00	0.1	0.0	-0.09	-0.1	0.0	0.06	5	3
SE	1.94	1.90	-0.03	79.4	85.5	6.1	83.4	89.3	5.9	60	19	14.2%	0.09	0.05	-0.03	0.2	0.1	-0.12	0.0	0.0	-0.01	18	4
UK	1.94	1.91	-0.03	78.3	85.2	7.0	82.4	89.1	6.7	198	134	13.0%	0.10	0.07	-0.03	0.6	0.2	-0.36	0.5	0.2	-0.35	14	20
NO	2.00	1.94	-0.06	78.7	85.2	6.5	83.1	89.2	6.1	37	12	16.4%	0.10	0.06	-0.04	0.0	0.0	-0.02	0.0	0.0	0.03	16	2
EU27	1.59	1.71	0.11	76.7	84.6	7.9	82.5	89.1	6.5	1043	945	11.8%	0.05	0.03	-0.02	0.2	0.1	-0.12	0.1	0.0	-0.07	-520	142
EA	1.54	1.65	0.12	76.5	83.5	7.1	81.9	87.8	5.9	735	722	13.5%											

Source: EUROSTAT (EUROPOP2010), Commission services (DG ECFIN), EPC (AWG).

Table 0. 2 - 2012 and 2009 projections compared, population projections

	Projection exercise 2012 (EUROPOP2010)									Projection exercise 2012 - Projection exercise 2009					
	Total population			Demographic dependency ratio			Total dependency ratio			Total population			Demographic dependency ratio		
	2010	2060	% change	2010	2060	p.p change	2010	2060	p.p change	2010	2060	diff in 2060 as % of tot pop in EUROPOP2008	2010	2060	p.p change
BE	10.9	13.5	23.7	26.1	43.8	17.7	51.8	71.9	20.1	0.1	1.2	9.5	0.0	-2.0	-2.0
BG	7.5	5.5	-26.9	25.7	60.0	34.3	45.6	84.1	38.5	0.1	0.8	0.5	0.4	-3.5	-3.9
CZ	10.5	10.5	-0.7	21.8	54.9	33.0	42.2	79.1	36.9	0.2	1.0	9.9	0.0	-6.6	-6.6
DK	5.5	6.1	9.7	25.3	43.7	18.4	52.8	71.3	18.5	0.0	0.5	2.7	0.3	1.1	0.7
DE	81.7	66.2	-19.0	31.2	59.8	28.6	51.6	82.6	31.1	-0.6	-0.2	-6.5	0.0	0.8	0.7
EE	1.3	1.2	-12.6	25.2	55.3	30.1	47.7	81.5	33.9	0.0	0.1	3.4	0.2	-0.2	-0.4
IE	4.5	6.6	46.5	17.1	36.5	19.4	49.3	66.5	17.2	0.2	1.1	-2.8	0.5	-7.0	-7.5
GR	11.3	11.3	-0.4	28.6	56.5	27.9	50.3	81.0	30.7	0.0	0.8	1.4	0.4	-0.6	-1.0
ES	46.1	52.2	13.4	24.9	56.2	31.3	47.0	79.0	32.0	1.1	10.4	0.6	0.5	-2.8	-3.3
FR	64.9	73.7	13.7	25.8	46.6	20.8	54.3	75.3	21.0	0.9	5.3	2.7	0.0	1.4	1.4
IT	60.5	64.9	7.3	30.8	56.6	25.8	52.2	78.9	26.7	1.0	8.5	9.3	-0.2	-2.7	-2.6
CY	0.8	1.1	40.9	18.9	47.8	29.0	42.9	73.6	30.7	0.0	0.3	-13.9	0.9	3.4	2.5
LV	2.2	1.7	-25.8	25.2	67.9	42.7	45.2	90.5	45.3	0.0	-0.1	-1.0	0.0	3.4	3.4
LT	3.3	2.7	-19.6	23.4	56.7	33.3	45.1	81.7	36.5	0.0	-0.1	4.8	0.2	-9.0	-9.2
LU	0.5	0.7	44.0	20.4	45.2	24.8	46.2	71.0	24.8	0.0	0.1	-0.4	-0.7	6.1	6.7
HU	10.0	8.8	-11.7	24.3	58.1	33.8	45.7	80.3	34.6	0.0	0.1	1.4	0.1	0.4	0.4
MT	0.4	0.4	-6.3	21.8	55.9	34.1	44.2	79.3	35.1	0.0	-0.1	-4.4	0.6	-3.2	-3.8
NL	16.6	17.1	2.7	23.0	47.5	24.5	49.2	74.6	25.4	-0.1	-0.5	2.8	0.2	0.3	0.1
AT	8.4	8.9	5.7	26.1	50.8	24.8	47.9	74.4	26.5	0.1	0.9	-1.9	0.1	0.2	0.1
PL	38.2	32.6	-14.6	19.0	64.8	45.8	40.2	87.3	47.2	0.2	-0.4	4.7	0.0	-4.2	-4.2
PT	10.6	10.2	-3.7	26.9	57.2	30.3	49.6	78.7	29.1	0.0	1.4	-9.0	0.4	2.5	2.1
RO	21.4	17.2	-19.6	21.3	64.8	43.5	43.0	86.3	43.4	-0.1	1.0	1.9	0.0	-0.5	-0.5
SI	2.1	2.1	0.0	23.7	57.5	33.7	44.0	82.4	38.3	0.0	0.0	15.5	-0.2	-4.7	-4.6
SK	5.4	5.1	-6.1	17.0	61.9	44.9	38.2	84.7	46.6	0.0	0.1	12.2	0.1	-6.6	-6.7
FI	5.4	5.7	7.1	26.1	47.6	21.5	51.1	75.7	24.6	0.0	0.2	6.4	0.4	-1.8	-2.1
SE	9.4	11.5	23.0	28.1	46.2	18.2	53.6	75.7	22.1	0.1	0.5	6.1	0.3	-0.5	-0.7
UK	62.2	79.0	27.0	25.0	42.1	17.1	51.5	71.5	20.0	0.8	10.2	3.1	0.3	0.0	-0.3
NO	4.9	6.6	35.0	22.7	43.1	20.4	51.1	72.6	21.5	:	:	9.3	-0.1	-0.8	-0.8
EU27	501.8	516.5	2.9	26.0	52.5	26.5	49.3	77.9	28.5	4.1	43.3	2.1	0.1	-0.9	-1.1
EA	331.4	340.8	2.9	27.6	53.3	25.7	50.9	78.0	27.2						

Source: EUROSTAT (EUROPOP2010), Commission services (DG ECFIN), EPC (AWG).

Table 0. 3 - 2012 and 2009 projections compared, labour force projections

Projection exercise 2012

	Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)		
	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change
AT	71.7	74.4	2.7	42.2	55.1	12.9	75.0	77.6	2.5	43.1	56.1	12.9	4.5	4.1	-0.4
BE	62.0	63.5	1.5	37.3	46.8	9.5	67.7	68.5	0.8	39.1	48.7	9.6	8.4	7.3	-1.1
BG	60.0	64.4	4.4	44.7	56.0	11.3	67.1	69.4	2.4	49.3	59.8	10.5	10.5	7.3	-3.2
CY	68.3	74.5	6.2	56.8	66.5	9.7	73.2	78.0	4.8	59.6	68.8	9.2	6.8	4.5	-2.3
CZ	65.1	68.6	3.5	46.8	69.1	22.3	70.3	73.1	2.8	50.1	72.6	22.5	7.3	6.1	-1.2
DE	71.2	74.0	2.9	57.7	70.0	12.3	76.7	78.9	2.2	62.5	74.8	12.3	7.2	6.1	-1.0
DK	73.5	76.8	3.3	57.6	70.7	13.1	79.5	80.6	1.1	61.1	73.2	12.1	7.5	4.8	-2.8
EE	61.3	70.1	8.7	54.0	68.7	14.7	74.1	75.6	1.5	64.4	73.6	9.2	17.2	7.3	-10.0
EL	59.6	67.3	7.7	42.6	67.1	24.5	68.4	72.6	4.2	45.5	69.6	24.1	20.2	7.3	-12.9
ES	58.6	71.8	13.2	43.6	72.5	28.9	73.4	77.5	4.0	50.8	76.4	25.6	8.6	6.6	-2.0
FI	68.2	71.2	3.0	56.6	62.6	6.0	74.6	76.2	1.7	60.5	65.8	5.3	9.4	7.3	-2.1
FR	63.8	69.2	5.4	39.7	60.2	20.4	70.4	74.7	4.2	42.5	63.3	20.8	12.8	7.3	-5.5
HU	55.4	62.2	6.8	34.2	56.6	22.4	62.4	67.1	4.7	37.1	59.1	22.0	11.3	7.3	-4.0
IE	60.0	63.2	3.2	49.9	61.7	11.7	69.6	67.3	-2.3	54.7	63.9	9.3	13.7	6.0	-7.7
IT	56.9	60.6	3.7	36.4	60.7	24.2	62.2	65.3	3.1	37.8	62.6	24.8	8.5	7.3	-1.2
LT	58.2	67.7	9.5	48.3	62.7	14.4	71.0	73.0	2.0	56.5	66.1	9.7	18.1	7.3	-10.8
LU	64.9	64.6	-0.2	39.2	40.7	1.5	67.9	67.5	-0.4	40.1	41.6	1.5	4.4	4.2	-0.2
LV	59.7	71.3	11.6	48.2	60.7	12.5	73.7	76.9	3.2	57.1	64.7	7.5	19.0	7.3	-11.7
MT	56.5	65.6	9.2	31.1	56.4	25.2	60.7	70.3	9.6	32.6	58.5	26.0	6.9	6.6	-0.3
NL	74.7	77.1	2.4	53.7	60.6	6.8	78.2	79.9	1.7	56.0	62.4	6.5	4.5	3.4	-1.1
NO	75.4	75.4	0.0	68.9	67.3	-1.6	78.2	78.0	-0.2	69.8	68.2	-1.7	9.8	7.3	-2.5
PL	59.3	62.3	3.0	34.2	44.8	10.6	65.8	67.2	1.4	36.8	47.4	10.5	11.4	7.3	-4.2
PT	65.6	71.1	5.5	49.4	65.5	16.1	74.1	76.7	2.6	54.2	69.4	15.2	7.6	7.0	-0.5
RO	58.9	56.8	-2.1	40.9	45.0	4.1	63.8	60.9	-2.9	42.3	46.3	4.0	8.5	6.5	-2.0
SE	72.4	76.5	4.2	70.0	74.7	4.6	79.1	81.9	2.8	73.9	77.9	3.9	7.4	5.7	-1.7
SI	66.4	70.5	4.1	34.9	59.9	25.0	71.7	74.7	3.0	36.3	61.6	25.3	14.4	7.3	-7.1
SK	59.0	62.8	3.8	40.6	48.3	7.8	68.9	67.8	-1.1	45.1	50.7	5.5	8.0	5.6	-2.4
UK	69.4	72.4	3.0	57.1	67.8	10.7	75.4	76.7	1.3	59.9	70.1	10.2	3.6	3.3	-0.3
EU27	64.1	68.9	4.7	46.3	62.7	16.5	71.1	73.7	2.6	49.7	65.7	16.0	9.7	6.5	-3.2
EA17	64.2	69.0	4.9	45.7	63.8	18.1	71.4	74.0	2.6	49.3	67.0	17.7	10.1	6.7	-3.4

Projection exercise 2012 - Projection exercise 2009

	Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)		
	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change	2010	2060	p.p. change
AT	-0.3	0.0	0.3	2.7	1.1	-1.6	-0.1	-0.1	0.1	2.6	0.6	-1.9	0.2	-0.2	-0.4
BE	-0.8	-1.9	-1.1	-0.2	-0.6	-0.4	-0.2	-1.3	-1.0	0.0	-0.4	-0.4	0.9	1.1	0.2
BG	-4.7	-1.6	3.2	0.6	8.0	7.4	-0.9	0.2	1.1	3.1	9.5	6.4	5.8	2.6	-3.2
CY	-3.8	-0.8	3.0	-0.6	3.0	3.6	-1.4	0.0	1.5	0.8	3.7	2.9	3.3	1.1	-2.3
CZ	-2.8	-1.6	1.2	-3.9	3.8	7.6	-0.8	-0.5	0.4	-2.6	4.9	7.4	2.9	1.6	-1.3
DE	0.1	-0.8	-0.9	3.4	1.4	-2.1	-0.6	-0.9	-0.3	2.6	1.0	-1.6	-0.8	-0.1	0.7
DK	-3.7	-1.5	2.3	-1.1	3.2	4.3	-0.3	-0.2	0.1	0.7	3.8	3.1	4.3	1.5	-2.8
EE	-10.6	-1.8	8.8	-7.3	6.3	13.5	-0.4	1.1	1.5	1.4	9.4	8.0	13.8	3.8	-10.0
EL	-8.3	-0.7	7.6	-4.4	2.0	6.4	0.1	0.1	0.0	-0.5	2.4	2.9	11.4	1.1	-10.4
ES	-2.7	-3.4	-0.6	1.9	-1.9	-3.7	-0.7	-2.9	-2.3	2.9	-2.0	-4.8	2.8	0.8	-2.0
FI	-0.5	2.1	2.6	2.8	12.8	10.0	0.6	3.1	2.4	3.7	14.1	10.4	1.6	1.1	-0.5
FR	-3.1	2.7	5.8	-0.8	16.6	17.4	0.2	3.8	3.6	0.6	17.8	17.2	4.7	1.1	-3.7
HU	-3.2	1.2	4.4	-6.0	8.6	14.6	-1.0	2.1	3.1	-4.9	9.6	14.5	3.5	1.1	-2.5
IE	-10.2	-9.2	1.0	-5.6	-5.6	0.0	-4.3	-9.0	-4.7	-2.4	-5.2	-2.7	8.7	1.0	-7.7
IT	-3.1	-3.2	-0.1	-1.7	-0.9	0.8	-1.4	-2.3	-0.9	-1.3	-0.5	0.8	2.8	1.5	-1.3
LT	-8.6	1.9	10.5	-8.5	10.1	18.6	1.8	4.8	3.0	-2.1	12.0	14.0	14.6	3.7	-10.8
LU	1.1	0.9	-0.2	3.6	0.2	-3.4	1.0	0.7	-0.3	3.7	0.3	-3.5	-0.2	-0.4	-0.2
LV	-11.1	0.7	11.7	-8.7	4.3	13.0	-0.7	2.7	3.3	-1.8	6.1	7.9	14.1	2.4	-11.7
MT	0.8	5.2	4.4	4.4	8.3	3.9	1.3	5.8	4.6	4.9	8.2	3.3	0.7	0.4	-0.2
NL	-1.6	-0.6	1.0	2.3	5.0	2.7	-0.5	-0.3	0.2	2.8	5.0	2.2	1.5	0.4	-1.1
NO	-0.9	-0.1	0.8	2.8	0.1	-2.7	1.8	0.9	-0.9	4.1	0.8	-3.3	3.9	1.4	-2.6
PL	-3.8	-0.5	3.3	-4.1	1.0	5.1	-1.1	0.4	1.5	-2.7	1.6	4.3	3.8	1.1	-2.7
PT	-1.2	-1.0	0.2	-2.7	0.3	3.0	-0.2	-0.4	-0.2	-2.2	0.8	3.0	1.6	1.1	-0.6
RO	-2.9	-1.1	1.8	-0.3	0.8	1.2	-0.9	-0.7	0.2	0.8	1.1	0.3	2.6	0.6	-2.0
SE	-1.8	2.0	3.8	-0.3	12.1	12.4	0.1	2.8	2.7	0.0	12.4	12.4	2.7	1.0	-1.7
SI	-3.6	-4.0	-0.4	-2.5	-2.2	0.3	-1.5	-3.4	-2.0	-1.6	-2.3	-0.7	3.3	1.1	-2.3
SK	-2.2	-2.0	0.2	0.4	-1.1	-1.5	-0.3	-2.0	-1.7	1.4	-1.1	-2.5	2.6	0.2	-2.4
UK	0.3	0.6	0.3	2.6	2.7	0.1	-0.1	0.0	0.1	2.5	2.5	0.0	-0.5	-0.8	-0.3
EU27	-2.4	-1.0	1.4	0.1	2.7	2.6	-0.3	-0.5	-0.2	1.1	3.1	2.0	3.1	0.8	-2.3
EA17	-2.5	-0.9	1.6	0.4	3.6	3.2	-0.5	-0.3	0.1	1.2	4.0	2.8	2.9	0.8	-2.1

Source: Commission services (DG ECFIN), EPC (AWG).

Table 0. 4 - 2012 and 2009 projections compared, economic growth projections

2012 projection (Due to growth in:)

	GDP growth in 2010-2060	*Productivity (GDP per hour worked)*	*TFP*	*Capital deepening*	*Labour input*	*Total pop.*	*Empl. rate*	*Share of Working age pop.*	*change in average hours worked*	GDP per capita growth in 2010-2060
	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	1.6	1.4	0.9	0.5	0.2	0.4	-0.1	-0.1	0.0	1.2
BG	1.3	2.3	1.4	0.9	-1.0	-0.6	0.0	-0.3	0.0	1.9
CZ	1.5	1.9	1.2	0.7	-0.3	0.0	0.0	-0.3	0.0	1.6
DK	1.4	1.4	0.9	0.5	0.0	0.2	0.0	-0.1	0.0	1.3
DE	0.8	1.5	0.9	0.5	-0.6	-0.4	0.1	-0.3	0.0	1.2
EE	1.5	2.1	1.2	0.8	-0.6	-0.3	-0.1	-0.2	0.0	1.8
IE	2.1	1.6	1.0	0.6	0.5	0.8	-0.1	-0.2	0.0	1.3
EL	1.0	1.1	0.8	0.3	-0.1	0.1	0.0	-0.3	0.0	0.9
ES	1.6	1.4	0.8	0.6	0.2	0.3	0.2	-0.3	0.0	1.3
FR	1.7	1.5	0.9	0.5	0.2	0.3	0.0	-0.1	0.0	1.4
IT	1.2	1.3	0.8	0.5	-0.1	0.2	0.0	-0.2	0.0	1.1
CY	1.8	1.4	0.8	0.5	0.5	0.8	-0.2	-0.2	0.0	1.1
LV	1.1	2.1	1.2	0.9	-1.0	-0.6	0.0	-0.3	-0.1	1.7
LT	1.3	1.9	1.1	0.8	-0.7	-0.4	-0.1	-0.2	0.1	1.7
LU	1.9	1.5	0.9	0.6	0.4	0.8	-0.1	-0.2	-0.1	1.2
HU	1.2	1.7	1.0	0.7	-0.5	-0.2	0.0	-0.2	0.0	1.4
MT	1.4	1.7	1.1	0.6	-0.2	-0.1	0.2	-0.2	-0.1	1.6
NL	1.3	1.5	1.0	0.5	-0.2	0.1	-0.1	-0.2	0.0	1.2
AT	1.4	1.5	1.0	0.5	-0.1	0.1	0.0	-0.2	0.0	1.3
PL	1.5	2.2	1.3	0.8	-0.6	-0.3	-0.1	-0.3	0.0	1.8
PT	1.2	1.4	0.9	0.5	-0.2	-0.1	0.0	-0.2	0.0	1.3
RO	1.1	2.1	1.3	0.8	-1.0	-0.4	-0.3	-0.3	0.0	1.5
SI	1.3	1.6	1.0	0.7	-0.3	0.0	0.0	-0.3	0.0	1.3
SK	1.6	2.3	1.4	0.8	-0.6	-0.1	-0.2	-0.3	0.0	1.8
FI	1.5	1.7	1.1	0.6	-0.1	0.2	-0.1	-0.2	0.0	1.4
SE	1.8	1.5	1.0	0.5	0.2	0.4	0.0	-0.2	0.0	1.3
UK	1.9	1.6	1.0	0.6	0.3	0.5	0.0	-0.2	0.0	1.4
NO	2.0	1.6	1.1	0.5	0.4	0.6	-0.1	-0.1	0.0	1.3
EA	1.3	1.4	0.9	0.5	-0.1	0.1	0.0	-0.2	0.0	1.2
EU27	1.4	1.5	1.0	0.6	-0.2	0.1	0.1	-0.2	-0.1	1.3

Projection exercise 2012 - Projection exercise 2009 (Due to growth in:)

	GDP growth in 2010-2060	*Productivity (GDP per hour worked)*	*TFP*	*Capital deepening*	*Labour input*	*Total pop.*	*Empl. rate*	*Share of Working age pop.*	*change in average hours worked*	GDP per capita growth in 2010-2060
	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	-0.2	-0.3	-0.2	-0.1	0.1	0.1	-0.1	0.1	0.0	-0.3
BG	-0.3	-0.4	-0.1	-0.3	0.1	0.0	0.0	0.0	0.0	-0.3
CZ	0.0	-0.2	-0.1	-0.1	0.2	0.2	-0.1	0.1	0.0	-0.2
DK	-0.3	-0.3	-0.2	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.3
DE	-0.4	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.2
EE	-0.3	-0.4	-0.2	-0.2	0.1	0.1	0.0	0.0	0.0	-0.3
IE	-0.2	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.1	0.0	-0.2
EL	-0.6	-0.8	-0.4	-0.4	0.2	0.1	0.0	0.0	0.0	-0.7
ES	-0.3	-0.5	-0.4	-0.1	0.2	0.0	0.1	0.1	0.0	-0.3
FR	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.2
IT	-0.2	-0.3	-0.3	-0.1	0.1	0.2	-0.1	0.0	0.0	-0.4
CY	-0.9	-0.5	-0.4	-0.2	-0.3	-0.2	-0.2	0.1	0.0	-0.7
LV	-0.3	-0.4	-0.2	-0.2	0.1	0.0	0.1	0.1	-0.1	-0.2
LT	-0.2	-0.5	-0.3	-0.2	0.3	0.1	0.0	0.1	0.1	-0.3
LU	-0.6	-0.3	-0.2	-0.1	-0.4	0.0	-0.3	0.0	-0.1	-0.6
HU	-0.5	-0.5	-0.4	-0.1	0.0	0.1	-0.1	0.1	0.0	-0.6
MT	-0.2	-0.2	-0.1	-0.1	0.1	-0.1	0.2	0.1	-0.1	-0.1
NL	-0.2	-0.2	-0.1	-0.1	0.0	0.1	-0.1	0.0	0.0	-0.3
AT	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	-0.1	0.1	0.0	-0.2
PL	0.0	-0.2	0.0	-0.2	0.2	0.1	0.0	0.1	0.0	-0.1
PT	-0.6	-0.5	-0.3	-0.2	-0.1	-0.2	0.0	0.0	0.1	-0.4
RO	-0.7	-0.6	-0.3	-0.3	-0.1	0.0	-0.2	0.1	0.0	-0.7
SI	-0.1	-0.5	-0.3	-0.2	0.4	0.3	0.0	0.1	0.0	-0.4
SK	-0.1	-0.1	-0.1	-0.1	0.1	0.2	-0.3	0.1	0.0	-0.3
FI	-0.1	-0.1	0.0	-0.1	0.0	0.1	-0.1	0.0	0.0	-0.2
SE	-0.1	-0.2	-0.1	-0.1	0.1	0.1	-0.1	0.0	0.0	-0.2
UK	-0.2	-0.2	-0.1	-0.1	0.0	0.1	-0.1	0.0	0.0	-0.3
NO	0.1	-0.1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	-0.1
EA	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	-0.3
EU27	-0.2	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	-0.3

Source: Commission services (DG ECFIN), EPC (AWG).

PART I - Underlying assumptions and projection methodologies

1. Population

1.1. Background and general approach

Eurostat's population projection EUROPOP2010, released in April 2011, (see Eurostat (2011))[10] is the basis for the 2012 age-related expenditure projection for the 27 EU Member States. A description of the methodologies used to project fertility rates, life expectancy and net migration in EUROPOP2010 can be found in Eurostat (2011). [11]

In preparing the EUROPOP2010 population projection, Eurostat actively involved national statistical institutes via the “Population Projection” Interest Group. Moreover, a joint meeting of the Working Group on Population Projections and the EPC Ageing Working Group (AWG) was held on 13 December 2010 in Luxembourg so that the views of the EPC-AWG could be communicated before the finalisation of the projection. However, responsibility for the population projections rests with Eurostat. In setting the assumptions and generating the population figures Eurostat acted in full independence.[12]

As was the case with the EUROPOP2008 demographic projection, the EUROPOP2010 was made using a ‘convergence’ approach. This means that the key demographic determinants are assumed to converge over the very long-term. These demographic determinants are: (i) the fertility rate; (ii) the mortality rate and (iii) the level of net migration. As far as fertility and mortality are concerned, it is assumed that they converge to that of the ‘forerunners’.

Specifically, *fertility rates* are assumed to converge to levels achieved by Member States that are considered to be 'forerunners' in the demographic transition.

Life expectancy increases are assumed to be greater for countries at lower levels of life expectancy and smaller for those at higher levels, thus following convergent trajectories.

In each Member State, immigration and emigration flows assumed to converge, taking also into account the changes in the national age structures.

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[10] See Eurostat (2011), News release 80/2011, 8 June 2011.

[11] See Lanzieri (2011), 'The Greying of the baby boomers: A century-long view of ageing in European populations', Eurostat Statistics in Focus 23/2011 and 'Eurostat Population Projections 2010-based 'EUROPOP2010': Methodology and results of a long-term scenario of demographic convergence (forthcoming).
The Europop2010 (Eurostat Population Projections 2010-based) convergence scenario provides population projections (and assumptions on total fertility rates (TFR), life expectancy at birth by sex and net international migration) at national level projected for each year on 1st January.
Data comprise the EU27 Member States and the EFTA countries.

[12] The assumptions do not necessarily fully reflect the views of the AWG neither as a group nor of individual Member States or national statistical offices. The Maltese authorities have expressed reservations on EUROPOP2010. Eurostat has adopted for Malta the same methodology used for the other countries.

1.2. Projection of fertility rates

1.2.1. Past trends

Fertility rates have been on a downward trend for several decades, but seem to be reversing more recently

Total fertility rates (TFR[13]) have declined sharply in the EU Member States since the post-war "baby boom" peak above 2.5 in the second half of the 1960s, to below the natural replacement level of 2.1 (see Table 1.1). This decline was relatively fast and completely unexpected.

[13] Fertility rates are reflected by the average number of children a woman would have, should she at each bearing age have the fertility rates of the year under review (this number is obtained by summing the fertility rates by age and is called the Total Fertility Rate, or TFR.

Table 1.1 - Past trends in total fertility rates (TFR), 1950-2009

	1950	1960	1970	1980	1990	2000	2005	2009	*1960-2009*	*2000-2009*
BE	2.34	2.54	2.25	1.68	1.62	1.67	1.76	1.84	*-0.7*	*0.2*
BG	:	2.31	2.17	2.05	1.82	1.26	1.32	1.57	*-0.7*	*0.3*
CZ	:	2.09	1.92	2.08	1.90	1.14	1.28	1.49	*-0.6*	*0.4*
DK	2.57	2.57	1.95	1.55	1.67	1.77	1.80	1.84	*-0.7*	*0.1*
DE	:	2.37	2.03	1.56	1.45	1.38	1.34	1.36	*-1.0*	*0.0*
EE	:	:	2.16	:	2.05	1.38	1.50	1.62	*:*	*0.2*
IE	:	3.78	3.85	3.21	2.11	1.89	1.86	2.07	*-1.7*	*0.2*
EL	:	2.23	2.40	2.23	1.40	1.26	1.33	1.52	*-0.7*	*0.3*
ES	:	2.86	2.90	2.20	1.36	1.23	1.35	1.40	*-1.5*	*0.2*
FR	2.93	2.73	2.47	1.95	1.78	1.89	1.94	2.00	*-0.7*	*0.1*
IT	2.50	2.37	2.38	1.64	1.33	1.26	1.32	:	*:*	*:*
CY	:	3.51	2.54	:	2.41	1.64	1.42	1.51	*-2.0*	*-0.1*
LV	:	:	2.00	1.88	2.01	1.24	1.31	1.31	*:*	*0.1*
LT	:	2.60	2.40	1.99	2.03	1.39	1.27	1.55	*-1.1*	*0.2*
LU	:	2.29	1.97	1.50	1.60	1.76	1.63	1.59	*-0.7*	*-0.2*
HU	:	2.02	1.98	1.91	1.87	1.32	1.31	1.32	*-0.7*	*0.0*
MT	:	3.62	2.02	1.99	2.04	1.70	1.38	1.44	*-2.2*	*-0.3*
NL	3.10	3.12	2.57	1.60	1.62	1.72	1.71	1.79	*-1.3*	*0.1*
AT	:	2.69	2.29	1.65	1.46	1.36	1.41	1.39	*-1.3*	*0.0*
PL	3.71	2.98	2.20	2.28	1.99	1.37	1.24	1.40	*-1.6*	*0.0*
PT	:	3.16	3.01	2.25	1.56	1.55	1.40	1.32	*-1.8*	*-0.2*
RO	:	:	:	2.43	1.83	1.31	1.32	1.38	*:*	*0.1*
SI	:	2.18	2.10	2.11	1.46	1.26	1.26	1.53	*-0.7*	*0.3*
SK	:	3.04	2.41	2.32	2.09	1.30	1.25	1.41	*-1.6*	*0.1*
FI	3.15	2.72	1.83	1.63	1.78	1.73	1.80	1.86	*-0.9*	*0.1*
SE	2.28	2.20	1.92	1.68	2.13	1.54	1.77	1.94	*-0.3*	*0.4*
UK	:	2.72	2.43	1.90	1.83	1.64	1.78	1.94	*-0.8*	*0.3*
NO	2.51	2.90	2.50	1.72	1.93	1.85	1.84	1.98	*-0.9*	*0.1*
EU27	:	2.70	2.31	1.97	1.79	1.48	1.48	1.59	*-1.1*	*0.1*
EA	:	2.83	2.42	1.97	1.71	1.53	1.51	1.60	*-1.2*	*0.1*
EA12	:	2.76	2.34	1.99	1.82	1.40	1.42	1.51	*-1.3*	*0.1*
EU15	:	2.69	2.42	1.88	1.65	1.58	1.61	1.70	*-1.0*	*0.1*
EU10	:	2.65	2.13	2.07	1.95	1.34	1.31	1.45	*-1.2*	*0.1*
EU25	:	2.71	2.32	1.95	1.78	1.49	1.50	1.60	*-1.1*	*0.1*

Source: Commission services based on Eurostat data, 2009 Ageing Report.
Note: EU averages are simple averages.

The trend of falling fertility rates differed across countries in size and timing. Fertility rates fell below replacement levels in the late 1960s in Sweden, Denmark, Finland, Luxembourg and Germany Hungary, Latvia and the Czech Republic. The fall took place somewhat later in Belgium, Netherlands, Austria, the UK, France (1972-73) and Italy (1975).[14] Declines in fertility rates occurred much later in Greece, Spain, Portugal (1981-82) and Ireland (2000) Malta (1980), Poland (1983) and Slovakia (in 1989). Several Member States had very low fertility rates (below 1.4) in 2000, namely Bulgaria, the Czech Republic, Germany, Estonia, Greece, Spain, Italy, Latvia, Lithuania, Hungary, Austria, Poland, Romania, Slovenia, and Slovakia.

However, more recent trends over the last decade indicate a trend shift. On average in the EU, fertility rates have increased since 2000. In particular, increases are noted in almost all Member States, with total fertility rates above 1.8 in Belgium, Denmark, Ireland, France,

[14] The time series for Germany (DE) exclude the former GDR before 1991 and refer to the Federal Republic starting with 1991 reference year.

Finland, Sweden and the UK. By contrast, fertility rates have continued to fall in Luxembourg, and Portugal while in Cyprus and Malta it has increase since 2005.

1.2.2. The EUROPOP2010 projection

The projected fertility rates in EUROPOP2010

The convergence scenario approach employed in the EUROPOP2010 projection entails a process of convergence in the fertility rates across Member States to that of the forerunners over the projection period over the very long-term. For the EU as a whole, the total fertility rate (TFR) is projected to rise from 1.59 in 2010 to 1.64 by 2030 and further to 1.71 by 2060. In the euro area, a similar increase is projected, from 1.54 in 2010 to 1.65 in 2060.[15]

The fertility rate is projected to increase over the projection period in nearly all Member States, with the exception of Ireland, France, Sweden and the UK (though remaining above 1.9), and in Belgium, Denmark and Finland it is projected to remain stable. Hence, in all countries the fertility rates is expected to remain below the natural replacement rate of 2.1 in the period to 2060. As a result of the convergence assumption, the largest increases in fertility rates are projected to take place in Latvia, Hungary and Portugal, which have the lowest fertility rates in the EU in 2010. The increase is projected to occur gradually, with fertility rates in these countries approaching but not reaching the current EU average fertility rate in 2060.

[15] Table 1.1 reports total fertility rates according to the age last birthday during the year, while Table 1.2 reports total fertility rates according to the age reached during a calendar year.

Table 1.2 - Projection of fertility rates in EUROPOP2010

	Fertility rate						
	2010	2020	2030	2040	2050	2060	change 2010-2060
BE	1.84	1.84	1.84	1.84	1.84	1.84	0.00
BG	1.56	1.58	1.60	1.63	1.65	1.67	0.10
CZ	1.49	1.52	1.55	1.57	1.60	1.62	0.13
DK	1.84	1.84	1.84	1.84	1.84	1.84	0.00
DE	1.36	1.40	1.43	1.47	1.50	1.54	0.17
EE	1.62	1.64	1.66	1.67	1.69	1.70	0.08
IE	2.07	2.05	2.04	2.02	2.00	1.99	-0.08
GR	1.52	1.55	1.57	1.59	1.62	1.64	0.12
ES	1.40	1.43	1.46	1.50	1.53	1.56	0.16
FR	2.00	1.99	1.98	1.97	1.96	1.95	-0.05
IT	1.42	1.45	1.48	1.51	1.54	1.57	0.15
CY	1.50	1.52	1.55	1.57	1.60	1.62	0.13
LV	1.31	1.35	1.39	1.43	1.47	1.51	0.19
LT	1.55	1.57	1.59	1.61	1.63	1.66	0.11
LU	1.59	1.61	1.63	1.65	1.66	1.68	0.09
HU	1.32	1.36	1.40	1.44	1.47	1.51	0.19
MT	1.44	1.47	1.50	1.53	1.56	1.59	0.15
NL	1.79	1.79	1.80	1.80	1.81	1.81	0.02
AT	1.39	1.43	1.46	1.49	1.52	1.56	0.16
PL	1.40	1.43	1.46	1.50	1.53	1.56	0.16
PT	1.32	1.36	1.40	1.44	1.47	1.51	0.19
RO	1.38	1.41	1.45	1.48	1.51	1.55	0.17
SI	1.54	1.56	1.58	1.60	1.63	1.65	0.11
SK	1.41	1.44	1.48	1.51	1.54	1.57	0.16
FI	1.86	1.86	1.86	1.86	1.86	1.86	0.00
SE	1.94	1.93	1.92	1.92	1.91	1.90	-0.03
UK	1.94	1.93	1.93	1.92	1.91	1.91	-0.03
NO	2.00	1.99	1.98	1.97	1.96	1.94	-0.06
EU27	1.59	1.62	1.64	1.66	1.68	1.71	0.11
EA	1.57	1.59	1.61	1.64	1.66	1.68	0.12
EA12	1.60	1.62	1.65	1.67	1.69	1.71	0.11
EU15	1.64	1.66	1.68	1.70	1.72	1.73	0.09
EU10	1.42	1.45	1.48	1.51	1.54	1.57	0.16
EU25	1.60	1.63	1.65	1.67	1.69	1.71	0.11

Source: Commission services based on Eurostat EUROPOP2010 data.
Note: EU averages are weighted averages.

1.3. Projection of life expectancy

1.3.1. Past trends

Large and continuous increases in life expectancy have been observed

Life expectancy has been increasing in most developed countries worldwide over very long time periods.[16] Since 1960, there have been significant increases in life expectancy at birth in all Member States (see Table 1.3). Between 1960 and 2009, life expectancy at birth has increased significantly, especially for women. In euro-area Member States, the increase is even more pronounced where the life expectancy at birth can increase wit up to three months each year.

In the EU, the gap between female and male life expectancy has diminished since 1990, due to faster improvements in life expectancy for males relative to females. In the euro area, this process started in 1980, and the difference between males and females is also smaller than in the EU as a whole. Since 2000, the increase in life expectancy has been 2.2 for females and 2.6 for males.

The gains in life expectancy at birth have differed across countries between 1960 and 2009. Women have gained 11 years or more in Germany, Spain, France, Italy, Luxembourg, Malta, Portugal and Finland. Smaller increases of 8 years or less were observed in Bulgaria, the Czech Republic, Denmark, Latvia and Slovakia.

Gains in the life expectancy over the same period for men have been 11 years or more in Germany, Spain, France, Italy, Luxembourg, Malta, Austria, Portugal and Finland, while increases of 7 years or less have occurred in Bulgaria, the Czech Republic, Denmark, Estonia, Latvia, Lithuania, Hungary, Poland and Slovakia.

There is no consensus among demographers on trends over the very long term, e.g. whether there is a natural biological limit to longevity, the impact of future medical breakthroughs, long-term impact of public health programmes and societal behaviour such as reduction of smoking rates or increased prevalence of obesity. Past population projections from official sources have, however, generally underestimated the gains in life expectancy at birth as it was difficult to imagine that the reduction of mortality would continue at the same pace in the long run. Some commentators have argued that in consequence governments may have underestimated the potential budgetary impact of ageing populations.

Official projections generally assume that gains in life expectancy at birth will slow down compared with historical trends. This is because mortality rates at younger ages are already

[16] Since the 19th century, improvements in living conditions and medical advances have led to increases in life expectancy at birth. Several stages have been identified in the decline in mortality, starting in northwest Europe around 1700 to 1800 with a reduction of variations in mortality rates as famine-related mortality was reduced (UN, 2004). Mortality levels began to decline in a second stage that started in the early 19th century in England and Northern European countries, due to vaccination and public health measures as well as improved personal hygiene. The decline in mortality rates accelerated during the third stage in the early years of the 20th century, with significant improvements made in reduction of infant and child mortality and in survival rates of young adults.

very low and future gains in life expectancy would require improvements in mortality rates at older ages (which statistically have a smaller impact on life expectancy at birth). On the other hand, the wide range of life expectancies across EU Member States, and also compared with other countries, points to considerable scope for future gains. In 2009, life expectancy at birth for females ranged from 77.4 in Romania and Bulgaria to 85 years in France, and for males ranging from 67.5 in Lithuania to over 79.4 in Sweden.

Table 1.3 - Past trends in life expectancy at birth, 1950-2009

Males	1950	1960	1970	1980	1990	2000	2005	2009	*1960-2009*	*2000-2009*
BE	62.0	66.8	67.9	69.9	72.7	74.6	76.2	77.3	*10.5*	*2.7*
BG	:	67.5	69.1	68.5	68.0	68.4	69.0	70.1	*2.6*	*1.7*
CZ	:	67.8	66.1	66.9	67.6	71.7	72.9	74.2	*6.4*	*2.5*
DK	:	70.4	70.7	71.2	72.0	74.5	76.0	76.9	*6.5*	*2.4*
DE	64.6	66.5	67.5	69.6	72.0	75.1	76.7	77.8	*11.3*	*2.7*
EE	:	64.3	65.5	64.1	64.7	65.2	67.3	69.8	*5.5*	*4.6*
IE	64.5	68.1	68.8	70.1	72.1	74.0	77.2	77.4	*9.3*	*3.4*
EL	63.4	67.3	71.6	73.0	74.7	75.5	76.8	77.8	*10.5*	*2.3*
ES	59.8	67.4	69.2	72.3	73.4	75.8	77.0	78.6	*11.2*	*2.8*
FR	62.9	66.9	68.4	70.2	72.8	75.3	76.7	78.0	*11.1*	*2.7*
IT*	63.7	67.2	69.0	70.6	73.8	76.9	78.0	79.1	*11.9*	*2.2*
CY	:	:	:	72.3	74.1	75.4	76.8	78.6	*:*	*3.2*
LV	:	65.2	66.0	63.6	64.3	65.0	65.4	68.1	*2.9*	*3.1*
LT	:	64.9	66.8	65.4	66.4	66.8	65.3	67.5	*2.6*	*0.7*
LU	:	66.5	67.1	70.0	72.4	74.6	76.7	78.1	*11.6*	*3.5*
HU	:	65.9	66.3	65.5	65.2	67.5	68.7	70.3	*4.4*	*2.8*
MT	:	66.5	68.4	68.0	73.7	76.2	77.2	77.8	*11.3*	*1.6*
NL	:	71.5	70.7	72.7	73.8	75.6	77.2	78.7	*7.2*	*3.1*
AT	:	66.2	66.5	69.0	72.3	75.2	76.6	77.6	*11.4*	*2.4*
PL	:	64.9	66.6	66.9	66.3	69.6	70.8	71.5	*6.6*	*1.9*
PT	56.4	61.1	63.7	67.9	70.6	73.2	74.9	76.5	*15.4*	*3.3*
RO	:	:	65.9	66.6	66.7	67.7	68.7	69.8	*:*	*2.1*
SI	:	66.1	65.0	67.4	69.8	72.2	73.9	75.9	*9.8*	*3.7*
SK	:	67.9	66.8	66.8	66.7	69.2	70.2	71.4	*3.5*	*2.2*
FI	:	65.5	66.5	69.3	71.0	74.2	75.6	76.6	*11.1*	*2.4*
SE	:	71.2	72.3	72.8	74.8	77.4	78.5	79.4	*8.2*	*2.0*
UK	66.2	67.9	68.7	70.2	72.9	75.5	77.1	78.3	*10.4*	*2.8*
NO	:	71.6	71.2	72.4	73.5	76.0	77.8	78.7	*7.1*	*2.7*
EU27		66.9	67.7	68.9	70.5	72.7	74.0	75.3	*8.4*	*2.6*
EA		66.6	67.7	69.6	71.8	74.0	75.6	76.9	*10.3*	*2.9*
EA12		66.7	67.9	70.2	72.8	75.0	76.5	77.8	*11.2*	*2.8*
EU15		67.4	68.6	70.6	72.8	75.2	76.7	77.9	*10.5*	*2.7*
EU10		65.9	66.4	66.7	67.9	69.9	70.9	72.5	*6.6*	*2.6*
EU25		66.8	67.8	69.0	70.8	73.0	74.4	75.7	*8.9*	*2.7*
Females	1950	1960	1970	1980	1990	2000	2005	2009	*1960-2009*	*2000-2009*
BE	67.3	72.8	74.3	76.7	79.5	81.0	81.9	82.8	*10.0*	*1.8*
BG	:	71.1	73.5	73.9	74.7	75.0	76.2	77.4	*6.3*	*2.4*
CZ	:	73.5	73.1	74.0	75.5	78.5	79.2	80.5	*7.0*	*2.0*
DK	:	74.4	75.9	77.3	77.8	79.2	80.5	81.1	*6.7*	*1.9*
DE	68.5	71.7	73.6	76.2	78.5	81.2	82.0	82.8	*11.1*	*1.6*
EE	:	71.6	74.1	74.1	74.9	76.2	78.1	80.2	*8.6*	*4.0*
IE	67.1	71.9	73.5	75.6	77.7	79.2	81.6	82.5	*10.6*	*3.3*
EL	68.5	72.4	76.1	77.5	79.5	80.6	81.6	82.7	*10.3*	*2.1*
ES	64.3	72.2	74.8	78.5	80.6	82.9	83.7	84.9	*12.7*	*2.0*
FR	68.5	73.6	75.9	78.4	81.2	83.0	83.8	85.0	*11.4*	*2.0*
IT*	67.2	72.3	74.9	77.4	80.3	82.8	83.6	84.5	*12.2*	*1.7*
CY	:	:	:	77.0	78.6	80.1	80.9	83.6	*:*	*3.5*
LV	:	72.4	74.4	74.2	74.6	76.1	76.5	78.0	*5.6*	*1.9*
LT	:	71.4	75.0	75.4	76.3	77.5	77.3	78.7	*7.3*	*1.2*
LU	:	72.2	73.0	75.6	78.7	81.3	82.3	83.3	*11.1*	*2.0*
HU	:	70.2	72.2	72.8	73.8	76.2	77.2	78.4	*8.2*	*2.2*
MT	:	70.5	72.6	72.8	78.1	80.3	81.4	82.7	*12.2*	*2.4*
NL	:	75.5	76.3	79.3	80.3	80.7	81.7	82.9	*7.4*	*2.2*
AT	:	72.7	73.5	76.1	79.0	81.2	82.2	83.2	*10.5*	*2.0*
PL	:	70.6	73.3	75.4	75.3	78.0	79.3	80.1	*9.5*	*2.1*
PT	61.6	66.7	69.7	74.9	77.5	80.2	81.3	82.6	*15.9*	*2.4*
RO	:	:	70.4	71.9	73.1	74.8	75.7	77.4	*:*	*2.6*
SI	:	72.0	72.4	75.2	77.8	79.9	80.9	82.7	*10.7*	*2.8*
SK	:	72.7	73.1	74.4	75.7	77.5	78.1	79.1	*6.4*	*1.6*
FI	:	72.5	75.0	78.0	79.0	81.2	82.5	83.5	*11.0*	*2.3*
SE	:	74.9	77.3	79.0	80.6	82.0	82.9	83.5	*8.6*	*1.5*
UK	71.2	73.7	75.0	76.2	78.5	80.3	81.3	82.5	*8.8*	*2.2*
NO	:	76.0	77.5	79.3	79.9	81.5	82.7	83.2	*7.2*	*1.7*
EU27	:	72.2	73.9	75.8	77.7	79.5	80.5	81.7	*9.5*	*2.2*
EA	:	72.1	73.9	76.3	78.6	80.5	81.6	82.9	*10.8*	*2.3*
EA12	:	72.0	73.9	76.6	79.2	81.2	82.1	83.4	*11.3*	*2.2*
EU15	:	72.6	74.6	77.1	79.2	81.1	82.2	83.2	*10.6*	*2.1*
EU10	:	71.6	73.3	74.5	76.1	78.0	78.9	80.4	*8.8*	*2.4*
EU25	:	72.3	74.1	76.1	78.0	79.9	80.9	82.1	*9.8*	*2.2*

Source: Commission services based on Eurostat data, 2009 Ageing Report.
Note: EU averages are simple averages. * 2008.

1.3.2. The EUROPOP2010 projection

A detailed overview of the projection methodology is provided by Eurostat.[17] [18]

Table 1.4 and Table 1. 5 present the projected changes in life expectancy at birth and at age 65 for males and females in the baseline scenario of EUROPOP2010. It projects large increases in life expectancy at birth being sustained during the projection period, albeit with a considerable degree of diversity across Member States.

In the EU, life expectancy at birth for males is projected to increase by 7.9 years over the projection period, from 76.7 in 2008 to 84.6 in 2060. For females, life expectancy at birth is projected to increase by 6.5 years for females, from 82.5 in 2008 to 89.1 in 2060, implying a convergence of life expectancy between males and females. The largest increases in life expectancy at birth, for both males and females, are projected to take place in the Member States with the lowest life expectancy in 2010. Life expectancy for males in 2010 is the lowest in Bulgaria, Estonia, Latvia, Lithuania, Hungary and Romania, ranging between 67 and 71 years. Some catching-up takes place over the projection period, with increases in life expectancy of more than 11 years up to 2060 for these countries. For females, the largest gains in life expectancy at birth of 8 years or more is projected in Bulgaria, Latvia, Lithuania, Hungary, Romania and Slovakia. Female life expectancy in 2010 in all of these countries are below 80 years.

Given the assumed ‘convergence hypothesis’, the projection compresses the spread of life expectancy at birth for males across the Member States, from 11.7 years in 2008 (Sweden 79.4 and Lithuania 67.7) to 4.8 years in 2060 (85.5 in Sweden and Italy compared with 80.7 in Lithuania). For females, the reduction of the differential in life expectancy at birth is lower, from 7.2 years in 2008 (84.7 in Spain and 77.5 in Bulgaria and Romania) to 3.4 year in 2060 (90 in France and 86.6 in Bulgaria).

In the EU as a whole, life expectancy at age 65 is projected to increase by 5.2 years for males and by 4.9 years for females over the projection period. In 2060, life expectancy at age 65 will reach 22.4 years for males and 25.6 for females and the projected difference (3.2 years) is smaller than the 4.5 year difference in life expectancy at birth. In 2060, the highest life expectancy at age 65 is expected in France for both males (23 years) and females (26.6 years), while the lowest is expected in Bulgaria for both males (20.6 years) and females (23.6 years).

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[17] See 'Eurostat Population Projections 2010-based 'EUROPOP2010)': Methodology and results of a long-term scenario of demographic convergence' (forthcoming).

[18] Table 1.3 reports life expectancy according to the age last birthday during the year, while Table 1.4 reports life expectancy according to the age reached during a calendar year.

Table 1.4 - Projection of life expectancy at birth in EUROPOP2010

	Males							Females						
	2010	2020	2030	2040	2050	2060	change 2010-2060	2010	2020	2030	2040	2050	2060	change 2010-2060
BE	77.3	79.0	80.5	82.0	83.3	84.6	7.3	82.6	84.0	85.4	86.7	87.9	89.0	6.4
BG	70.3	72.9	75.4	77.6	79.7	81.7	11.4	77.5	79.6	81.5	83.3	85.0	86.6	9.1
CZ	74.3	76.3	78.2	79.9	81.6	83.2	8.8	80.4	82.1	83.6	85.1	86.5	87.8	7.4
DK	77.0	78.6	80.2	81.7	83.1	84.4	7.4	81.1	82.8	84.3	85.8	87.2	88.4	7.3
DE	77.6	79.3	80.8	82.2	83.6	84.8	7.2	82.7	84.1	85.4	86.6	87.8	88.9	6.2
EE	69.8	72.5	75.0	77.4	79.6	81.6	11.8	80.1	81.9	83.6	85.1	86.6	88.0	7.9
IE	77.0	78.7	80.3	81.8	83.2	84.5	7.5	82.0	83.5	85.0	86.4	87.7	88.9	6.9
GR	77.8	79.4	80.9	82.3	83.7	84.9	7.1	82.8	84.0	85.1	86.2	87.3	88.3	5.5
ES	78.6	80.2	81.6	83.0	84.2	85.4	6.8	84.7	85.8	86.9	88.0	89.0	89.9	5.3
FR	77.9	79.6	81.1	82.5	83.9	85.1	7.2	84.6	85.8	87.0	88.1	89.1	90.0	5.5
IT	78.9	80.4	81.8	83.1	84.3	85.5	6.6	84.2	85.4	86.6	87.7	88.8	89.7	5.6
CY	78.3	79.9	81.3	82.7	83.9	85.1	6.8	82.8	84.2	85.4	86.7	87.9	89.0	6.2
LV	68.3	71.2	74.0	76.6	78.9	81.1	12.8	78.0	80.1	82.1	83.9	85.6	87.2	9.2
LT	67.7	70.7	73.5	76.1	78.5	80.7	12.9	78.7	80.6	82.4	84.0	85.6	87.1	8.4
LU	77.8	79.4	80.9	82.3	83.6	84.9	7.1	82.9	84.4	85.8	87.1	88.3	89.5	6.6
HU	70.4	73.0	75.5	77.8	80.0	81.9	11.5	78.4	80.5	82.4	84.2	85.9	87.4	9.0
MT	77.6	79.3	80.8	82.3	83.6	84.9	7.3	82.3	83.8	85.3	86.6	87.8	88.9	6.6
NL	78.7	80.1	81.5	82.8	84.0	85.2	6.5	82.8	84.2	85.5	86.8	88.0	89.1	6.3
AT	77.6	79.2	80.7	82.2	83.5	84.8	7.2	83.0	84.4	85.6	86.9	88.0	89.1	6.1
PL	71.7	74.2	76.4	78.6	80.6	82.4	10.7	80.1	81.9	83.5	85.1	86.6	87.9	7.8
PT	76.5	78.3	79.9	81.5	82.9	84.2	7.7	82.5	83.9	85.1	86.3	87.5	88.6	6.1
RO	70.0	72.8	75.3	77.6	79.8	81.8	11.8	77.5	79.6	81.6	83.4	85.1	86.7	9.3
SI	75.8	77.7	79.4	81.0	82.5	84.0	8.1	82.3	83.7	85.1	86.4	87.6	88.8	6.5
SK	71.6	74.0	76.2	78.4	80.3	82.2	10.6	79.1	81.0	82.7	84.4	86.0	87.4	8.3
FI	76.6	78.4	80.0	81.6	83.0	84.4	7.7	83.2	84.6	85.9	87.0	88.2	89.2	6.0
SE	79.4	80.8	82.1	83.3	84.4	85.5	6.1	83.4	84.8	86.0	87.2	88.3	89.3	5.9
UK	78.3	79.9	81.4	82.7	84.0	85.2	7.0	82.4	83.9	85.4	86.7	87.9	89.1	6.7
NO	78.7	80.2	81.5	82.8	84.1	85.2	6.5	83.1	84.5	85.8	87.0	88.1	89.2	6.1
EU27	76.7	78.6	80.3	81.8	83.3	84.6	7.9	82.5	84.0	85.4	86.7	87.9	89.1	6.5
EA	77.9	79.5	81.0	82.5	83.8	85.0	7.1	83.5	84.9	86.1	87.3	88.4	89.4	5.9
EA12	79.5	81.2	82.7	84.1	85.4	86.6	7.1	85.3	86.7	87.9	89.1	90.1	91.2	5.8
EU15	78.1	79.7	81.2	82.6	83.9	85.1	7.0	83.4	84.8	86.0	87.2	88.3	89.4	6.0
EU10	71.8	74.3	76.5	78.7	80.6	82.4	10.6	79.8	81.6	83.3	84.9	86.4	87.8	8.0
EU25	77.1	78.9	80.5	82.0	83.5	84.8	7.6	82.8	84.3	85.6	86.9	88.1	89.2	6.3

Source: Commission services based on Eurostat EUROPOP2010 data.
Note: EU averages are weighted averages.

Table 1. 5 - Projection of life expectancy at 65 in EUROPOP2010

	Males							Females						
	2010	2020	2030	2040	2050	2060	change 2010-	2010	2020	2030	2040	2050	2060	change 2010-
BE	17.4	18.4	19.4	20.4	21.4	22.3	4.9	20.9	21.9	22.9	23.9	24.8	25.7	4.8
BG	13.8	15.3	16.6	18.0	19.3	20.6	6.7	17.0	18.4	19.7	21.1	22.4	23.6	6.6
CZ	15.3	16.5	17.7	18.9	20.1	21.2	5.9	18.7	19.9	21.1	22.3	23.4	24.5	5.8
DK	16.8	17.9	19.0	20.0	21.1	22.0	5.2	19.5	20.8	21.9	23.1	24.1	25.1	5.6
DE	17.4	18.5	19.5	20.5	21.5	22.4	5.0	20.6	21.6	22.6	23.6	24.5	25.4	4.8
EE	14.1	15.5	16.9	18.3	19.6	20.9	6.8	19.1	20.4	21.6	22.7	23.8	24.9	5.8
IE	16.8	18.0	19.1	20.1	21.2	22.2	5.3	20.0	21.2	22.4	23.5	24.5	25.5	5.5
GR	17.9	18.9	19.9	20.8	21.7	22.6	4.7	20.2	21.1	22.0	22.9	23.8	24.6	4.4
ES	18.2	19.2	20.2	21.1	22.0	22.9	4.7	22.1	23.0	23.9	24.7	25.5	26.3	4.1
FR	18.5	19.5	20.4	21.3	22.1	23.0	4.5	22.7	23.6	24.4	25.2	25.9	26.6	3.9
IT	18.1	19.1	20.1	21.0	22.0	22.8	4.7	21.7	22.7	23.6	24.5	25.3	26.1	4.4
CY	17.8	18.8	19.8	20.7	21.6	22.5	4.8	20.0	21.1	22.2	23.3	24.3	25.3	5.3
LV	13.5	15.0	16.5	17.9	19.3	20.6	7.2	18.1	19.5	20.8	22.1	23.3	24.4	6.3
LT	13.5	15.0	16.4	17.8	19.1	20.4	6.9	18.4	19.6	20.8	22.0	23.1	24.2	5.8
LU	17.3	18.4	19.5	20.5	21.4	22.4	5.0	21.1	22.2	23.3	24.3	25.2	26.1	4.9
HU	14.0	15.5	16.9	18.3	19.7	20.9	6.9	18.1	19.5	20.9	22.2	23.4	24.6	6.4
MT	17.0	18.1	19.2	20.3	21.3	22.2	5.2	20.2	21.3	22.4	23.4	24.4	25.4	5.2
NL	17.5	18.5	19.5	20.5	21.4	22.3	4.9	20.9	21.9	22.9	23.8	24.8	25.6	4.8
AT	17.6	18.6	19.6	20.6	21.5	22.4	4.8	20.9	21.9	22.9	23.8	24.7	25.6	4.7
PL	14.8	16.2	17.5	18.8	20.0	21.2	6.4	19.1	20.3	21.5	22.7	23.8	24.8	5.7
PT	17.1	18.1	19.2	20.2	21.1	22.1	5.0	20.4	21.4	22.4	23.3	24.2	25.1	4.7
RO	14.1	15.5	16.9	18.3	19.6	20.8	6.7	17.2	18.6	20.0	21.3	22.6	23.8	6.6
SI	16.4	17.6	18.7	19.8	20.8	21.9	5.5	20.2	21.3	22.4	23.4	24.4	25.3	5.1
SK	14.1	15.5	16.9	18.2	19.5	20.8	6.6	18.0	19.3	20.6	21.9	23.1	24.3	6.3
FI	17.3	18.3	19.4	20.4	21.4	22.3	5.0	21.3	22.2	23.2	24.1	25.0	25.8	4.5
SE	18.2	19.2	20.1	21.0	21.8	22.7	4.4	21.1	22.1	23.1	24.0	24.9	25.7	4.7
UK	18.0	19.0	20.0	21.0	21.9	22.8	4.8	20.7	21.8	22.8	23.8	24.8	25.7	5.0
NO	17.9	18.9	19.9	20.8	21.7	22.5	4.6	21.0	22.0	23.0	23.9	24.8	25.7	4.7
EU27	17.2	18.3	19.4	20.5	21.4	22.4	5.2	20.7	21.8	22.8	23.8	24.7	25.6	4.9
EA	17.8	18.8	19.8	20.8	21.7	22.6	4.8	21.4	22.4	23.3	24.2	25.1	25.9	4.5
EA12	18.2	19.2	20.2	21.2	22.2	23.0	4.9	21.9	22.9	23.8	24.7	25.6	26.4	4.6
EU15	17.9	18.9	19.9	20.9	21.8	22.7	4.8	21.3	22.3	23.3	24.2	25.1	25.9	4.6
EU10	14.7	16.1	17.4	18.7	20.0	21.1	6.4	18.8	20.1	21.3	22.5	23.6	24.7	5.9
EU25	17.4	18.5	19.5	20.6	21.5	22.5	5.1	20.9	21.9	23.0	23.9	24.8	25.7	4.8

Source: Commission services based on Eurostat EUROPOP2010 data.
Note: EU averages are weighted averages.

1.4. Projection of net migration flows

1.4.1. Past trends and driving forces

European countries have gradually become a destination for migrants, starting in the 1950s in countries with post-war labour recruitment needs and with colonial past. Southern European countries became net receiving countries during the 1990s and several countries in Central and Eastern Europe are currently both source and destination of migrants. Three distinct phases of immigration can be identified in the last half century:

- the *guest worker* phase, with programmes to recruit foreign workers to cope with increasing labour demand during the economic boom in the 1950s and 1960s in Austria, Denmark, Germany, Luxemburg, Belgium, France, the Netherlands and the UK. They turned to other European countries, such as Italy, Portugal and Spain, and/or to former colonies or neighbouring countries: North Africa in the case of France and Belgium; the Caribbean and the Indian subcontinent for the UK; and Yugoslavia and

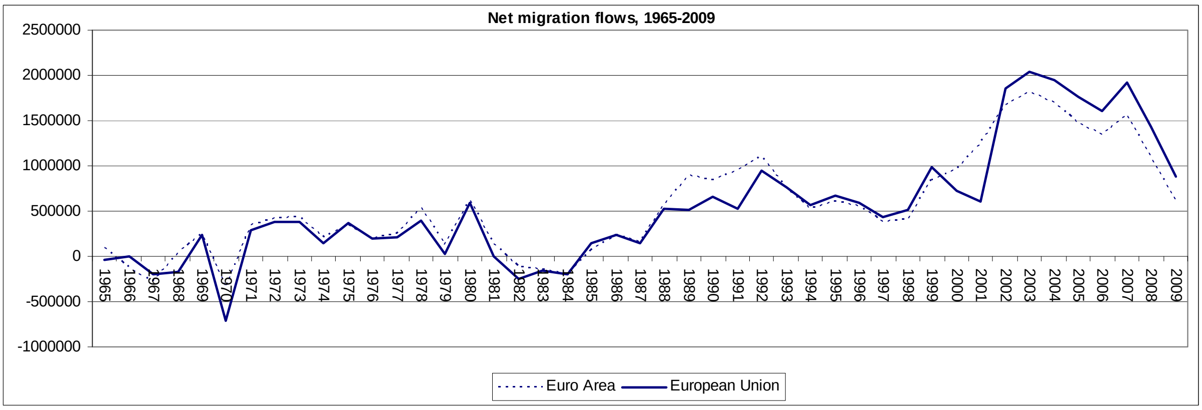
Turkey for Germany. Foreign labour recruitment stopped in 1974, after the first oil price shock and subsequent rise in unemployment;[19]

- immigration continued, mostly due to *family reunification*: net migration flows during the 1970s were of 240,000 people per year on average as immigrants who were present in these countries decided to stay and were joined by their families from their home countries;

- the *asylum seekers* phase: After a brief period of net outflows during the early 1980s recession, net migration flows rose again, peaking in 1991-1992, as the fall of the "iron curtain" and a number of wars and ethnic conflicts, such as in former Yugoslavia, pushed upwards the number of people seeking asylum.

Net inflows dropped significantly between 1992 and 1997, partly due to tighter controls over migratory flows in the main receiving countries, but they resumed their growth at the end of the 1990s. Overall, the average annual net entries for the EU25 more than tripled from around 198,000 people per year during the 1980s to around 750,000 people per year during the 1990s. High clandestine migration also marks the decade of the 1990s. In the beginning of the 2000's the net migration flows to the EU27 countries encountered a vigorous increase, totalling more than 2,000,000 in 2003.

Graph 1. 1 - Net migration flows, 1965-2009



Source: Commission services based on Eurostat data.

[19] Measures of macroeconomic conditions, such as unemployment rates, are typically not helpful in explaining *long-run* immigration policy changes; however the *timing* of their introduction is strongly influenced by short-run macroeconomic conditions (Hatton and Williamson, 2003). See also the Box "Drivers of migration trends" that identifies four main economic and demographic drivers as identified by Hatton and Williamson (2003). However, Eurostat migration projections were not based on explicit regard of these factors but on trend projections.

Box 1.1: Drivers of migration trends

The economic theory of migration is based on the assumption that migrants try to maximise the net gains from migration, calculated as the difference in present value of alternative earnings streams, minus migration costs. An individual is more likely to migrate the higher is the wage in the destination country and the lower the source country wage and the migration cost. Policies that restrict immigration can be seen as raising the migration cost. The likelihood of migration tends to decline with age because the remaining working life is shorter. Thus, for a given incentive to migrate, migration will be higher the younger is the population of working-age in the source country.

New economic theories have expanded this framework to incorporate the idea that migration decisions are taken in a household context rather than by an individual. The family member in a foreign labour market sends a stream of remittances to improve the economic situation of the family which can either stay in the country or follow via family reunification.

Hatton and Williamson (2003) have identified four main economic and demographic factors generating migration :

- the gap in income per capita between rich, high-wage countries and poor, low-wage countries;

- emigration from poor countries may increase as economic development takes place, which does not seem consistent with the fact that migration is driven by the gap between income in the source and destination regions. This is due to the relaxation of the poverty constraints to migrate. Indeed, for the very poor it may be difficult to finance migration so income gains have a positive effect on migration, which may dominate the negative effect associated with a reduction of the income gap between sending and receiving countries. A hump shaped relationship between economic development in sending countries and emigration has been observed: emigration rates out of very poor countries are very low, whilst they are much higher out of moderately poor countries (Hatton and Williamson, 1998); this could be explained by catching up that relaxes the poverty constraint.

- the share of young adult population in a receiving country has a negative effect on immigration, whilst a bigger young adult share in sending countries increases emigration.

- networks (friends and relatives) drive dynamic effects of migration through the stock of previous migrants from the sending country residing in the receiving country.

On the demand-side, the policies of receiving countries are factors of migration, notably the promotion of immigration to fill labour shortages.

[1] See Hatton and Williamson (2003).

Net migration flows[20] per country are characterised by high variability, see Table 1.6. Traditionally, Germany, France and the UK record the largest number of arrivals in the EU, but in the last decade there has been a rise of migration flows to Italy, Spain and Ireland that have switched from countries of origin to destination countries. After high migration inflows to the EU in the first half of the 2000s, flows were reduced drastically and even turned into outflows in some countries that previously had experienced sharp increases. For the EU as a whole, annual inward migration was more than halved between 2005 and 2009 (from +1,760,933 in 2005 to +879,644 in 2009). In terms of persons, the largest declines in annual

[20] Due to difficulties in having for each Member State good statistics of the migration flows, net migration is measured as the difference between the total population on 31 December and 1 January for a given calendar year, minus the difference between births and deaths (or natural increase). The approach is different from that of subtracting recorded emigration flows from immigration flows. Notably, when operating like that, the "net migration" not only records errors due to the difficulty of registering the migration moves, it also includes all possible errors and adjustments in te other demographic variables.

inflows were recorded in ES, FR, DE, IE and UK (between 590,000 and 48,000 less). By contrast, higher inflows were noted in NL, SE, BE and IT (between 61,000 and 14,000 more). However, net migration flows do not show the size of inward and outward movements – due to temporary and return migration. Therefore, net migration flows are much smaller than gross flows, as can be seen in a country like Germany.

Table 1.6 - Past trends in net migration flows

	1961	1970	1980	1990	2000	2005	2009
BE	-39859	-32718	-2436	19547	12836	49186	64037
BG	-67	-11031	-5	-94611	0	0	-15729
CZ	4911	-121345	-41216	-58893	6539	36229	28344
DK	2745	21113	570	8553	10094	6734	15341
DE	118435	-271686	304410	656166	167863	81578	-10681
EE	8506	6066	6052	-5623	224	140	30
IE	-19662	-2796	-592	-7667	31820	62553	-27556
GR	-16761	-46393	55777	63920	29401	39974	35099
ES	-82664	72947	112659	-20007	389774	641199	50780
FR	:	:	:	:	166761	187185	70288
IT	-136302	-107276	4914	22260	49526	303640	318066
CY	-6519	-903	836	8708	3960	14421	1846
LV	15467	6734	2445	-13085	-5504	-564	-4700
LT	3690	14025	2122	-8848	-20306	-8782	-15483
LU	2415	1084	1344	3937	3431	6106	6583
HU	909	0	0	18313	16658	17268	17321
MT	-6037	-1944	380	857	873	1612	-1561
NL	5924	32516	50557	48730	57033	-22824	38522
AT	-2679	10406	9357	58562	17272	49938	21067
PL	-61865	-293620	-24125	-12620	-409925	-12878	-1196
PT	-38078	-121955	41969	-39107	47000	38400	15406
RO	-41623	-12190	52937	-86781	-3729	-7234	-1605
SI	-4489	3713	5420	-245	2747	6436	11508
SK	-5636	-35091	-11493	-2322	-22301	3403	4367
FI	-11815	-36381	-2180	8604	2410	9152	14566
SE	13115	46726	9606	34814	24386	26724	62614
UK	87400	-14821	-33485	24662	143871	231337	182370
NO	694	-758	3741	1796	9707	18332	38589
EU27	-26925	-712311	589797	655279	722714	1760933	879644
EA17	-51607	-347902	620948	843775	960630	1472099	612367
EA12	-43951	-320646	620589	851108	979087	1460508	598023
EU15	-117786	-449234	552470	882974	1153478	1710882	856502
EU10	-51063	-422365	-59579	-73758	-427035	57285	40476
EU25	14765	-689090	536865	836671	726443	1768167	896978

Source: Commission services based on Eurostat data.

1.4.2. The EUROPOP 2010 projection

Projected net migration flows in EUROPOP2010

The methodology used to project net migration in EUROPOP2010 is described in Eurostat (2011).[21]

Table 1.7 presents the projected net migration flows in the baseline of EUROPOP2010. For the EU as a whole, annual net inflows are projected to increase from about 1,018,000 people in 2010 (equivalent to 0.20% of the EU population) to 1217,000,000 by 2020 and thereafter declining to 878,000 people by 2060 (a slightly smaller part, 0.17% of the EU population).

Over the entire projection period, the cumulated net migration to the EU is 55 millions, of which the bulk is concentrated in the euro area (42 millions). Net migration flows are projected to be concentrated to a few destination countries: Italy (15.4 millions cumulated up to 2060), Spain (10.9 millions) and the UK (8.6 millions). According to the assumptions, the change of Spain and Italy from origin in the past to destination countries would be confirmed in coming decades. For countries that currently experience a net outflow (BG, EE, LV, LT, MT and RO), this is projected to taper off or reverse in the coming decades.

Table 1.7 - Projection of net migration flows in EUROPOP2010

	Net migration ('000)						as % of total population		cumulated (1000's)	Cumulated net migration as share
	2010	2020	2030	2040	2050	2060	2010	2060	2010-2060	of population in 2060
BE	61.3	46.2	42.6	39.1	35.5	32.0	0.6%	0.2%	2147	16.0%
BG	-9.9	-14.6	-3.3	5.5	3.8	0.7	-0.1%	0.0%	-110	-2.0%
CZ	30.5	29.0	25.6	29.9	24.1	18.3	0.3%	0.2%	1355	13.0%
DK	12.3	11.4	12.0	9.9	8.7	8.7	0.2%	0.1%	528	8.7%
DE	41.0	114.6	133.0	82.4	87.7	72.3	0.1%	0.1%	4974	7.5%
EE	-0.5	-1.0	-0.3	0.6	0.8	0.0	0.0%	0.0%	2	0.2%
IE	-21.5	22.5	20.8	19.0	17.3	15.6	-0.5%	0.2%	758	11.6%
GR	26.2	37.0	35.8	35.9	29.8	25.3	0.2%	0.2%	1667	14.8%
ES	79.1	267.4	254.0	249.6	209.7	185.2	0.2%	0.4%	11241	21.5%
FR	71.9	92.7	87.0	76.8	70.7	62.9	0.1%	0.1%	4047	5.5%
IT	360.7	344.1	338.7	312.3	269.8	244.3	0.6%	0.4%	15938	24.5%
CY	2.2	6.0	5.5	5.0	4.7	4.1	0.3%	0.4%	247	21.8%
LV	-3.4	-0.5	0.4	1.5	1.9	0.6	-0.2%	0.0%	25	1.5%
LT	-13.0	-5.1	-1.0	1.2	2.2	0.8	-0.4%	0.0%	-85	-3.2%
LU	6.3	3.7	3.4	3.1	2.8	2.6	1.2%	0.4%	180	24.7%
HU	22.5	27.3	22.1	26.7	22.0	18.9	0.2%	0.2%	1194	13.5%
MT	-1.2	0.5	0.4	0.5	0.5	0.4	-0.3%	0.1%	14	3.7%
NL	35.5	9.3	11.8	5.2	5.9	6.2	0.2%	0.0%	570	3.3%
AT	19.1	35.2	35.6	29.9	27.9	25.8	0.2%	0.3%	1542	17.4%
PL	11.7	13.0	3.2	26.4	34.2	14.1	0.0%	0.0%	950	2.9%
PT	18.5	36.8	37.2	37.0	30.7	27.8	0.2%	0.3%	1669	16.3%
RO	-0.2	8.4	3.2	17.6	16.8	7.6	0.0%	0.0%	564	3.3%
SI	11.0	6.3	5.7	5.6	5.0	3.8	0.5%	0.2%	304	14.8%
SK	10.6	9.9	8.2	10.3	9.9	6.8	0.2%	0.1%	478	9.4%
FI	14.8	11.4	9.7	8.6	8.2	7.3	0.3%	0.1%	507	8.8%
SE	59.9	28.2	26.0	23.8	21.7	19.5	0.6%	0.2%	1438	12.5%
UK	197.9	193.0	178.1	163.3	148.5	133.6	0.3%	0.2%	8652	10.9%
NO	36.9	17.4	16.0	14.7	13.4	12.0	0.8%	0.2%	884	13.4%
EU27	1043.0	1332.5	1295.2	1226.7	1100.9	945.0	0.21%	0.18%	60798	11.77%
EA	734.8	1042.5	1028.9	920.9	817.0	722.2	0.2%	0.2%	45806	13.4%
EA12	722.9	1029.8	1017.4	909.8	806.8	713.9	0.2%	0.2%	45240	13.7%
EU15	982.8	1253.4	1225.6	1096.0	975.0	868.8	0.2%	0.2%	55859	13.1%
EU10	70.3	85.3	69.7	107.5	105.3	67.8	0.1%	0.1%	4486	6.8%
EU25	1053.1	1338.8	1295.3	1203.5	1080.3	936.6	0.2%	0.2%	60344	12.2%

Source: Eurostat, EUROPOP2010.

[21] Eurostat projections of migration flows were based on average levels estimated from 2002 to 2009.

1.5. Overall results of the EUROPOP2010 population projection

Table 1.8 presents an overview of the baseline population projection - EUROPOP2010 - used in the 2012 EC-EPC age-related expenditure projection exercise.

The age structure of the EU population will dramatically change in coming decades due to the dynamics of fertility, life expectancy and migration. The overall size of the population is projected to be slightly larger in 50 years time, but much older than it is now. The EU population is projected to increase (from 501 million in 2010) up to 2040 by almost 5%, when it will peak (at 526 million). Thereafter, a steady decline occurs and the population shrinks by nearly 2%. Nonetheless, according to the projections, the population in 2060 will be slightly higher than in 2008, at 517 million.

While the EU population as a whole would be slightly larger in 2060 compared to 2010, there are wide differences in population trends until 2060 across Member States. Decreases of the total population are projected for about half of the EU Member States (BG, CZ, DE, EE, EL, LV, LT, HU, MT, PL, PT, RO and SK). For the other Member States (BE, DK, IE, ES, FR, IT, CY, LU, NL, AT, SI, FI, SE and UK) an increase is projected. The strongest population growth is projected to be found in Ireland (+46%), Luxembourg (+45%), Cyprus (+41%), the United Kingdom (+27%), Belgium (+24%) and Sweden (+23%), and the sharpest declines in Bulgaria (-27%), Latvia (-26%), Lithuania (-20%), Romania and Germany (both -19%) (see Table 1.8).

Table 1.8 - Projection of the total population (in millions)

	Total population (annual average)						% change		
	2010	2020	2030	2040	2050	2060	2010-2020	2020-2060	2010-2060
BE	10.9	11.6	12.2	12.7	13.1	13.5	6.8	15.8	23.7
BG	7.5	7.1	6.6	6.2	5.9	5.5	-6.0	-22.3	-26.9
CZ	10.5	10.8	10.8	10.7	10.7	10.5	2.8	-3.4	-0.7
DK	5.5	5.7	5.9	6.0	6.0	6.1	3.3	6.2	9.7
DE	81.7	80.0	77.7	74.6	70.6	66.2	-2.0	-17.3	-19.0
EE	1.3	1.3	1.3	1.2	1.2	1.2	-1.3	-11.5	-12.6
IE	4.5	4.8	5.3	5.8	6.2	6.6	8.1	35.5	46.5
GR	11.3	11.5	11.6	11.6	11.6	11.3	1.9	-2.2	-0.4
ES	46.1	48.1	50.1	51.8	52.7	52.2	4.3	8.7	13.4
FR	64.9	68.0	70.4	72.3	73.2	73.7	4.7	8.5	13.7
IT	60.5	63.0	64.6	65.7	65.9	64.9	4.1	3.1	7.3
CY	0.8	0.9	1.0	1.0	1.1	1.1	10.4	27.6	40.9
LV	2.2	2.1	2.0	1.9	1.8	1.7	-4.8	-22.0	-25.8
LT	3.3	3.2	3.0	2.9	2.8	2.7	-4.4	-15.9	-19.6
LU	0.5	0.6	0.6	0.7	0.7	0.7	13.8	26.6	44.0
HU	10.0	9.9	9.7	9.4	9.2	8.8	-1.1	-10.6	-11.7
MT	0.4	0.4	0.4	0.4	0.4	0.4	0.7	-6.9	-6.3
NL	16.6	17.2	17.6	17.6	17.3	17.1	3.8	-1.1	2.7
AT	8.4	8.6	8.9	9.0	9.0	8.9	2.6	3.0	5.7
PL	38.2	38.4	37.5	36.0	34.5	32.6	0.5	-15.0	-14.6
PT	10.6	10.7	10.8	10.8	10.6	10.2	0.8	-4.5	-3.7
RO	21.4	21.0	20.2	19.4	18.4	17.2	-2.2	-17.8	-19.6
SI	2.1	2.1	2.2	2.1	2.1	2.1	4.4	-4.2	0.0
SK	5.4	5.6	5.6	5.5	5.3	5.1	2.7	-8.6	-6.1
FI	5.4	5.6	5.7	5.7	5.7	5.7	4.1	2.9	7.1
SE	9.4	10.1	10.6	10.9	11.2	11.5	7.7	14.2	23.0
UK	62.2	66.5	70.4	73.6	76.5	79.0	6.9	18.9	27.0
NO	4.9	5.4	5.8	6.1	6.4	6.6	10.5	22.1	35.0
EU27	501.8	514.9	522.6	525.7	523.8	516.5	2.6	0.3	2.9
EA	331.4	340.1	345.8	348.6	346.8	340.8	2.6	0.2	2.9
EA12	321.3	329.7	335.4	338.3	336.6	331.0	2.6	0.4	3.0
EU15	398.5	412.1	422.3	428.8	430.5	427.7	3.4	3.8	7.3
EU10	74.3	74.8	73.5	71.3	69.0	66.1	0.6	-11.6	-11.1
EU25	472.8	486.8	495.8	500.1	499.5	493.7	3.0	1.4	4.4

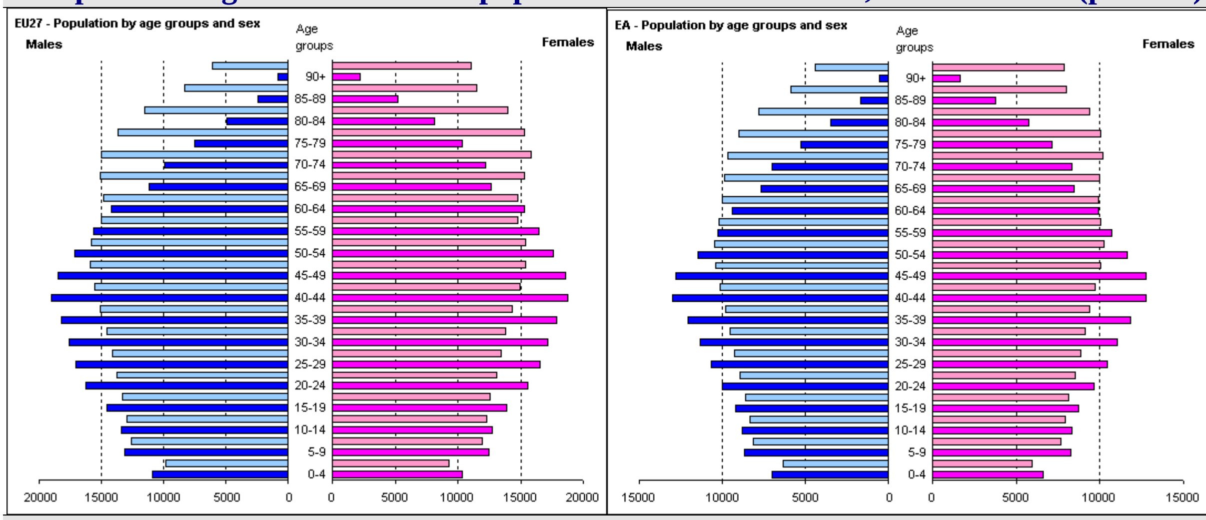
Source: Commission services based on Eurostat EUROPOP2010 data.

In 2010, the Member States with the largest population were: Germany (82 million), France (65 mn), the United Kingdom (62 mn), Italy (60 mn) and Spain (46 mn). In 2060, the UK would become the most populous EU country (79 million), followed by France (74 mn), Germany (66 mn), Italy (65 mn) and Spain (52 mn). In the case of Germany, the main driver for the significant decrease of the projected population is the very low net migration that results from the underlying migration assumptions.[22]

Age structure

The age structure of the EU population is projected to change dramatically, as shown in the population pyramids presented in Graph 1.2. The most numerous cohorts in 2010 are around 40 years old for men and women. Elderly people are projected to account for an increasing share of the population; this is due to the combination of the arrival at age 65 and more of the numerous cohorts born in the 1950's and 1960's with gains in life expectancy continuing over the projection period. At the same time, the base of the age pyramid becomes smaller during the projection period due to below replacement fertility rates. As a consequence, the shape of the age-pyramids gradually changes from pyramids to pillars. A similar development is projected for the euro area.

Graph 1. 2 – Age structure of the population in 2010 and 2060, EU27 and EA (persons)



Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1. 9 to Table 1. 13 present overviews of different population groups in the EU: the young population (0-14), the working-age population (15-64), those aged 65 and over and finally those aged 80 and over.

[22] During the next 50 years, net immigration to Germany is projected to be about 5 million, while in other Member States (e.g. ES and IT), it is between two and three times higher. Reflecting these assumptions, based as well on the latest observed trends, German population shrinks considerably. In 2060, Germany will no longer be the most populous Member States in the EU, but it is projected to become the third most populous Member State.

Table 1. 9 - Projection of young population aged 0-14 (in millions)

	Population aged 0-14						% change		
	2010	2020	2030	2040	2050	2060	2010-2020	2020-2060	2010-2060
BE	1.8	2.0	2.1	2.1	2.2	2.2	9.5	8.9	19.3
BG	1.0	1.1	0.9	0.8	0.8	0.7	2.4	-31.7	-30.0
CZ	1.5	1.7	1.5	1.4	1.5	1.4	13.0	-16.8	-6.0
DK	1.0	1.0	1.0	1.0	1.0	1.0	-2.7	0.8	-2.0
DE	11.0	10.1	9.7	9.0	8.5	8.3	-8.0	-18.2	-24.7
EE	0.2	0.2	0.2	0.2	0.2	0.2	11.2	-25.6	-17.2
IE	1.0	1.1	1.0	1.1	1.2	1.2	11.5	9.8	22.4
GR	1.6	1.7	1.6	1.5	1.6	1.5	4.7	-10.6	-6.4
ES	6.9	7.1	6.4	6.6	6.9	6.7	3.2	-6.8	-3.8
FR	12.0	12.3	12.2	12.2	12.2	12.1	2.6	-2.0	0.6
IT	8.5	8.5	8.1	8.2	8.3	8.1	-0.1	-4.7	-4.8
CY	0.1	0.2	0.2	0.2	0.2	0.2	13.6	9.4	24.3
LV	0.3	0.3	0.3	0.2	0.2	0.2	3.1	-37.9	-36.0
LT	0.5	0.5	0.5	0.4	0.4	0.4	3.8	-29.0	-26.3
LU	0.1	0.1	0.1	0.1	0.1	0.1	7.3	14.9	23.3
HU	1.5	1.4	1.3	1.2	1.1	1.1	-3.2	-23.4	-25.8
MT	0.1	0.1	0.1	0.1	0.1	0.1	-3.0	-18.8	-21.2
NL	2.9	2.8	2.8	2.8	2.7	2.6	-4.0	-5.2	-9.0
AT	1.2	1.2	1.2	1.2	1.2	1.2	-3.3	0.0	-3.3
PL	5.8	6.0	5.1	4.3	4.3	3.9	3.5	-34.3	-32.0
PT	1.6	1.5	1.3	1.3	1.3	1.2	-9.8	-15.3	-23.7
RO	3.2	3.1	2.6	2.3	2.2	2.0	-4.6	-35.7	-38.7
SI	0.3	0.3	0.3	0.3	0.3	0.3	12.6	-13.9	-3.1
SK	0.8	0.9	0.8	0.7	0.7	0.6	4.7	-27.6	-24.2
FI	0.9	0.9	0.9	0.9	0.9	0.9	6.1	-2.4	3.5
SE	1.6	1.8	1.9	1.8	1.9	1.9	16.3	6.7	24.1
UK	10.9	12.1	12.5	12.7	13.2	13.5	11.5	11.9	24.8
NO	0.9	1.0	1.1	1.1	1.1	1.1	9.4	12.0	22.5
EU27	78	80	76	75	75	74	2	-8.0	-6.1
EA	51	51	49	48	48	47	0	-7.0	-7.2
EA12	51	50	48	48	48	47	0	-7.0	-7.3
EU15	63	64	63	63	63	63	2	-2.6	-0.7
EU10	11	12	10	9	9	8	4	-28.3	-25.1
EU25	74	76	73	71	72	71	2	-6.5	-4.3

Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1. 10 - Projection of working age population aged 15-64 (in millions)

	Population aged 15-64						% change		
	2010	2020	2030	2040	2050	2060	2010-2020	2020-2060	2010-2060
BE	7.2	7.4	7.4	7.6	7.7	7.8	2.7	6.4	9.2
BG	5.2	4.5	4.1	3.7	3.3	3.0	-12.3	-34.1	-42.2
CZ	7.4	7.0	6.9	6.6	6.1	5.8	-5.7	-16.4	-21.2
DK	3.6	3.6	3.6	3.5	3.6	3.6	-0.4	-1.7	-2.1
DE	53.9	51.4	46.0	41.9	39.2	36.2	-4.7	-29.5	-32.8
EE	0.9	0.8	0.8	0.8	0.7	0.6	-7.4	-23.2	-28.9
IE	3.0	3.1	3.4	3.5	3.6	3.9	2.0	28.8	31.3
GR	7.5	7.4	7.3	6.8	6.3	6.2	-1.8	-15.8	-17.3
ES	31.3	31.7	32.1	30.7	29.2	29.2	1.1	-8.0	-6.9
FR	42.0	41.8	41.8	41.6	41.9	42.1	-0.5	0.6	0.1
IT	39.7	40.4	39.8	37.8	36.8	36.3	1.6	-10.1	-8.7
CY	0.6	0.6	0.6	0.7	0.7	0.7	4.2	11.3	16.0
LV	1.5	1.4	1.3	1.2	1.0	0.9	-8.9	-37.9	-43.4
LT	2.3	2.1	1.9	1.8	1.6	1.5	-8.4	-29.9	-35.8
LU	0.3	0.4	0.4	0.4	0.4	0.4	12.4	9.6	23.1
HU	6.9	6.5	6.3	5.9	5.3	4.9	-5.5	-24.5	-28.6
MT	0.3	0.3	0.3	0.3	0.2	0.2	-6.6	-19.3	-24.6
NL	11.1	11.0	10.5	10.1	10.0	9.8	-1.1	-11.3	-12.3
AT	5.7	5.7	5.5	5.3	5.2	5.1	0.5	-10.8	-10.3
PL	27.2	25.4	23.9	22.6	19.6	17.4	-6.7	-31.5	-36.1
PT	7.1	7.1	6.8	6.4	6.0	5.7	-0.9	-18.7	-19.4
RO	15.0	14.2	13.5	12.1	10.5	9.3	-5.5	-34.7	-38.3
SI	1.4	1.4	1.3	1.3	1.2	1.1	-2.6	-18.9	-21.0
SK	3.9	3.8	3.7	3.5	3.1	2.8	-3.5	-27.2	-29.8
FI	3.5	3.4	3.3	3.4	3.3	3.3	-4.2	-3.8	-7.9
SE	6.1	6.2	6.4	6.5	6.6	6.6	1.5	5.9	7.5
UK	41.1	41.9	42.8	43.9	45.4	46.1	2.0	10.0	12.2
NO	3.2	3.4	3.6	3.6	3.8	3.8	6.4	11.1	18.2
EU27	336.0	330.3	321.6	309.5	298.4	290.4	-1.7	-12.1	-13.6
EA	219.7	217.5	211.0	201.8	195.5	191.4	-1.0	-12.0	-12.8
EA12	217.4	215.2	208.8	199.6	193.4	189.4	-1.0	-12.0	-12.9
EU15	263.4	262.3	257.0	249.3	245.2	242.2	-0.4	-7.7	-8.0
EU10	52.5	49.3	47.0	44.4	39.5	35.9	-6.1	-27.1	-31.6
EU25	315.8	311.6	304.0	293.7	284.7	278.1	-1.3	-10.7	-11.9

Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1. 11 - Projection of persons aged 65 and over (in millions)

	Population aged 65+						% change		
	2010	2020	2030	2040	2050	2060	2010-2020	2020-2060	2010-2060
BE	1.9	2.2	2.7	3.1	3.3	3.4	20.1	52.8	83.5
BG	1.3	1.5	1.6	1.7	1.8	1.8	12.2	20.3	35.0
CZ	1.6	2.1	2.4	2.7	3.1	3.2	32.6	49.2	97.9
DK	0.9	1.1	1.3	1.5	1.5	1.6	24.7	35.6	69.1
DE	16.8	18.6	22.1	23.7	22.8	21.7	10.4	16.8	28.9
EE	0.2	0.3	0.3	0.3	0.3	0.4	11.8	39.7	56.1
IE	0.5	0.7	0.9	1.2	1.4	1.4	37.2	104.3	180.2
GR	2.2	2.4	2.8	3.3	3.6	3.5	12.5	45.0	63.2
ES	7.8	9.2	11.6	14.5	16.6	16.4	18.2	77.6	109.9
FR	10.8	13.8	16.5	18.5	19.1	19.6	27.4	41.9	80.8
IT	12.3	14.1	16.6	19.7	20.8	20.5	15.1	45.6	67.6
CY	0.1	0.1	0.2	0.2	0.3	0.3	39.2	111.3	194.1
LV	0.4	0.4	0.5	0.5	0.6	0.6	5.3	44.7	52.4
LT	0.5	0.6	0.7	0.7	0.8	0.8	5.2	48.0	55.6
LU	0.1	0.1	0.1	0.2	0.2	0.2	28.7	111.8	172.6
HU	1.7	2.0	2.1	2.4	2.7	2.8	18.5	44.0	70.7
MT	0.1	0.1	0.1	0.1	0.1	0.1	38.0	40.1	93.4
NL	2.6	3.4	4.3	4.8	4.7	4.6	33.8	35.1	80.8
AT	1.5	1.7	2.2	2.5	2.5	2.6	15.8	51.0	74.9
PL	5.2	7.0	8.5	9.1	10.6	11.3	35.3	61.2	118.1
PT	1.9	2.2	2.6	3.0	3.3	3.3	16.1	47.4	71.2
RO	3.2	3.7	4.1	5.0	5.7	6.0	15.7	62.0	87.5
SI	0.3	0.4	0.5	0.6	0.6	0.6	26.9	50.8	91.3
SK	0.7	0.9	1.2	1.3	1.6	1.7	36.5	87.2	155.4
FI	0.9	1.2	1.4	1.5	1.5	1.6	34.4	25.0	68.0
SE	1.7	2.1	2.4	2.6	2.8	3.0	21.8	45.4	77.1
UK	10.3	12.5	15.0	17.0	17.9	19.4	21.4	55.4	88.6
NO	0.7	1.0	1.2	1.4	1.5	1.6	30.0	72.8	124.7
EU27	87.5	104.7	124.6	141.7	150.2	152.6	19.7	45.8	74.4
EA	60.6	71.6	86.0	98.4	102.8	102.0	18.2	42.4	68.3
EA12	60.1	71.0	85.2	97.5	101.8	100.9	18.1	42.2	67.9
EU15	72.1	85.5	102.5	117.0	122.1	122.9	18.6	43.6	70.3
EU10	10.8	13.9	16.4	18.0	20.6	21.9	29.1	57.3	103.0
EU25	82.9	99.5	118.9	135.0	142.7	144.8	19.9	45.6	74.6

Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1. 12 - Projection of persons aged 80 and over (in millions)

	Population aged 80+						% change		
	2010	2020	2030	2040	2050	2060	2010-2020	2020-2060	2010-2060
BE	0.5	0.6	0.8	1.0	1.3	1.3	19.2	106.6	146.2
BG	0.3	0.3	0.4	0.5	0.6	0.7	17.5	107.0	143.3
CZ	0.4	0.4	0.7	0.8	0.9	1.3	15.5	192.5	237.9
DK	0.2	0.3	0.4	0.5	0.6	0.6	17.4	130.2	170.3
DE	4.2	5.9	6.4	8.0	10.2	8.9	40.4	52.3	113.9
EE	0.1	0.1	0.1	0.1	0.1	0.1	31.3	78.6	134.4
IE	0.1	0.2	0.2	0.4	0.5	0.6	27.1	274.4	376.0
GR	0.5	0.8	0.8	1.0	1.3	1.5	38.2	101.3	178.2
ES	2.3	2.8	3.5	4.5	6.1	7.5	24.0	164.3	227.7
FR	3.5	4.1	5.3	6.8	7.8	8.1	18.6	98.5	135.5
IT	3.5	4.5	5.3	6.4	8.3	9.2	27.9	101.8	158.1
CY	0.0	0.0	0.1	0.1	0.1	0.1	42.5	211.9	344.6
LV	0.1	0.1	0.1	0.2	0.2	0.2	30.0	82.3	136.9
LT	0.1	0.2	0.2	0.2	0.3	0.3	27.0	84.4	134.2
LU	0.0	0.0	0.0	0.0	0.1	0.1	31.9	200.4	296.3
HU	0.4	0.5	0.6	0.8	0.8	1.1	18.3	137.1	180.4
MT	0.0	0.0	0.0	0.0	0.0	0.0	41.6	122.7	215.2
NL	0.7	0.8	1.3	1.6	2.0	1.9	27.2	126.2	187.7
AT	0.4	0.5	0.6	0.8	1.1	1.0	19.4	112.4	153.6
PL	1.3	1.6	2.1	3.3	3.3	4.1	27.4	149.2	217.4
PT	0.5	0.6	0.8	1.0	1.2	1.4	31.3	118.5	186.8
RO	0.7	0.9	1.0	1.5	1.8	2.3	34.4	152.1	238.7
SI	0.1	0.1	0.1	0.2	0.2	0.3	36.1	134.3	218.9
SK	0.1	0.2	0.3	0.4	0.5	0.6	19.9	249.6	319.0
FI	0.3	0.3	0.5	0.6	0.6	0.6	24.1	90.8	136.8
SE	0.5	0.5	0.8	0.9	1.1	1.1	9.8	111.0	131.8
UK	2.9	3.5	4.7	5.7	7.2	7.3	19.7	111.7	153.4
NO	0.2	0.2	0.4	0.5	0.6	0.6	4.2	176.0	187.7
EU27	23.7	30.0	37.1	47.3	57.9	62.4	26.5	108.3	163.4
EA	16.8	21.6	26.0	32.9	41.2	43.3	28.5	100.4	157.5
EA12	16.7	21.4	25.7	32.6	40.8	42.9	28.4	100.0	156.8
EU15	20.1	25.5	31.3	39.2	49.0	51.3	26.6	101.2	154.7
EU10	2.6	3.2	4.3	6.1	6.5	8.2	24.5	151.7	213.2
EU25	22.7	28.7	35.6	45.3	55.5	59.4	26.4	106.9	161.5

Source: Commission services based on Eurostat EUROPOP2010 data.

The proportion of young people (aged 0-14) is projected to remain fairly constant by 2060 in the EU27 and the euro area (around 15%), while those aged 15-64 will become a substantially smaller share, declining from 67% to 56%. Those aged 65 and over will become a much larger share (rising from 18% to 30% of the population), and those aged 80 and over (rising from 5% to 12%) will almost become as numerous as the young population in 2060.

Table 1. 13 - Decomposition of the population by age-groups

	2010				2060			
	(0-14)	(15-64)	(65+)	(80+)	(0-14)	(15-64)	(65+)	(80+)
BE	17%	66%	17%	5%	16%	58%	26%	10%
BG	14%	69%	18%	4%	13%	54%	33%	13%
CZ	14%	70%	15%	4%	14%	56%	31%	12%
DK	18%	65%	17%	4%	16%	58%	26%	10%
DE	13%	66%	21%	5%	12%	55%	33%	14%
EE	15%	68%	17%	4%	14%	55%	30%	11%
IE	22%	67%	11%	3%	18%	60%	22%	9%
GR	14%	67%	19%	5%	14%	55%	31%	13%
ES	15%	68%	17%	5%	13%	56%	31%	14%
FR	18%	65%	17%	5%	16%	57%	27%	11%
IT	14%	66%	20%	6%	12%	56%	32%	14%
CY	17%	70%	13%	3%	15%	58%	28%	9%
LV	14%	69%	17%	4%	12%	52%	36%	13%
LT	15%	69%	16%	4%	14%	55%	31%	11%
LU	18%	68%	14%	4%	15%	58%	26%	10%
HU	15%	69%	17%	4%	12%	55%	32%	13%
MT	16%	69%	15%	3%	13%	56%	31%	11%
NL	18%	67%	15%	4%	16%	57%	27%	11%
AT	15%	68%	18%	5%	14%	57%	29%	12%
PL	15%	71%	14%	3%	12%	53%	35%	13%
PT	15%	67%	18%	5%	12%	56%	32%	14%
RO	15%	70%	15%	3%	12%	54%	35%	13%
SI	14%	69%	16%	4%	14%	55%	32%	13%
SK	15%	72%	12%	3%	12%	54%	34%	12%
FI	17%	66%	17%	5%	16%	57%	27%	10%
SE	17%	65%	18%	5%	17%	57%	26%	10%
UK	17%	66%	17%	5%	17%	58%	25%	9%
NO	19%	66%	15%	5%	17%	58%	25%	10%
EU27	16%	67%	17%	5%	14%	56%	30%	12%
EA	15%	66%	18%	5%	14%	56%	30%	13%
EA12	16%	68%	19%	5%	14%	57%	30%	13%
EU15	16%	66%	18%	5%	15%	57%	29%	12%
EU10	15%	71%	15%	4%	13%	54%	33%	12%
EU25	16%	67%	18%	5%	14%	56%	29%	12%

Source: Commission services based on Eurostat EUROPOP2010 data.

As a result of these different trends among age-groups, the demographic old-age dependency ratio (people aged 65 or above relative to those aged 15-64) is projected to increase from 26% to 52.5% in the EU as a whole over the projection period, see Table 1.14. This entails that the EU would move from having four working-age people for every person aged over 65 years to two working-age persons.

The increase in the total age-dependency ratio (people aged 14 and below and aged 65 and above over the population aged 15-64) is projected to be even larger, rising from 49.3 to 77.9.

The difference is noticeable among individual EU Member States. A relatively small increase in the total age-dependency ratio (less than 20 p.p.) is projected in Belgium, Denmark, Ireland and the UK, while in Poland, Slovakia, Romania and Latvia an increase of 40 percentage points or more is projected by 2060 (see Table 1.15).

Table 1.14 - Old-age dependency ratio (65+/(15-64))

	Demographic dependency ratio (65+)						p.p. change
	2010	2020	2030	2040	2050	2060	2010-2060
BE	26.1	30.5	37.0	41.0	42.5	43.8	17.7
BG	25.7	32.8	38.9	46.5	56.5	60.0	34.3
CZ	21.8	30.7	34.5	40.7	50.5	54.9	33.0
DK	25.3	31.7	37.4	42.1	41.8	43.7	18.4
DE	31.2	36.2	48.0	56.4	58.2	59.8	28.6
EE	25.2	30.4	36.0	40.8	48.8	55.3	30.1
IE	17.1	23.0	27.8	33.3	39.7	36.5	19.4
GR	28.6	32.8	38.1	48.4	57.6	56.5	27.9
ES	24.9	29.1	36.0	47.4	57.0	56.2	31.3
FR	25.8	33.0	39.4	44.4	45.5	46.6	20.8
IT	30.8	34.9	41.7	52.2	56.4	56.6	25.8
CY	18.9	25.2	31.0	33.4	40.2	47.8	29.0
LV	25.2	29.1	36.4	43.7	55.1	67.9	42.7
LT	23.4	26.9	35.6	42.0	47.8	56.7	33.3
LU	20.4	23.4	30.4	37.4	42.1	45.2	24.8
HU	24.3	30.5	33.7	40.2	50.6	58.1	33.8
MT	21.8	32.2	39.3	40.4	46.9	55.9	34.1
NL	23.0	31.2	40.7	47.3	46.5	47.5	24.5
AT	26.1	30.0	39.4	46.9	48.6	50.8	24.8
PL	19.0	27.5	35.4	40.4	53.8	64.8	45.8
PT	26.9	31.6	38.3	47.3	55.8	57.2	30.3
RO	21.3	26.1	30.3	41.3	54.5	64.8	43.5
SI	23.7	30.9	39.3	46.6	55.4	57.5	33.7
SK	17.0	24.1	31.7	38.6	52.1	61.9	44.9
FI	26.1	36.6	43.0	43.5	44.9	47.6	21.5
SE	28.1	33.7	37.5	40.5	41.9	46.2	18.2
UK	25.0	29.8	35.2	38.8	39.6	42.1	17.1
NO	22.7	27.7	33.3	38.6	40.4	43.1	20.4
EU27	26.0	31.7	38.7	45.8	50.3	52.5	26.5
EA	27.6	32.9	40.8	48.8	52.6	53.3	25.7
EA12	27.7	33.0	40.8	48.8	52.6	53.3	25.6
EU15	27.4	32.6	39.9	46.9	49.8	50.7	23.3
EU10	20.6	28.3	34.9	40.5	52.2	61.0	40.5
EU25	26.3	31.9	39.1	46.0	50.1	52.1	25.8

Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1.15 – Demographic total age-dependency ratio (0-14 plus 65+/(15-64))

	Total dependency ratio						p.p. change
	2010	2020	2030	2040	2050	2060	2010-2060
BE	51.8	57.9	64.7	68.6	70.6	71.9	20.1
BG	45.6	56.1	60.0	68.4	80.9	84.1	38.5
CZ	42.2	55.1	56.2	62.3	75.1	79.1	36.9
DK	52.8	58.5	65.3	70.5	69.0	71.3	18.5
DE	51.6	55.8	69.0	77.9	80.0	82.6	31.1
EE	47.7	57.4	60.3	63.9	75.1	81.5	33.9
IE	49.3	58.2	57.3	64.4	73.3	66.5	17.2
GR	50.3	55.9	59.5	71.0	82.6	81.0	30.7
ES	47.0	51.7	55.9	68.9	80.7	79.0	32.0
FR	54.3	62.5	68.5	73.7	74.8	75.3	21.0
IT	52.2	56.0	62.0	74.0	78.8	78.9	26.7
CY	42.9	51.4	56.8	56.6	64.6	73.6	30.7
LV	45.2	51.8	56.8	63.2	76.8	90.5	45.3
LT	45.1	51.5	59.6	63.7	71.9	81.7	36.5
LU	46.2	48.0	55.5	62.3	67.4	71.0	24.8
HU	45.7	52.4	54.2	60.4	72.2	80.3	34.6
MT	44.2	55.5	62.2	61.3	68.8	79.3	35.1
NL	49.2	56.5	67.7	74.9	73.1	74.6	25.4
AT	47.9	51.1	61.7	69.7	71.3	74.4	26.5
PL	40.2	51.0	56.8	59.6	75.9	87.3	47.2
PT	49.6	52.2	57.8	68.1	77.4	78.7	29.1
RO	43.0	47.9	49.7	60.6	75.5	86.3	43.4
SI	44.0	54.4	61.2	68.4	80.5	82.4	38.3
SK	38.2	47.0	52.7	58.1	74.1	84.7	46.6
FI	51.1	64.3	71.3	70.6	72.7	75.7	24.6
SE	53.6	62.9	66.9	68.3	70.5	75.7	22.1
UK	51.5	58.7	64.5	67.7	68.7	71.5	20.0
NO	51.1	56.9	63.2	67.8	69.6	72.6	21.5
EU27	49.3	55.9	62.5	69.9	75.5	77.9	28.5
EA	50.9	56.4	63.9	72.7	77.4	78.0	27.2
EA12	50.9	56.4	64.0	72.8	77.4	78.0	27.1
EU15	51.3	57.1	64.3	72.0	75.5	76.5	25.2
EU10	41.7	51.8	56.3	60.5	74.9	84.1	42.5
EU25	49.7	56.2	63.1	70.3	75.4	77.5	27.8

Source: Commission services based on Eurostat EUROPOP2010 data.

1.6. Population ageing in the EU in a global context

Looking at demographic trends in a global perspective, using the UN statistics and projections, the share of the population of what is the EU today halved from 14.7% of the world population in 1950 to 7.2% in 2010, and it is projected to drop close to 5.4% in 2050, despite net migration flows projected.[23] The share of populations of Japan, China and the US was also declining over the last five decades. These declining trends over the period 1950 to 2010, is in contrast with opposing trends in Africa, Asia or Latin America, whose share of the world population was rising.

[23] The United Nations Population Division produces global population projections revised every two years. The latest projections are the 2008 Revision.

Over the period 2010 to 2050, the share of the population in Africa is projected to increase fast, exceeding 20% of the world population in 2050. In Asia as a whole, a slight decline is projected though it is projected to still account for close to 60% of the world population in 2050. The decline is particularly evident for China, where the share of the population in the world population is projected to fall from 19.6% to 15.5% between 2010 and 2050. The population of the European continent will become relative smaller by 2050 with its share shrinking by 3 p.p. (from 10.6% to 7.6%. The Northern America and the US shares 5.1% and 4.6%, respectively) will decline only marginally. The other regions of the world will roughly keep their share in the sharply growing world population (the 6,895,889 inhabitants would become 9,615,189 in 2060, that is an increase of 39.4% over forty years).

Table 1.16 – Geographic distribution of world population based on the 2008 UN revision

	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	Change 1950-00	Change 2000-50
Africa	8.8	9.3	9.8	10.8	12.0	13.4	15.0	16.6	18.3	20.1	21.8	4.6	8.4
Asia	55.6	56.2	57.8	59.2	60.1	60.5	60.3	59.9	59.2	58.2	57.2	4.9	-3.3
China	21.9	21.7	22.5	22.4	21.7	20.7	19.6	18.6	17.6	16.5	15.5	-1.1	-5.3
India	14.7	14.7	14.9	15.5	16.2	17.1	17.6	17.8	17.9	17.8	17.6	2.4	0.6
Japan	3.3	3.1	2.8	2.6	2.3	2.1	1.8	1.6	1.4	1.2	1.1	-1.2	-1.0
Russian Federation	4.1	4.0	3.5	3.1	2.8	2.4	2.0	1.8	1.6	1.4	1.3	-1.6	-1.1
Europe	21.6	20.0	17.8	15.6	13.6	11.9	10.6	9.6	8.7	8.0	7.6	-9.7	-4.3
EU27	14.7	13.3	11.8	10.3	8.9	7.9	7.2	6.6	6.1	5.7	5.4	-6.9	-2.5
EA	9.5	8.5	7.6	6.6	5.7	5.1	4.7	4.3	4.0	3.8	3.6	-4.4	-1.6
Latin America	6.6	7.3	7.8	8.2	8.4	8.5	8.6	8.6	8.6	8.5	8.4	1.9	-0.1
Northern America	6.8	6.7	6.3	5.7	5.4	5.2	5.1	5.0	4.9	4.9	4.9	-1.6	-0.3
United States	6.2	6.1	5.7	5.2	4.8	4.7	4.6	4.5	4.4	4.4	4.4	-1.6	-0.3
Oceania	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.0	0.1

Source: UN World Population Prospects: The 2008 Revision.

Table 1. 17 shows the old-age dependency ratio in the world (people aged 65 and above over the working-age population). The UN projects a old-age dependency ratio of 50.7 in the EU in 2050 (compared with 50.3 according to EUROPOP2010), which is much larger than in the rest of the world with the exception of Japan, where it is projected to reach 74.3. The EU of today had the highest old-age dependency ratio already in 1950 (and higher still in the euro area), slightly higher than in the US, but its increase has been faster over the period 1950 to 2010 (up by 13 percentage points in the EU compared with 6 percentage points in the US). Sharper increases in the old-age dependency ratio are projected during the period 2010 to 2050 than between 1950 and 2000 everywhere. The largest increases are projected to take place in Japan (by close to 50 p.p.) and in China, the EU and the euro area (by almost 30 p.p.).

Table 1. 17 - Old-age dependency ratio based on the 2008 UN revision (65 and over/15-64)

	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	Change 1950-00	Change 2000-50
World	8.5	9.1	9.5	9.9	9.9	10.9	11.6	14.2	17.8	21.9	25.3	2.4	14.4
Africa	5.9	5.9	6.2	6.1	6.0	6.1	6.1	6.6	7.4	8.5	10.8	0.1	4.7
Asia	6.8	7.2	7.1	7.4	7.7	9.1	9.9	12.8	17.0	22.4	26.7	2.3	17.6
China	7.2	8.6	7.7	7.9	8.1	10.0	11.4	16.8	23.7	34.6	38.0	2.8	28.0
India	5.3	5.3	5.8	6.3	6.8	7.6	7.7	9.4	12.2	15.4	20.2	2.3	12.6
Japan	8.3	9.0	10.3	13.4	17.2	25.3	35.1	47.7	52.8	65.2	74.3	17.0	49.0
Russian Federation	9.5	9.9	11.7	15.0	14.8	17.7	17.9	22.8	29.7	31.6	38.8	8.1	21.1
Europe	12.5	13.7	16.3	18.9	19.0	21.8	23.8	29.0	36.1	42.0	47.5	9.2	25.7
EU27	13.4	15.2	18.2	20.6	20.8	23.4	26.1	31.5	38.7	46.1	50.7	10.0	27.2
EA	14.2	16.1	19.4	21.4	21.6	24.9	28.4	33.8	42.4	51.6	55.8	10.8	30.9
Latin America	6.2	6.8	7.6	7.9	8.2	9.2	10.6	13.4	18.0	23.3	29.2	3.0	20.0
Northern America	12.7	15.1	15.6	16.6	18.3	18.6	19.5	25.2	32.2	34.6	35.9	5.9	17.3
United States	12.8	15.3	15.9	16.9	18.5	18.6	19.0	24.5	31.1	33.0	34.1	5.9	15.5
Oceania	11.7	12.2	11.8	12.8	14.1	15.3	16.6	20.8	25.5	28.6	30.0	3.6	14.7

Source: UN World Population Prospects: The 2008 Revision.

Table 1. 18 - Old-age dependency ratio based on the 2008 UN revision (80 and over/15-64)

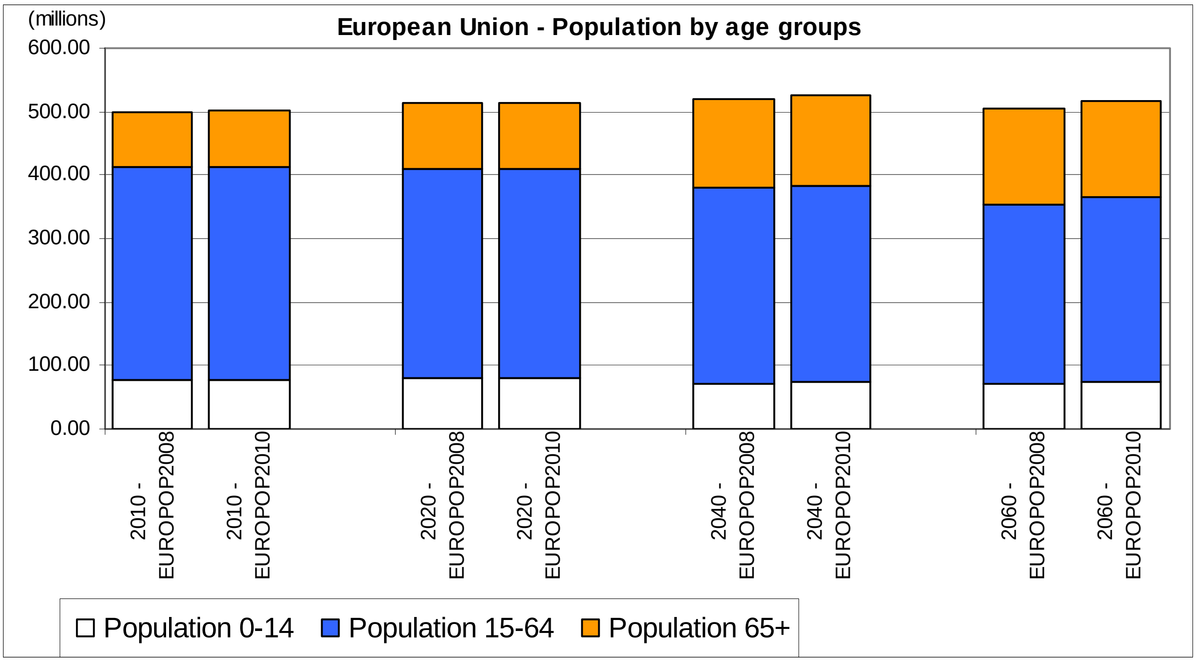
	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	Change 1950-00	Change 2000-50
World	0.9	1.1	1.3	1.4	1.6	1.8	2.3	2.8	3.6	5.0	6.7	0.9	4.9
Africa	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	1.0	1.3	1.6	0.2	0.9
Asia	0.6	0.7	0.8	0.8	0.9	1.3	1.7	2.2	3.0	4.6	6.7	0.7	5.5
China	0.5	0.6	0.9	0.7	0.9	1.3	2.0	2.8	4.2	7.2	11.6	0.9	10.3
India	0.6	0.6	0.6	0.6	0.7	1.0	1.0	1.4	1.8	2.8	3.9	0.4	2.9
Japan	0.8	1.1	1.3	2.0	3.4	5.6	9.9	15.3	22.1	26.1	30.6	4.8	25.1
Russian Federation	1.5	1.6	1.8	2.0	2.7	2.7	4.1	5.5	5.6	8.9	10.0	1.2	7.3
Europe	1.7	2.1	2.5	3.1	4.1	4.3	6.2	7.9	9.7	13.2	16.6	2.6	12.3
EU27	1.7	2.2	2.8	3.6	4.7	5.0	7.1	9.0	11.3	14.9	19.0	3.3	14.0
EA	1.8	2.4	3.1	3.9	5.1	5.5	7.9	10.2	12.8	17.1	22.2	3.7	16.7
Latin America	0.8	0.8	0.9	1.1	1.3	1.7	2.3	2.8	3.9	5.8	8.2	0.9	6.6
Northern America	1.8	2.3	2.9	3.5	3.9	4.8	5.7	6.1	8.4	11.7	13.1	3.0	8.3
United States	1.8	2.4	3.0	3.6	3.9	4.9	5.5	5.7	8.0	11.1	12.3	3.1	7.5
Oceania	1.6	1.8	2.0	2.2	2.7	3.4	4.4	5.0	6.8	8.9	10.5	1.9	7.1

Source: UN World Population Prospects: The 2008 Revision.

1.7. Comparison with the EUROPOP2008 demographic projection used in the 2009 Ageing Report

This section provides a comparison of the main features of the EUROPOP2010 projection with the EUROPOP2008 projection used in the 2009 Ageing Report.

Graph 1. 3 – Population projections compared



Source: Commission services based on Eurostat EUROPOP2010 data.

In the EU as a whole, the population in 2010 was 2,403,000 larger compared with the EUROPOP2008 projection (see Table 1. 19). By 2030, the population is projected to be about 2.6 million larger and by 2060 about 10.7 million larger (+2.1%). The higher population in 2060 is mostly concentrated to the working-age population (15-64), but both more young persons and older persons are projected too (see Table 1. 20- Table 1. 22).

As a result of the differences between the two rounds of population projections, the increase in old-age dependency ratio (persons aged 65 and over in relation to persons aged 15-64) is lower in the EUROPOP2010 projection compared with the EUROPOP2008 projection, rising less; by 26.5 percentage points between 2010 and 2060 (compared with 27.6 percentage points in the previous projection over the same period), see Table 1. 23. Due to diverging changes of assumptions, the projected increase in the old-age dependency ratio is significantly lower in LT, IE, SK, and CZ and significantly higher in LU, LV, CY, and PT.

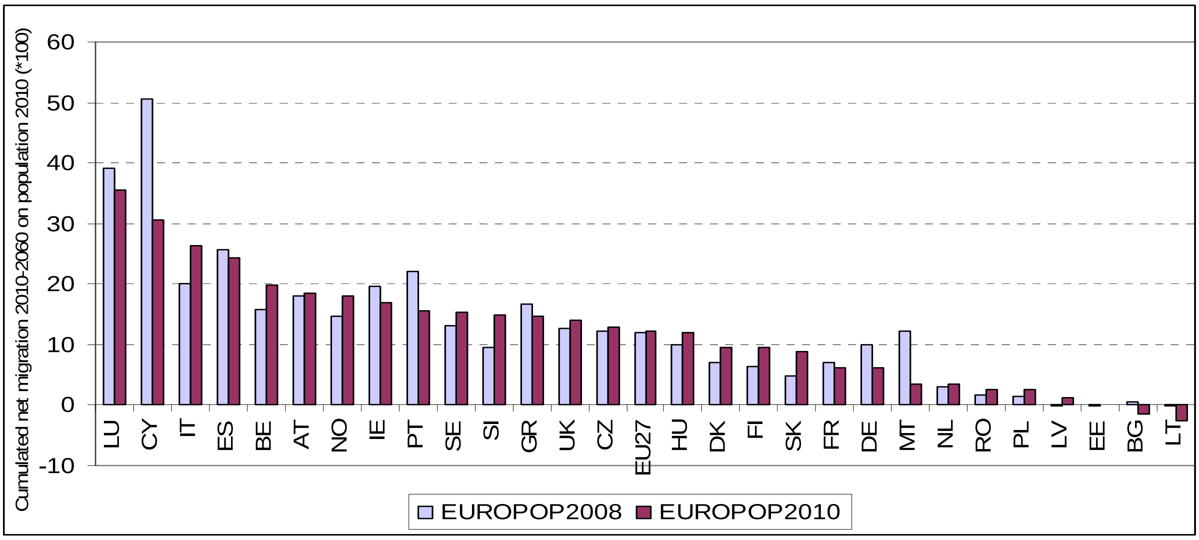
Total fertility rates in the EU as a whole are higher in the EUROPOP2010 projection compared with the previous projection, and in particular in the beginning of the projection period (up by 0.05 in 2010). This pattern is especially the case in BG, CZ, IE, EL, PL, SI, SK and the UK (higher by 0.1 or more in 2010). By contrast, the total fertility rate is lower in 2010 compared with EUROPOP2008 in DK, LV, LU, HU, AT and PT. Over the projection period to 2060, the increase is now expected to be slightly lower in the EU (see Table 1.24).

Life expectancy at birth in 2010 in the EU as a whole is assumed to be higher in EUROPOP2010 compared with EUROPOP2008 for both males (+0.2 years) and females (+0.1 years). The largest increases in 2010 (of 0.5 years of more) for males occurs in EE, ES, LV, LT, LU, MT, SI, and UK and for females in EE, ES, CY, LV, LT, LU, MT and UK. Over the projection period to 2060, the increase is now expected to be slightly lower in the EU, with a rise of 0.1 years less for both males and females (see Table 1.25).

In light of the recent observed decreases in net migration inflows to the EU, especially in some Member States (ES, DE, IE), net migration flows in the EU are projected to be lower in the EUROPOP2010 projection compared with EUROPOP2008 in 2010 by be about 545 thousand. Overall, EU net inward migration is projected to be 4.4 million lower by 2060 in EUROPOP2010 compared with EUROPOP2008. (see Table 1. 26). The revised methodology for the migration projections in EUROPOP2010 compared with the EUROPOP2008 affects the EU Member States differently (see Table 1.26).

Graph 1. 4 shows the projected cumulated net migration per capita 2010 - 2060 on basis of EUROPOP2008 and on the basis of EUROPOP2010 as used for the 2011 pension projections. Differences are result of the revised methodology for the migration projections only, since projections during the 50 years time base on the average migration only from 2002 to 2009.

Graph 1. 4 – Projected cumulated net migration per capita 2010-2060 according to EUROPOP2008 and EUROPOP2010 sorted by value of EUROPOP2010



Source: Commission services based on Eurostat EUROPOP2010 data.

Table 1. 19 - Total population compared (EUROPOP2010 – EUROPOP2008) ('000)

	2010	2020	2030	2040	2050	2060	Diff in 2060 as % of total population EUROPOP2008
BE	98	303	487	708	949	1166	9.5
BG	-20	-93	-164	-111	-42	27	0.5
CZ	132	281	415	579	770	938	9.9
DK	32	68	93	113	145	162	2.7
DE	-480	-1467	-2412	-3189	-3907	-4609	-6.5
EE	6	11	10	20	30	38	3.4
IE	-136	-565	-582	-439	-304	-192	-2.8
GR	14	-24	7	64	121	159	1.4
ES	-595	-3032	-2608	-1499	-535	323	0.6
FR	2301	2351	2432	2356	2173	1947	2.7
IT	485	1549	2695	3732	4651	5534	9.3
CY	-14	-64	-95	-128	-159	-184	-13.9
LV	-5	-16	-17	-9	-12	-18	-1.0
LT	-17	-46	-46	4	69	121	4.8
LU	12	25	22	15	8	-3	-0.4
HU	-15	1	40	78	101	125	1.4
MT	-1	-11	-15	-17	-18	-18	-4.4
NL	113	345	381	384	433	461	2.8
AT	-21	-118	-129	-142	-162	-174	-1.9
PL	96	420	523	818	1185	1468	4.7
PT	-80	-376	-536	-689	-864	-1018	-9.0
RO	109	142	158	233	282	318	1.9
SI	20	86	131	182	235	276	15.5
SK	27	148	243	346	459	556	12.2
FI	26	85	138	206	279	344	6.4
SE	76	248	326	444	576	662	6.1
UK	238	821	1157	1588	2038	2366	3.1
NO	71	224	299	380	481	560	9.3
EU27	2403	1075	2655	5647	8500	10776	2.1
EA	:	:	:	:	:	:	:
EA12	1739	-923	-105	1508	2843	3938	1.2
EU15	2085	215	1471	3652	5602	7127	1.7
EU10	229	811	1190	1873	2659	3303	5.3
EU25	2314	1026	2661	5525	8260	10431	2.2

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1. 20 - Working-age (15-64) population compared (EUROPOP2010 – EUROPOP2008) ('000)

	2010	2020	2030	2040	2050	2060	Diff in 2060 as % of working-age population EUROPOP2008
BE	53	144	278	433	559	718	10.1
BG	-42	-155	-213	-185	-90	41	1.4
CZ	75	115	243	357	504	664	12.8
DK	17	39	68	95	82	77	2.2
DE	-325	-1289	-1880	-2218	-2639	-2674	-6.9
EE	1	-4	-4	-1	5	19	3.0
IE	-137	-489	-457	-419	-246	34	0.9
GR	-21	-56	-11	-8	1	70	1.1
ES	-530	-2193	-1869	-1116	39	754	2.7
FR	1456	1401	1366	1332	1156	869	2.1
IT	349	1094	1729	2449	3118	3537	10.8
CY	-13	-56	-78	-94	-109	-122	-15.8
LV	-6	-16	-18	-28	-29	-24	-2.6
LT	-23	-83	-63	-10	43	122	9.1
LU	11	21	19	12	-3	-15	-3.3
HU	-3	25	66	59	88	75	1.6
MT	-2	-11	-10	-9	-7	-6	-2.9
NL	56	112	120	163	140	183	1.9
AT	-6	-89	-111	-103	-89	-90	-1.7
PL	25	-27	297	493	694	1070	6.6
PT	-60	-221	-353	-486	-545	-613	-9.7
RO	70	32	103	72	108	188	2.1
SI	12	43	84	119	143	170	17.8
SK	11	51	138	213	282	364	15.2
FI	8	46	94	145	182	222	7.3
SE	32	117	170	254	302	373	6.0
UK	2	-116	-22	117	317	1076	2.4
NO	50	133	187	259	288	329	9.4
EU27	1010	-1566	-317	1637	4006	7084	2.5
EA	:	:	:	:	:	:	:
EA12	5694	3116	3370	4396	5419	6403	3.5
EU15	904	-1481	-861	652	2374	4522	1.9
EU10	78	38	655	1099	1614	2332	6.9
EU25	982	-1443	-206	1750	3988	6854	2.5

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1. 21 - Population aged 0-14 compared (EUROPOP2010 – EUROPOP2008) ('000)

	2010	2020	2030	2040	2050	2060	Diff in 2060 as % of 0-14 population EUROPOP2008
BE	30	121	147	188	249	274	14.2
BG	13	31	19	46	65	66	10.0
CZ	40	154	167	201	252	250	21.4
DK	0	23	15	-2	13	15	1.6
DE	-75	-173	-464	-474	-468	-632	-7.1
EE	3	5	2	7	11	11	6.7
IE	11	-63	-121	12	66	36	3.2
GR	9	45	48	66	81	87	6.1
ES	-90	-785	-636	-169	-113	-49	-0.7
FR	477	384	379	253	138	97	0.8
IT	91	279	541	667	736	883	12.2
CY	-4	-13	-17	-22	-27	-29	-14.9
LV	3	-10	-16	-5	-8	-9	-4.2
LT	6	40	23	34	59	51	16.0
LU	1	3	-1	-6	-6	-8	-6.7
HU	-15	-41	-23	-12	-21	-14	-1.2
MT	0	0	-2	-1	-1	-1	-1.5
NL	20	143	135	93	142	160	6.4
AT	-17	-52	-47	-40	-47	-49	-3.9
PL	66	370	252	333	466	388	11.0
PT	-30	-152	-165	-161	-199	-211	-14.6
RO	27	41	28	66	59	51	2.6
SI	8	34	34	41	54	53	23.2
SK	11	77	84	96	123	124	24.5
FI	3	28	34	48	67	69	8.2
SE	20	94	89	102	151	145	8.1
UK	101	457	358	587	871	845	6.7
NO	12	75	83	77	113	119	11.8
EU27	708	1040	864	1949	2713	2602	3.7
EA	:	:	:	:	:	:	:
EA12	1466	875	814	1328	1501	1457	3.2
EU15	551	351	313	1165	1681	1662	2.7
EU10	116	616	504	672	909	823	11.0
EU25	668	967	817	1837	2590	2485	3.6

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1. 22 - Population aged 65 and over compared (EUROPOP2010 – EUROPOP2008) ('000)

	2010	2020	2030	2040	2050	2060	Diff in 2060 as % of 65+ population EUROPOP2008
BE	15	39	62	87	141	174	5.3
BG	9	31	30	28	-17	-80	-4.3
CZ	17	13	4	22	14	25	0.8
DK	16	6	10	19	50	70	4.7
DE	-80	-4	-68	-496	-799	-1303	-5.7
EE	2	9	11	13	14	9	2.5
IE	-9	-13	-4	-32	-124	-262	-15.4
GR	26	-13	-30	7	39	2	0.1
ES	26	-53	-103	-215	-461	-382	-2.3
FR	368	567	687	770	880	981	5.3
IT	44	177	425	616	797	1114	5.7
CY	3	5	1	-11	-24	-32	-9.4
LV	-1	10	18	23	24	15	2.5
LT	0	-3	-6	-19	-32	-51	-5.8
LU	0	2	4	9	17	20	11.7
HU	3	17	-2	32	34	64	2.3
MT	1	-1	-3	-7	-10	-11	-8.1
NL	37	89	126	128	151	118	2.6
AT	2	23	29	1	-26	-35	-1.3
PL	4	77	-26	-9	26	10	0.1
PT	10	-4	-18	-42	-120	-194	-5.6
RO	12	68	28	95	115	79	1.3
SI	0	9	14	23	38	53	8.9
SK	5	21	21	37	53	68	4.1
FI	15	12	10	12	30	52	3.5
SE	25	38	67	87	123	144	5.0
UK	135	480	820	884	849	444	2.3
NO	9	16	29	45	80	112	7.3
EU27	685	1601	2108	2062	1781	1091	0.7
EA	:	:	:	:	:	:	:
EA12	1353	1989	2563	2487	2452	2352	2.4
EU15	630	1345	2018	1835	1546	943	0.8
EU10	34	157	31	103	136	149	0.7
EU25	664	1502	2050	1938	1682	1092	0.8

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1. 23 - Old-age dependency ratio (persons aged 65 and over in relations to persons aged 15-64) compared (EUROPOP2010 – EUROPOP2008)

	2010	2020	2030	2040	2050	2060	2010-2060
BE	0.0	-0.1	-0.6	-1.3	-1.4	-2.0	-2.0
BG	0.4	1.7	2.6	2.9	1.0	-3.5	-3.9
CZ	0.0	-0.3	-1.2	-2.0	-4.3	-6.6	-6.6
DK	0.3	-0.2	-0.4	-0.6	0.5	1.1	0.7
DE	0.0	0.9	1.7	1.7	1.8	0.8	0.7
EE	0.2	1.2	1.6	1.8	1.7	-0.2	-0.4
IE	0.5	2.8	3.2	2.7	-0.7	-7.0	-7.5
GR	0.4	0.1	-0.4	0.2	0.6	-0.6	-1.0
ES	0.5	1.7	1.7	1.0	-1.7	-2.8	-3.3
FR	0.0	0.3	0.4	0.4	0.9	1.4	1.4
IT	-0.2	-0.5	-0.8	-1.9	-2.8	-2.7	-2.6
CY	0.9	2.9	3.5	2.6	2.6	3.4	2.5
LV	0.0	1.0	1.9	3.0	3.9	3.4	3.4
LT	0.2	0.9	0.9	-0.8	-3.3	-9.0	-9.2
LU	-0.7	-0.9	-0.4	1.0	4.3	6.1	6.7
HU	0.1	0.1	-0.4	0.1	-0.2	0.4	0.4
MT	0.6	0.9	0.2	-1.3	-2.9	-3.2	-3.8
NL	0.2	0.5	0.7	0.5	0.9	0.3	0.1
AT	0.1	0.9	1.3	0.9	0.3	0.2	0.1
PL	0.0	0.3	-0.6	-0.9	-1.8	-4.2	-4.2
PT	0.4	0.9	1.6	2.7	2.8	2.5	2.1
RO	0.0	0.4	0.0	0.5	0.5	-0.5	-0.5
SI	-0.2	-0.3	-1.5	-2.8	-4.0	-4.7	-4.6
SK	0.1	0.2	-0.6	-1.4	-3.4	-6.6	-6.7
FI	0.4	-0.2	-0.9	-1.6	-1.7	-1.8	-2.1
SE	0.3	0.0	0.1	-0.3	-0.1	-0.5	-0.7
UK	0.3	1.2	1.9	1.9	1.6	0.0	-0.3
NO	-0.1	-0.6	-1.0	-1.6	-1.1	-0.8	-0.8
EU27	0.1	0.6	0.7	0.4	-0.1	-0.9	-1.1
EA	:	:	:	:	:	:	:
EA12	-0.1	0.5	0.6	0.2	-0.2	-0.6	-0.5
EU15	0.1	0.7	0.9	0.6	0.2	-0.6	-0.7
EU10	0.0	0.3	-0.4	-0.8	-1.9	-3.8	-3.8
EU25	0.1	0.6	0.7	0.4	-0.1	-0.9	-1.0

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1.24 - Fertility rates compared (EUROPOP2010 – EUROPOP2008)

	2010	2020	2030	2040	2050	2060	change 2010-2060
BE	0.08	0.08	0.07	0.06	0.06	0.05	-0.03
BG	0.17	0.16	0.14	0.14	0.13	0.12	-0.06
CZ	0.15	0.14	0.14	0.12	0.11	0.10	-0.05
DK	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
DE	0.01	0.02	0.01	0.02	0.01	0.01	-0.01
EE	0.07	0.07	0.06	0.05	0.05	0.04	-0.03
IE	0.17	0.15	0.15	0.13	0.12	0.11	-0.06
GR	0.11	0.10	0.09	0.08	0.08	0.07	-0.04
ES	0.01	0.00	0.00	0.01	0.01	0.00	-0.01
FR	0.02	0.02	0.02	0.02	0.02	0.02	0.00
IT	0.03	0.03	0.02	0.02	0.02	0.02	-0.01
CY	0.04	0.03	0.03	0.03	0.03	0.02	-0.01
LV	-0.05	-0.05	-0.04	-0.04	-0.03	-0.03	0.01
LT	0.20	0.18	0.16	0.14	0.12	0.12	-0.08
LU	-0.06	-0.06	-0.05	-0.05	-0.05	-0.04	0.02
HU	-0.03	-0.03	-0.02	-0.02	-0.03	-0.02	0.01
MT	0.05	0.05	0.04	0.04	0.04	0.04	-0.01
NL	0.07	0.06	0.06	0.05	0.05	0.04	-0.03
AT	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01	0.01
PL	0.12	0.11	0.10	0.10	0.09	0.07	-0.05
PT	-0.05	-0.04	-0.04	-0.03	-0.04	-0.03	0.02
RO	0.05	0.04	0.04	0.04	0.03	0.03	-0.02
SI	0.21	0.19	0.18	0.16	0.15	0.13	-0.08
SK	0.15	0.14	0.14	0.13	0.11	0.10	-0.05
FI	0.02	0.02	0.02	0.02	0.02	0.02	0.00
SE	0.09	0.08	0.07	0.07	0.06	0.05	-0.03
UK	0.10	0.09	0.09	0.08	0.07	0.07	-0.03
NO	0.10	0.09	0.09	0.08	0.07	0.06	-0.04
EU27	0.05	0.05	0.05	0.04	0.04	0.03	-0.02
EA	:	:	:	:	:	:	:
EA12	0.03	0.03	0.02	0.03	0.02	0.02	-0.01
EU15	0.04	0.04	0.04	0.04	0.03	0.03	-0.01
EU10	0.11	0.10	0.09	0.08	0.08	0.06	-0.04
EU25	0.05	0.05	0.04	0.04	0.04	0.03	-0.02

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1.25 - Life expectancy at birth compared (EUROPOP2010 – EUROPOP2008)

	Males							Females						
	2010	2020	2030	2040	2050	2060	change 2010-2060	2010	2020	2030	2040	2050	2060	change 2010-2060
BE	0.3	0.3	0.3	0.2	0.2	0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
BG	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.1	-0.2
CZ	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
DK	0.2	0.2	0.2	0.2	0.2	0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.2
DE	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.0
EE	1.2	1.1	1.0	0.9	0.8	0.8	-0.4	1.0	0.8	0.7	0.6	0.5	0.4	-0.5
IE	-0.9	-0.8	-0.8	-0.8	-0.7	-0.7	0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.1
GR	0.0	0.0	0.0	0.1	0.1	0.1	0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.3
ES	0.9	0.8	0.7	0.6	0.5	0.5	-0.4	0.5	0.5	0.4	0.4	0.3	0.3	-0.2
FR	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IT	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	0.1
CY	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.2	0.8	0.7	0.6	0.5	0.4	0.3	-0.5
LV	1.7	1.4	1.2	1.0	0.8	0.6	-1.1	0.8	0.7	0.6	0.5	0.5	0.4	-0.4
LT	1.2	0.9	0.7	0.5	0.4	0.2	-1.0	0.8	0.6	0.5	0.4	0.3	0.2	-0.6
LU	1.1	0.9	0.7	0.6	0.5	0.4	-0.7	1.3	1.3	1.2	1.1	1.1	1.0	-0.4
HU	0.2	0.1	0.1	0.1	0.1	0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.1
MT	1.2	1.0	0.9	0.8	0.7	0.6	-0.7	0.9	0.8	0.6	0.5	0.4	0.3	-0.6
NL	0.4	0.4	0.3	0.3	0.3	0.2	-0.2	0.3	0.3	0.2	0.2	0.2	0.2	-0.1
AT	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.1
PL	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	0.0	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.1
PT	0.4	0.3	0.3	0.2	0.2	0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.0
RO	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.2	-0.2
SI	0.7	0.6	0.5	0.4	0.3	0.2	-0.5	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
SK	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
FI	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1
SE	0.2	0.2	0.1	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UK	0.6	0.5	0.4	0.3	0.3	0.2	-0.4	0.5	0.5	0.4	0.3	0.2	0.2	-0.4
NO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EU27	0.2	0.2	0.2	0.1	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
EA	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EA12	0.2	0.2	0.2	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
EU15	0.2	0.2	0.2	0.2	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
EU10	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EU25	0.2	0.2	0.2	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

Table 1. 26 - Net migration flows compared (EUROPOP2010 – EUROPOP2008) ('000)

	Net migration ('000)							Diff. in cum. net migr. (2010-2060) in % of total pop. in 2060 in EUROPOP2010
	2010	2020	2030	2040	2050	2060	2010-2060	
BE	14	10	11	12	10	9	467	3.5
BG	-10	-15	-3	3	2	2	-153	-2.8
CZ	5	4	3	3	2	2	102	1.0
DK	2	3	3	3	3	3	139	2.3
DE	-106	-59	-54	-49	-48	-44	-3209	-4.9
EE	0	-1	0	1	0	0	3	0.3
IE	-75	1	12	13	10	7	-111	-1.7
GR	-13	-1	-1	-1	-1	-1	-208	-1.8
ES	-461	4	93	99	75	55	-414	-0.8
FR	-26	0	0	0	1	0	-328	-0.4
IT	105	103	90	83	76	70	3944	6.1
CY	-7	-3	-2	-2	-2	-2	-155	-13.6
LV	-3	0	1	1	1	1	30	1.8
LT	-11	-5	-1	1	1	1	-80	-3.0
LU	2	0	0	0	0	0	-9	-1.2
HU	3	5	5	4	4	4	185	2.1
MT	-2	-1	-1	0	0	0	-36	-9.4
NL	28	-1	-2	-1	-1	-2	58	0.3
AT	-14	5	4	4	3	3	41	0.5
PL	27	-1	5	9	8	6	412	1.3
PT	-33	-11	-9	-8	-8	-7	-678	-6.6
RO	5	2	4	5	4	4	207	1.2
SI	6	2	2	2	2	2	111	5.4
SK	7	5	4	4	4	3	219	4.3
FI	5	4	4	4	3	3	173	3.0
SE	18	1	6	7	5	4	226	2.0
UK	14	27	27	25	22	20	831	1.1
NO	16	2	4	4	3	2	189	2.9
EU27	-520	80	202	221	177	142	1767	0.3
EA	:	:	:	:	:	:	:	:
EA12	-564	64	157	166	130	100	-274	-0.1
EU15	-540	87	185	190	150	119	922	0.2
EU10	25	6	16	23	20	17	791	1.2
EU25	-515	93	201	213	170	136	1713	0.3

Source: Commission services based on Eurostat EUROPOP2010 and EUROPOP2008 data.

2. Labour force projections

2.1. Introduction

The cohort simulation model (CSM)[24] developed by the European Commission (DG ECFIN) is used to project participation rates by gender and single age. This methodology is based on the calculation of the average probability of labour force entry and exit observed over the last 10 years (2001-2010).[25] Last decade's average entry and exit rates are then used to project future participation rates as older generations are progressively replaced by younger ones. For those Member States having legislated pension reforms, average exit rates are changed (after fifty years of age) to take into account their projected impact, according to the best reasoned judgment of the EPC and Commission Services. Otherwise, both average entry and exit rates are kept constant throughout the projection period (at the average values for the period 2001-2010), reflecting a 'no policy change' assumption.[26]

2.2. Past trends and main drivers of labour market developments

The rationale for using the CSM is to reflect the substantial changes in labour market behaviour in recent decades across different cohorts and gender groups. In recent periods, labour force participation has undergone profound changes, especially for the young, women and the elderly. There are basically four sets of stylised facts underlying these changes, namely:

- *social factors,* such as longer schooling or change in the role of women in households;
- *demographic factors,* including the decline of fertility rates and delays in childbearing;
- *institutional factors*, in particular changes in early retirement or changes in the statutory/effective age of retirement, and/or;
- *economic factors*, such as, substitution and income effects of labour taxation particularly relevant for second earners, take-up rates of part-time employment, and the share (relative prices) of services in the economy.

[24] The methodology was initially developed at the OECD, see J.-M. Burniaux, R. Duval, and F. Jaumotte (2003).
[25] A more detailed description of the methodology and results can be found in Carone (2005).
[26] For a given set of exogenous macroeconomic assumptions and using partial equilibrium methodologies, a 'no policy change' assumption tries to measure future outcomes corresponding to unchanged policies. It should not be interpreted as a forecast, because no assumptions are made regarding (entry/exit) probability distributions, but more as an 'unbiased' estimate.

Despite a large cross-country labour force variability (see Table 2.1), some common features call for our attention and need to be catered for in any projection exercise.[27] They can be summarised as follows:

- the participation rates of prime-age male workers (aged 25 to 54), at around 90%, remain the highest of all groups. The participation rates of men aged 55 to 64 years, which had recorded a steady decline in the past twenty five years, are showing clear signs of a reversal in most countries since the turn of the century, mostly due to pension reforms raising the statutory retirement age;

- women participation rates have steadily increased over the past twenty five years;

- the participation rates of young people (aged 15 to 24 years) have declined, mostly due to a longer stay in school;

Given these trends, the main drivers of change in the total participation rate will be changes in the labour force attachment of prime-age women, older workers (especially men) and, to a lesser extent, young people.

Table 2. 1 – Historical participation rates: workers aged 15 to 64

	Total						Men						Women						
	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	
BE	59,6	58,7	62,1	65,2	66,7	66,9	74,2	71,3	72,3	73,8	73,9	72,8	45,1	46,1	51,7	56,6	59,5	60,9	BE
BG				61,6	62,1	67,2				67,4	67,0	72,0				56,1	57,3	62,5	BG
CZ				71,2	70,4	70,1				79,0	78,4	78,5				63,5	62,4	61,5	CZ
DK	80,3	82,4	79,5	80,0	79,8	80,7	86,0	87,1	85,6	84,0	83,6	84,0	74,6	77,6	73,3	75,9	75,9	77,3	DK
DE	66,2	69,9	70,5	71,0	74,3	76,9	81,1	82,1	79,6	78,8	80,6	82,3	51,7	57,6	61,3	63,0	68,0	71,4	DE
EE				69,6	70,1	74,0				74,9	73,6	77,6				64,8	66,9	70,6	EE
IE	60,9	60,7	61,6	67,5	70,8	70,2	82,3	78,8	76,1	79,3	80,6	78,1	39,1	41,9	47,1	55,6	60,8	62,4	IE
GR	60,0	59,1	60,1	63,9	66,8	67,8	80,6	76,8	77,2	77,6	79,2	79,0	41,0	42,6	44,3	50,6	54,5	56,5	GR
ES		58,7	60,6	65,1	69,7	73,0		77,6	75,5	78,5	80,9	81,0		40,6	45,8	51,8	58,3	64,8	ES
FR	67,6	67,1	67,6	68,8	70,0	70,6	78,9	76,5	74,9	75,2	75,3	75,1	56,7	58,0	60,6	62,5	64,8	66,2	FR
IT	58,8	59,8	57,6	59,9	62,5	62,4	78,6	77,0	73,2	73,8	74,6	73,7	39,7	43,2	42,4	46,2	50,4	51,1	IT
CY				68,9	72,4	74,0				81,3	82,9	82,0				57,3	62,5	66,2	CY
LV				67,1	69,6	73,9				73,0	74,4	77,0				61,7	65,1	71,0	LV
LT				71,2	68,4	69,8				74,9	72,1	72,0				67,7	64,9	67,8	LT
LU	60,3	60,1	60,3	64,2	66,6	68,7	79,2	77,4	75,9	76,4	76,0	76,6	41,5	42,4	44,1	51,7	57,0	60,7	LU
HU				59,9	61,3	61,6				67,6	67,9	68,2				52,5	55,1	55,3	HU
MT				58,2	58,1	59,0				80,3	79,1	76,6				35,8	36,9	40,6	MT
NL	58,4	66,2	69,2	74,9	76,9	79,7	75,4	79,7	79,9	83,9	83,7	85,3	41,1	52,4	58,3	65,7	70,0	74,1	NL
AT			71,5	71,3	72,4	75,3			80,8	80,1	79,3	81,0			62,3	62,5	65,6	69,6	AT
PL				66,1	64,4	64,7				71,8	70,8	71,8				60,5	58,1	57,8	PL
PT		68,8	67,4	71,1	73,4	73,7		81,4	76,4	78,7	79,0	78,5		57,1	59,1	63,7	67,9	69,0	PT
RO				69,6	62,3	63,1				75,7	69,4	70,9				63,6	55,3	55,4	RO
SI				67,4	70,7	71,8				71,7	75,1	75,6				63,1	66,1	67,9	SI
SK				69,5	68,9	68,4				76,5	76,5	76,3				62,8	61,5	60,6	SK
FI			72,1	76,8	74,7	75,0			74,8	79,4	76,6	76,4			69,4	74,1	72,8	73,5	FI
SE			77,7	75,3	78,7	78,9			79,6	77,2	80,9	81,4			75,9	73,4	76,3	76,4	SE
UK	73,6	76,5	74,7	75,2	75,4	75,7	86,2	86,8	83,3	82,8	82,0	82,0	61,0	66,1	66,0	67,8	68,8	69,5	UK
NO			76,8	80,7	78,3	78,9			81,2	84,8	81,6	81,3			72,3	76,4	74,9	76,4	NO
EU27				68,5	69,8	71,0				77,1	77,3	77,8				60,1	62,4	64,3	EU27
EA17				67,5	70,1	71,5				77,2	78,2	78,5				57,9	61,9	64,6	EA17

Source: Commission services.

[27] Values reported in Tables 2.1 to 2.5 are taken from Eurostat's Labour Force Survey (LFS) and refer to average annual participation rates.

Table 2. 2 - Historical participation rates: workers aged 20 to 64

	Total						Men						Women						
	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	
BE	65,1	64,2	67,6	70,8	72,4	72,7	81,5	78,2	78,7	80,1	80,2	79,2	48,7	50,3	56,4	61,3	64,6	66,2	BE
BG				67,1	68,6	73,7				73,4	74,2	79,1				61,0	63,1	68,4	BG
CZ				77,4	76,5	75,8				86,2	85,3	85,0				68,8	67,7	66,5	CZ
DK	82,2	84,6	80,8	81,4	81,7	82,4	88,0	89,5	87,2	85,7	85,8	86,1	76,3	79,6	74,3	77,1	77,6	78,6	DK
DE	69,3	72,6	73,8	74,6	78,7	81,0	86,0	85,7	83,5	82,9	85,4	86,8	53,2	59,4	63,9	66,2	71,9	75,2	DE
EE				77,2	78,1	80,7				83,8	82,3	85,1				71,3	74,2	76,7	EE
IE	65,4	66,7	68,5	73,0	75,7	75,3	90,2	87,7	85,1	86,2	86,5	84,0	40,1	45,1	51,9	59,9	64,8	66,7	IE
GR	64,7	64,0	65,5	69,6	71,6	72,6	87,4	83,7	84,5	85,1	84,9	84,5	43,7	45,6	47,8	54,6	58,4	60,6	GR
ES		63,5	65,9	69,8	73,6	77,1		85,0	82,7	84,4	85,5	85,6		42,9	49,4	55,2	61,5	68,5	ES
FR	72,7	72,9	73,7	74,9	75,9	76,1	85,0	83,1	81,6	81,9	81,6	81,0	60,9	63,0	66,1	68,1	70,4	71,4	FR
IT	62,5	64,0	61,7	63,6	66,5	66,7	84,8	83,2	78,5	78,6	79,5	78,9	41,3	45,6	45,2	48,9	53,6	54,6	IT
CY				75,6	78,5	79,9				89,2	89,3	88,0				62,8	68,2	72,0	CY
LV				73,7	77,0	80,7				80,5	82,6	84,2				67,6	71,8	77,5	LV
LT				78,6	76,9	77,8				82,8	81,6	80,6				74,7	72,7	75,2	LT
LU	62,9	64,1	64,1	69,0	72,1	74,0	84,2	82,7	81,0	82,2	82,2	82,4	41,8	45,0	46,7	55,5	61,9	65,3	LU
HU				65,0	66,9	67,1				73,6	74,2	74,5				56,7	59,9	60,1	HU
MT				60,5	61,4	62,4				85,8	85,2	81,6				35,1	37,5	42,3	MT
NL	63,5	69,1	71,6	76,0	78,5	81,3	83,2	84,1	83,2	85,8	86,0	87,5	43,4	53,8	59,7	66,0	70,9	75,0	NL
AT			73,9	74,1	75,2	78,2			83,4	83,2	82,2	84,0			64,4	65,1	68,3	72,5	AT
PL				72,9	70,9	70,6				79,4	78,1	78,6				66,7	63,9	63,0	PL
PT		72,3	73,4	76,4	78,4	78,9		86,6	83,8	84,8	84,5	84,1		59,5	63,8	68,3	72,5	73,8	PT
RO				75,9	68,4	68,0				82,6	76,2	76,4				69,4	60,8	59,7	RO
SI				73,4	76,0	76,3				78,0	80,6	80,3				68,8	71,2	72,1	SI
SK				76,5	76,5	75,1				84,7	85,1	83,9				68,5	68,0	66,5	SK
FI			76,1	79,6	79,0	79,4			79,3	82,6	81,3	81,3			72,8	76,6	76,7	77,5	FI
SE			83,5	80,7	83,9	84,5			85,9	83,1	86,9	87,6			80,9	78,3	80,8	81,2	SE
UK	75,9	78,6	77,4	77,7	78,3	79,1	90,1	89,9	86,8	86,1	85,7	86,2	61,8	67,2	67,9	69,6	71,0	72,1	UK
NO			80,8	82,9	81,2	82,8			85,9	87,4	85,0	85,8			75,7	78,3	77,3	79,6	NO
EU27				73,1	74,5	75,6				82,4	82,6	83,0				63,9	66,4	68,3	EU27
EA17				71,9	74,5	76,0				82,4	83,3	83,4				61,4	65,8	68,5	EA17

Source: Commission services.

Table 2. 3 - Historical participation rates: workers aged 20 to 24

	Total						Men						Women						
	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	
BE	67,6	60,1	57,9	60,7	59,6	55,3	69,3	62,7	60,5	65,5	63,1	59,2	65,9	57,6	55,3	55,8	56,1	51,5	BE
BG				48,5	51,3	53,2				58,3	58,3	61,3				38,5	44,1	44,6	BG
CZ				69,3	57,3	53,1				77,3	65,6	62,1				61,5	48,6	43,5	CZ
DK	85,0	82,5	78,9	79,1	77,3	79,9	86,5	86,0	83,4	84,4	80,1	82,0	83,4	78,9	74,7	74,2	74,5	77,7	DK
DE	74,5	76,2	71,9	71,1	70,2	71,1	77,3	77,9	74,3	74,6	73,1	73,6	71,8	74,6	69,6	67,8	67,4	68,6	DE
EE				62,9	61,4	63,9				74,2	70,0	72,7				51,1	52,8	55,1	EE
IE	82,0	78,1	73,0	73,6	74,8	71,0	88,5	82,0	76,8	79,2	79,1	73,7	75,4	73,9	69,2	67,9	70,5	68,6	IE
GR	60,3	61,6	60,3	63,1	53,4	52,0	74,7	70,4	69,7	69,3	58,2	56,0	49,1	54,0	51,9	57,1	48,6	47,7	GR
ES		68,8	61,8	60,9	67,0	66,5		76,0	65,8	65,2	72,1	69,8		61,6	57,7	56,6	61,8	63,0	ES
FR	76,8	70,7	59,1	59,3	61,7	63,8	82,5	74,9	62,1	63,2	65,9	67,9	71,7	66,8	56,5	55,7	57,5	59,8	FR
IT	66,7	68,0	55,8	55,8	52,8	48,1	76,1	74,3	62,7	61,9	59,7	55,9	57,6	62,0	49,1	49,9	45,7	40,0	IT
CY				72,6	71,6	70,8				78,2	74,9	70,4				68,0	68,5	71,1	CY
LV				64,8	63,3	66,1				74,7	73,3	73,1				54,7	53,0	58,8	LV
LT				64,6	48,0	54,0				70,0	56,1	60,0				59,1	39,6	47,7	LT
LU	77,2	68,0	61,9	56,3	50,4	51,5	79,1	68,4	63,3	61,5	54,4	54,7	75,5	67,6	60,5	51,0	46,4	48,0	LU
HU				57,6	47,4	44,2				66,0	52,8	49,6				49,0	42,0	38,7	HU
MT				79,5	76,9	74,4				81,7	80,6	78,3				77,1	73,0	69,9	MT
NL	71,1	75,6	76,4	80,6	81,7	81,9	72,5	75,6	76,0	82,5	82,4	82,4	69,7	75,5	76,8	78,7	81,1	81,4	NL
AT			74,5	71,7	74,8	75,9			74,7	75,3	77,8	78,5			74,3	68,1	71,8	73,5	AT
PL				63,7	59,1	57,6				68,3	65,0	65,3				59,2	53,0	49,9	PL
PT		74,1	62,0	63,6	63,3	62,8		81,3	68,1	70,0	68,3	63,9		67,4	55,9	57,1	58,2	61,6	PT
RO				60,9	48,9	44,6				67,2	55,2	51,0				54,9	42,4	38,0	RO
SI				59,4	61,9	59,0				63,4	67,1	64,7				55,1	56,4	52,1	SI
SK				70,1	63,2	53,5				78,0	70,7	62,8				62,3	55,5	43,7	SK
FI			68,1	77,7	69,7	70,5			73,2	82,2	72,7	72,5			63,0	73,3	66,8	68,6	FI
SE			66,7	61,3	71,0	71,9			67,8	64,8	73,4	75,5			65,6	57,7	68,5	68,2	SE
UK	81,6	83,3	77,7	76,9	76,6	75,4	91,4	90,7	84,8	83,8	82,4	80,2	71,6	75,6	70,2	70,1	70,8	70,5	UK
NO			69,1	74,6	72,9	73,3			70,3	78,8	75,3	75,2			68,1	70,4	70,7	71,3	NO
EU27				65,0	64,0	63,3				70,3	69,0	68,0				59,8	59,0	58,5	EU27
EA17				64,0	64,6	64,0				68,6	69,0	67,9				59,5	60,2	60,0	EA17

Source: Commission services.

Table 2. 4 - Historical participation rates: workers aged 25 to 54

	Total						Men						Women						
	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	
BE	75,7	76,7	80,4	82,8	84,6	85,6	94,0	92,2	92,3	92,1	92,2	91,8	57,1	60,8	68,2	73,2	76,8	79,2	BE
BG				81,6	80,2	84,3				84,4	83,3	88,0				78,9	77,2	80,6	BG
CZ				88,5	88,3	87,7				95,0	94,8	95,1				81,9	81,6	79,9	CZ
DK	89,1	91,2	87,1	87,9	88,1	89,7	93,5	94,5	91,8	91,5	91,7	92,4	84,5	87,8	82,1	84,3	84,5	87,0	DK
DE	77,0	80,0	83,3	85,4	87,1	88,0	94,6	93,9	93,1	93,7	93,6	93,4	59,2	65,6	73,2	77,0	80,6	82,5	DE
EE				88,0	86,0	87,8				92,3	89,2	91,9				84,0	83,1	83,9	EE
IE	66,1	69,6	72,8	78,4	80,9	80,6	94,3	93,3	90,9	92,0	92,1	89,5	37,0	45,1	54,8	64,9	69,6	71,7	IE
GR	70,6	72,2	74,2	78,3	81,5	82,8	94,8	94,3	94,5	94,5	94,6	94,4	47,8	51,5	55,0	62,2	68,2	71,0	GR
ES		70,0	74,3	78,0	80,9	84,7		94,2	92,9	93,2	92,4	92,3		46,7	55,7	62,7	69,0	76,7	ES
FR	82,2	83,8	86,1	86,4	87,5	88,8	96,0	95,6	95,1	94,3	94,0	94,4	68,4	72,2	77,2	78,6	81,3	83,5	FR
IT	70,4	72,8	71,9	74,2	77,4	77,2	95,2	94,0	90,3	90,4	91,2	90,0	46,5	52,1	53,6	57,9	63,6	64,5	IT
CY				81,6	85,7	86,6				95,3	95,3	93,5				68,6	76,5	79,7	CY
LV				85,5	85,6	88,5				88,5	89,4	91,1				82,7	82,0	86,1	LV
LT				89,3	87,9	87,3				90,4	90,1	88,3				88,3	85,8	86,3	LT
LU	69,5	72,8	73,8	79,8	83,9	84,8	94,9	95,0	93,9	94,2	95,5	94,1	43,2	49,7	52,7	64,9	72,2	75,3	LU
HU				77,3	78,7	80,2				84,3	85,5	86,9				70,5	72,1	73,6	HU
MT				64,2	65,7	71,9				93,5	93,2	93,8				34,5	37,6	48,8	MT
NL	69,6	76,0	79,4	83,6	86,5	88,8	92,7	93,4	92,6	93,8	93,8	94,4	45,4	57,9	65,7	73,0	79,0	83,0	NL
AT			83,3	85,3	86,4	87,7			93,2	93,6	92,8	92,6			73,3	76,8	79,9	82,8	AT
PL				82,7	82,5	83,4				88,4	88,7	89,4				77,1	76,4	77,5	PL
PT		79,8	83,4	84,6	87,1	87,9		94,0	93,6	92,4	92,4	92,4		67,0	74,1	77,1	81,8	83,4	PT
RO				84,4	78,2	78,5				91,0	85,8	86,3				77,9	70,7	70,6	RO
SI				87,7	88,8	89,6				90,7	91,1	91,3				84,7	86,4	87,9	SI
SK				88,3	88,0	87,2				94,0	93,8	93,6				82,5	82,1	80,7	SK
FI			85,4	88,1	87,7	88,2			88,3	91,1	90,3	90,6			82,4	85,1	85,1	85,7	FI
SE			89,9	86,8	89,5	90,0			92,2	88,6	92,4	92,8			87,6	84,9	86,5	87,1	SE
UK	81,6	84,0	83,4	84,0	84,1	85,1	95,5	95,0	92,7	91,9	91,1	91,7	67,7	73,0	74,0	76,2	77,3	78,7	UK
NO			86,3	87,7	86,5	88,1			91,2	91,7	89,9	90,8			81,1	83,5	82,9	85,2	NO
EU27				82,7	83,8	84,9				92,0	91,7	91,8				73,4	75,9	77,9	EU27
EA17				82,1	84,1	85,3				93,0	92,9	92,6				71,1	75,3	77,9	EA17

Source: Commission services.

Table 2. 5 - Historical participation rates: workers aged 55 to 64

	Total						Men						Women						
	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	1985	1990	1995	2000	2005	2009	
BE	27,3	22,2	24,2	25,9	33,3	37,2	45,1	35,4	35,9	36,3	43,4	45,2	11,0	9,9	13,3	15,8	23,4	29,3	BE
BG				25,1	38,0	49,2				39,9	49,9	57,4				12,5	27,8	42,1	BG
CZ				38,1	46,9	49,6				54,5	62,1	63,2				23,3	32,9	37,2	CZ
DK	53,2	57,1	53,6	56,9	62,8	60,3	65,8	69,1	67,9	64,5	68,7	67,7	42,4	45,9	40,1	48,2	56,8	53,0	DK
DE	39,5	42,4	42,8	42,9	52,1	61,1	58,8	58,3	54,5	52,5	61,2	69,4	24,3	27,5	31,3	33,4	43,1	53,0	DE
EE				47,2	59,0	66,7				56,8	62,9	67,4				39,8	56,0	66,1	EE
IE	45,8	42,6	43,0	46,3	53,1	54,6	73,6	66,5	65,0	64,6	67,7	66,2	18,9	18,9	21,0	27,7	38,2	42,8	IE
GR	46,1	41,5	41,9	40,9	43,2	44,2	67,3	59,5	61,1	57,7	60,8	60,1	26,4	24,3	24,5	25,9	27,1	29,3	GR
ES		40,1	36,6	40,8	45,9	50,2		62,3	55,0	60,3	63,2	64,0		19,6	19,6	22,5	29,6	37,2	ES
FR	35,6	32,9	31,4	31,7	40,7	41,4	44,3	39,3	36,1	35,5	43,8	44,2	27,7	26,9	27,1	28,2	37,7	38,8	FR
IT	33,8	32,5	29,0	28,6	32,6	37,0	54,4	51,7	45,2	42,2	44,3	48,5	15,1	15,0	14,2	15,9	21,5	26,1	IT
CY				51,2	52,4	58,5				69,5	73,2	74,9				33,6	32,8	42,6	CY
LV				39,0	53,8	61,4				53,8	61,0	63,8				28,0	48,5	59,7	LV
LT				45,6	52,8	57,6				59,0	63,8	63,8				35,4	44,5	52,9	LT
LU	25,7	28,4	24,0	27,6	32,4	39,4	40,2	43,2	35,1	38,6	39,4	47,7	13,6	13,8	13,3	16,8	25,1	30,6	LU
HU				22,6	34,3	35,0				34,3	42,3	42,6				13,2	27,7	28,8	HU
MT				29,5	31,9	29,6				52,9	53,1	47,6				8,6	12,4	11,8	MT
NL	30,3	30,9	29,9	38,6	48,1	56,8	49,2	45,8	41,4	50,8	59,5	67,6	13,2	16,8	18,6	26,4	36,5	46,0	NL
AT			30,2	31,4	33,0	42,1			42,6	44,5	43,0	52,3			18,8	18,9	23,5	32,4	AT
PL				32,1	30,5	34,5				41,1	40,9	47,5				24,4	21,5	23,2	PL
PT		47,6	47,4	53,0	53,8	53,9		65,9	61,9	64,5	62,4	62,7		31,5	34,5	42,9	46,1	45,9	PT
RO				52,5	40,4	43,9				58,4	48,4	54,5				47,5	33,5	34,7	RO
SI				23,7	32,1	36,9				33,5	45,4	48,2				14,8	18,9	25,6	SI
SK				24,6	35,0	42,8				41,0	55,1	58,7				11,1	18,1	29,0	SK
FI			39,6	45,5	56,6	59,1			41,6	46,4	56,9	58,7			37,7	44,6	56,4	59,5	FI
SE			67,2	68,4	72,6	73,9			71,0	72,1	76,2	77,8			63,4	64,6	69,0	69,9	SE
UK	51,4	53,1	51,5	52,8	58,4	60,3	69,2	68,3	62,5	63,3	68,3	70,3	35,0	38,7	40,9	42,6	48,9	50,6	UK
NO			63,2	66,2	66,5	69,5			70,6	72,7	72,1	73,9			56,0	59,7	60,9	65,0	NO
EU27				39,7	45,2	49,1				50,6	55,2	58,6				29,6	35,8	40,2	EU27
EA17				37,2	43,7	48,4				48,4	53,8	57,4				26,5	34,0	39,9	EA17

Source: Commission services.

2.3. Main features of the cohort simulation model (CSM) and main assumptions of the 2012 exercise

The CSM is used to project participation rates, as in the 2006 and 2009 long-term exercises. This methodology is particularly adapted to take into account the significant rise in the labour force participation of women over recent decades, as younger women, with a much stronger attachment to the labour force, gradually replace older women with relatively low participation rates. Simultaneously, the cohort methodology also caters for a (relatively small) decline in the participation rate of men over generations in a large majority of countries, a trend opposite to what is observed for women.

The 2012 projection is made using the EUROPOP2010 population projections[28] prepared by Eurostat with the close involvement of National Institutes of Statistic. Population projections are the major driving force of labour force projections. In the present round of projections, there are significant changes in population values when compared to the previous exercise of 2009, mainly reflecting different (net) migration assumptions (see Chapter 1).

The EPC agreed on the following specifications to apply to the CSM:

- the starting year for labour market projections is 2010;
- labour market participation rates are calculated by gender and single age,[29] using average entry/exit rates in the labour force observed over the last ten years (2001-2010);[30]
- a correction mechanism is applied for young generations (15-24), in order to avoid that any increase in enrolment rates (and the corresponding decline in participation rates) feeds into future declines of participation rates for prime age workers. This assumption implies that participation rates cannot decline in the age bracket 15-24;
- as in the 2009 Ageing Report, the impact of pension reforms continues to be modelled through their estimated[31] impact on the labour market exit rates of older workers (aged 50-74). This is largely a judgemental approach, using the probabilistic nature of the CSM of labour force participation. Specifically, exit rates of older workers (50-74) are adjusted relatively to average historical values (2001-2010) in order to incorporate the expected future effects of legislated pension reforms on retirement behaviour.

[28] In order to be consistent with the Labour Force Survey data, rather than using EUROPOP2010 population projections on 1st of January, the projections are adjusted to reflect the average over the year. This could explain some discrepancies with reported figures in chapter 1.
[29] For Luxembourg, in line with what was done in the 2009 exercise, an adjustment is made that takes into account the high incidence of non-resident workers (cross-border workers).
[30] In the 2009 Ageing Report, participation rates were calculated using average entry/exit rates over the period 1998-2007.
[31] By Commission Services in close cooperation with EPC-AWG delegates. A more detailed description of the methodology can be found in Carone (2005).

2.3.1. Two main steps to project the labour force/supply

Firstly, participation rates by single year and gender are projected up to 2060 using the CSM. Aggregate values for participation rates are a weighted average of participation rates by single age and gender using as weights population shares. For example, the average participation rate for age groups $\underline{a}$ (lower age) to $\overline{a}$ (upper age) in period *t* is calculated as:

$$PR(\underline{a},\overline{a},t) = \sum_{a=\underline{a}}^{\overline{a}} \sum_{g=m,f} PR_{a,g}^{t} * p_{a,g}^{t}$$

where

$$p_{a,g}^{t} = \frac{pop_{a,g}^{t}}{\sum_{a=\underline{a}}^{\overline{a}} \sum_{g=m,f} pop_{a,g}^{t}}$$

where *a* is the age index; *g* is the gender index; $PR_{a,g}^{t}$ is the participation rate for single age *a* and gender *g* in period *t*; *pop* is the population; and *p* is the structure of the population.

Secondly, the labour force ($LF_{a,g}^{t}$)/labour supply (for each single age and gender combination) is derived multiplying the age/gender labour force participation rate by the corresponding population projection:

$$LF_{a,g}^{t} = PR_{a,g}^{t} * pop_{a,g}^{t}$$

The total labour supply for age groups $\underline{a}$ (lower age) to $\overline{a}$ (upper age) in period *t* is calculated as:

$$LF(\underline{a},\overline{a},t) = \sum_{a=\underline{a}}^{\overline{a}} \sum_{g=m,f} LF_{a,g}^{t} = \sum_{a=\underline{a}}^{\overline{a}} \sum_{g=m,f} PR_{a,g}^{t} * pop_{a,g}^{t}$$

Age aggregates commonly used are for example the groupings (15-64; 20-64; 25-54; 55-64; 20-71; 20-74).

2.3.2. Data sources and an additional assumption on labour input

Labour force participation rates are derived from the harmonised EU Labour Force Surveys of Member States (as compiled by Eurostat).[32] Detailed data by single age and gender are used, covering individuals aged 15 to 74 years old for the period 2001-2010. The starting point of the projections is 2010, the year for which the most recent figures are available.

For the current round of projections, the EPC decided to:

- use the production function methodology to project GDP growth (see Chapter 3), using total hours worked as the labour input variable, and;

[32] For Luxembourg, an adjustment is made to correct for the large non-resident work force (i.e. cross-border workers).

- the split between full- and part-time work (for the age groupings 15-24, 25-54, 55-64, and 65-74), as well as the corresponding weekly hours of work are fixed at the average values for the last available year (2010), during the entire projection period.

Although part-time vs. full-time rates and the corresponding average weekly hours of work are frozen per age grouping considered over the projection period, per capita hours worked change due to "compositional effects" that mostly reflect the expected increase in labour force participation of women, for which the incidence of part-time is higher than for men.

2.4. Legislated pension reforms in EU Member States

A strong point of the CSM is that the baseline scenario takes into account the expected effects on the participation rate of older workers of legislated pension reforms, including measures to be phased in gradually. A description of recent legislated pension reforms covering a total of 22 EU Member States is provided in Box 2.1.[33]

This framework for analysis is able to incorporate a broad typology of measures, inter alia, increases in the statutory retirement age, the convergence of women's lower statutory retirement age to that of men, the linking of the statutory retirement age to changes in life expectancy, the tightening of conditions for early retirement, and changes in (price) incentives affecting the retirement decision. Moreover, policy changes can be incorporated as one-off measures or be phased in progressively within a specified period.

Findings in the literature based on both micro data[34] and cross-country regressions[35] suggest that changing pension schemes has large and significant effects on the labour force participation of older workers (Duval 2003; Gruber and Wise, 2002 and 2005; and Bassanini and Duval, 2006).

Duval (2003) builds an indicator of implicit taxes on continued work and uses it to assess participation effects of the retirement incentives embedded in pension schemes. Across OECD countries, there is a significant negative correlation between the fall in male labour force participation and the corresponding implicit tax rate on continuing work (OECD, 2005).[36] Bassanini and Duval (2006) find that a 10 pp cut in the implicit tax rate on continuing work raises the average employment rate of older workers (55-64 age grouping) by 1 pp.

[33] This information was provided by EPC and AWG delegates.
[34] Matching information on individual's characteristics with their retirement incentives and decisions.
[35] Using macro data.
[36] The implicit tax on continued work can be seen as a key summary indicator of retirement incentives embedded in statutory pension and early retirement schemes. At a given age, it measures the cost of remaining (an addition year) in the labour force in terms of foregone pensions and higher social security contributions paid against the discounted gains of higher future pensions (resulting from additional contributions paid and possibly also higher accrual rates).

Using micro data, Gruber and Wise (2002) consider the average effect across 12 OECD countries of a reform that would delay benefit eligibility to a statutory pension by three years. They find that such a reform can engineer a dramatic rise in (male) participation rates.[37]

Box 2.1: Pension reforms legislated in the Member States and reflected in the labour force projections

Austria

The minimum retirement age for men increases from 61.5 years to 65 years (currently: 63.5 years); for women the age rises from 56.5 to 60 years (currently: 58.5 years). The increase has been phased in gradually in July 2004 and by 2017 early retirement will be eliminated. Early retirement reduces pension claims by 4.2% per year, in general. The statutory retirement age for women will be increased gradually between 2024 and 2033 to reach the retirement age for men at 65. A bonus for later retirement up to the age of 68 years (4.2% per year, up to a maximum of 10 %) is introduced. Since January 2005, harmonised guaranteed pension accounts have been established (Act on the harmonisation of pension system, approved in November 2004). The new system of individual pension accounts provides for a transparent reporting of benefits accrued from contributions paid in and other credits acquired, such as from active child and elderly care. This system aims to provide an 80% replacement rate for people retiring at 65 years of age and with 45 years of contributions. Pension benefits are adjusted to the consumer price index, while pensionable earnings are adjusted to the average insured wage.

In December 2010, the government approved measures to foster rehabilitation and keep people in the workforce, thereby decreasing expenditure on disability pensions. Specifically, it will be necessary to apply for rehabilitation before applying for a disability pension. During rehabilitation, payments are higher than unemployment benefits, and unemployment benefits are paid for longer periods, if an individual does not find a job after rehabilitation.

From 2014 onwards, long-term insurance pensions ('hacklerregelung') will be increased by 2 years (men to 62 and women to 57 years) and the purchase of schooling and study years will be abolished.

Bulgaria

Since 1 October 2008, all old-age pension entitlements calculated before 31 December 2007 were recalculated using the 2007 average insurance income (about EUR 203.6) in order to standardise the set of parameters for calculating pension entitlements, namely the individual coefficients and length of service.

On 1 January 2009, the insurance contribution rate to the Public Social Security Pension Fund was reduced from 22% to 18%. The contribution rate of employers was set to 10% and that of employees to 8%. In addition, the government budget provides a 12% contribution to the Public Social Security Pension Fund. In 2010 this transfer amounted to EUR 1.18 billion, or 34% of all pension expenditure.

On 1 January 2009, minimum pensions were increased by 10%.

On 1 April 2009, the annual accrual rate for old-age pensions increased from 1 to 1.1. In addition, the maximum pension amount (excluding bonuses) was increased to EUR 357.9, from EUR 250.5.

On 1 July 1 2009, pensions were updated by 9.0% following the so called Swiss rule.

New pension system measures entered into force on 1 January 2011, with amendments to the Social

[37] Cross-country comparisons can be distorted by the wide variation in the age at which (normal) retirement begins. In order to account for this, Gruber and Wise (2002) define the first age at which at least 25% of men are out of the labour force as the "25% age". Then they consider the five ages beginning with the "25% age" (i.e. "25% age + 4 years". Within the "25% age + 4 years" range, they find that the proportion of men out of the labour force declines on average by 47%, following a pension reform that delays benefit eligibility by three years.

Security Code (SSC), including:

- Financial strengthening of the first pillar of the pension system through:
  - Raising as of 2011 the social security contribution by 1.8 percentage points.
  - Introducing differentiated insurance income levels for self-employed on the basis of taxable income.
  - As of 1 January 2012, increasing the length of service for workers in the third labour category by 4 months every year until reaching 37 years of career for women and 40 years for men by 2020.
  - As of 1 January 2021, increasing the retirement age for men and women – by six months, until 63 for women (2026) and 65 for men (2024).
  - Extending until 31 December 2014 the period when early retirement of first and second labour category workers will be covered by the public social security instead of the professional pension funds.
  - The pensions' indexation in accordance with the so-called "Swiss rule" (Article 100 of the SSC) will be applied after 2013.
- Increasing the adequacy of social security pensions:
  - As of 1 January 2017 the weight of each year length of service is increased from 1.1% to 1.2% for social security pensions[38].
  - As of 1 January 2014 the maximum levels of newly awarded pensions will be abolished and the maximum levels of old pensions will be gradually increased.

As of 1 January 2017 the contribution for universal pension funds will be increased by 2 percentage points to 7%.

Czech Republic

In October 2011, a pension reform was approved. The statutory retirement age was increased above 65 years, depending on the year of birth. Younger cohorts (both genders) are subject to an additional increase of 2 months. As an example, for persons born in 1978 the statutory retirement age is 67 years and 2 months; for persons born in 1979 the statutory retirement age is 67 years and 4 months.

Germany

Forthcoming increase of the statutory retirement age (latest reform of 2007)

- For persons born after 1946, the statutory retirement age is increased in steps of either 1 or 2 months from 65 years of age, depending on the year of birth (see attached Table). As an example, the statutory retirement age for persons born in 1946 or earlier remains at 65; for persons born in 1947, the statutory retirement age is 65 years and 1 month; for persons born in 1948, the statutory retirement age is 65 years and 2 months; for persons born in 1958, the statutory retirement age is 65 years and 12 months i.e. 66 years; for persons born in 1963, the statutory retirement age is 65 years and 22 months. For those born in 1964 and younger, the statutory retirement age will be 67.

[38] This means that a length of service of 37 years will be automatically equal to 44.4, and 40 years will be equal to 48 years. The objective is that in 2025 the net income replacement ratio from the first and the second pillar reaches 65%.

Born in	Additional number of months
1947	1
1948	2
1949	3
1950	4
1951	5
1952	6
1953	7
1954	8
1955	9
1956	10
1957	11
1958	12
1959	14
1960	16
1961	18
1962	20
1963	22
1964	24

- Early retirement for persons with a minimum contributory period of 35 years will remain at 63 years of age. Since the statutory retirement age is planned to increase in the next two decades, the maximum penalties for early retirement at age 63 raise from 7.2% to 14.4%.
- Persons with a contributory career of 45 years or more can retire at full rate at 65.

Effects on the statutory retirement age (of previous reforms)

In the last two decades, the statutory and early retirement ages have also increased for different types of old age pensions. In some cases, further increases are still expected on account of past reforms. For example, women born before 1952 are entitled to a special old age pension. In the coming years, the relevance of these special pension types will decline further.

Denmark

Denmark introduced in 2006 a major reform package known as the "Welfare Agreement". This reform package affects mainly people younger than 48 years of age at the end of 2006. It reverses the 2004 decision to lower retirement age from 67 to 65. It also increases early retirement (VERB) from age 60 to age 62 between 2019 and 2022 with a minimum contribution period of 30 years instead of 25 for taking a VERB. The normal retirement age is increased from age 65 to 67 between 2024 and 2027. Finally, it indexes the retirement ages to the average life expectancy of 60-years old from 2025 onwards.

Estonia

The Estonian pension system has three pillars: (i) the first pillar is the pay-as-you-go public pension; (ii) the second pillar is a mandatory fully funded pension scheme; and (iii) the third pillar is a voluntary additional saving scheme.

The funded second pillar pension scheme provides supplementary income for pensioners. It is a retirement savings plan where a working person saves for his or her own pension, contributing 2% of their gross salary to the pension fund. The state contributes an additional 4% of the 20% of the social tax used for pensions to the individual's personal account, and retains the remaining 16% for members of the first pillar. Subscription to the funded pension is mandatory for individuals born in 1983 or later, but is voluntary for those born before 1983. A large majority of the labour force has joined the second pillar.

Retirement age will be increased to 65 years for both males and females gradually by 2026.

Contributions to the second pillar were halted for the period of 1.7.2009 to 31.12.2010. For the year 2011 the contribution rates were halved. From 2012 onwards, the normal system will be restored.

Greece

In July 2010, the Parliament adopted a comprehensive pension reform of the main pension schemes. The reform simplified the highly fragmented pension system, enhanced transparency and fairness, postponed the retirement age, and decreased the generosity of benefits. The new universally binding rules on entitlements, contributions, accumulation rules and indexation of pension rights applies to the main pension funds (IKA, OGA, OAEE, public sector scheme, Bank of Greece scheme). The pension reform is applied pro-rata to all current and future workers.

The main elements of the reform are:

(i) The introduction of a new basic pension of EUR 360/month (12 yearly payments).
(ii) The new system introduces accrual rates with the same profile for all workers that depend only on the length of the career (ranging from 0.8 to 1.5 percent of earnings).
(iii) The reform increases the statutory retirement age from 60 to 65. The minimum age for retirement is set to 60; penalties apply for persons with less than the full contributory career.
(iv) The full contributory career is increased to 40 years (compared with generally 35 years previously).
(v) As from 2021, the minimum and statutory retirement ages will be adjusted in line with changes in life expectancy every three years.
(vi) Equalisation of retirement ages of men and women in both the private and public sector by 2013.
(vii) Indexation of benefits (including basic pension) will not exceed HICP inflation.
(viii) Pensionable earnings will be calculated based on the full-earnings history.

The new legislation includes a sustainability clause (article 11.b.1, of Law 3863, 15 July 2010) which stipulates that, if long-term projections (to be run by the NAA every 2 years) show the rise in public pension expenditure between 2009 and 2060 to exceed 2.5 percentage points of GDP, then relevant parameters of the pension system will be changed to bring the increase of expenditure below the targeted threshold.

Spain

The 2002 pension reform (Law 35/2002)

It abolished mandatory retirement at 65 in the private sector. Workers remaining active after 65 will increase their pension benefit by 2% per year, and both employers and employees are exempted from paying most social security contributions. For workers aged at least 60, social contributions are reduced by 50%, and this amount is increased by 10% to reach 100% for those aged 65. Early retirement is possible from 61 years old, with at least 30 years of paid contributions and registered as unemployed for at least 6 months, but with a high penalty associated, from 6% to 8% per year (8% for those with only 30 years of contributions, 6% for those with at least 40 years of contributions). Pensions became compatible with part-time work (but the pension benefit was reduced according to the length of the working day).

A new law on Social Security measures was enacted in 2007

This package of reforms contains the following main measures:

- increase in the effective contribution period to be eligible for a retirement pension;
- partial retirement from age 61 instead of 60 for people entering the system after 1967 (and a

minimum of 30 years of contribution instead of 15);

- incentives for people working after age 65;
- more restrictive rules to get an invalidity pension.

The 2011 pension reform (Law on Social Security Reform 27/2011, August 1st)

This reform contains the following main measures:

- The statutory retirement age will gradually increase from 65 in 2013 to 67 in 2027.
- Early retirement can be taken at age 63 (previously 61). Eligibility for early retirement requires 33 years of contributions (previously 30). Penalties are increased to 7.5% per year of early retirement for careers shorter than 38.5 years of contributions, and 6.5% for careers longer than 38.5 years of contributions.
- Early retirement at 61 is still possible during economic crisis for workers with contributory careers longer than 33 years.
- Partial retirement at 61 is still allowed, but it will be less attractive because the partial employee will have to pay total social security contributions.
- Depending on the length of the contributory career, bonuses for delaying retirement are increased: +2%, +2¾%, and +4% for an extra year, respectively, for careers below 25 years, between 25 and 37, and over 37.
- The period used to calculate pensionable earnings will be gradually increased from 15 years to 25 years (by 2022).
- The contributory career for a full pension will be gradually increased from 35 to 37 years, with calculations being made on a monthly basis, instead of rounding to the next full year.
- The percentage of the full pension received will be proportional to the length of the contributory career, starting at 50% for careers shorter than 15 years and rising to 100% for a 37 years career. This is expected to eliminate the previous bias favouring shorter careers.

Sustainability factor:

Beginning in 2027, the fundamental parameters of the pension system will be revised each five years to take into account changes in life expectancy. Calculations will be based on projections carried out by official agencies.

Exceptions:

- Workers with contributory careers of more than 38.5 years are allowed to retire at 65 will a full pension.
- Women having interrupted their careers due to child care reasons can add, up to 112 days per child (below 6 year-old), starting in 2013, and increasing up to 270 days per child in 2018.

Finland Since 2005, flexible old-age retirement (63 to 68 years) with an increase of the accrual rate to 4.5% for those continuing to work beyond the age of 63. The ceiling on the maximum pension is abolished. A new early retirement scheme is introduced with a minimum age of 62 and an actuarial reduction of 0.6% per month prior to 63. Those borne after 1949 are not eligible for the unemployment pension scheme, which is replaced by an extended period of unemployment benefit (the so-called “unemployment pipeline" to retirement (currently from 57 for those born before 1950, age 59 for those born between 1950 – 1954 and age 60 for those born 1955 and later).

France
 	
Between 2004 and 2008, public sector pensions have been gradually aligned with private sector pensions by increasing the number of contribution years for entitlement to a full pension (from 37.5 to 40 years). Since 2009, the number of contribution years have increased with life expectancy following a rule that keeps constant the ratio of the number of contribution years to the number of years spent in pension to the level of 1.79 reached in 2003. The number of contribution years will be increased to 41 for generation 1952 and 41.5 for generation 1960, reflecting the expected gains in life expectancy (of 1.5 years every 10 years). A yearly 3% bonus has been introduced for postponing retirement in 2003. It increased to 5% in 2009. The penalty for early-retirement (before 40 years of contributions) has been modified too. Between 2006 and 2015, the yearly penalty ('la décote') for early-retirement will gradually decrease from 10% to 5% of pension benefits for private sector workers, while increasing from 0.5% to 5% for civil servants.
 	
The 2010 pension reform (law n°2010-1330):
 	
• (a) *a progressive rise of age limits*
  o The standard pension age will be gradually increased, for all pension schemes, from 60 to 62 years of age. Simultaneously, the full rate pension age will rise from 65 to 67 years of age. These two rises imply a 4 months increase in age limits every year from generation 1951 to generation 1956. (For example, people born in 1956 will be able to claim pension at 62 in 2018 and a full rate pension at 67 in 2023);
  o The early retirement age for long contributory careers will also be increased by 2 years.
 	
• (b) *convergence of pension rules between the public and private sectors*
  o Closing down of pathways to early retirement in the public sector: i) for parents with 3 children after a 15 years career; ii) provisions in the "Cessation Progressive d'Activité" programme;
  o The minimum pension of the public sector ('minimum garanti') will be computed using the same rule as in the private sector ('minimum contributif'). To be entitled to the minimum pension, insured persons will have first to reach the full rate pensionable age.
 	
• (c) Discriminatory positive measures partly limiting the favourable effect on labour force participation of the pension reform
  o Some categories/groups will still be granted a full rate pension at 65 years of age;
  o People suffering from a professional disease or an accident that results in a permanent incapacity of at least 10% can continue to retire at 60 with a full rate pension.

Hungary The 1997 pension reform: • aimed to raise gradually (by one year every two years) the statutory pension age for men from

60 to 62 and for women from 55 to 62 by 2009;

- started to build up a new framework for the mandatory pension system, by splitting the existing one into two parts: a) a dominant PAYG pension pillar; and b) a partly funded pension pillar;
- the new mixed system (approximately 3/4 PAYG and 1/4 funded pillar) is obligatory for new entrants into the labour market, for others it is optional.

In 2006-2007, Parliament adopted a package of reforms (two laws) which specifies that early retirement is allowed only 2 years before normal retirement (previously 3 years). Thus from 2013 onwards, early retirement is possible from age 60 for both women and men. From 2013 onwards, all early pensions will be subject to a penalty. The rate of reduction, depending on the time remaining until the statutory retirement age, will be 0.3% per month for the 61-62 age-group, and 0.4% per month below the age of 61. It introduces also changes in the calculation of benefits, a minimum contribution from 40-41 for early retirement, and some favourable retirement conditions for those working in potentially health-hazard occupations.

<u>The 2009 pension reform</u>:

- the statutory retirement age is increased from 62 to 65 between 2014 and 2022 (i.e. by 6 months every year). The early retirement age is also gradually increased form 60 to 63.
- use of a less generous indexation rule for pensions, depending on GDP growth. The Swiss indexation formula used earlier will be applied only if GDP growth exceeds 5.0%.

Weights in the indexation formula		
GDP growth	CPI	Wages
< 3.0	100	0
3.0 - 3.9	80	20
4.0 - 4.9	60	40
> 5.0	50	50

- abolition of the 13th month for pensions from the second half of 2009, in its place a pension premium is introduced.

The 13th month for pensions had been introduced between 2004 and 2006, then capped at HUF 80,000 (average pension benefit) in 2008, and abolished in the second half of 2009. Instead, a pension supplement will now be paid, starting with GDP growth of 3.5%, and rising with GDP growth. For GDP growth of 7.5% or more, the pension premium will equal the 13th month for pensions, but will also be capped at HUF 80,000.

Italy

Major changes to pension legislation, since 2006:

<u>A. Law 127/2007</u> increases low pension benefits through an additional annual lump sum (€420 from 2008) given to pensioners aged 64 and over with income lower than 1.5 times the annual minimum pension (€9.133 in 2011). Such an increase is reduced or augmented by 20% for contribution careers lower than 15 years or higher than 25, respectively (18 and 28, for the self- employed).

Additional increases are also foreseen for social assistance pensions (improving upon legislation passed in 2002), through the so-called ‘social assistance additional lump sums’ (*maggiorazioni sociali*). They are provided to the elderly with a personal income (in case of a single) or couple’s income (in case of married people), including social security pensions, below certain limits and up to them. In 2011, personal income limits are 5,600 euro per year, in the age bracket 65-69, and 7,850 in the age bracket 70+. For married people, couple’s income limits are 11,680 euro per year, in the age bracket (referring to the beneficiary) 65-69, and 13,290 in the age bracket 70+.

<u>B. Law 247/2007</u> includes the following measures:

- <u>Minimum requirements for early retirement</u>. The process of increasing the minimum requirements for early retirement has been slowed down, keeping unchanged the phased-in values foreseen by Law 243/2004. In particular, in 2008 the age requirement, for those with a contributory career of 35 years, is 58 for employees and 59 for self-employed instead of 60 and 61. From 2013 onwards (previously 2014, according to Law 243/2004) the age requirement, for those with a contributory career of 35 years, is 62 for employees and 63 for self-employed. In addition, from July 2009 onwards, workers may retire 1 year earlier provided that they have a contributory career of at least 36 years.

- Revision of transformation coefficients. The new transformation coefficients, revised on the basis of the procedure foreseen in Law 335/95, are applied since January 2010. Subsequent revisions will be made every three years, instead of every ten years, through a simplified procedure falling entirely under the application of administrative rules.
- Contribution rate of atypical workers. The contribution rate for atypical workers has been increased by 3 percentage points (up to 26% from 2010) in order to improve pension adequacy for this category.

C. Law 133/2008 states that old age and seniority pensions may be fully accumulated with labour income. The new legislation improves upon the previous one which foresaw some restrictions in the possibility of accumulating, especially for employees.

D. Article 12 of the law 122/2010 (amending decree law 78/2010) introduces three changes to the public pension system:

- "Exit window' mechanism. The 'exit window' mechanism, which after completion of minimum age and/or contribution period postpones pension receipt, has been increased. It applies to those qualifying for a pension after 1 January 2011. It involves a 1 year postponement for employees and 1½ years for the self-employed, concerning both early (including those with a 40 years contributory career) and old age pensions.
- Indexation of retirement age. Age requirements for early and old age pensions, and old age allowances (*assegno sociale*) have been indexed to changes in life expectancy at 65, as measured by the National Statistical Institute over the preceding three-years. Indexation to life expectancy will be first applied in 2015, when the gradual increase of age requirements for retirement, according to previous legislation, has been fully phased-in, but cannot exceed three months. Subsequent retirement age indexations are envisaged for 2019 and then every three years, so as to align this mechanism with the revision of the transformation coefficients used to calculate pension entitlements according to the contributions-based method.
- Statutory retirement age of women in the public sector. In the public sector, the statutory retirement age of women (60, in 2009) will be equalised with that of men (currently 65) in 2012 (61 in 2010-2011), instead of 2018 as previously foreseen in law 102/2009. This accelerated pace of convergence reflects an European Court of Justice recommendation to remove any discrimination based on gender.

D. Law 111/2011[(1)] (amending decree law 98/2011), approved the 15th July 2011, further strengthens the eligibility requirements, keeping unchanged the 'exit windows' mechanism, with the exception of early retirement with 40 years of contributions, as reported below. The major interventions may be summarized as follows:

- Statutory retirement age of women in the private sector. The statutory retirement age of women in the private sector will be gradually equalised to the one of men (and women in the public sector) passing from the current level of 60 to 65 over the period 2020-2032.
- Indexation of retirement age. The indexation of the eligibility requirements (early and old age pensions, and old age allowance), previously foreseen to start from 2015 (law 122/2010), has been brought forward to 2013. This implies a further increase in the age requirements of 4 months starting from 2016, compared to previous legislation (Law 122/2010).
- Early pension with 40 years of contributions. For those retiring with 40 years of contributions regardless of age, the postponement envisaged by the 'exit windows' mechanism has been further increased by 3 months starting from 2014 (1 month in 2012 and 2 months in 2013).
- Benefit indexation. For the two-year period 2012-2013 and limited to pensions above five

times the minimum pension, the indexation to price inflation is reduced to 70% and only applied to the part of pension up to three times the minimum. For the part exceeding such a threshold, the indexation is nil.

E. Law 148/2011[(1)] (amending decree law 138/2011), approved the 14th September 2011, foresees two further interventions on retirement age:

- Statutory retirement age of women in the private sector. The alignment process of statutory retirement age of women in the private sector to that of men (and women in the public sector) has been brought forward 6 years, from 2020-2032 to 2014-2026.

- ‘Exit window’ mechanism. Further postponement due to the exit window mechanism is also applied to workers in the public educational system, previously exempt.

[(1)] Measures legislated after June 2011 are not yet reflected in the macroeconomic assumptions.

Cyprus

On 20 March 2009, the Social Insurance Law N. 22(I)/2009 was approved regarding the pension reform package for securing the long-term viability of the Social Insurance Scheme. The two measures of the reform expected to impact in future labour force participation rates are:

- Stricter eligibility conditions to old-age pensions, which are to be introduced gradually over the period until January 2012, namely increase of the minimum contributory period to 10 years (previously 3 years);

- Maximum limit of 6 years on credits granted to an insured person in the lower end of the income distribution for any period of time spent in full time education or approved training after 16 years of age (previously no maximum limited existed). This measure came into effect in January 2010.

Lithuania

In June 2011, a new law was passed that gradually increases the statutory retirement age from 62.5 to 65 for men and from 60 to 65 for women by 2026. Under the new law, the retirement age will increase every year by 2 months for men and by 4 months for women, starting in January 2012. In order to receive a full pension, workers must also have a career contribution of 30 years.

Malta

In December 2006, the government completed the legislative process associated with the enactment of the pensions reform bill. Following the implementation of the reform, pension age was raised to 65 years, however, a number of provisos apply, whereby for persons born on or before the 31 December 1951, pension age is 61 years while for females pension age is 60 years; in the case of a person born during the calendar years 1952-1955, pension age is 62 years; for persons born during the period 1956-1958, pension age is 63 years; for persons born in the period 1959-1961, pension age is 64 years.

Secondly, following the reform, a person of 61 years of age, not having attained pensionable age, may claim a pension if he/she is no longer employed provided that the claimant has accumulated since her/his 18th birthday a total of: (i) 40 years of paid or credited contributions (for those born after 1962); or (ii) 35 years of paid or credited contributions (for those born between 1952 and 1961).

According to the pension reform law, for those born after 1962, the pension shall be determined by taking the yearly average of the basic wage/salary/net income/net earnings as the case may be, during the best 10 calendar years within the last 40 years immediately preceding his/her retirement or invalidity. In determining pensionable income, past wages and incomes are indexed to the cost of living (i.e. HCPI).

The contribution period was also changed: (i) a 30 years period is expected for persons born before 1952; (ii) 35 years for persons born between 1952 and 1961; and, (iii) 40 years for persons born after 1962.

Following enactment of the pension reform law, those born after 1962 who are not entitled to a (contributory) Pension are entitled to a Guaranteed National Minimum Pension not lower than 60% of the National Median Income. Furthermore, the categories of persons benefitting from credit contributions is extended to individuals born after 1962, who have the legal care and custody of a child younger than 6 years old, or 10 years old in the case of a child suffering from a serious disability. Following the pension reform, persons born after 1962 have their pension updated annually by a sum corresponding to 70% of the increase in the national average wage and 30% to consumer price inflation.

The Maltese Government also introduced changes to the regime regulating the award of invalidity pensions and the procedures for their review, including changes in: (i) application; (ii) medical panel; (iii) specific medical criteria for their award; and (iv) setting of an independent audit system.

The Netherlands

Since 1 January 2006 the Dutch early retirement scheme is integrated with the second pillar old age pension system by a law called VPL ('VUT-Prepensioen-Levensloop). The installation of this law implied a replacement of a previous scheme that facilitated actuarially unfair early retirement, called the VUT scheme. The old scheme had an important impact on the participation rate. Since January 2009, older workers receive an age-related tax credit on their wage income in order to increase participation (at 62, this credit is 5% of gross wages, at 63 it is 7%, at 64 it is 10%; then at 65 and 66 it is 2% and decreases to 1% at 67).

Poland

The general system: all insured persons born after 1948 are covered by the new defined contribution PAYG with notional accounts and three-pillars. The standard retirement age remains at 65 years of age for men and 60 for women. There are no early pension for those born after 1948 and retiring after 2008, with the exception of miners. Since 2007, disability pension insurance contributions were reduced.

In 2009, "bridging" pensions and compensation benefits replaced early retirement pensions for eligible workers. This only affects those that started working in special conditions before 1999.

Since May 2010, contributions to the funded tier are modeled accordingly to the PAYG contribution. From 2017 onwards (i.e. after the transition period) of the existing 7.3%, 3.5% will remain in the funded system, while an extra 3.8% will be paid to the public system to dedicated accounts.

Portugal

Portugal introduced in 2007 a "Sustainability factor" linking initial benefits to average life expectancy at retirement (i.e. at the legal retirement age of 65). Individuals can opt to postpone retirement beyond the legal retirement age to compensate (at least partially) for the financial penalty associated with the sustainability factor. Simultaneously, a "national strategy for the promotion of active ageing" was introduced aiming to encourage older workers to remain longer in the labour force through: better access to vocational training, improvement of older workers employment conditions, a higher penalty for early retirement, and benefits granted in case of longer contribution careers.

In the framework of the 2006 Agreement on the Social Security Reform, a new law defining the social security contributory code to the general regime was approved (Law 110/2009, 119/2009 and 55-A/2010), and it is in force since 1 January 2011.

Romania

In 2007, a three pillar pension system was introduced. As regards the first pillar, the retirement age for men will increase from 64 to 65, while that for women it will increase to 63 by 2030. There will also be an increase in the mandatory contributory period. Additionally, the indexation of public pensions will also become less generous, with the current earnings-related indexation rule being replaced by a Swiss indexation rule. Penalties for early retirement will be increased, while eligibility for disability pensions will be tightened.

Sweden

The pension reform was approved by Parliament in 1999. Under the new notional defined contribution system it is possible to retire after 61 years of age, with an actuarially fair compensation for those who stay in the labour force. Every year of contributions enters in the calculation of pensions. A person with an average wage will increase his yearly pension benefit by nearly 60 per cent if he/she postpones retirement until 67 years of age compared with leaving at 61. A yearly "statement of account" informs workers of the costs and benefits of retirement. The new system is phased in gradually for generations born between 1938 and 1953, while fully affecting those born after 1953.

Slovenia

Under the Pension and Disability Insurance Act entered into force on 1 January 2000 (comprising a three-pillar defined benefit PAYG system plus compulsory and voluntary supplementary funded schemes), the standard retirement age has been increased. It is now possible to retire between 58 and 63 for men and 61 for women (the minimum retirement age was 58 for men and 53 for women before the reform). Women that worked before the age of 18 can retire earlier (but not before the age of 55). Special regulations reduce the age of retirement to 55 in certain cases (before the reform it was possible even below 50). The minimum retirement age is raised from 53 to 58 for women (the same level as for men). The accrual rate was reduced by 2% to 1.5% since 2000. Later retirement has been encouraged: a person who fulfils the requirement for pension but continues to work beyond the age 63/61 will receive an additional pension increase (3.6% the first additional year, 2.4% the second year and 1.2% in the third, in addition to the normal rate of accrual of 1.5% per year).

Slovakia

Under the reformed (from 2004) three–pillar pension system, the standard retirement age has been increased from 60 to 62 for men (9 month per year) by 2006, while for women it will be increased from 57 to 62 by 2014. A worker can still retire earlier if the combined benefit from the first and the newly introduced second pillar equals at least 60% of the minimum living standard set by the government. In case of early retirement, the pension is reduced by 6% per year, while increased by 6% per year of postponement. It is now possible to accumulate pension benefit with labour income.

<u>Opening of a second pillar</u>:

- For a second time, between 15 November 2008 and 30 June 2009, all pension savers were given (as in 2008) an opportunity to leave the 2nd pillar, while at the same time, those individuals who had not yet entered it were allowed to join in. During this period, 66 thousands people left the 2nd pillar, while 14,6 thousands people joined it, leading to a net decline of 3.5% in the number of individuals covered by the 2nd pillar.

On 1st January 2008, eligibility conditions to early pensions were tightened. It can now be granted only two years before reaching the normal retirement age.

As of 1st January 2008, the minimum contributory period was increased from 10 to 15 years.

As of 1st January 2011, it is not possible to cumulate an early pension with labour income.

The United Kingdom

Between 2010 and 2020, women's pensionable age will gradually rise from 60 to 65, as for men. The Pension Act 2007 adds also several measures, including the gradual increase of the state pension age between 2024 and 2046 to 68 for men and women (previously 65).

Source: EPC/AWG delegates.

2.5. The impact of pension reforms on the participation rate of older workers

The impact of pension reforms on the participation rate of older workers is simulated through its estimated effects on the retirement decision (or labour market exit). The likely impact of pension reforms is incorporated in the baseline labour force projection by appropriately changing (average) labour market exit probabilities calculated using the CSM for the period 2001-2010. More specifically, the distribution of labour market exit probabilities (between ages 50 and 74), calculated separately for both genders, is 'shifted' according to the expected effects of pension reforms. The estimation of the 'shift' takes into account country-specific information about the relationship between retirement behaviour and the parameters of the pension system, together with cross-country econometric evidence of the impact of changes in the implicit tax rate on continuing work and retirement decisions.

Estimation of the effects of pension reforms highlights the following stylised fact. Although the age profiles of the probability of retirement vary across countries, reflecting the heterogeneity of pension systems, a common feature is that the distribution of retirement decisions is markedly skewed towards the earliest possible retirement age. In fact, a typical distribution of the retirement age tends to have spikes/modes at both the minimum age for early retirement and the normal (statutory) retirement ages.[39]

A comprehensive assessment of how to shift the distribution of retirement ages ultimately depends on the considered judgement of all the relevant factors underlying retirement decisions, which is carried out by Commission Services (DG ECFIN) in close cooperation with EPC and AWG delegates.

Finally, historical retirement/exit rates (the average over the period 2001-2010) are replaced in the CSM with the new estimated exit rates, according to the phasing-in of the reforms. Consequently, pension reforms change estimated participation rates for older workers. The magnitude of the expected impact of pension reforms can be assessed by comparing participation rates calculated with and without the effect of reforms.

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[39] For example, let us assume that in a given country the (historical) retirement probability is concentrated at age 58, while a reform ends with early retirement schemes or increases the minimum years of contribution. In order to calculate the impact of this reform, the peak of the retirement probability distribution is shifted away from the historical peak of 58 years and moved closer to the statutory retirement age (usually 65 for men and 60 for women).

2.5.1. Estimates of the impact of pension reforms

The *average exit* age from the labour force has increased by approximately 1½ years in the EU27 between 2001 and 2009, reaching 61.4 years (Table 2.6), being in a rising path in a large majority of EU Member States.

Table 2. 6 – Historical average exit age from the labour force

	Total			Men			Women		
	2001	2005	2009	2001	2005	2009	2001	2005	2009
Austria	59,2	59,9		59,9	60,3		58,5	59,4	
Belgium	56,8	60,6		57,8	61,6		55,9	59,6	
Bulgaria		60,2			62,4			58,4	
Cyprus	62,3		62,8						
Czech Republic	58,9	60,6	60,5	60,7	62,3	61,5	57,3	59,1	59,6
Denmark	61,6	61,0	62,3	62,1	61,2	63,2	61,0	60,7	61,4
Estonia	61,1	61,7	62,6						
Finland	61,4	61,7	61,7	61,5	61,8	62,3	61,3	61,7	61,1
France	58,1	59,0	60,0	58,2	58,7	60,3	58,0	59,3	59,8
Germany	60,6		62,2	60,9		62,6	60,4		61,9
Greece		61,7	61,5		62,5	61,3		61,0	61,6
Hungary	57,6	59,8	59,3	58,4	61,2	60,1	57,0	58,7	58,7
Ireland	63,2	64,1		63,4	63,6		63,0	64,6	
Italy	59,8	59,7	60,1	59,9	60,7	60,8	59,8	58,8	59,4
Latvia	62,4	62,1							
Lithuania	58,9	60,0							
Luxembourg	56,8	59,4							
Malta	57,6	58,8	60,3						
Netherlands	60,9	61,5	63,5	61,1	61,6	63,9	60,8	61,4	63,1
Poland	56,6	59,5		57,8	62,0		55,5	57,4	
Portugal	61,9	63,1		62,3	62,4		61,6	63,8	
Romania	59,8	63,0		60,5	64,7		59,2	61,5	
Slovakia	57,5	59,2	58,8	59,3	61,1	60,4	56,0	57,6	57,5
Slovenia		58,5							
Spain	60,3	62,4	62,3	60,6	62,0	61,2	60,0	62,8	63,4
Sweden	62,1	63,6	64,3	62,3	64,3	64,7	61,9	63,0	64,0
United Kingdom	62,0	62,6	63,0	63,0	63,4	64,1	61,0	61,9	62,0
Norway	63,3	63,1	63,2	63,0	63,1	63,0	63,6	63,1	63,3
EA17	59,9	60,7	61,2	60,2	60,9	61,4	59,6	60,5	61,0
EU27	59,9	61,0	61,4	60,4	61,6	61,8	59,4	60,4	61,0

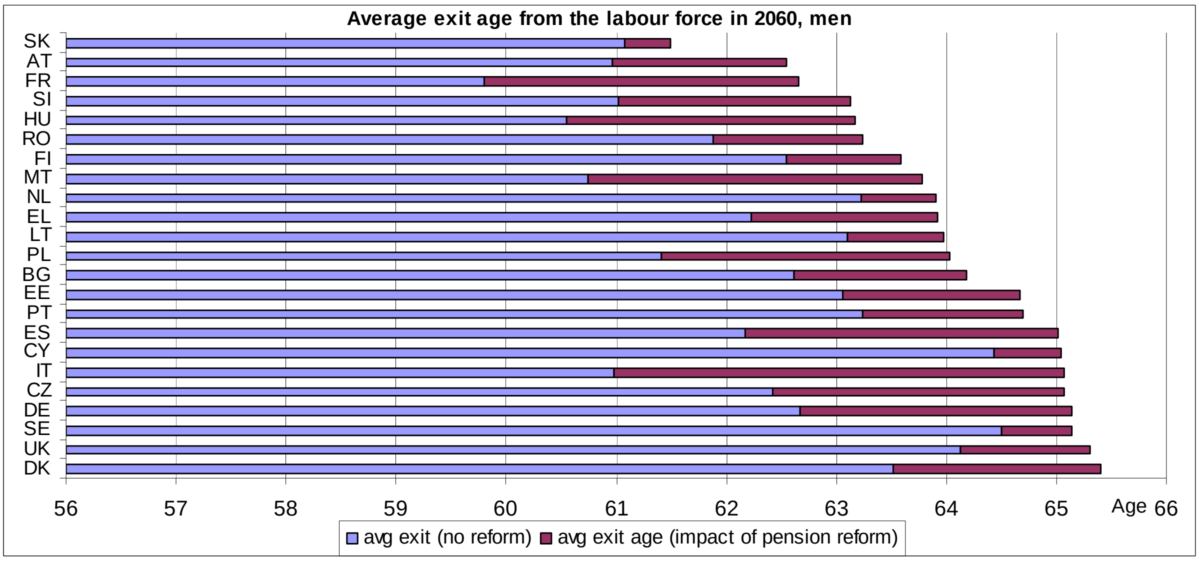
Source: Commission services.

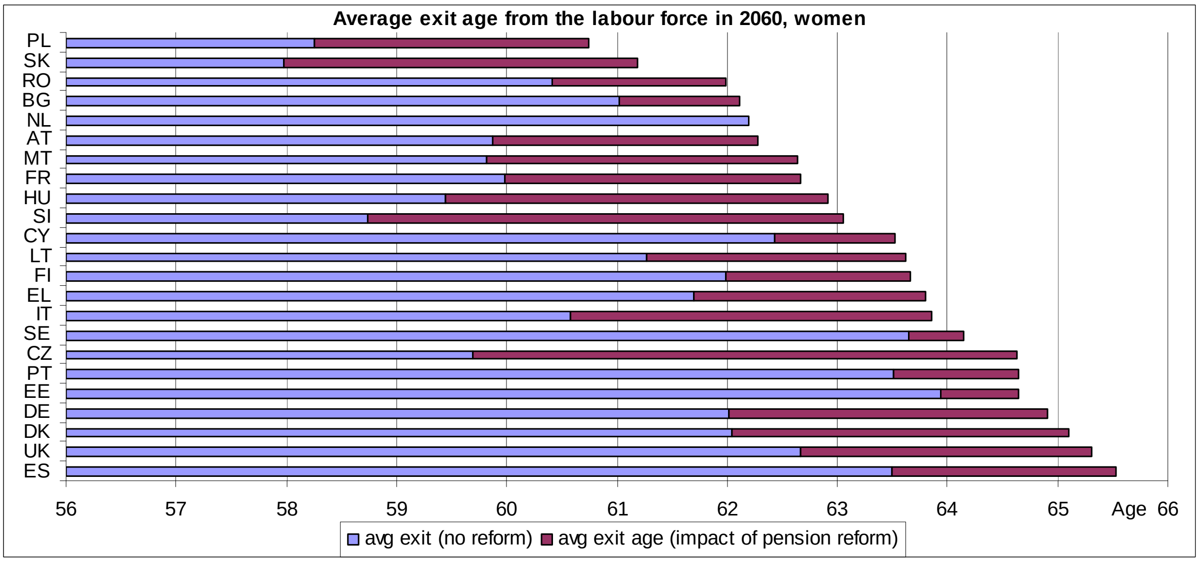
The *average exit age* from the labour force (in 2060) can be seen as a summary measure of the long-term impact of all currently legislated pension reforms. This report deals with the impact of enacted pension reforms in 22 Member States.[40] Projections show an average increase of 1.9 in the effective retirement rate for men.[41] In Italy and Malta, the expected increase exceeds three years, while it is between two and three years in the Czech Republic, Germany, France, Hungary, Poland, Slovenia and Spain. The expected increase in the retirement age for women is slightly higher (2.4 years on average), reflecting in a number of countries the progressive convergence of the retirement age of women to that of men.

[40] AT, BG, CZ, DK, DE, EE, EL, ES, FI, FR, HU, IT, CY, LT, MT, PL, PT, RO, SE, SI, SK, and the UK.

[41] Non-weighted average of the 22 Member States considered.

Graph 2. 1 - Impact of pension reforms on the average effective retirement age[42] from the labour force





Source: Commission services, EPC.

[42] Based on the reference age group 50-70.

Table 2. 7 - Estimated impact of pension reforms on participation rates (2020, 2040, 2060), in percentage points (comparison of projections with and without incorporating pension reforms)

		AT			BG			CY			CZ			DE		
Ages	Gender	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060
15_64	M	1.8	2.0	2.2	0.2	2.8	2.1	0.7	0.8	0.8	0.6	3.2	2.8	2.8	2.9	3.1
	F	1.5	3.6	3.9	0.0	1.9	1.5	0.8	1.1	1.1	1.2	6.2	6.3	2.8	3.8	4.1
	T	1.7	2.8	3.0	0.1	2.4	1.8	0.7	1.0	1.0	0.9	4.6	4.5	2.8	3.4	3.6
15_74	M	1.5	2.2	2.4	0.3	2.7	2.1	0.3	0.4	0.2	0.7	4.1	4.2	3.4	4.1	4.4
	F	1.4	3.4	3.9	0.1	1.7	1.4	1.0	1.4	1.5	1.0	6.2	7.1	3.0	4.3	4.7
	T	1.4	2.8	3.1	0.2	2.2	1.8	0.6	0.9	0.8	0.9	5.2	5.7	3.2	4.2	4.5
20_64	M	2.0	2.2	2.4	0.3	3.0	2.4	0.7	0.9	0.9	0.7	3.4	3.1	3.1	3.2	3.4
	F	1.6	4.0	4.2	0.0	2.1	1.6	0.8	1.2	1.2	1.3	6.7	6.9	3.0	4.2	4.5
	T	1.8	3.1	3.3	0.2	2.6	2.0	0.8	1.0	1.0	1.0	5.0	5.0	3.1	3.6	3.9
55_64	M	8.1	9.7	10.2	0.9	10.2	10.0	3.1	3.5	3.5	3.2	12.6	14.2	10.9	12.6	13.1
	F	6.3	17.2	17.6	0.0	6.4	6.4	3.6	4.5	5.0	5.9	24.3	31.8	10.9	16.6	17.5
	T	7.2	13.5	13.9	0.4	8.3	8.2	3.4	4.0	4.3	4.5	18.4	22.9	10.9	14.6	15.3
20_74	M	1.6	2.3	2.6	0.3	2.9	2.3	0.3	0.4	0.2	0.7	4.4	4.6	3.6	4.4	4.7
	F	1.5	3.6	4.1	0.1	1.9	1.5	1.1	1.5	1.6	1.1	6.7	7.7	3.2	4.5	5.0
	T	1.5	3.0	3.4	0.2	2.4	1.9	0.7	1.0	0.9	0.9	5.5	6.1	3.4	4.5	4.9

		DK			EE			EL			ES			FI		
Ages	Gender	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060
15_64	M	0.9	1.5	2.0	0.5	2.8	2.2	1.3	3.4	3.8	1.4	3.6	3.0	1.5	1.5	1.5
	F	0.7	2.9	3.5	1.0	1.9	1.5	1.4	2.8	3.3	1.0	2.3	1.9	2.0	2.0	2.0
	T	0.8	2.2	2.7	0.8	2.3	1.8	1.3	3.1	3.5	1.2	2.9	2.4	1.7	1.8	1.7
15_74	M	0.4	1.7	2.6	0.7	2.8	2.4	0.4	1.8	2.4	1.9	5.3	4.5	1.1	1.5	1.4
	F	0.5	3.8	4.6	-0.3	0.8	0.2	1.0	1.9	2.5	1.3	3.8	3.2	2.2	2.4	2.5
	T	0.5	2.7	3.6	0.2	1.8	1.3	0.7	1.8	2.5	1.6	4.6	3.8	1.6	1.9	1.9
20_64	M	1.0	1.7	2.2	0.6	3.0	2.5	1.4	3.7	4.2	1.5	3.9	3.3	1.6	1.7	1.6
	F	0.8	3.2	3.9	1.1	2.1	1.6	1.5	3.1	3.6	1.1	2.4	2.0	2.2	2.2	2.2
	T	0.9	2.4	3.0	0.9	2.5	2.0	1.4	3.4	3.9	1.3	3.2	2.7	1.9	1.9	1.9
55_64	M	4.2	7.9	9.7	2.1	10.9	10.9	4.7	12.0	16.8	6.1	13.9	13.3	6.7	7.3	7.3
	F	2.8	14.5	16.3	4.7	8.2	8.2	5.9	10.9	15.0	4.6	9.0	8.6	8.5	9.0	9.3
	T	3.5	11.3	12.9	3.6	9.5	9.5	5.3	11.4	15.9	5.3	11.5	10.9	7.6	8.1	8.3
20_74	M	0.5	1.9	2.8	0.8	3.1	2.6	0.5	1.9	2.6	2.1	5.7	4.8	1.2	1.6	1.5
	F	0.5	4.1	5.0	-0.3	0.8	0.3	1.0	2.1	2.7	1.4	4.0	3.5	2.3	2.6	2.7
	T	0.5	3.0	3.9	0.2	1.9	1.4	0.7	2.0	2.7	1.7	4.9	4.1	1.8	2.1	2.1

		FR			HU			IT			LT			MT		
Ages	Gender	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060
15_64	M	3.0	4.3	4.4	2.3	4.6	4.0	2.9	5.2	5.7	0.5	1.1	1.2	2.5	5.4	5.6
	F	2.4	4.0	4.0	3.8	6.3	5.5	2.1	4.1	4.6	2.0	4.2	3.8	1.0	3.8	3.7
	T	2.7	4.2	4.2	3.0	5.5	4.8	2.5	4.6	5.1	1.3	2.6	2.5	1.8	4.6	4.7
15_74	M	2.4	4.1	4.2	1.9	4.4	3.7	2.5	5.3	6.2	0.5	1.3	1.3	2.0	4.9	4.8
	F	2.1	4.0	4.0	2.9	5.7	4.9	1.8	3.5	4.1	1.6	3.6	3.2	0.8	3.2	2.9
	T	2.2	4.1	4.1	2.4	5.1	4.3	2.2	4.4	5.2	1.1	2.4	2.3	1.4	4.1	3.9
20_64	M	3.4	4.8	4.9	2.5	5.0	4.4	3.2	5.6	6.2	0.6	1.2	1.3	2.7	5.9	6.1
	F	2.7	4.4	4.4	4.1	6.8	6.0	2.2	4.4	5.0	2.1	4.5	4.2	1.0	4.1	4.0
	T	3.0	4.6	4.7	3.3	5.9	5.2	2.7	5.0	5.6	1.4	2.9	2.7	1.9	5.0	5.1
55_64	M	14.7	22.3	22.3	12.1	18.1	17.1	12.3	22.4	24.6	2.6	5.1	6.0	12.4	24.6	26.2
	F	11.1	19.4	19.5	18.7	24.8	24.3	8.1	16.4	19.5	8.2	17.4	18.5	3.6	14.0	14.8
	T	12.8	20.8	20.9	15.7	21.5	20.7	10.2	19.3	22.1	5.7	11.6	12.3	8.0	19.2	20.6
20_74	M	2.6	4.5	4.6	2.1	4.7	4.0	2.7	5.6	6.7	0.6	1.4	1.4	2.2	5.3	5.1
	F	2.2	4.4	4.4	3.1	6.1	5.3	1.9	3.7	4.3	1.7	3.8	3.5	0.8	3.5	3.1
	T	2.4	4.4	4.5	2.6	5.4	4.6	2.3	4.7	5.5	1.2	2.6	2.5	1.5	4.4	4.2

		NL			PL			PT			RO			SE		
Ages	Gender	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060
15_64	M	1.8	2.3	2.6	1.9	4.2	3.5	1.0	2.3	2.1	1.6	2.7	2.3	0.2	0.2	0.2
	F	0.2	0.2	0.2	1.6	4.0	3.1	0.8	2.1	2.0	0.6	2.6	2.2	0.1	0.1	0.1
	T	1.0	1.3	1.4	1.7	4.1	3.3	0.9	2.2	2.1	1.1	2.6	2.2	0.2	0.2	0.2
15_74	M	1.5	2.1	2.4	1.6	4.3	3.7	0.9	2.8	2.6	1.1	2.4	2.0	0.7	1.0	1.0
	F	0.1	0.1	0.1	1.5	4.0	3.2	0.6	2.0	1.9	0.3	1.9	1.7	0.7	0.8	0.9
	T	0.8	1.1	1.2	1.5	4.2	3.5	0.7	2.4	2.3	0.7	2.2	1.8	0.7	0.9	1.0
20_64	M	1.7	2.3	2.6	2.0	4.5	3.8	1.1	2.5	2.3	1.8	2.9	2.5	0.3	0.3	0.3
	F	0.1	0.1	0.1	1.7	4.3	3.3	0.9	2.3	2.2	0.6	2.7	2.3	0.1	0.1	0.1
	T	0.9	1.2	1.4	1.8	4.4	3.6	1.0	2.4	2.2	1.2	2.8	2.4	0.2	0.2	0.2
55_64	M	4.8	5.1	5.8	8.8	15.4	15.7	4.6	9.0	8.6	8.5	9.7	9.3	1.2	1.3	1.3
	F	0.0	0.0	0.0	5.5	12.1	11.3	2.9	7.6	7.5	2.1	8.2	7.9	0.5	0.5	0.5
	T	2.4	2.6	3.0	7.1	13.7	13.5	3.7	8.3	8.0	5.1	8.9	8.6	0.8	0.9	0.9
20_74	M	1.4	2.0	2.3	1.7	4.6	3.9	0.9	2.9	2.8	1.2	2.6	2.1	0.8	1.0	1.1
	F	0.0	0.0	0.0	1.5	4.3	3.5	0.6	2.1	2.0	0.4	2.1	1.8	0.7	0.9	1.0
	T	0.7	1.0	1.2	1.6	4.4	3.7	0.8	2.5	2.4	0.8	2.3	2.0	0.7	1.0	1.1

		SI			SK			UK			EA17			EU27		
Ages	Gender	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060	2020	2040	2060
15_64	M	3.0	4.7	3.6	0.7	1.0	0.8	0.1	0.6	0.9	2.4	3.5	3.6	1.9	3.0	3.0
	F	3.7	8.6	6.9	4.4	6.9	5.4	1.2	2.4	2.5	2.0	3.3	3.3	1.7	3.2	3.1
	T	3.3	6.6	5.3	2.5	3.9	3.1	0.7	1.5	1.7	2.2	3.4	3.5	1.8	3.1	3.1
15_74	M	1.9	3.8	2.9	0.5	0.7	0.5	0.0	0.7	1.5	2.3	4.1	4.2	1.8	3.4	3.5
	F	2.6	7.2	5.9	3.4	5.8	4.3	0.8	3.2	3.4	1.9	3.5	3.5	1.6	3.4	3.4
	T	2.3	5.5	4.4	2.0	3.3	2.4	0.4	1.9	2.5	2.1	3.8	3.8	1.7	3.4	3.5
20_64	M	3.2	5.0	4.0	0.8	1.0	0.9	0.1	0.7	1.0	2.6	3.8	3.9	2.0	3.3	3.3
	F	3.9	9.3	7.6	4.7	7.5	5.9	1.3	2.7	2.8	2.2	3.6	3.6	1.9	3.5	3.4
	T	3.6	7.1	5.8	2.7	4.2	3.4	0.7	1.7	1.9	2.4	3.7	3.8	1.9	3.4	3.4
55_64	M	13.4	17.6	17.5	3.8	3.8	3.8	0.2	2.6	4.4	10.1	15.4	16.1	8.2	13.0	13.6
	F	13.7	31.7	31.5	20.1	24.8	23.8	5.4	12.6	13.1	8.4	14.2	14.9	7.3	13.6	14.3
	T	13.5	24.4	24.4	12.3	14.4	13.8	2.9	7.6	8.7	9.2	14.8	15.5	7.8	13.3	14.0
20_74	M	2.1	4.1	3.1	0.6	0.8	0.5	0.0	0.8	1.7	2.5	4.3	4.5	1.9	3.7	3.8
	F	2.8	7.8	6.4	3.6	6.2	4.6	0.9	3.4	3.7	2.0	3.7	3.8	1.7	3.7	3.7
	T	2.4	5.9	4.7	2.1	3.5	2.6	0.5	2.1	2.7	2.3	4.0	4.1	1.8	3.7	3.7

Source: Commission services, EPC.

Table 2.7 shows the estimated impact of pension reforms on participation rates. In most of the 22 EU Member States that have recently legislated pension reforms, they are projected to have a sizeable impact on the labour market participation of older workers (aged 55 to 64), which depends on their magnitude and phasing-in.

Overall in the EU27, the participation rate of older people (55-64) is estimated to be higher by about 7.7 pp in 2020, 13.2 pp in 2040, and 13.8 pp in 2060 due to the projected impact of pension reforms. In the euro area, the impact is estimated to be even larger: 9.1 pp, 14.7 pp, and 15.4 pp, respectively, in 2020, 2040, and 2060. In Germany, France, Hungary, Italy, Slovenia and Slovakia the impact is estimated to be above 10 pp by 2020, while in Austria, the Czech Republic, Denmark, Greece, Spain, Lithuania, Malta and Poland the impact is estimated to be above 10 pp by 2040.

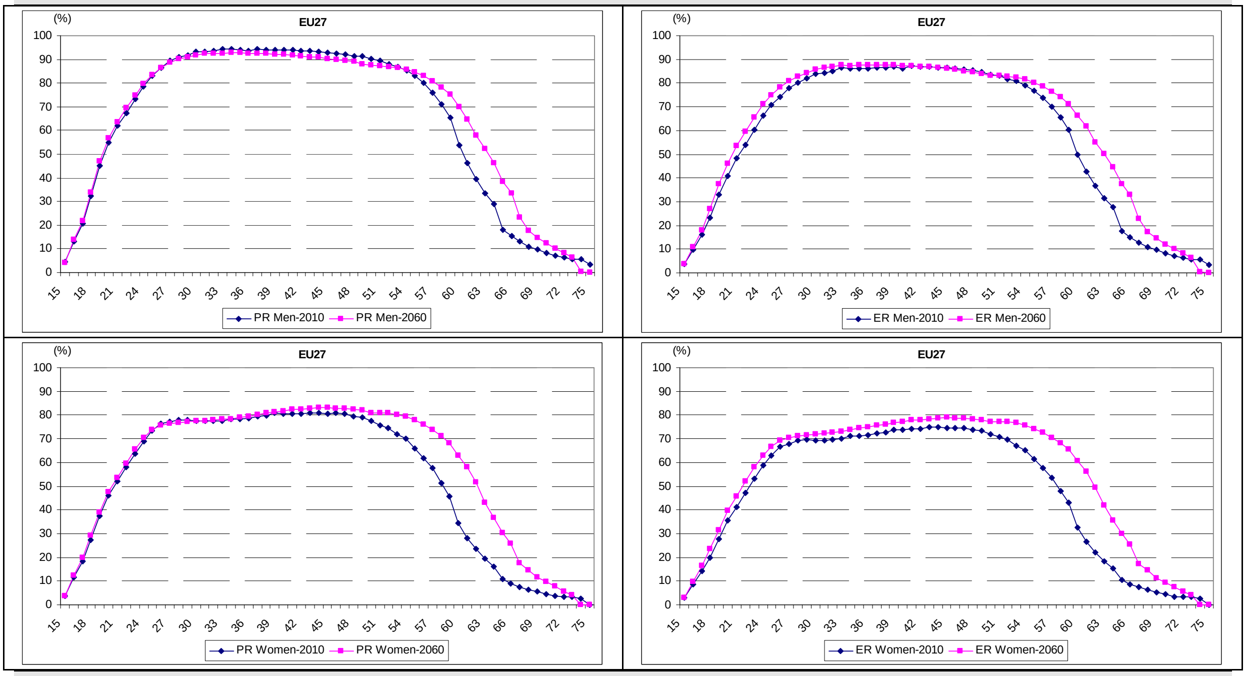
It should be recalled that total participation rates (15-64 and 20-64) are mainly driven by changes in the participation rate of prime-age workers (25-55), as this group accounts for about 60% of the total labour force (15-64). Therefore, even these significant projected rises in participation rates for older workers will only have a rather limited impact on the total participation rate. For example, the 13.8 pp increase in the participation rate of workers aged 55 to 64 years in the EU will lead to an increase in the total participation rate (15 to 64) of only about 3 pp by 2060.

2.6. Main results of the projection of labour market participation rates

2.6.1. Projection of participation rates

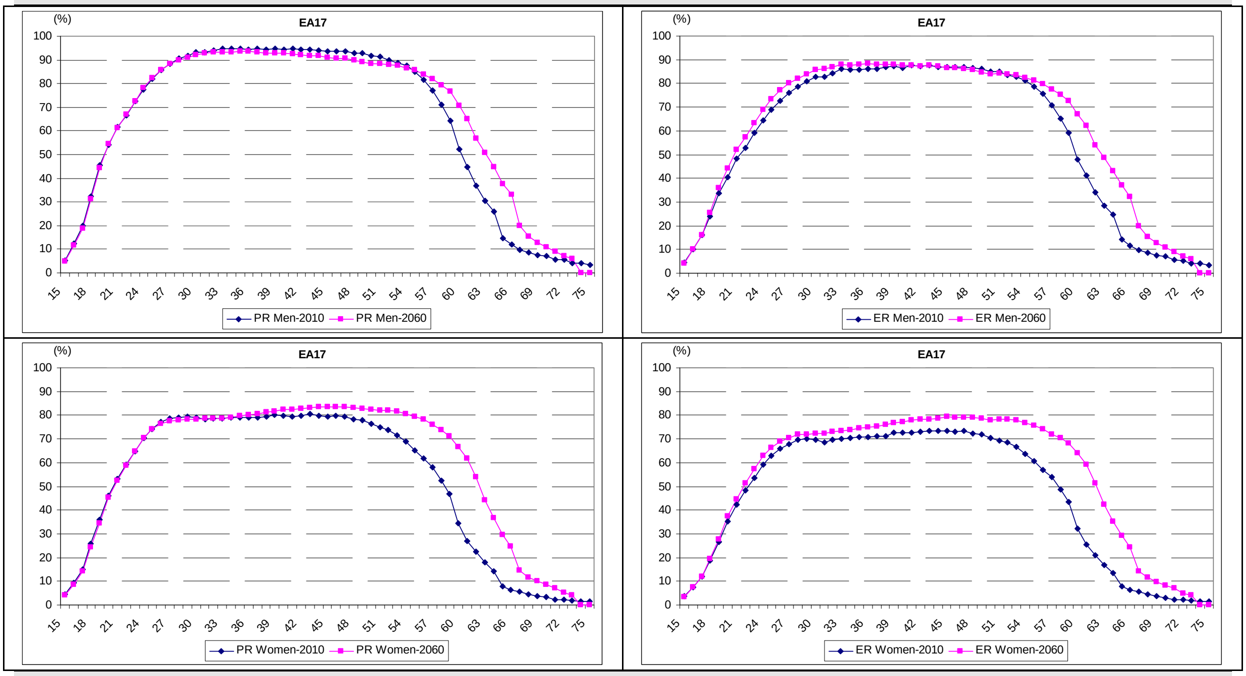
The methodology used leads to a projected rightward shift in the age profiles of participation rates, meaning that older individuals (aged 50 years and more) tend to stay longer in the labour market, particularly women (see Graphs 2.2 and 2.3).

Graph 2. 2 – Age profiles of participation and employment rates by gender in 2010 and 2060 – EU27



Source: Commission services, EPC.

Graph 2. 3 - Age profiles of participation and employment rates by gender in 2010 and 2060 – EA17



Source: Commission services, EPC.

Table 2.8 presents participation rate projections. The total participation rate (for the age group 20 to 64) in the EU27 is projected to increase by 3.1 percentage points (from 75.6% in 2010 to 78.7% in 2060). For the euro area, a slightly higher increase of 3.3 pp is projected (from

75.9% in 2010 to 79.2% in 2060). For the age group 15-64, the projected increases in participation rates are smaller, with 80% of the total improvement occurring in the period up to 2020.

Table 2. 8 – Projected changes in participation rates

	Age group 15 to 64					Age group 20 to 64					
	Level	Level	Change in participation rates			Level	Level	Change in participation rates			
	2010	2060	2060-2010	2020-2010	2060-2020	2010	2060	2060-2010	2020-2010	2060-2020	
AT	75.0	77.6	2.5	0.9	1.7	78.0	80.6	2.5	0.4	2.1	AT
BE	67.7	68.5	0.8	1.7	-0.9	73.5	74.8	1.3	1.5	-0.2	BE
BG	67.1	69.4	2.4	1.7	0.7	72.1	75.7	3.6	1.6	2.0	BG
CY	73.2	78.0	4.8	4.7	0.1	79.9	84.2	4.3	3.3	1.0	CY
CZ	70.3	73.1	2.8	2.6	0.2	75.9	79.7	3.7	2.0	1.7	CZ
DE	76.7	78.9	2.2	1.7	0.5	80.6	83.2	2.6	1.5	1.1	DE
DK	79.5	80.6	1.1	0.4	0.7	81.6	82.7	1.1	0.3	0.8	DK
EE	74.1	75.6	1.5	1.9	-0.4	80.2	82.7	2.5	1.5	1.0	EE
EL	68.4	72.6	4.2	2.9	1.3	73.2	78.8	5.6	3.1	2.5	EL
ES	73.4	77.5	4.0	3.0	1.1	77.7	83.0	5.3	3.7	1.7	ES
FI	74.6	76.2	1.7	1.8	-0.2	79.1	81.1	2.0	1.6	0.3	FI
FR	70.4	74.7	4.2	2.6	1.6	76.1	81.1	5.0	3.1	1.9	FR
HU	62.4	67.1	4.7	5.4	-0.7	68.0	72.6	4.6	5.0	-0.4	HU
IE	69.6	67.3	-2.3	-0.4	-1.9	74.8	73.2	-1.6	0.5	-2.1	IE
IT	62.2	65.3	3.1	2.0	1.1	66.5	70.3	3.8	2.2	1.6	IT
LT	71.0	73.0	2.0	2.9	-1.0	78.5	79.9	1.4	0.6	0.7	LT
LU	67.9	67.5	-0.4	0.5	-0.9	73.5	73.0	-0.5	0.1	-0.6	LU
LV	73.7	76.9	3.2	3.5	-0.4	79.9	83.1	3.3	2.5	0.7	LV
MT	60.7	70.3	9.6	5.7	4.0	64.3	74.3	10.0	5.4	4.6	MT
NL	78.2	79.9	1.7	1.4	0.3	80.0	81.7	1.7	1.3	0.3	NL
NO	78.2	78.0	-0.2	0.1	-0.4	82.2	81.9	-0.3	-0.2	-0.1	NO
PL	65.8	67.2	1.4	2.6	-1.2	71.5	72.6	1.1	1.4	-0.3	PL
PT	74.1	76.7	2.6	1.6	1.0	79.4	82.1	2.8	2.0	0.8	PT
RO	63.8	60.9	-2.9	0.7	-3.6	68.4	65.2	-3.2	0.4	-3.6	RO
SE	79.1	81.9	2.8	2.4	0.3	84.5	87.4	3.0	1.9	1.0	SE
SI	71.7	74.7	3.0	3.0	0.0	76.0	80.6	4.5	2.9	1.6	SI
SK	68.9	67.8	-1.1	2.1	-3.2	75.1	73.4	-1.8	0.7	-2.4	SK
UK	75.4	76.7	1.3	1.1	0.2	79.0	80.7	1.7	0.9	0.8	UK
NO	78.2	78.0	-0.2	0.1	-0.4	82.2	81.9	-0.3	-0.2	-0.1	NO
EU12	66.4	67.7	1.3	2.4	-1.1	71.9	73.2	1.3	1.6	-0.3	EU12
EU15	72.4	74.9	2.5	1.9	0.6	76.6	79.8	3.1	2.0	1.1	EU15
EU27	71.1	73.7	2.6	2.1	0.6	75.6	78.7	3.1	2.0	1.1	EU27
EA17	71.4	74.0	2.6	2.0	0.5	75.9	79.2	3.3	2.2	1.1	EA17

Source: Commission services, EPC.

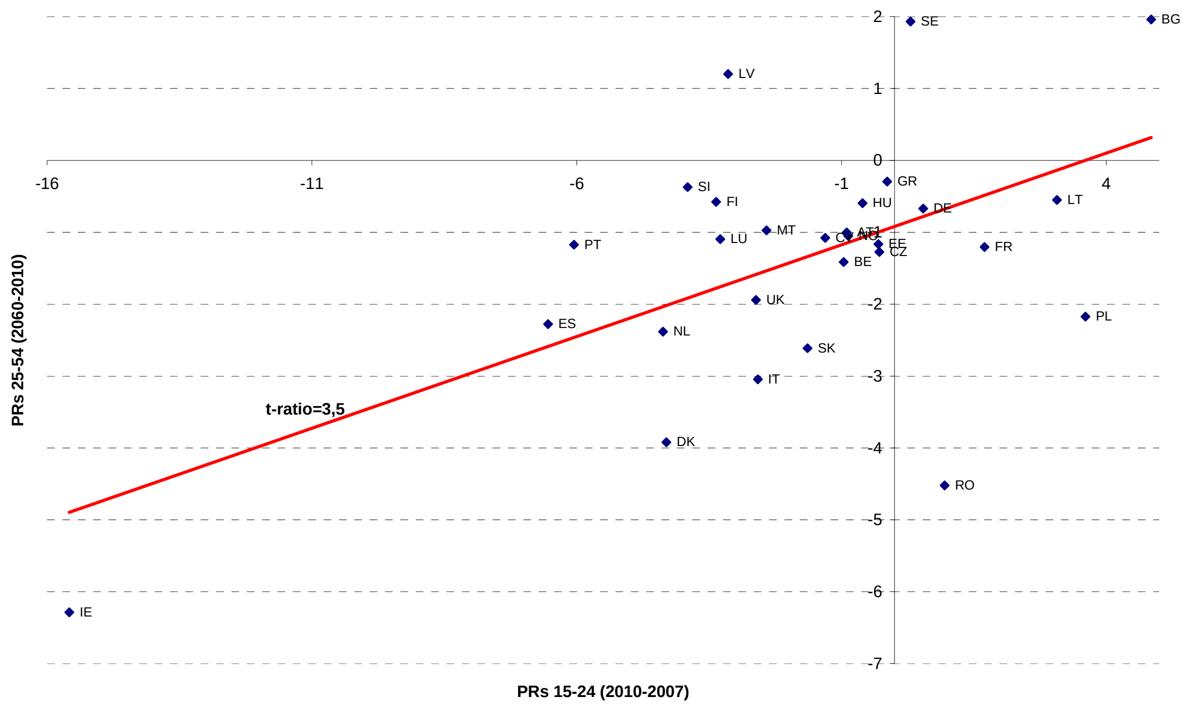
The population of working-age is projected to decline substantially in the coming decades, as large cohorts of people retire and are replaced by smaller cohorts of younger workers. Other things being equal and given the age profile of participation rates, the increasing share of older workers in the labour force puts downward pressure on the total participation rate.

Tables 2.9 to 2.11 provide an overview of major developments in participation rates between 2010 and 2060 broken down by age groups and gender. By large, the biggest increase in participation rates is projected for older workers (around 20 pp for women and 10 pp for men) in the EU27. Consequently, the gender gap in terms of participation rates is projected to narrow substantially in the period up to 2060.

Although the participation rate of total prime age workers (25-54) in the EU27 is projected to remain almost unchanged between 2010 and 2060, at about 85.0%, this results from opposite trends by gender. In fact, women's participation rate is projected to rise by 1.9 pp, reaching 80.0% in 2060, while men's participation rate is projected to decline by 1.7 pp, attaining 90.0% in 2060.

In the framework of the CSM, participation rate dynamics are determined, *inter alia*, by labour market conditions affecting younger generations, cohort effects,[43] and demographic composition effects. The severe economic recession of 2008-2009 disproportionately affected young (male) workers, having a detrimental impact on their entry rates in the labour force. Given that in the CSM, participation rates are calculated as cumulative entry (minus exit) rates, it is not surprising that today's decline in entry (and participation) rates for younger cohorts (15-24) has significant knock-on effects on tomorrow's participation rates of prime age workers (25-54).[44] In fact, despite the various determinants of participation rates, Graph 2.4 strongly suggests that the decline in the prime age (25-54) participation rate of men in 2060 partly reflects the negative impact of the 2008-2009 economic recession on young (15-24) men workers' participation rate.

Graph 2. 4 – Knock-on effects of the 2008-2009 economic recession on men's prime-age participation rate



Source: Commission services, EPC.
Participation rate differences: 15-24 age group between 2010-2007, against the 25-54 age group between 2060-2010.

[43] That is how the age profile of participation rates shifts across generations.
[44] Despite the correction mechanism described in the third bullet of section 2.3. This effect is not present for women, because of a strong counteracting cohort effect, and a less dramatic impact of the 2008-2009 economic recession on younger women's participation rates.

Table 2. 9 – Participation rates by age groups – Total, 2010-2060

	Total		Young		Prime age		Older		Change 2010-2060				
	15-64		15-24		25-54		55-64		Total	Young	Prime age	Older	
	2010	2060	2010	2060	2010	2060	2010	2060	15-64	15-24	25-54	55-64	
AT	75.0	77.6	59.5	61.3	87.7	89.5	43.1	56.1	2.5	1.8	1.9	12.9	AT
BE	67.7	68.5	32.7	33.3	86.3	85.6	39.1	48.7	0.8	0.6	-0.7	9.6	BE
BG	67.1	69.4	32.0	29.9	82.7	84.0	49.3	59.8	2.4	-2.0	1.3	10.5	BG
CY	73.2	78.0	42.0	41.9	87.3	91.0	59.6	68.8	4.8	-0.1	3.7	9.2	CY
CZ	70.3	73.1	31.1	29.7	87.9	85.7	50.1	72.6	2.8	-1.4	-2.1	22.5	CZ
DE	76.7	78.9	51.6	50.6	87.3	88.2	62.5	74.8	2.2	-1.0	0.9	12.3	DE
DK	79.5	80.6	67.8	69.3	89.0	86.6	61.1	73.2	1.1	1.5	-2.4	12.1	DK
EE	74.1	75.6	39.6	35.7	88.3	88.2	64.4	73.6	1.5	-4.0	-0.1	9.2	EE
EL	68.4	72.6	31.4	30.6	83.5	85.9	45.5	69.6	4.2	-0.8	2.4	24.1	EL
ES	73.4	77.5	43.0	41.8	85.5	87.9	50.8	76.4	4.0	-1.2	2.4	25.6	ES
FI	74.6	76.2	50.0	50.8	87.5	87.4	60.5	65.8	1.7	0.8	-0.1	5.3	FI
FR	70.4	74.7	39.8	39.6	88.9	89.7	42.5	63.3	4.2	-0.2	0.7	20.8	FR
HU	62.4	67.1	25.7	25.3	81.0	81.0	37.1	59.1	4.7	-0.4	0.0	22.0	HU
IE	69.6	67.3	42.3	42.0	80.4	76.9	54.7	63.9	-2.3	-0.4	-3.5	9.3	IE
IT	62.2	65.3	28.7	29.2	76.9	76.1	37.8	62.6	3.1	0.5	-0.8	24.8	IT
LT	71.0	73.0	31.3	29.4	88.5	87.6	56.5	66.1	2.0	-2.0	-0.8	9.7	LT
LU	67.9	67.5	25.3	28.4	85.7	86.9	40.1	41.6	-0.4	3.2	1.2	1.5	LU
LV	73.7	76.9	42.2	38.5	88.5	91.3	57.1	64.7	3.2	-3.7	2.8	7.5	LV
MT	60.7	70.3	51.9	51.5	73.2	79.5	32.6	58.5	9.6	-0.3	6.3	26.0	MT
NL	78.2	79.9	69.1	71.0	87.9	88.6	56.0	62.4	1.7	2.0	0.7	6.5	NL
NO	78.2	78.0	57.1	57.7	87.3	87.4	69.8	68.2	-0.2	0.6	0.1	-1.7	NO
PL	65.8	67.2	35.5	33.4	84.2	82.8	36.8	47.4	1.4	-2.1	-1.4	10.5	PL
PT	74.1	76.7	37.3	37.7	88.7	90.0	54.2	69.4	2.6	0.3	1.3	15.2	PT
RO	63.8	60.9	31.9	29.2	79.5	74.8	42.3	46.3	-2.9	-2.7	-4.7	4.0	RO
SE	79.1	81.9	51.9	52.9	90.0	92.2	73.9	77.9	2.8	1.0	2.1	3.9	SE
SI	71.7	74.7	39.6	38.2	90.2	89.6	36.3	61.6	3.0	-1.4	-0.6	25.3	SI
SK	68.9	67.8	31.8	30.1	86.9	83.7	45.1	50.7	-1.1	-1.7	-3.2	5.5	SK
UK	75.4	76.7	59.4	58.4	85.0	84.5	59.9	70.1	1.3	-0.9	-0.5	10.2	UK
NO	78.2	78.0	57.1	57.7	87.3	87.4	69.8	68.2	-0.2	0.6	0.1	-1.7	NO
EU12	66.4	67.7	33.3	31.2	83.7	82.2	42.2	53.9	1.3	-2.0	-1.5	11.7	EU12
EU15	72.4	74.9	46.6	46.1	85.3	85.7	51.8	68.1	2.5	-0.5	0.4	16.3	EU15
EU27	71.1	73.7	43.5	43.8	85.0	85.2	49.7	65.7	2.6	0.3	0.2	16.0	EU27
EA17	71.4	74.0	42.9	41.8	85.2	85.8	49.3	67.0	2.6	-1.1	0.6	17.7	EA17

Source: Commission services, EPC.

Table 2. 10 - Participation rates by age groups – Men, 2010-2060

	Total		Young		Prime age		Older		Change 2010-2060				
	15-64		15-24		25-54		55-64		Total	Young	Prime age	Older	
	2010	2060	2010	2060	2010	2060	2010	2060	15-64	15-24	25-54	55-64	
AT	80.8	79.7	64.1	65.5	92.5	91.5	52.9	56.9	-1.0	1.5	-1.0	4.0	AT
BE	73.4	72.8	35.2	35.8	92.2	90.7	47.5	52.0	-0.7	0.6	-1.4	4.5	BE
BG	71.6	74.5	36.6	34.5	86.1	88.0	56.8	68.9	2.9	-2.0	2.0	12.1	BG
CY	79.8	80.1	42.6	43.2	93.5	92.4	75.1	74.4	0.3	0.6	-1.1	-0.7	CY
CZ	78.7	80.1	36.4	34.9	95.5	94.3	62.8	76.6	1.4	-1.6	-1.3	13.8	CZ
DE	82.4	82.4	54.3	53.4	93.1	92.4	70.8	76.9	0.0	-0.9	-0.7	6.1	DE
DK	82.8	82.1	68.0	69.3	92.4	88.5	67.4	75.0	-0.7	1.3	-3.9	7.5	DK
EE	77.1	77.9	43.9	39.9	91.8	90.6	64.3	73.9	0.9	-4.0	-1.2	9.6	EE
EL	78.8	79.4	34.5	33.6	94.2	94.0	60.4	77.3	0.6	-0.9	-0.3	16.9	EL
ES	80.8	79.1	45.6	44.5	92.5	90.2	63.9	74.9	-1.7	-1.0	-2.3	11.0	ES
FI	76.3	77.6	49.9	50.4	90.5	89.9	60.2	65.0	1.2	0.6	-0.6	4.8	FI
FR	74.8	77.5	43.5	43.4	94.2	93.0	45.1	63.9	2.7	-0.1	-1.2	18.8	FR
HU	68.4	71.5	28.7	28.4	87.4	86.8	43.0	60.8	3.1	-0.4	-0.6	17.7	HU
IE	77.2	71.3	43.2	43.3	89.3	83.0	65.0	64.3	-5.9	0.1	-6.3	-0.7	IE
IT	73.3	74.3	33.6	34.3	89.4	86.4	49.5	70.8	0.9	0.7	-3.0	21.4	IT
LT	73.0	74.3	34.9	32.6	89.2	88.6	62.6	67.2	1.4	-2.2	-0.5	4.6	LT
LU	75.6	71.6	27.4	28.6	94.8	93.7	48.5	41.1	-4.0	1.2	-1.1	-7.4	LU
LV	76.6	78.9	45.7	42.2	91.3	92.5	59.0	67.6	2.3	-3.6	1.2	8.6	LV
MT	77.7	82.4	54.7	54.5	94.4	93.4	51.2	72.5	4.7	-0.2	-1.0	21.3	MT
NL	83.7	82.5	68.7	71.5	93.3	91.0	67.4	67.4	-1.3	2.8	-2.4	0.0	NL
NO	80.6	79.2	56.7	57.1	90.2	89.1	73.8	69.9	-1.4	0.5	-1.1	-3.9	NO
PL	72.6	73.8	40.1	38.1	89.8	87.6	49.1	60.3	1.2	-2.1	-2.2	11.1	PL
PT	78.3	78.1	39.2	39.5	92.6	91.4	62.0	70.7	-0.2	0.3	-1.2	8.7	PT
RO	71.7	68.9	36.8	33.7	87.5	83.0	52.6	56.4	-2.8	-3.1	-4.5	3.8	RO
SE	81.6	84.3	52.1	52.9	92.8	94.7	78.0	82.8	2.7	0.8	1.9	4.7	SE
SI	75.7	76.6	43.7	41.0	91.8	91.5	47.0	62.5	0.9	-2.8	-0.4	15.5	SI
SK	76.4	73.4	37.2	35.4	93.0	90.4	59.8	53.5	-3.0	-1.9	-2.6	-6.3	SK
UK	81.5	80.7	61.9	61.0	91.4	89.5	69.2	72.5	-0.8	-1.0	-1.9	3.3	UK
NO	80.6	79.2	56.7	57.1	90.2	89.1	73.8	69.9	-1.4	0.5	-1.1	-3.9	NO
EU12	73.1	73.8	37.8	35.7	89.7	88.0	52.7	62.2	0.7	-2.2	-1.7	9.5	EU12
EU15	78.9	78.8	49.5	49.0	92.3	90.5	60.4	70.8	-0.1	-0.4	-1.8	10.3	EU15
EU27	77.7	78.0	46.8	46.9	91.7	90.1	58.8	69.3	0.3	0.2	-1.7	10.5	EU27
EA17	78.2	78.0	46.0	45.0	92.4	90.6	58.1	69.7	-0.2	-1.0	-1.8	11.6	EA17

Source: Commission services, EPC.

Table 2. 11 - Participation rates by age groups – Women, 2010-2060

	Total 15-64		Young 15-24		Prime age 25-54		Older 55-64		Change 2010-2060				
	2010	2060	2010	2060	2010	2060	2010	2060	Total 15-64	Young 15-24	Prime age 25-54	Older 55-64	
AT	69.3	75.3	54.7	56.8	82.8	87.4	33.9	55.3	6.0	2.1	4.7	21.4	AT
BE	61.9	64.0	30.3	30.7	80.4	80.2	30.9	45.5	2.1	0.5	-0.1	14.5	BE
BG	62.6	64.3	27.1	25.1	79.4	80.0	42.7	50.6	1.7	-2.0	0.6	7.9	BG
CY	66.6	75.9	41.3	40.6	81.0	89.5	44.8	63.1	9.3	-0.8	8.6	18.3	CY
CZ	61.7	65.8	25.6	24.3	79.8	76.9	38.3	68.6	4.2	-1.2	-2.9	30.3	CZ
DE	70.8	75.3	48.8	47.7	81.3	83.9	54.5	72.7	4.5	-1.2	2.5	18.2	DE
DK	76.1	79.0	67.6	69.4	85.6	84.6	54.9	71.4	2.9	1.8	-1.0	16.5	DK
EE	71.4	73.2	35.2	31.4	84.9	85.7	64.4	73.4	1.9	-3.8	0.8	8.9	EE
EL	57.7	65.8	28.0	27.5	72.3	78.0	31.4	61.9	8.1	-0.5	5.7	30.5	EL
ES	65.9	75.8	40.2	38.9	78.3	85.5	38.5	78.0	9.9	-1.3	7.2	39.5	ES
FI	72.8	74.9	50.1	51.2	84.4	84.8	60.9	66.7	2.1	1.1	0.4	5.8	FI
FR	66.2	71.7	36.1	35.6	83.8	86.2	40.1	62.8	5.5	-0.5	2.4	22.7	FR
HU	56.5	62.6	22.6	22.2	74.6	75.1	32.2	57.5	6.0	-0.4	0.5	25.3	HU
IE	62.0	63.1	41.5	40.6	71.6	70.6	44.3	63.6	1.1	-0.9	-1.0	19.3	IE
IT	51.1	55.8	23.5	23.7	64.4	65.1	26.8	54.1	4.7	0.2	0.7	27.3	IT
LT	69.1	71.5	27.7	25.9	87.8	86.6	51.9	65.1	2.4	-1.7	-1.2	13.3	LT
LU	60.0	63.3	23.1	28.3	76.4	80.1	31.4	42.0	3.3	5.2	3.6	10.7	LU
LV	70.9	74.8	38.5	34.6	85.8	90.0	55.7	61.7	3.8	-3.8	4.2	6.0	LV
MT	43.0	57.2	48.8	48.2	51.1	64.2	14.3	44.0	14.2	-0.6	13.1	29.6	MT
NL	72.6	77.2	69.5	70.6	82.4	86.1	44.5	57.4	4.6	1.1	3.8	12.9	NL
NO	75.7	76.7	57.6	58.4	84.3	85.7	65.8	66.4	1.0	0.7	1.4	0.7	NO
PL	59.1	60.3	30.6	28.5	78.6	77.7	26.1	34.6	1.2	-2.1	-0.9	8.5	PL
PT	70.0	75.2	35.4	35.8	84.9	88.6	47.3	68.1	5.2	0.4	3.7	20.9	PT
RO	55.9	52.6	26.7	24.4	71.4	66.2	33.3	36.2	-3.3	-2.3	-5.1	2.9	RO
SE	76.5	79.3	51.8	53.0	87.1	89.4	69.8	72.9	2.7	1.2	2.3	3.1	SE
SI	67.5	72.9	35.2	35.5	88.3	87.7	25.6	60.7	5.4	0.2	-0.6	35.1	SI
SK	61.4	62.0	26.1	24.6	80.8	76.9	32.2	47.9	0.6	-1.6	-3.9	15.7	SK
UK	69.3	72.6	56.7	55.8	78.6	79.4	51.1	67.7	3.2	-0.9	0.8	16.6	UK
NO	75.7	76.7	57.6	58.4	84.3	85.7	65.8	66.4	1.0	0.7	1.4	0.7	NO
EU12	59.7	61.3	28.5	26.6	77.7	76.2	32.9	45.6	1.6	-1.9	-1.4	12.7	EU12
EU15	65.8	70.7	43.7	43.0	78.3	80.8	43.5	65.3	5.0	-0.6	2.5	21.8	EU15
EU27	64.5	69.2	40.1	40.5	78.1	80.0	41.1	62.0	4.7	0.3	1.9	20.9	EU27
EA17	64.6	69.7	39.7	38.4	78.0	80.8	40.9	64.2	5.2	-1.3	2.8	23.3	EA17

Source: Commission services, EPC.

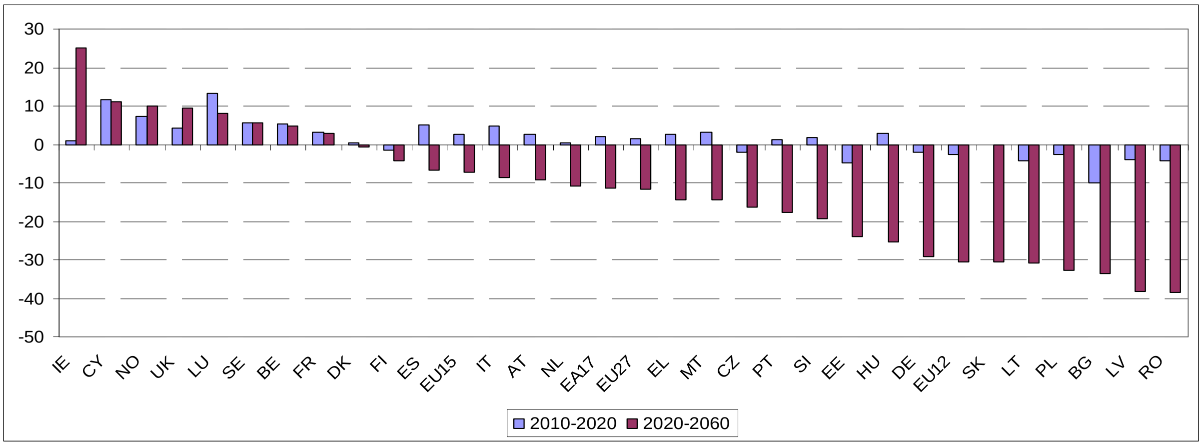
2.6.2. Projection of labour supply

Labour supply projections are calculated by single age and gender (by multiplying participation rates by population values). Total labour supply in the EU27 is projected to increase by 1.4% from 2010 to 2020 (age group 20 to 64). In terms of persons, this represents an increase in labour force of roughly 3.3 million. In the euro area, the labour force is projected to increase by 2.0% in the same period. The increase in labour supply over the period 2010 to 2020 is mainly due to the increase in women's labour supply, as men's labour force is projected to remain substantially unchanged (see Table 2.12).

The positive trend in labour supply up to 2020 is expected to be reversed during the period 2020 to 2060 when the total labour force is projected to contract by 11.8%, equivalent to 27.7 million people (24.5 million compared with the 2010 level). In the euro area, the projected fall in labour supply between 2020 and 2060 is 11.5%, which represents 17.9 million people (14.9 million compared with the 2010 level).

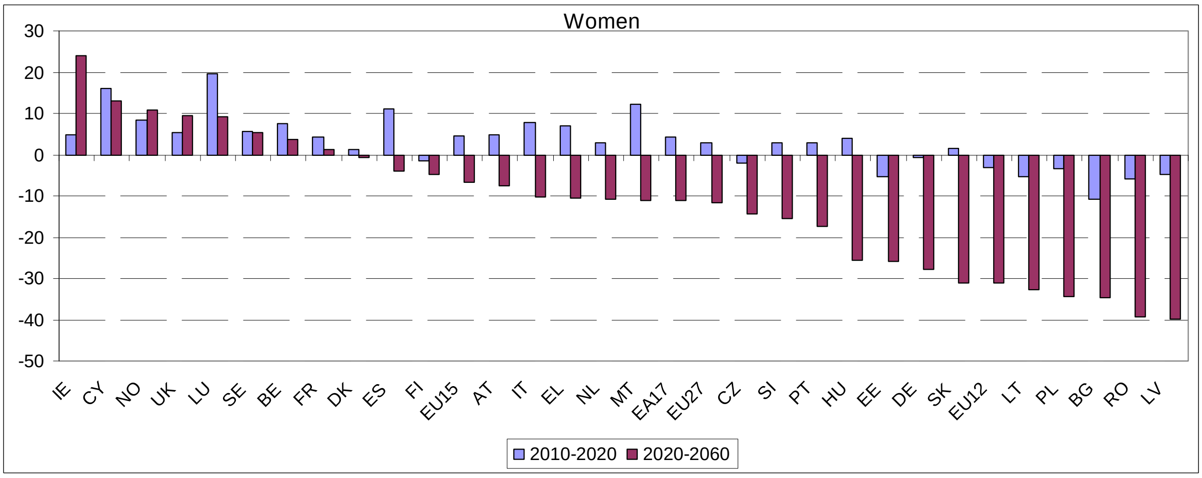
Graphs 2.5 and 2.6 highlight the wide diversity across Member States of labour supply projections, ranging from an increase of 25.0% in Ireland to a decrease of 38.5% in Romania (2060-2020). The initially positive trend across most countries in the period 2010-2020 is projected to be reversed after 2020, when a large majority of countries is expected to record a decline (20 EU Member States in total).

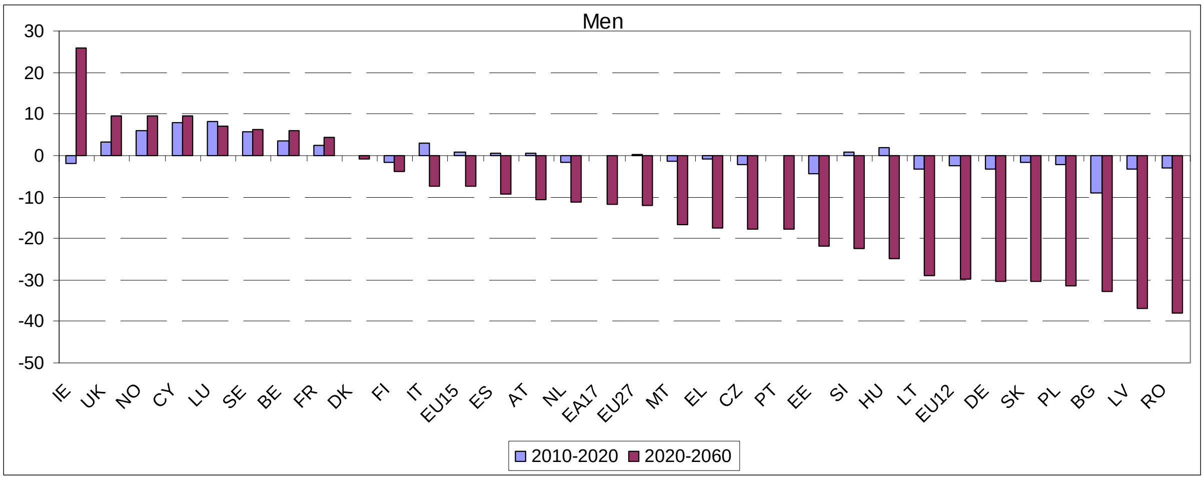
Graph 2. 5 – Percentage change in total labour supply of the population aged 20 to 64 (2060-2010)



Source: Commission services, EPC.
Countries ranked in descending order of changes over the period 2020-2060.

Graph 2. 6 – Percentage change in labour supply by gender of the population aged 20 to 64 (2060-2010)





Source: Commission services, EPC.
Countries ranked in descending order of changes over the period 2020-2060.

Table 2. 12 – Labour supply – age groups 20-64 ('000)

	Total			Avg annual growth rate		Men			Avg annual growth rate		Women			Avg annual growth rate	
Country	2010	2020	2060	2020-2010	2060-2020	2010	2020	2060	2020-2010	2060-2020	2010	2020	2060	2020-2010	2060-2020
AT	4034	4136	3759	0.3%	-0.2%	2163	2176	1947	0.1%	-0.3%	1871	1960	1812	0.5%	-0.2%
BE	4794	5049	5295	0.5%	0.1%	2611	2700	2859	0.3%	0.1%	2184	2350	2436	0.8%	0.1%
BG	3448	3105	2062	-1.0%	-0.8%	1830	1663	1118	-0.9%	-0.8%	1618	1442	944	-1.1%	-0.9%
CY	406	453	503	1.2%	0.3%	220	238	260	0.8%	0.2%	185	215	243	1.6%	0.3%
CZ	5164	5053	4231	-0.2%	-0.4%	2924	2862	2354	-0.2%	-0.4%	2240	2191	1877	-0.2%	-0.4%
DE	40032	39170	27715	-0.2%	-0.7%	21735	21017	14635	-0.3%	-0.8%	18297	18152	13080	-0.1%	-0.7%
DK	2674	2687	2665	0.0%	0.0%	1410	1408	1394	0.0%	0.0%	1264	1279	1271	0.1%	0.0%
EE	665	633	482	-0.5%	-0.6%	333	319	249	-0.4%	-0.5%	332	314	233	-0.5%	-0.7%
EL	5102	5228	4474	0.2%	-0.4%	2974	2952	2436	-0.1%	-0.4%	2128	2276	2038	0.7%	-0.3%
ES	22624	23801	22174	0.5%	-0.2%	12567	12640	11451	0.1%	-0.2%	10057	11161	10723	1.1%	-0.1%
FI	2545	2507	2398	-0.2%	-0.1%	1322	1301	1249	-0.2%	-0.1%	1223	1206	1148	-0.1%	-0.1%
FR	28977	29916	30752	0.3%	0.1%	15156	15508	16183	0.2%	0.1%	13821	14407	14569	0.4%	0.0%
HU	4264	4385	3275	0.3%	-0.6%	2305	2347	1761	0.2%	-0.6%	1959	2038	1513	0.4%	-0.6%
IE	2040	2060	2575	0.1%	0.6%	1130	1107	1394	-0.2%	0.6%	910	953	1181	0.5%	0.6%
IT	24453	25651	23446	0.5%	-0.2%	14376	14799	13719	0.3%	-0.2%	10077	10853	9727	0.8%	-0.3%
LT	1613	1542	1066	-0.4%	-0.8%	802	774	550	-0.3%	-0.7%	811	768	516	-0.5%	-0.8%
LU	232	263	284	1.3%	0.2%	131	142	152	0.8%	0.2%	101	121	133	2.0%	0.2%
LV	1124	1078	665	-0.4%	-1.0%	566	547	346	-0.3%	-0.9%	557	531	319	-0.5%	-1.0%
MT	167	172	147	0.3%	-0.4%	109	108	90	-0.1%	-0.4%	57	64	57	1.2%	-0.3%
NL	8109	8144	7254	0.0%	-0.3%	4396	4324	3842	-0.2%	-0.3%	3713	3820	3411	0.3%	-0.3%
NO	2394	2565	2823	0.7%	0.3%	1264	1341	1467	0.6%	0.2%	1129	1224	1355	0.8%	0.3%
PL	17720	17237	11581	-0.3%	-0.8%	9698	9483	6497	-0.2%	-0.8%	8022	7754	5084	-0.3%	-0.9%
PT	5199	5266	4340	0.1%	-0.4%	2717	2715	2232	0.0%	-0.4%	2481	2551	2108	0.3%	-0.4%
RO	9417	9024	5546	-0.4%	-1.0%	5274	5120	3180	-0.3%	-0.9%	4143	3903	2366	-0.6%	-1.0%
SE	4630	4891	5172	0.6%	0.1%	2439	2579	2739	0.6%	0.2%	2191	2312	2433	0.5%	0.1%
SI	1005	1022	825	0.2%	-0.5%	546	550	426	0.1%	-0.6%	458	472	399	0.3%	-0.4%
SK	2685	2679	1858	0.0%	-0.8%	1487	1461	1017	-0.2%	-0.8%	1198	1218	840	0.2%	-0.8%
UK	29358	30616	33515	0.4%	0.2%	15903	16433	17994	0.3%	0.2%	13456	14183	15521	0.5%	0.2%
NO	2394	2565	2823	0.7%	0.3%	1264	1341	1467	0.6%	0.2%	1129	1224	1355	0.8%	0.3%
EU12	47677	46383	32242	-0.3%	-0.8%	26095	25472	17850	-0.2%	-0.7%	21581	20912	14392	-0.3%	-0.8%
EU15	184804	189386	175818	0.2%	-0.2%	101029	101800	94227	0.1%	-0.2%	83774	87585	81591	0.5%	-0.2%
EU27	232480	235769	208060	0.1%	-0.3%	127125	127272	112076	0.0%	-0.3%	105356	108497	95983	0.3%	-0.3%
EA17	153068	156151	138281	0.2%	-0.3%	83974	84056	74142	0.0%	-0.3%	69095	72095	64138	0.4%	-0.3%

Source: Commission services, EPC.

In the eight largest (in terms of labour force) EU Member States, representing about 78% of the total EU labour force in 2020, their prospective evolution in the period 2020-2060 is strikingly dissimilar (see Table 2.13). Expected differences in the annual growth rate of the total labour force are very significant, because they are "compounded" over forty years. DE, PL and RO are projected to register average annual declines of close to 1% or in excess during a period of forty years, while IT, ES and the NL are projected to register declines of around 0.2%-0.3%, which are equivalent to the EU average.[45] Conversely, the UK and France are expected to register small expansions in the total labour force. Consequently, country rankings (in terms of labour force shares) are expected to change significantly during the period 2020-2060.

[45] In the case of Germany, this is due to Eurostat's population projection, which assumes a relatively low level of net migration (see Table 1.7 and Graph 1.4). Over the entire projection period, net migration flows are projected to be concentrated in a few destination countries, particularly Italy, Spain and the UK.

Table 2. 13 – Labour supply projection in the "largest" eight EU Member States

	Total LF (20-64) (thousands persons)		Avg. annual growth rate of the LF	Impact on potential output growth (a)
	2020	2060	2060-2020	
DE	39170	27715	-0.9%	-0.4%
UK	30616	33515	0.2%	0.4%
FR	29916	30752	0.1%	0.2%
IT	25651	23446	-0.2%	0.1%
ES	23801	22174	-0.2%	0.1%
PL	17237	11581	-1.0%	-0.4%
RO	9024	5546	-1.2%	-0.6%
NL	8144	7254	-0.3%	0.0%
EU27	235769	208060	-0.3%	0.0%
EA17	156151	138281	-0.3%	0.0%

(a) Impact of LF growth differentials relative to the EU average:

$$\Delta \log Y_p^i - \Delta \log Y_p^{EU} = \beta * \Delta\left(\log LF_a^i - \log LF_a^{EU}\right)$$

Source: Commission services, EPC.

Obviously, and all else being equal, such dissimilar prospects for labour supply growth will result in marked differences in the growth potential of the economy. In fact, the growth rate of potential output is the sum of (trend) total factor productivity plus a weighted average of the growth rate of labour and capital inputs, weighted by their respective income shares (see Chapter 3):

$$\Delta \log Y_p = \Delta \log \mathrm{TFP} + \beta * \Delta \log LF_a + (1-\beta) * \Delta \log K$$

where

$$LF_a \equiv LF * (1 - Nairu) * Hours$$

where Δ represents first differences (i.e. $\Delta y_t = y_t - y_{t-1}$); Y_p is potential GDP; *TFP* is trend total factor productivity; LF_a is total labour input; *K* is capital services input; and β is the labour income share.[46]

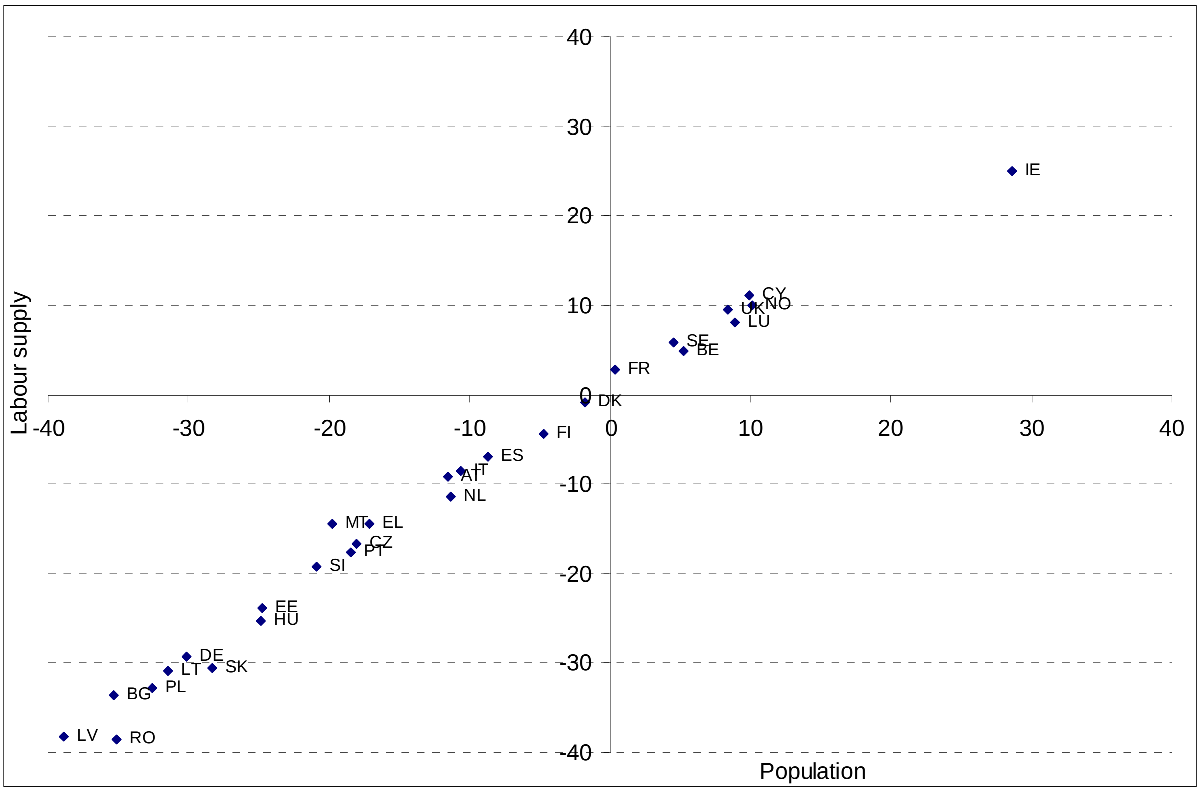
As an example and all else being equal, the contraction (expansion) in labour force in Germany (the UK) (compared to the EU27 average) brings about an annual 0.4% reduction (increase) in potential output growth relative to the EU27 average (see last column of Table 2.13).

These huge differences in potential growth rates basically reflect the partial equilibrium nature of the projection methodology, namely the fact that demographic, labour force participation, migration and productivity assumptions are effectively independent i.e. do not interact.[47]

The projected negative labour force growth over the period 2020-2060 in the EU27 is mainly due to negative demographic developments, given that participation rates over the period 2020-2060 – especially for older workers - are projected to continue to increase, although at a slower pace than during the period 2010-2020 (Graph 2.7).

[46] The labour income share is assumed to be 0.65.
[47] Especially, there is no interaction between migration flows and productivity.

Graph 2. 7 – Population and labour supply in 2060-2020 (percentage change in the age group 20-64)



Source: Commission services, EPC.

2.6.3. Breaking down changes in participation rates and labour force

Tables 2.14 and 2.15 apply a shift-share analysis to changes in the total participation rate and the labour force over the period 2010 to 2060, focusing on both the age and gender dimensions. The overall participation rate is algebraically broken down in three components: i) a participation rate effect; ii) a population/demographic effect, and iii) an interaction/residual effect.[48]

[48] See Carone (2005), pp. 54.

Table 2. 14 – Contribution to the overall change in participation rates, 2010-2060 (change in %)

	Participation rates in 2060	Total change in participation rates (%)	Contribution of group-specific changes in participation rates to change in overall participation rate												Demographic effect						Interaction effect	
			Total	Young	Prime age	Older	Male	Young	Prime age	Older	Female	Young	Prime age	Older	Total	Young	Prime age	Older	Male	Female		
BE	68.5	0.8	1.4	0.1	-0.5	1.8	0.0	0.1	-0.4	0.4	1.4	0.0	0.0	1.4	-0.7	0.4	-1.1	0.1	0.5	-0.4	0.0	BE
BG	69.4	2.4	2.4	-0.4	0.8	2.1	1.6	-0.2	0.6	1.1	0.9	-0.2	0.2	0.8	-0.1	0.2	0.0	-0.3	0.6	-0.5	-0.1	BG
CZ	73.1	2.8	3.0	-0.3	-1.3	4.5	0.8	-0.1	-0.4	1.3	2.2	-0.1	-0.9	3.2	0.1	0.2	0.6	-0.6	0.2	-0.1	-0.3	CZ
DK	80.6	1.1	1.2	0.3	-1.5	2.4	-0.3	0.1	-1.2	0.7	1.5	0.2	-0.3	1.6	-0.2	0.1	-0.5	0.3	0.7	-0.6	0.1	DK
DE	78.9	2.2	2.7	-0.2	0.6	2.3	0.3	-0.1	-0.2	0.6	2.4	-0.1	0.8	1.7	-0.9	-0.1	-3.3	2.6	0.1	-0.1	0.5	DE
EE	75.6	1.5	0.8	-0.8	-0.1	1.6	0.0	-0.4	-0.4	0.7	0.8	-0.4	0.3	0.9	0.6	-0.5	1.2	0.0	1.5	-1.4	0.0	EE
IE	67.3	-2.3	-1.1	-0.1	-2.3	1.4	-2.1	0.0	-2.1	-0.1	1.0	-0.1	-0.3	1.5	-1.8	1.2	-4.4	1.4	0.9	-0.8	0.4	IE
GR	72.6	4.2	6.0	-0.1	1.6	4.4	1.3	-0.1	-0.1	1.5	4.7	0.0	1.9	2.8	-2.2	0.7	-4.0	1.2	-0.6	0.5	0.5	GR
ES	77.5	4.0	5.6	-0.2	1.6	4.1	0.0	-0.1	-0.8	0.9	5.6	-0.1	2.4	3.3	-2.6	0.9	-6.0	2.5	0.2	-0.1	1.1	ES
FR	74.7	4.2	4.4	0.0	0.5	4.0	1.4	0.0	-0.4	1.8	3.0	0.0	0.8	2.3	-0.3	0.2	-0.5	0.0	1.1	-1.0	0.0	FR
IT	65.3	3.1	3.9	0.1	-0.5	4.7	1.0	0.1	-1.0	1.9	2.9	0.0	0.2	2.6	-1.9	0.4	-3.5	1.2	1.2	-0.8	0.9	IT
CY	78.0	4.8	3.8	0.0	2.3	1.5	-0.3	0.1	-0.3	-0.1	4.1	-0.1	2.7	1.5	0.7	-1.5	0.1	2.0	0.5	-0.4	0.3	CY
LV	76.9	3.2	2.1	-0.8	1.7	1.3	0.6	-0.4	0.4	0.6	1.5	-0.4	1.3	0.6	0.6	-1.5	0.2	1.9	1.6	-1.5	0.4	LV
LT	73.0	2.0	0.5	-0.4	-0.5	1.5	-0.1	-0.3	-0.2	0.3	0.6	-0.2	-0.4	1.2	1.0	-1.2	0.1	2.0	1.6	-1.5	0.4	LT
LU	67.5	-0.4	1.6	0.6	0.8	0.2	-0.9	0.1	-0.4	-0.6	2.5	0.4	1.2	0.8	-2.0	0.1	-3.8	1.6	-0.2	0.2	0.0	LU
HU	67.1	4.7	4.2	-0.1	0.0	4.3	1.4	0.0	-0.2	1.6	2.8	0.0	0.2	2.7	-0.1	-0.4	-0.5	0.9	0.8	-0.6	0.5	HU
MT	70.3	9.6	8.6	-0.1	3.7	5.3	1.8	0.0	-0.3	2.1	6.8	-0.1	3.8	3.0	0.3	-1.6	1.7	0.2	0.8	-0.5	0.3	MT
NL	79.9	1.7	2.0	0.4	0.4	1.3	-0.5	0.3	-0.7	0.0	2.5	0.1	1.2	1.3	-0.5	0.4	-1.5	0.6	0.7	-0.6	0.1	NL
AT	77.6	2.5	3.7	0.3	1.2	2.2	0.1	0.1	-0.3	0.3	3.6	0.2	1.5	1.9	-1.7	-0.5	-3.1	1.8	0.5	-0.5	0.5	AT
PL	67.2	1.4	0.4	-0.4	-0.9	2.0	0.1	-0.2	-0.7	1.0	0.4	-0.2	-0.3	0.8	0.5	-1.0	0.7	0.8	1.1	-0.9	0.3	PL
PT	76.7	2.6	3.6	0.1	0.8	2.7	0.4	0.0	-0.4	0.7	3.2	0.0	1.2	2.0	-1.7	0.0	-4.5	2.8	0.8	-0.7	0.7	PT
RO	60.9	-2.9	-3.0	-0.5	-3.0	0.7	-1.4	-0.3	-1.4	0.3	-1.6	-0.2	-1.6	0.3	-0.4	-1.0	-1.6	2.2	0.6	-0.4	0.4	RO
SI	74.7	3.0	4.2	-0.2	-0.4	4.8	1.1	-0.2	-0.1	1.5	3.1	0.0	-0.2	3.3	-1.3	0.7	-2.3	0.3	-0.8	0.7	0.2	SI
SK	67.8	-1.1	-1.5	-0.3	-2.0	1.0	-1.5	-0.2	-0.8	-0.5	0.1	-0.2	-1.2	1.4	0.0	-0.9	-0.8	1.7	0.5	-0.4	0.3	SK
FI	76.2	1.7	1.3	0.1	0.0	1.2	0.4	0.1	-0.2	0.5	0.9	0.1	0.1	0.7	0.5	0.3	1.9	-1.7	0.4	-0.3	-0.1	FI
SE	81.9	2.8	2.2	0.2	1.3	0.8	1.1	0.1	0.6	0.5	1.1	0.1	0.7	0.3	0.5	-0.4	2.0	-1.2	0.3	-0.3	0.0	SE
UK	76.7	1.3	1.3	-0.2	-0.3	1.8	-0.4	-0.1	-0.6	0.3	1.7	-0.1	0.2	1.5	0.0	0.0	-0.1	0.1	0.8	-0.6	0.0	UK
NO	78.0	-0.2	-0.1	0.1	0.1	-0.3	-0.7	0.0	-0.3	-0.4	0.5	0.1	0.4	0.1	-0.1	0.0	-0.6	0.5	0.0	0.0	0.0	NO
EU27	73.7	2.6	3.0	0.0	0.1	2.9	0.4	0.0	-0.5	0.9	2.6	0.0	0.6	2.0	-0.8	0.1	-1.9	1.0	0.7	-0.6	0.3	EU27
EA	74.0	2.6	3.4	-0.2	0.4	3.2	0.4	-0.1	-0.6	1.0	3.0	-0.1	0.9	2.2	-1.3	0.3	-3.0	1.3	0.6	-0.5	0.4	EA
EU15	74.9	2.5	3.1	-0.1	0.3	3.0	0.3	0.0	-0.6	0.9	2.8	-0.1	0.8	2.0	-1.0	0.4	-2.4	1.0	0.6	-0.5	0.3	EU15
EU12	67.7	1.3	0.7	-0.4	-0.9	2.2	0.1	-0.2	-0.5	0.8	0.6	-0.2	-0.4	1.2	0.1	-0.7	-0.1	1.0	0.8	-0.6	0.3	EU12

Source: Commission services, EPC.

Table 2. 15 - Contribution to the overall change in the labour force, 2010-2060 (change in %)

	Labour force in 2060 (thousands)	Total change in labour force (%)	Contribution of group-specific changes in participation rates to change in overall labour supply												Demographic effect						Interaction effect	
			Total	Young	Prime age	Older	Male	Young	Prime age	Older	Female	Young	Prime age	Older	Total	Young	Prime age	Older	Male	Female		
BE	5362.2	10.5	2.0	0.2	-0.7	2.6	0.0	0.1	-0.7	0.6	2.0	0.1	-0.1	2.0	8.1	1.4	5.6	1.2	5.8	3.6	0.3	BE
BG	2079.4	-40.2	3.6	-0.5	1.2	3.1	2.3	-0.3	0.9	1.7	1.3	-0.3	0.3	1.3	-42.3	-3.4	-32.4	-6.5	-21.9	-20.2	-1.7	BG
CZ	4264.3	-18.1	4.2	-0.4	-1.9	6.5	1.1	-0.2	-0.6	1.9	3.1	-0.1	-1.2	4.5	-21.1	-1.4	-15.9	-3.8	-11.8	-9.3	-1.2	CZ
DK	2862.5	-0.8	1.5	0.4	-1.9	3.0	-0.4	0.2	-1.5	0.9	1.9	0.2	-0.4	2.1	-2.3	-0.2	-2.1	0.0	-0.3	-1.8	0.1	DK
DE	28572.5	-30.8	3.5	-0.2	0.8	3.0	0.3	-0.1	-0.3	0.7	3.1	-0.1	1.1	2.2	-33.6	-3.9	-27.0	-2.7	-17.7	-15.0	-0.7	DE
EE	487.4	-27.5	1.0	-1.1	-0.1	2.2	0.0	-0.6	-0.5	1.0	1.1	-0.5	0.3	1.2	-28.3	-3.6	-20.2	-4.5	-13.0	-15.8	-0.3	EE
IE	2650.1	26.9	-1.6	-0.1	-3.3	2.0	-3.1	0.0	-3.0	-0.1	1.5	-0.1	-0.5	2.1	28.0	5.8	15.8	6.4	19.1	12.6	0.3	IE
GR	4520.8	-12.2	8.8	-0.2	2.3	6.4	1.9	-0.1	-0.1	2.2	6.8	-0.1	2.7	4.2	-19.9	-0.4	-18.8	-0.7	-10.8	-6.7	-0.9	GR
ES	22598.9	-1.8	7.6	-0.3	2.2	5.6	0.0	-0.1	-1.1	1.2	7.6	-0.1	3.3	4.5	-10.2	0.5	-13.2	2.5	-3.7	-3.2	0.9	ES
FR	31412.8	6.1	6.2	-0.1	0.7	5.7	2.0	0.0	-0.5	2.5	4.2	-0.1	1.1	3.2	-0.3	0.3	-0.6	0.1	1.6	-1.3	0.0	FR
IT	23704.4	-4.1	6.2	0.1	-0.8	7.5	1.6	0.1	-1.6	3.1	4.6	0.0	0.4	4.2	-11.5	-0.1	-12.3	0.8	-3.4	-4.8	0.7	IT
CY	510.6	23.6	5.2	0.0	3.2	2.0	-0.5	0.1	-0.5	-0.1	5.6	-0.1	3.7	2.1	17.0	-0.4	12.2	5.3	9.4	6.7	1.3	CY
LV	671.9	-41.0	2.9	-1.0	2.3	1.7	0.8	-0.5	0.5	0.8	2.1	-0.5	1.8	0.8	-43.0	-6.2	-32.5	-4.2	-20.7	-22.7	-1.0	LV
LT	1072.0	-34.0	0.7	-0.6	-0.7	2.1	-0.2	-0.4	-0.2	0.4	0.9	-0.3	-0.5	1.7	-34.9	-4.5	-27.8	-2.6	-16.3	-19.4	0.1	LT
LU	287.6	22.4	2.4	0.8	1.2	0.4	-1.3	0.2	-0.5	-0.9	3.7	0.7	1.8	1.2	19.4	1.6	12.6	5.1	12.7	10.4	0.6	LU
HU	3288.4	-23.3	6.7	-0.1	0.0	6.9	2.2	-0.1	-0.3	2.5	4.6	-0.1	0.3	4.3	-28.7	-2.6	-23.8	-2.4	-14.6	-13.9	-1.4	HU
MT	151.7	-12.7	14.2	-0.1	6.2	8.7	3.0	0.0	-0.5	3.5	11.2	-0.1	6.3	5.0	-24.2	-6.1	-15.7	-2.4	-15.0	-9.1	-3.2	MT
NL	7806.1	-10.4	2.6	0.5	0.6	1.6	-0.6	0.3	-1.0	0.0	3.2	0.1	1.5	1.6	-12.8	-1.5	-10.3	-1.0	-5.9	-6.3	-0.2	NL
AT	3941.6	-7.3	4.9	0.4	1.6	2.9	0.2	0.2	-0.4	0.4	4.7	0.2	2.0	2.5	-12.4	-2.0	-11.5	1.2	-4.9	-5.3	0.1	AT
PL	11693.8	-34.8	0.7	-0.6	-1.3	3.0	0.1	-0.3	-1.0	1.5	0.5	-0.3	-0.4	1.3	-35.7	-4.9	-27.8	-3.0	-18.8	-17.2	-0.1	PL
PT	4396.7	-16.6	4.8	0.1	1.1	3.7	0.5	0.0	-0.5	1.0	4.3	0.0	1.6	2.7	-21.3	-1.7	-20.2	0.5	-9.3	-10.0	-0.2	PT
RO	5631.9	-41.1	-4.7	-0.8	-4.7	1.1	-2.3	-0.5	-2.3	0.5	-2.5	-0.4	-2.5	0.4	-38.7	-4.7	-31.8	-2.3	-20.9	-17.3	2.1	RO
SI	842.1	-17.6	5.9	-0.3	-0.5	6.6	1.5	-0.3	-0.2	2.0	4.3	0.0	-0.3	4.6	-22.4	-1.1	-19.6	-1.7	-12.3	-8.8	-1.0	SI
SK	1872.3	-30.9	-2.1	-0.5	-2.9	1.4	-2.2	-0.3	-1.2	-0.7	0.1	-0.2	-1.8	2.1	-29.8	-3.6	-24.6	-1.6	-16.0	-13.7	0.9	SK
FI	2493.5	-5.8	1.7	0.2	-0.1	1.6	0.5	0.1	-0.2	0.7	1.2	0.1	0.2	0.9	-7.2	-0.6	-3.1	-3.5	-3.6	-4.2	-0.3	FI
SE	5375.1	11.2	2.8	0.3	1.6	1.0	1.4	0.1	0.7	0.6	1.4	0.2	0.9	0.4	8.2	0.5	7.9	-0.2	4.3	3.2	0.2	SE
UK	35359.1	14.1	1.7	-0.3	-0.4	2.4	-0.5	-0.1	-0.8	0.4	2.2	-0.1	0.3	2.0	12.2	1.9	8.4	1.8	7.7	4.7	0.2	UK
NO	2979.8	17.8	-0.1	0.1	0.1	-0.4	-0.8	0.1	-0.4	-0.5	0.7	0.1	0.5	0.1	18.0	2.6	11.7	3.7	9.5	8.6	0.0	NO
EU27	213909.5	-10.4	4.3	0.1	0.2	4.1	0.6	0.0	-0.8	1.3	3.7	0.0	0.8	2.8	-14.6	-1.4	-12.7	-0.5	-6.6	-6.8	-0.2	EU27
EA	141611.1	-9.7	4.7	-0.3	0.5	4.5	0.5	-0.1	-0.8	1.5	4.2	-0.2	1.3	3.1	-14.4	-0.9	-13.5	0.0	-6.3	-6.4	-0.1	EA
EU15	181343.6	-4.8	4.3	-0.1	0.4	4.1	0.4	-0.1	-0.8	1.3	3.9	-0.1	1.1	2.8	-9.3	-0.4	-9.1	0.3	-3.6	-4.3	0.0	EU15
EU12	32565.8	-32.4	1.0	-0.6	-1.4	3.3	0.1	-0.3	-0.8	1.2	0.9	-0.3	-0.7	1.9	-33.6	-4.0	-26.7	-3.0	-17.7	-15.9	-0.1	EU12

Source: Commission services, EPC.

The participation rate effect, reflecting changes in the participation rate of specific age/gender groups, tends to be positive. Specifically, rises in the participation rate of older workers and women have a significant positive impact on the total participation rate.

The demographic effect (i.e. the effect of the structure of the working age population) is negative in many Member States, being mainly driven by projected developments in the prime-age population (aged 25 to 54), women and net migration. Women are associated with both positive participation and negative demographic effects. The former reflects the upward displacement of the participation rate age profile of younger cohorts embedded in the CSM, the latter reflects the ageing of the population which has a stronger impact on women than on men, largely due to their (still) relatively lower average exit ages from the labour force.

2.7. Assumptions on structural unemployment

As in previous rounds of the long-term budgetary exercise, DG-ECFIN's structural unemployment rate estimates (NAWRU) are used as a proxy for the structural unemployment rate under a "no policy change" scenario. However, the outlook on structural unemployment rates has worsened compared to the previous round of projections, because of the 2008-2009 economic recession.

As a general rule, actual unemployment rates are assumed to converge to NAWRU rates by 2015(7),[49] and thereafter gradually decline towards country-specific historical minima. The latter are capped at 7.3%, which corresponds to the EU27 NAWRU average (based on the spring 2011 DG ECFIN's Economic Forecasts), that is, if the historical unemployment rate minimum for a country is higher than the EU27 NAWRU average, actual unemployment rates will converge to the latter. Capping is done in order to avoid extrapolating into the future too high unemployment rate values.[50] It should be noted that this cap on unemployment rates is a crucial assumption for some countries which currently still have unemployment rates which are much higher. Higher long-term unemployment than assumed here would, through weaker employment growth, lead to lower potential output growth.

In order to avoid changes in total/average unemployment rates as a result of the interaction between cohort-specific structural unemployment rates (u_{ag}) and the structure of the labour force, the age-specific unemployment rates (by gender) for each projection year are calculated as follows:

[49] Convergence by 2015 corresponds to a general rule for closing the output gap. Convergence by 2017 represents a two years extension for those countries with initial (2012) large output gaps (more than double the EU average, applied to Greece).

[50] NAWRU rates (calculated using the Production Function Methodology endorsed by the Output Gap Working Group of the EPC) can be seen as short-term structural unemployment rates, while historical minima (or their capped values) can be seen as long-term structural unemployment rates. The economic theory distinguishes a short-term NAWRU, which is influenced by the presence of nominal rigidities limiting the adjustment in actual unemployment, from a long-term NAWRU, which is only affected by real rigidities and institutional settings (see DG ECFIN (2009), "Impact of the current economic and financial crisis on potential output", Occasional Papers No. 49).

$$u_{a,g}^{t} = \frac{u_{total}^{t}}{\sum_{a,g}\left\{u_{a,g}^{2010} * l_{a,g}^{t}\right\}} * u_{a,g}^{2010}$$

where

$$l_{a,g}^{t} = \frac{LF_{a,g}^{t}}{LF_{total}^{t}}$$

where $u_{a,g}^{t}$ is the unemployment rate in age group *a*, gender *g*, and period *t*; u_{total}^{t} is the total unemployment rate in period *t*; and $l_{a,g}^{t}$ is the fraction in the total labour force.

This means that the unemployment rate structure (by age and gender) observed in the base year (2010) is kept unchanged throughout the projection period, thereby age/gender values are adjusted proportionally in order to satisfy a given total unemployment rate target.

Table 2.16 presents the unemployment rate assumptions. In the EU27, the unemployment rate is assumed to decline by 3.2 pp (from 9.7% in 2010 to 6.5% in 2060). In the euro area, the unemployment rate is expected to fall from 10.1% in 2010 to 6.7% in 2060.

Table 2. 16 – Unemployment rate assumptions (age 15-64, in percentage)

	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	
AT	4,5	4,1	4,1	4,1	4,1	4,1	4,1	4,1	4,1	4,1	AT
BE	8,4	7,6	7,4	7,4	7,3	7,3	7,3	7,3	7,3	7,3	BE
BG	10,5	8,2	7,7	7,5	7,4	7,3	7,3	7,3	7,3	7,3	BG
CY	6,8	5,3	4,9	4,7	4,6	4,6	4,5	4,5	4,5	4,5	CY
CZ	7,3	6,4	6,3	6,2	6,1	6,1	6,1	6,1	6,1	6,1	CZ
DE	7,2	6,1	6,1	6,1	6,1	6,1	6,1	6,1	6,1	6,1	DE
DK	7,5	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8	DK
EE	17,2	14,0	10,9	8,2	7,7	7,5	7,4	7,3	7,3	7,3	EE
ES	20,2	17,2	12,6	8,9	8,1	7,7	7,5	7,4	7,3	7,3	ES
FI	8,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	FI
FR	9,4	8,0	7,7	7,5	7,4	7,3	7,3	7,3	7,3	7,3	FR
GR	12,8	10,6	8,9	8,1	7,7	7,5	7,4	7,3	7,3	7,3	GR
HU	11,3	11,4	9,5	7,8	7,6	7,4	7,4	7,3	7,3	7,3	HU
IE	13,7	13,4	10,0	7,1	6,5	6,3	6,1	6,1	6,0	6,0	IE
IT	8,5	7,3	7,3	7,3	7,3	7,3	7,3	7,3	7,3	7,3	IT
LT	18,1	16,7	12,4	8,6	7,9	7,6	7,4	7,4	7,3	7,3	LT
LU	4,4	4,5	4,3	4,3	4,2	4,2	4,2	4,2	4,2	4,2	LU
LV	19,0	18,3	13,3	8,8	8,0	7,7	7,5	7,4	7,3	7,3	LV
MT	6,9	6,8	6,7	6,7	6,7	6,7	6,6	6,6	6,6	6,6	MT
NL	4,5	3,5	3,5	3,5	3,5	3,4	3,4	3,4	3,4	3,4	NL
PL	9,8	7,6	7,5	7,4	7,3	7,3	7,3	7,3	7,3	7,3	PL
PT	11,4	11,6	9,6	8,0	7,6	7,5	7,4	7,3	7,3	7,3	PT
RO	7,6	7,4	7,2	7,1	7,1	7,2	7,2	7,2	7,1	7,0	RO
SE	8,5	6,6	6,6	6,5	6,5	6,5	6,5	6,5	6,5	6,5	SE
SI	7,4	8,3	7,1	6,0	5,9	5,8	5,7	5,7	5,7	5,7	SI
SK	14,4	13,1	10,4	8,1	7,7	7,5	7,4	7,3	7,3	7,3	SK
UK	8,0	6,9	6,3	5,9	5,8	5,7	5,7	5,7	5,6	5,6	UK
NO	3,6	3,4	3,4	3,3	3,3	3,3	3,3	3,3	3,3	3,3	NO
EU12	10,0	8,8	8,0	7,3	7,2	7,1	7,1	7,1	7,0	7,0	EU12
EU15	9,7	8,3	7,5	6,8	6,6	6,5	6,5	6,5	6,5	6,5	EU15
EU27	9,7	8,4	7,5	6,9	6,7	6,6	6,6	6,6	6,5	6,5	EU27
EA17	10,1	8,8	7,8	7,0	6,9	6,8	6,7	6,7	6,7	6,7	EA17

Source: Commission services, EPC.

2.8. Employment projections

The methodology used projects employment as a residual variable. Employment is determined given Eurostat's population projections, future participation rates derived using the CSM, and finally the unemployment rate assumptions that are applied to labour force values. The total employment rate (for individuals aged 20 to 64) in the EU27 is projected to increase from 68.6% in 2010 to 71.3% in 2020 and to 73.8% in 2060. In the euro area, a similar development is projected, with the employment rate attaining 74.0% in 2060.

The 2008-2009 economic recession has complicated the task of producing comparable employment rate projections (both across countries and between exercises). Firstly, the methodology used in general, and in particular the capping of unemployment rates, tends to generate stronger declines (rises) in unemployment (employment) rates in those Member States that undergone the more severe increases in unemployment rates during the crisis. Secondly, in some Member States, employment rate projections are also negatively affected by the downward revision in participation rates, namely for prime-age male workers (see Graph 2.4).

The employment rate of women is projected to rise from 62.1% in 2010 to 65.9% in 2020 and to 69.4% in 2060. The employment rate for older workers is expected to increase by even more, from 46.3% in 2010 to 56.1% in 2020 and to 62.7% in 2060, reflecting the expected impact of recent pension reforms in many Member States aiming at increasing the retirement age. For the euro area, the increase in the employment rate of older workers (55-64) is higher than in the EU27, rising by 18.1 pp compared with 16.4 pp in the EU27.

The number of persons employed (using the LFS definition) is projected to record an annual growth rate of only 0.3% over the period 2010 to 2020 (compared to 0.9% over the period 2000-2009), which is expected to reverse to a negative annual growth rate of a similar magnitude over the period 2020 to 2060 (see Table 2.18). The outcome of these opposite trends is an overall significant decline of about 15.8 million workers over the period 2010 to 2060. The negative prospects for population developments, including the rapid ageing of the population, will only be partly offset by the increase in (older workers) participation rates and migration inflows, leading to an overall sharp reduction in employment levels during the period 2020 to 2060.

Table 2. 17 – Employment rate projections

	Total (20-64)			Women (20-64)			Older workers (55-64)			
	2010	2020	2060	2010	2020	2060	2010	2020	2060	
AT	74.8	75.4	77.5	69.5	71.7	75.9	42.2	50.2	55.1	AT
BE	67.6	69.5	69.6	61.7	64.9	65.0	37.3	47.1	46.8	BE
BG	64.8	67.8	70.3	60.8	63.4	65.4	44.7	46.4	56.0	BG
CY	74.8	79.0	80.5	67.9	75.0	78.4	56.8	61.7	66.5	CY
CZ	70.5	73.1	75.0	61.0	63.7	66.9	46.8	52.0	69.1	CZ
DE	74.9	77.2	78.2	69.6	72.7	75.1	57.7	67.3	70.0	DE
DK	76.0	78.3	79.1	73.0	75.5	77.8	57.6	64.9	70.7	DK
EE	66.8	70.5	76.8	65.8	69.8	75.2	54.0	58.2	68.7	EE
EL	64.1	68.4	73.2	51.8	58.5	65.1	42.6	52.5	67.1	EL
ES	62.6	67.9	77.2	55.8	64.5	75.8	43.6	58.2	72.5	ES
FI	73.1	76.0	76.3	71.6	74.4	75.1	56.6	63.2	62.6	FI
FR	69.3	73.1	75.5	64.9	69.5	72.5	39.7	52.3	60.2	FR
HU	60.4	64.8	67.4	54.9	60.2	63.0	34.2	49.1	56.6	HU
IE	64.9	65.7	69.0	60.4	63.2	65.9	49.9	59.1	61.7	IE
IT	61.1	63.9	65.4	49.5	53.8	55.5	36.4	50.6	60.7	IT
LT	64.6	66.1	74.2	65.2	66.4	73.8	48.3	54.1	62.7	LT
LU	70.4	70.4	70.1	61.7	64.9	65.3	39.2	41.2	40.7	LU
LV	65.1	67.6	77.2	64.8	67.7	76.2	48.2	52.7	60.7	LV
MT	60.4	65.4	69.9	42.2	49.9	56.5	31.1	39.4	56.4	MT
NL	76.8	78.8	79.2	70.8	74.6	76.4	53.7	59.7	60.6	NL
NO	79.6	79.5	79.5	77.1	77.6	78.3	68.9	68.2	67.3	NO
PL	64.7	67.5	67.5	57.7	60.3	60.4	34.2	39.3	44.8	PL
PT	70.5	72.1	76.3	65.7	68.9	74.6	49.4	57.4	65.5	PT
RO	63.4	64.2	61.1	56.0	55.9	53.1	40.9	42.7	45.0	RO
SE	78.3	81.4	82.5	75.6	78.4	79.7	70.0	72.5	74.7	SE
SI	70.5	72.5	76.1	66.6	69.3	74.5	34.9	49.3	59.9	SI
SK	64.7	66.1	68.2	57.4	60.0	62.3	40.6	46.6	48.3	SK
UK	73.5	75.1	76.8	67.8	70.3	72.9	57.1	63.3	67.8	UK
NO	79.6	79.5	79.5	77.1	77.6	78.3	68.9	68.2	67.3	NO
EU12	64.8	67.3	68.2	58.3	60.6	61.9	39.1	44.5	51.4	EU12
EU15	69.6	72.4	74.9	63.2	67.3	70.9	48.3	58.8	65.0	EU15
EU27	68.6	71.3	73.8	62.1	65.9	69.4	46.3	56.1	62.7	EU27
EA17	68.4	71.4	74.1	61.7	66.2	69.9	45.7	57.3	63.8	EA17

Source: Commission services, EPC.

Table 2. 18 – Employment projections (20-64)

	Persons (in thousands)			Changes (in thousands)			Changes (in %)			Annual growth rate			
	2010	2020	2060	2010-2020	2020-2060	2010-2060	2010-2020	2020-2060	2010-2060	2010-2020	2020-2060	2010-2060	
BE	4409	4679	4925	269	247	516	6.1	5.3	11.7	0.6	0.1	0.2	BE
BG	3097	2858	1917	-239	-941	-1181	-7.7	-32.9	-38.1	-0.8	-1.0	-1.0	BG
CZ	4797	4738	3982	-59	-756	-815	-1.2	-16.0	-17.0	-0.1	-0.4	-0.4	CZ
DK	2490	2568	2549	78	-19	59	3.1	-0.7	2.4	0.3	0.0	0.0	DK
DE	37205	36799	26041	-407	-10758	-11165	-1.1	-29.2	-30.0	-0.1	-0.9	-0.7	DE
EE	554	547	448	-7	-99	-106	-1.3	-18.0	-19.1	-0.1	-0.5	-0.4	EE
IE	1770	1797	2427	27	630	657	1.5	35.1	37.1	0.2	0.8	0.6	IE
GR	4462	4686	4156	224	-530	-306	5.0	-11.3	-6.9	0.5	-0.3	-0.1	GR
ES	18219	19867	20626	1648	759	2407	9.0	3.8	13.2	0.9	0.1	0.2	ES
FR	26376	27620	28615	1245	994	2239	4.7	3.6	8.5	0.5	0.1	0.2	FR
IT	22468	23877	21828	1408	-2049	-640	6.3	-8.6	-2.8	0.6	-0.2	-0.1	IT
CY	380	430	482	50	52	102	13.2	12.1	26.8	1.2	0.3	0.5	CY
LV	917	884	618	-32	-267	-299	-3.5	-30.1	-32.6	-0.4	-0.9	-0.8	LV
LT	1326	1288	990	-38	-298	-336	-2.9	-23.1	-25.4	-0.3	-0.7	-0.6	LT
LU	222	252	273	29	21	50	13.2	8.3	22.6	1.2	0.2	0.4	LU
HU	3791	3892	3040	101	-852	-751	2.7	-21.9	-19.8	0.3	-0.6	-0.4	HU
MT	157	162	138	5	-23	-18	3.2	-14.3	-11.6	0.3	-0.4	-0.2	MT
NL	7784	7889	7031	105	-858	-752	1.4	-10.9	-9.7	0.1	-0.3	-0.2	NL
AT	3866	3976	3614	111	-362	-251	2.9	-9.1	-6.5	0.3	-0.2	-0.1	AT
PL	16025	15947	10757	-77	-5191	-5268	-0.5	-32.5	-32.9	0.0	-1.0	-0.8	PL
PT	4620	4671	4033	50	-638	-588	1.1	-13.7	-12.7	0.1	-0.4	-0.3	PT
RO	8733	8428	5194	-305	-3235	-3540	-3.5	-38.4	-40.5	-0.4	-1.2	-1.0	RO
SI	932	939	779	7	-160	-153	0.7	-17.0	-16.4	0.1	-0.5	-0.4	SI
SK	2311	2335	1726	24	-609	-585	1.0	-26.1	-25.3	0.1	-0.8	-0.6	SK
FI	2350	2358	2257	8	-101	-94	0.3	-4.3	-4.0	0.0	-0.1	-0.1	FI
SE	4290	4606	4878	315	272	588	7.3	5.9	13.7	0.7	0.1	0.3	SE
UK	27336	28778	31899	1442	3121	4563	5.3	10.8	16.7	0.5	0.3	0.3	UK
NO	2319	2488	2742	169	253	423	7.3	10.2	18.2	0.7	0.2	0.3	NO
EU27	210887	216870	195221	5983	-21648	-15666	2.8	-10.0	-7.4	0.3	-0.3	-0.2	EU27
EA	138085	142882	129399	4797	-13483	-8686	3.5	-9.4	-6.3	0.3	-0.2	-0.1	EA
EA12	167868	174421	165151	6553	-9270	-2717	3.9	-5.3	-1.6	0.4	-0.1	0.0	EA12
EU15	43019	42448	30070	-570	-12378	-12949	-1.3	-29.2	-30.1	-0.1	-0.9	-0.7	EU15

Source: Commission services, EPC.

Table 2. 19 – Employment rate projections by age group, Total

	Total 15-64		Total 20-64		Young 15-24		Prime age 25-54		Older 55-64		15-64	20-64	15-24	25-54	55-64	
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	Changes in 2010-2060					
AT	71.7	74.4	74.8	77.5	54.2	56.2	84.2	86.1	42.2	55.1	2.7	2.7	2.0	1.9	12.9	AT
BE	62.0	63.5	67.6	69.6	25.4	26.9	80.0	80.1	37.3	46.8	1.5	2.0	1.5	0.1	9.5	BE
BG	60.0	64.4	64.8	70.3	24.8	25.2	75.0	78.5	44.7	56.0	4.4	5.6	0.3	3.6	11.3	BG
CY	68.3	74.5	74.8	80.5	34.6	36.6	82.5	87.6	56.8	66.5	6.2	5.8	2.0	5.0	9.7	CY
CZ	65.1	68.6	70.5	75.0	25.5	25.0	82.2	81.1	46.8	69.1	3.5	4.4	-0.5	-1.1	22.3	CZ
DE	71.2	74.0	74.9	78.2	46.5	46.4	81.5	83.2	57.7	70.0	2.9	3.3	-0.1	1.7	12.3	DE
DK	73.5	76.8	76.0	79.1	58.5	63.4	83.2	82.9	57.6	70.7	3.3	3.1	4.9	-0.3	13.1	DK
EE	61.3	70.1	66.8	76.8	26.6	30.6	74.9	82.4	54.0	68.7	8.7	10.1	3.9	7.5	14.7	EE
EL	59.6	67.3	64.1	73.2	21.1	24.6	73.4	79.9	42.6	67.1	7.7	9.2	3.5	6.4	24.5	EL
ES	58.6	71.8	62.6	77.2	25.2	35.2	69.6	81.9	43.6	72.5	13.2	14.7	10.1	12.3	28.9	ES
FI	68.2	71.2	73.1	76.3	39.2	42.5	81.6	82.9	56.6	62.6	3.0	3.2	3.3	1.3	6.0	FI
FR	63.8	69.2	69.3	75.5	30.9	32.6	81.8	84.0	39.7	60.2	5.4	6.2	1.7	2.2	20.4	FR
HU	55.4	62.2	60.4	67.4	19.0	20.7	72.6	75.2	34.2	56.6	6.8	7.0	1.7	2.7	22.4	HU
IE	60.0	63.2	64.9	69.0	30.7	36.8	70.3	72.8	49.9	61.7	3.2	4.1	6.1	2.5	11.7	IE
IT	56.9	60.6	61.1	65.4	20.7	22.1	71.1	71.0	36.4	60.7	3.7	4.4	1.3	-0.1	24.2	IT
LT	58.2	67.7	64.6	74.2	20.6	25.0	73.7	81.5	48.3	62.7	9.5	9.6	4.5	7.7	14.4	LT
LU	64.9	64.6	70.4	70.1	21.6	24.7	82.4	83.7	39.2	40.7	-0.2	-0.3	3.0	1.4	1.5	LU
LV	59.7	71.3	65.1	77.2	27.8	33.2	73.3	85.1	48.2	60.7	11.6	12.1	5.4	11.7	12.5	LV
MT	56.5	65.6	60.4	69.9	45.2	44.8	68.9	74.5	31.1	56.4	9.2	9.5	-0.4	5.6	25.2	MT
NL	74.7	77.1	76.8	79.2	63.1	66.4	84.7	86.1	53.7	60.6	2.4	2.4	3.3	1.4	6.8	NL
NO	75.4	75.4	79.6	79.5	51.9	52.9	84.7	85.0	68.9	67.3	0.0	-0.1	1.0	0.3	-1.6	NO
PL	59.3	62.3	64.7	67.5	27.2	27.1	77.2	77.5	34.2	44.8	3.0	2.8	-0.1	0.3	10.6	PL
PT	65.6	71.1	70.5	76.3	29.1	32.2	79.2	83.8	49.4	65.5	5.5	5.8	3.1	4.5	16.1	PT
RO	58.9	56.8	63.4	61.1	24.9	23.0	74.4	70.3	40.9	45.0	-2.1	-2.4	-1.9	-4.1	4.1	RO
SE	72.4	76.5	78.3	82.5	39.1	42.9	84.4	87.7	70.0	74.7	4.2	4.2	3.8	3.3	4.6	SE
SI	66.4	70.5	70.5	76.1	33.9	33.7	83.9	84.7	34.9	59.9	4.1	5.6	-0.2	0.8	25.0	SI
SK	59.0	62.8	64.7	68.2	21.3	24.6	75.8	78.1	40.6	48.3	3.8	3.5	3.4	2.3	7.8	SK
UK	69.4	72.4	73.5	76.8	47.7	50.2	79.8	80.9	57.1	67.8	3.0	3.3	2.5	1.0	10.7	UK
NO	75.4	75.4	79.6	79.5	51.9	52.9	84.7	85.0	68.9	67.3	0.0	-0.1	1.0	0.3	-1.6	NO
EU12	59.7	63.0	64.8	68.2	25.4	25.7	76.4	77.1	39.1	51.4	3.3	3.4	0.3	0.7	12.3	EU12
EU15	65.4	70.0	69.6	74.9	37.2	39.4	78.0	80.9	48.3	65.0	4.7	5.3	2.2	2.9	16.8	EU15
EU27	64.1	68.9	68.6	73.8	34.5	37.3	77.6	80.2	46.3	62.7	4.7	5.2	2.8	2.6	16.5	EU27
EA17	64.2	69.0	68.4	74.1	34.1	35.6	77.4	80.6	45.7	63.8	4.9	5.6	1.5	3.2	18.1	EA17

Source: Commission services, EPC.

Table 2. 20 - Employment rate projections by age group, Men

	Total 15-64		Total 20-64		Young 15-24		Prime age 25-54		Older 55-64		15-64	20-64	15-24	25-54	55-64	
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	Changes in 2010-2060					
AT	77.0	76.2	80.1	79.0	58.3	60.0	88.7	87.8	51.5	55.6	-0.7	-1.1	1.7	-0.8	4.1	AT
BE	67.4	67.5	73.5	74.0	27.3	28.9	85.5	85.0	45.5	50.1	0.1	0.5	1.6	-0.5	4.6	BE
BG	63.6	68.8	68.8	75.1	28.0	28.8	77.5	81.9	51.3	64.3	5.1	6.4	0.7	4.4	13.1	BG
CY	74.5	76.4	81.7	82.6	35.4	38.0	88.4	89.0	71.2	71.6	1.9	1.0	2.5	0.5	0.4	CY
CZ	73.7	75.7	79.8	82.7	29.9	29.4	90.6	90.0	58.7	72.8	2.1	2.9	-0.5	-0.6	14.1	CZ
DE	76.1	77.0	80.1	81.2	48.4	48.5	86.5	86.8	65.1	71.7	0.9	1.1	0.1	0.3	6.6	DE
DK	75.9	77.7	79.0	80.4	57.4	62.5	85.8	84.4	62.8	71.9	1.8	1.4	5.1	-1.5	9.1	DK
EE	61.8	71.4	67.8	78.4	28.6	33.8	75.7	83.7	52.2	68.2	9.6	10.7	5.2	8.0	16.0	EE
EL	70.7	74.7	76.1	81.4	25.3	28.2	85.4	88.8	56.7	74.5	4.0	5.4	2.9	3.4	17.9	EL
ES	64.8	73.3	69.2	78.7	26.0	37.3	75.7	84.2	54.8	71.0	8.5	9.5	11.3	8.5	16.2	ES
FI	69.2	72.0	74.5	77.5	37.8	41.2	83.9	84.9	55.7	61.3	2.8	3.0	3.3	1.0	5.6	FI
FR	68.0	72.0	73.7	78.3	34.0	35.9	87.1	87.5	42.0	60.6	4.0	4.5	1.9	0.3	18.5	FR
HU	60.4	66.1	66.2	71.6	20.9	23.0	78.1	80.4	39.5	58.0	5.7	5.5	2.1	2.4	18.6	HU
IE	64.0	65.9	69.4	72.0	28.7	36.8	75.0	77.2	58.0	61.2	1.9	2.6	8.2	2.2	3.2	IE
IT	67.7	69.2	72.8	74.7	24.6	26.2	83.6	81.2	47.5	68.5	1.5	1.9	1.6	-2.3	20.9	IT
LT	57.3	67.9	63.9	74.5	21.8	27.4	71.4	81.2	52.0	63.0	10.7	10.6	5.6	9.8	11.0	LT
LU	72.7	68.9	78.8	74.7	22.5	23.9	91.9	91.1	47.5	40.3	-3.7	-4.1	1.4	-0.9	-7.1	LU
LV	59.9	72.3	65.5	78.3	29.9	36.3	73.0	85.1	47.6	62.7	12.4	12.8	6.4	12.1	15.1	LV
MT	72.4	77.0	78.0	82.2	47.1	46.8	88.8	87.9	48.8	69.3	4.6	4.2	-0.2	-0.9	20.5	MT
NL	80.0	79.6	82.8	81.9	62.6	66.7	90.0	88.4	64.5	65.2	-0.4	-0.8	4.1	-1.6	0.7	NL
NO	77.3	76.1	82.1	80.8	50.4	51.4	87.1	86.3	72.5	68.7	-1.1	-1.4	1.0	-0.8	-3.7	NO
PL	65.7	68.6	71.8	74.2	31.3	31.3	82.6	82.2	45.5	56.8	2.9	2.4	0.0	-0.4	11.4	PL
PT	70.1	72.8	75.4	78.0	31.0	34.1	83.9	85.8	55.8	66.1	2.7	2.6	3.1	1.9	10.4	PT
RO	65.9	64.0	71.0	68.8	28.7	26.6	81.5	77.7	50.2	54.3	-1.8	-2.2	-2.1	-3.8	4.1	RO
SE	74.3	78.6	80.9	85.1	38.6	42.4	86.8	90.0	73.5	79.0	4.3	4.3	3.8	3.1	5.5	SE
SI	69.9	72.0	74.2	77.7	37.1	35.9	85.3	86.3	45.0	60.6	2.1	3.5	-1.2	1.0	15.5	SI
SK	65.6	68.1	72.0	73.9	24.5	28.7	81.4	84.5	54.1	51.0	2.5	1.9	4.3	3.0	-3.1	SK
UK	74.3	75.6	79.2	80.6	48.6	51.5	85.3	85.3	65.1	69.4	1.4	1.3	3.0	-0.1	4.4	UK
NO	77.3	76.1	82.1	80.8	50.4	51.4	87.1	86.3	72.5	68.7	-1.1	-1.4	1.0	-0.8	-3.7	NO
EU12	65.7	68.6	71.5	74.3	28.9	29.3	81.8	82.5	48.7	59.0	2.9	2.9	0.4	0.7	10.4	EU12
EU15	71.3	73.7	76.0	78.9	39.1	41.6	84.5	85.4	56.1	67.4	2.4	2.8	2.5	0.9	11.3	EU15
EU27	70.1	72.8	75.1	78.1	36.7	39.7	83.9	84.9	54.5	66.0	2.8	3.0	3.0	1.0	11.5	EU27
EA17	70.4	72.9	75.2	78.1	36.4	38.3	84.2	85.3	53.7	66.3	2.5	3.0	1.9	1.1	12.6	EA17

Source: Commission services, EPC.

Table 2. 21 - Employment rate projections by age group, Women

	Total 15-64		Total 20-64		Young 15-24		Prime age 25-54		Older 55-64		15-64	20-64	15-24	25-54	55-64	
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	Changes in 2010-2060					
AT	66.3	72.4	69.5	75.9	49.9	52.1	79.6	84.3	33.3	54.6	6.1	6.4	2.2	4.6	21.3	AT
BE	56.6	59.3	61.7	65.0	23.5	24.9	74.4	75.0	29.3	43.5	2.7	3.4	1.3	0.7	14.2	BE
BG	56.5	59.9	60.8	65.4	21.5	21.4	72.3	75.0	39.0	47.5	3.4	4.6	-0.1	2.7	8.6	BG
CY	62.0	72.5	67.9	78.4	33.9	35.2	76.6	86.2	43.0	61.2	10.5	10.5	1.4	9.6	18.3	CY
CZ	56.4	61.3	61.0	66.9	20.9	20.5	73.4	71.8	35.8	65.4	4.9	5.9	-0.4	-1.6	29.6	CZ
DE	66.1	71.0	69.6	75.1	44.5	44.1	76.3	79.5	50.5	68.3	4.9	5.5	-0.4	3.2	17.7	DE
DK	71.1	75.8	73.0	77.8	59.7	64.3	80.6	81.4	52.4	69.5	4.7	4.8	4.6	0.8	17.1	DK
EE	60.9	68.7	65.8	75.2	24.6	27.3	74.0	81.0	55.4	69.1	7.8	9.4	2.7	7.0	13.8	EE
EL	48.2	59.9	51.8	65.1	16.6	20.8	61.1	71.1	29.3	59.7	11.7	13.3	4.2	10.0	30.3	EL
ES	52.3	70.3	55.8	75.8	24.3	33.1	63.2	79.5	33.2	74.1	18.0	19.9	8.8	16.3	40.9	ES
FI	67.2	70.4	71.6	75.1	40.7	43.9	79.2	80.8	57.5	63.9	3.2	3.5	3.2	1.6	6.4	FI
FR	59.7	66.3	64.9	72.5	27.7	29.1	76.7	80.4	37.5	59.7	6.6	7.6	1.4	3.8	22.2	FR
HU	50.4	58.2	54.9	63.0	17.0	18.4	67.1	69.9	29.8	55.1	7.8	8.2	1.4	2.8	25.3	HU
IE	56.1	60.5	60.4	65.9	32.8	36.7	65.7	68.1	41.9	62.1	4.4	5.5	4.0	2.5	20.3	IE
IT	46.1	51.4	49.5	55.5	16.6	17.6	58.7	60.1	26.0	52.6	5.3	6.1	0.9	1.4	26.6	IT
LT	59.0	67.4	65.2	73.8	19.2	22.5	76.0	81.7	45.6	62.5	8.4	8.6	3.3	5.7	16.9	LT
LU	56.9	60.3	61.7	65.3	20.7	25.5	72.5	76.3	30.7	41.0	3.4	3.6	4.8	3.7	10.4	LU
LV	59.6	70.3	64.8	76.2	25.6	30.0	73.7	85.0	48.7	58.8	10.7	11.4	4.4	11.3	10.1	LV
MT	40.0	53.3	42.2	56.5	43.1	42.5	48.1	59.9	13.9	42.9	13.3	14.3	-0.6	11.8	29.0	MT
NL	69.3	74.6	70.8	76.4	63.5	66.0	79.3	83.7	42.8	55.7	5.3	5.5	2.5	4.4	12.9	NL
NO	73.4	74.6	77.1	78.3	53.4	54.5	82.2	83.7	65.2	65.9	1.2	1.2	1.1	1.5	0.7	NO
PL	53.0	55.7	57.7	60.4	22.9	22.7	71.7	72.5	24.4	32.9	2.7	2.7	-0.2	0.8	8.5	PL
PT	61.2	69.4	65.7	74.6	27.1	30.3	74.6	81.7	43.7	64.9	8.2	8.9	3.2	7.1	21.2	PT
RO	52.0	49.4	56.0	53.1	21.0	19.3	67.2	62.6	32.7	35.7	-2.6	-2.9	-1.7	-4.6	2.9	RO
SE	70.3	74.3	75.6	79.7	39.6	43.4	81.9	85.2	66.6	70.3	4.0	4.1	3.8	3.3	3.7	SE
SI	62.7	68.9	66.6	74.5	30.4	31.5	82.4	83.0	24.7	59.2	6.2	7.9	1.1	0.6	34.5	SI
SK	52.5	57.5	57.4	62.3	17.9	20.4	70.0	71.5	28.7	45.7	5.0	4.9	2.4	1.5	17.0	SK
UK	64.5	69.0	67.8	72.9	46.8	48.8	74.3	76.3	49.5	66.2	4.6	5.0	2.0	2.0	16.8	UK
NO	73.4	74.6	77.1	78.3	53.4	54.5	82.2	83.7	65.2	65.9	1.2	1.2	1.1	1.5	0.7	NO
EU12	53.8	57.1	58.3	61.9	21.7	21.8	70.8	71.4	30.7	43.7	3.4	3.6	0.1	0.6	13.0	EU12
EU15	59.4	66.3	63.2	70.9	35.3	37.1	71.4	76.1	40.9	62.7	6.8	7.7	1.8	4.7	21.8	EU15
EU27	58.2	64.7	62.1	69.4	32.1	34.7	71.3	75.3	38.6	59.5	6.5	7.3	2.6	4.1	20.9	EU27
EA17	57.9	65.0	61.7	69.9	31.8	32.9	70.5	75.7	38.1	61.4	7.1	8.2	1.1	5.2	23.3	EA17

Source: Commission services, EPC.

Mainly as a result of the ageing process, the age structure of the working population is projected to undergo a number of relevant changes. The share of older workers (aged 55 to 64) in the labour force (aged 20 to 64) is projected to rise by around 40%, rising from 13.2% in 2010 to 18.7% in 2060 in the EU27 (see Table 2.22). In the euro area, it is projected to rise by slightly more, reaching 19.5% in 2060. The projected increase is particularly high in Spain, Italy Greece, Hungary and Portugal.

Table 2. 22 – Share of older workers aged 55 to 64 as a percentage of the labour force aged 20 to 64

	Total			Men			Women			
	2010	2020	2060	2010	2020	2060	2010	2020	2060	
BE	10.9	15.0	13.6	12.1	15.4	13.5	9.6	14.6	13.8	BE
DK	14.9	15.4	16.9	15.1	15.6	18.0	14.7	15.2	15.6	DK
DE	14.5	14.2	18.9	15.4	14.8	17.9	13.2	13.4	20.1	DE
GR	16.4	18.4	19.7	17.1	19.2	19.4	15.7	17.5	20.1	GR
ES	15.5	23.1	22.0	15.9	23.3	21.5	15.0	22.9	22.5	ES
FR	15.7	17.9	17.5	13.4	15.2	17.0	17.9	20.7	18.1	FR
IE	12.2	17.0	17.3	13.1	16.7	16.1	11.0	17.3	18.7	IE
IT	12.2	16.3	20.1	13.5	16.9	20.5	10.4	15.4	19.6	IT
LU	11.3	17.6	21.2	12.4	17.3	20.2	9.9	18.0	22.3	LU
NL	12.0	15.7	16.9	11.8	15.2	16.2	12.2	16.1	17.7	NL
AT	11.6	17.8	21.4	12.5	18.1	21.0	10.2	17.4	22.0	AT
PT	13.4	15.2	17.5	15.2	17.1	18.4	11.3	13.1	16.5	PT
FI	13.2	17.0	17.1	11.7	15.9	17.0	14.7	18.2	17.1	FI
SE	12.5	17.9	17.5	12.0	17.2	17.0	13.0	18.6	18.1	SE
UK	9.6	11.9	12.5	10.4	11.7	11.6	8.4	12.1	13.6	UK
CY	11.7	14.2	19.4	11.4	12.7	18.4	12.1	15.9	20.6	CY
CZ	11.3	12.9	18.0	13.4	15.2	18.7	7.4	9.0	17.0	CZ
EE	15.0	18.0	17.3	16.7	19.4	17.9	13.0	16.4	16.7	EE
HU	10.3	15.5	16.1	11.4	16.8	15.7	8.9	14.0	16.5	HU
LT	10.5	12.1	14.7	12.0	13.7	16.6	8.8	10.2	12.3	LT
LV	13.3	17.2	21.2	13.8	17.3	21.2	12.8	17.2	21.3	LV
MT	11.6	12.0	17.3	12.0	13.0	18.4	11.1	10.8	15.9	MT
PL	9.7	15.1	16.5	11.6	16.2	16.4	7.5	13.8	16.6	PL
SK	11.3	13.8	15.8	12.7	13.4	15.2	9.6	14.3	16.6	SK
SI	18.7	19.3	17.3	17.6	18.2	16.4	19.8	20.4	18.3	SI
BG	19.1	18.4	17.8	19.1	18.6	18.0	19.0	18.2	17.5	BG
RO	14.9	17.7	17.3	15.6	17.4	16.7	14.2	17.9	17.9	RO
NO	17.2	17.3	17.5	17.4	17.5	17.3	17.0	17.1	17.6	NO
EU27	13.2	17.4	18.7	13.8	17.5	18.4	12.4	17.2	19.1	EU27
EA	13.0	18.4	19.5	13.6	18.5	19.0	12.2	18.3	20.0	EA
EU15	13.5	18.4	19.1	14.1	18.4	18.6	12.8	18.3	19.6	EU15
EU12	11.8	13.3	16.7	12.6	14.0	17.3	10.9	12.5	15.8	EU12

Source: Commission services, EPC.

2.9. Resulting economic dependency ratios

The effective economic old-age dependency ratio is an important indicator to assess the impact of ageing on budgetary expenditure, particularly on its pension component. This indicator is calculated as the ratio between the inactive elderly (65+) and total employment (either 20-64 or 20-74). The effective economic old age dependency ratio is projected to rise significantly from around 40% in 2010 to 74% in 2060 in the EU27 (employed aged 20-64). In the euro area, a similar deterioration is projected from 43% in 2010 to 75% in 2060.

Table 2. 23 – Effective economic old-age dependency ratio

	Inactive population aged 65 and more as % of employed (20-64)					Inactive population aged 65 and more as % of employed (20-74)					
	2010	2020	2060	Change 2010 2020	Change 2020 2060	2010	2020	2060	Change 2010 2020	Change 2020 2060	
BE	42	47	68	5	21	42	46	67	5	21	BE
DK	35	42	56	8	14	34	41	53	7	12	DK
DE	44	47	77	3	31	43	45	73	2	28	DE
GR	47	51	83	4	32	46	50	82	4	32	GR
ES	42	44	75	2	30	42	43	71	2	28	ES
FR	41	49	66	9	17	40	49	65	8	16	FR
IE	27	35	55	8	20	26	34	53	8	19	IE
IT	53	57	90	4	33	52	56	86	4	30	IT
LU	31	36	70	5	34	31	36	70	5	34	LU
NL	31	40	62	9	22	31	39	60	8	21	NL
AT	37	41	67	4	26	36	40	64	4	25	AT
PT	37	42	73	6	31	35	40	67	5	27	PT
FI	38	49	65	12	16	37	48	63	11	15	FI
SE	37	42	58	5	16	36	40	55	4	15	SE
UK	35	40	55	6	15	34	39	52	5	13	UK
CY	25	31	60	6	29	25	30	56	5	27	CY
CZ	32	43	74	10	31	32	41	70	10	28	CZ
EE	38	42	74	5	31	36	41	70	4	29	EE
HU	43	50	91	6	41	43	49	88	6	39	HU
LT	39	42	81	3	39	38	41	78	3	37	LT
LV	40	42	89	2	47	39	40	83	1	42	LV
MT	39	52	85	14	33	38	52	84	14	32	MT
PL	31	41	100	10	58	31	40	95	10	55	PL
SK	29	38	97	10	59	28	38	96	9	58	SK
SI	34	43	79	9	35	34	42	75	9	33	SI
BG	42	48	89	7	40	41	47	85	5	38	BG
RO	32	40	109	8	69	30	39	102	8	63	RO
NO	29	35	56	6	21	28	33	53	6	20	NO
EA	43	48	75	5	27	42	47	72	5	25	EA
EU27	40	46	74	6	28	39	45	70	5	26	EU27
EU15	41	46	70	5	24	41	45	67	5	22	EU15
EU12	34	42	94	9	51	33	41	89	8	48	EU12

Source: Commission services, EPC.

Table 2. 24 – Total economic dependency ratio

	Total inactive population as % of employed (20-64)					Total inactive population as % of employed (20-74)					
	2010	2020	2060	Change 2010 2020	Change 2020 2060	2010	2020	2060	Change 2010 2020	Change 2020 2060	
BE	136	138	163	2	25	135	137	161	2	24	BE
DK	105	108	121	4	13	102	106	115	4	10	DK
DE	107	104	138	-3	34	105	101	131	-5	30	DE
GR	137	132	161	-4	29	134	131	158	-4	27	GR
ES	126	118	139	-8	21	125	116	133	-9	17	ES
FR	133	135	146	1	11	132	133	143	1	10	FR
IE	133	147	157	15	9	130	142	151	12	9	IE
IT	158	153	185	-5	31	156	150	177	-5	27	IT
LU	121	123	161	1	39	120	122	160	2	38	LU
NL	100	104	128	4	24	98	100	123	2	22	NL
AT	105	105	132	0	26	104	103	126	-1	23	AT
PT	112	110	137	-1	26	106	105	126	-2	21	PT
FI	114	123	140	9	17	112	119	135	7	16	FI
SE	103	106	122	3	16	101	102	116	2	14	SE
UK	111	117	131	5	15	108	113	124	5	11	UK
CY	101	97	124	-4	27	98	94	118	-5	24	CY
CZ	110	118	149	9	31	108	115	140	7	25	CZ
EE	117	121	147	4	26	113	116	139	2	23	EE
HU	150	140	180	-10	40	149	138	175	-10	36	HU
LT	126	124	158	-2	34	124	122	152	-2	30	LT
LV	118	114	153	-4	39	115	110	143	-6	33	LV
MT	151	146	168	-5	22	150	145	165	-5	20	MT
PL	125	129	189	4	60	124	126	180	2	54	PL
SK	117	123	185	5	63	117	121	182	4	61	SK
SI	109	116	151	7	36	106	113	145	6	32	SI
BG	130	135	174	5	39	129	130	166	2	36	BG
RO	131	137	217	5	80	125	132	203	7	72	RO
NO	99	105	128	6	23	96	101	122	5	21	NO
EA	125	124	150	-1	26	123	121	144	-3	23	EA
EU27	123	123	150	0	27	121	120	144	-1	24	EU27
EU15	122	122	145	0	23	120	119	139	-1	20	EU15
EU12	126	129	182	3	53	124	126	173	2	47	EU12

Source: Commission services, EPC.

Across EU Member States, the effective economic old age dependency ratio is projected to range from a minimum of 55% in Ireland to a maximum of 109% in Romania in 2060. This ratio is projected to be above 85% in eight EU Member Sates, namely Bulgaria, Hungary, Italy, Latvia, Malta, Poland, Romania and Slovakia by 2060.

The total economic dependency ratio is calculated as the ratio between the total inactive population and employment. It gives a measure of the average number of individuals that each employed 'supports', being relevant when considering prospects for potential GDP per capita growth. It is expected to stabilise in the period up to 2020 in the EU27, while rising above 150% by 2060. A similar evolution is projected in the euro area. The projected development of this indicator reflects the strong impact of the ageing process after 2020 in most EU Member States. However, there are large cross-country differences. In Bulgaria, Luxembourg, Poland, Romania, Slovenia and Slovakia it is projected to increase by 40 pp or more between 2010 and 2060, while in others (Denmark, Spain, France, Malta, Sweden and the United Kingdom) it is projected to rise by less than 20 pp.

2.10. Projection of total hours worked

Total hours worked are projected to increase by 3.3% in the period 2010 to 2020 in the EU27.[51] However from 2020 onwards, this upward trend is projected to be reversed and total hours worked are expected to decline by 8.4% between 2020 and 2060. Over the entire projection period (i.e. 2010-2060), total hours worked are projected to fall by 5.3% in the EU27. For the euro area, the projected fall is less marked (-3.8% between 2010 and 2060). In terms of annual average growth rates, hours worked are projected to decline by 0.1% over the period 2010-2060 in both the EU27 and the euro area (see Table 2.25). These trends in hours worked largely reflect employment trends (see Section 8). In addition, given women's relatively high take-up rates of part-time work, their rising participation rates are expected – through composition effects – to slightly increase the total share of part-time in total hours worked from 10.1% in 2010 to 10.5% in 2060 in the EU27.[52]

There are major differences across Member States, reflecting different demographic outlooks. A reduction in total hours worked of 20% or more between 2010 and 2060 is projected for BG, DE, LT, LV, PL, SK, and RO. In contrast, for some Member States an increase of 10% or more is projected over the same period, namely for BE, CY, ES, FR, IE, LU, SE, and the UK.

Table 2. 25 – Projections for total weekly hours worked (thousands), and their breakdown by full- part-time, 2010-2060 (15-74)

	Total	of which %		Total	of which %		Total	of which %		Total % change			Total Avg. Annual growth			
		Full-time	Part-time		Full-time	Part-time		Full-time	Part-time							
	2010	2010	2010	2020	2020	2020	2060	2060	2060	2020-2010	2060-2020	2060-2010	2020-2010	2060-2020	2060-2010	
AT	150938253	86.7%	13.3%	154780917	86.5%	13.5%	143366299	86.2%	13.8%	2.5	-7.4	-5.0	0.4	-0.2	-0.1	AT
BE	165360425	85.1%	14.9%	175713348	84.8%	15.2%	186081415	84.8%	15.2%	6.3	5.9	12.5	0.7	0.1	0.3	BE
BG	127237221	98.9%	1.1%	120287118	98.8%	1.2%	81666138	98.8%	1.2%	-5.5	-32.1	-35.8	-0.8	-1.0	-0.9	BG
CY	15426552	96.0%	4.0%	17499638	95.9%	4.1%	19983887	95.8%	4.2%	13.4	14.2	29.5	1.5	0.3	0.6	CY
CZ	198180036	97.3%	2.7%	197992826	97.3%	2.7%	172140930	97.2%	2.8%	-0.1	-13.1	-13.1	-0.1	-0.3	-0.3	CZ
DE	1390538239	87.0%	13.0%	1395700956	86.8%	13.2%	1008797194	86.6%	13.4%	0.4	-27.7	-27.5	0.1	-0.8	-0.6	DE
DK	93782286	85.1%	14.9%	96651788	85.1%	14.9%	98232801	85.0%	15.0%	3.1	1.6	4.7	0.1	0.0	0.1	DK
EE	22226950	94.6%	5.4%	22133697	94.6%	5.4%	18490858	94.7%	5.3%	-0.4	-16.5	-16.8	-0.3	-0.4	-0.4	EE
ES	699088052	93.6%	6.4%	770355340	93.4%	6.6%	822937681	93.2%	6.8%	10.2	6.8	17.7	0.7	0.2	0.3	ES
FI	89353713	92.3%	7.7%	90989990	92.2%	7.8%	87644787	92.2%	7.8%	1.8	-3.7	-1.9	0.2	-0.1	0.0	FI
FR	990488233	89.3%	10.7%	1039617753	89.2%	10.8%	1090049835	89.3%	10.7%	5.0	4.9	10.1	0.7	0.1	0.2	FR
GR	186630416	97.0%	3.0%	194494957	96.9%	3.1%	173169559	96.8%	3.2%	4.2	-11.0	-7.2	0.5	-0.3	-0.1	GR
HU	151855505	96.7%	3.3%	156202456	96.7%	3.3%	124251979	96.6%	3.4%	2.9	-20.5	-18.2	0.4	-0.5	-0.4	HU
IE	64232675	88.4%	11.6%	66142884	88.0%	12.0%	90329205	88.2%	11.8%	3.0	36.6	40.6	-0.1	0.8	0.6	IE
IT	855328338	91.6%	8.4%	911479501	91.4%	8.6%	854008457	91.6%	8.4%	6.6	-6.3	-0.2	0.6	-0.1	0.0	IT
LT	52053018	95.5%	4.5%	50647162	95.5%	4.5%	39677083	95.5%	4.5%	-2.7	-21.7	-23.8	-0.6	-0.6	-0.6	LT
LU	8542118	90.4%	9.6%	9582630	89.9%	10.1%	10396005	89.8%	10.2%	12.2	8.5	21.7	1.4	0.2	0.5	LU
LV	36288338	94.8%	5.2%	35536714	94.8%	5.2%	25701967	94.8%	5.2%	-2.1	-27.7	-29.2	-0.5	-0.8	-0.7	LV
MT	6244781	93.6%	6.4%	6347403	93.3%	6.7%	5466218	93.1%	6.9%	1.6	-13.9	-12.5	0.2	-0.4	-0.2	MT
NL	265163017	68.2%	31.8%	272908669	67.8%	32.2%	244248406	67.7%	32.3%	2.9	-10.5	-7.9	0.1	-0.3	-0.2	NL
PL	649688633	95.9%	4.1%	652619362	95.9%	4.1%	451760179	95.8%	4.2%	0.5	-30.8	-30.5	0.4	-0.9	-0.6	PL
PT	188440060	95.8%	4.2%	191137665	95.7%	4.3%	169700644	95.6%	4.4%	1.4	-11.2	-9.9	0.0	-0.3	-0.2	PT
RO	364241808	93.0%	7.0%	347670037	93.1%	6.9%	220499211	92.9%	7.1%	-4.5	-36.6	-39.5	-0.4	-1.1	-1.0	RO
SE	162624226	83.0%	17.0%	175129591	83.0%	17.0%	188161443	83.1%	16.9%	7.7	7.4	15.7	0.8	0.2	0.3	SE
SI	37536499	95.0%	5.0%	37809535	94.9%	5.1%	32092851	94.8%	5.2%	0.7	-15.1	-14.5	0.0	-0.4	-0.3	SI
SK	92063058	98.1%	1.9%	93342641	98.1%	1.9%	69710811	98.1%	1.9%	1.4	-25.3	-24.3	0.0	-0.7	-0.6	SK
UK	1030591140	86.5%	13.5%	1081077607	86.4%	13.6%	1234395910	86.3%	13.7%	4.9	14.2	19.8	0.6	0.3	0.4	UK
NO	84350375	83.0%	17.0%	90598778	82.8%	17.2%	100701074	82.8%	17.2%	7.4	11.2	19.4	0.7	0.3	0.4	NO
EA	5227601378	89.1%	10.9%	5450037525	89.0%	11.0%	5026474112	89.2%	10.8%	4.3	-7.8	-3.8	0.4	-0.2	-0.1	EA
EU27	8094143589	89.9%	10.1%	8363852185	89.8%	10.2%	7662961751	89.5%	10.5%	3.3	-8.4	-5.3	0.3	-0.2	-0.1	EU27

Source: Commission services, EPC.

[51] For the purpose of calculating potential GDP, the estimated potential hours worked using the production function approach were used (see Table 3.5 in Chapter 3). Specifically, for the potential GDP projections, until 2015, the growth rates of hours worked estimated using the production function approach are used and thereafter the growth rates estimated with the CSM – as reported in Table 2.25 – are used.

[52] Part-time work varies considerably across the EU, accounting for less than 2% of total hours worked in Bulgaria and Slovakia to over 30% in the Netherlands.

2.11. Comparing the 2012 and 2009 labour market projections

This section provides a summary comparison of main labour market outcomes between the current 2012 projection exercise and the previous one of 2009. The impact of the 2008-2009 economic recession is clearly visible in the downward revision for 2010 of labour force, employment values and employment rates (see Tables 2.26 to 2.28).[53]

Table 2. 26 – Labour force projections: 2012 round – 2009 round, 2010-2060 ('000)

	Labour Force (20-64)		Employment (20-64)	
	2010	2060	2010	2060
AT	-9.2	-45.4	-19.7	-40.8
BE	14.1	397.4	-29.3	319.4
BG	-54.2	43.1	-245.0	-10.1
CY	-19.6	-93.0	-31.7	-95.0
CZ	6.1	464.1	-136.6	379.1
DE	-511.5	-2275.0	-155.1	-2118.2
DK	12.3	61.8	-96.1	19.8
EE	2.4	23.6	-87.5	4.5
ES	-288.7	798.2	-2813.0	484.9
FI	3.1	90.5	-62.3	67.4
FR	1222.3	1908.5	679.2	1468.1
GR	13.8	294.6	-226.8	228.1
HU	-61.6	164.8	-208.8	118.0
IE	-209.8	-293.8	-375.0	-309.2
IT	-297.9	1624.9	-944.0	1186.0
LT	28.4	158.1	-204.2	113.0
LU	9.7	-6.9	9.4	-5.8
LV	-2.2	12.9	-157.3	-4.1
MT	4.4	10.1	2.8	8.7
NL	17.5	106.6	-95.6	72.4
PL	504.5	909.8	-198.2	705.5
PT	-98.5	-407.2	-284.4	-431.0
RO	38.9	112.8	-119.4	65.2
SE	-15.6	260.2	-126.2	212.1
SI	9.9	153.4	-17.0	138.5
SK	-44.5	172.8	-128.4	142.8
UK	20.8	10.6	-694.2	-102.6
NO	35.9	247.4	40.7	253.8
EU12	412.4	2132.5	-1531.1	1566.1
EU15	-117.5	2525.0	-5233.0	1050.7
EU27	294.9	4657.6	-6764.1	2616.8
EA17	-182.5	2459.4	-4578.1	1121.0

Source: Commission services, EPC.

The economic recession of 2008-2009 led to a considerable downward revision in employment levels for 2010 (i.e. between the 2009 and the 2012 exercises). In the EU27, employment levels were revised downwards by 6.8 million persons for the age group 20-64.

[53] Also in the age profile of participation rates (see Graph 2.10). Note the downward revision of participation rates for young (male) cohorts.

In addition, given the assumed rise of 0.8 pp in the structural unemployment rate in the EU27 by 2060 (see Table 2.28), the employment rate in 2060 is also lowered by 1.0 pp (15-64). In contrast, the participation rate of older workers (55-64) is increased by 3.1 pp in 2060, reflecting the positive effect of (further) legislated pension reforms in many Member States.

Table 2. 27 – Labour force projections: 2012 round (2010-2060)

	Employment rate 15-64		Employment rate 20-64		Employment rate 55-64		Participation rate 15-64		Participation rate 20-64		Participation rate 55-64		Unemployment rate 55-64		
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	
AT	71.7	74.4	74.8	77.5	42.2	55.1	75.0	77.6	78.0	80.6	43.1	56.1	4.5	4.1	AT
BE	62.0	63.5	67.6	69.6	37.3	46.8	67.7	68.5	73.5	74.8	39.1	48.7	8.4	7.3	BE
BG	60.0	64.4	64.8	70.3	44.7	56.0	67.1	69.4	72.1	75.7	49.3	59.8	10.5	7.3	BG
CY	68.3	74.5	74.8	80.5	56.8	66.5	73.2	78.0	79.9	84.2	59.6	68.8	6.8	4.5	CY
CZ	65.1	68.6	70.5	75.0	46.8	69.1	70.3	73.1	75.9	79.7	50.1	72.6	7.3	6.1	CZ
DE	71.2	74.0	74.9	78.2	57.7	70.0	76.7	78.9	80.6	83.2	62.5	74.8	7.2	6.1	DE
DK	73.5	76.8	76.0	79.1	57.6	70.7	79.5	80.6	81.6	82.7	61.1	73.2	7.5	4.8	DK
EE	61.3	70.1	66.8	76.8	54.0	68.7	74.1	75.6	80.2	82.7	64.4	73.6	17.2	7.3	EE
ES	58.6	71.8	62.6	77.2	43.6	72.5	73.4	77.5	77.7	83.0	50.8	76.4	20.2	7.3	ES
FI	68.2	71.2	73.1	76.3	56.6	62.6	74.6	76.2	79.1	81.1	60.5	65.8	8.6	6.6	FI
FR	63.8	69.2	69.3	75.5	39.7	60.2	70.4	74.7	76.1	81.1	42.5	63.3	9.4	7.3	FR
GR	59.6	67.3	64.1	73.2	42.6	67.1	68.4	72.6	73.2	78.8	45.5	69.6	12.8	7.3	GR
HU	55.4	62.2	60.4	67.4	34.2	56.6	62.4	67.1	68.0	72.6	37.1	59.1	11.3	7.3	HU
IE	60.0	63.2	64.9	69.0	49.9	61.7	69.6	67.3	74.8	73.2	54.7	63.9	13.7	6.0	IE
IT	56.9	60.6	61.1	65.4	36.4	60.7	62.2	65.3	66.5	70.3	37.8	62.6	8.5	7.3	IT
LT	58.2	67.7	64.6	74.2	48.3	62.7	71.0	73.0	78.5	79.9	56.5	66.1	18.1	7.3	LT
LU	64.9	64.6	70.4	70.1	39.2	40.7	67.9	67.5	73.5	73.0	40.1	41.6	4.4	4.2	LU
LV	59.7	71.3	65.1	77.2	48.2	60.7	73.7	76.9	79.9	83.1	57.1	64.7	19.0	7.3	LV
MT	56.5	65.6	60.4	69.9	31.1	56.4	60.7	70.3	64.3	74.3	32.6	58.5	6.9	6.6	MT
NL	74.7	77.1	76.8	79.2	53.7	60.6	78.2	79.9	80.0	81.7	56.0	62.4	4.5	3.4	NL
PL	59.3	62.3	64.7	67.5	34.2	44.8	65.8	67.2	71.5	72.6	36.8	47.4	9.8	7.3	PL
PT	65.6	71.1	70.5	76.3	49.4	65.5	74.1	76.7	79.4	82.1	54.2	69.4	11.4	7.3	PT
RO	58.9	56.8	63.4	61.0	40.9	45.0	63.8	60.9	68.4	65.2	42.3	46.3	7.6	6.7	RO
SE	72.4	76.5	78.3	82.5	70.0	74.7	79.1	81.9	84.5	87.4	73.9	77.9	8.5	6.5	SE
SI	66.4	70.5	70.5	76.1	34.9	59.9	71.7	74.7	76.0	80.6	36.3	61.6	7.4	5.7	SI
SK	59.0	62.8	64.7	68.2	40.6	48.3	68.9	67.8	75.1	73.4	45.1	50.7	14.4	7.3	SK
UK	69.4	72.4	73.5	76.8	57.1	67.8	75.4	76.7	79.0	80.7	59.9	70.1	8.0	5.6	UK
NO	75.4	75.4	79.6	79.5	68.9	67.3	78.2	78.0	82.2	81.9	69.8	68.2	3.6	3.3	NO
EU12	59.7	63.0	64.8	68.2	39.1	51.4	66.4	67.7	71.9	73.2	42.2	53.9	10.0	6.9	EU12
EU15	65.4	70.0	69.6	74.9	48.3	65.0	72.4	74.9	76.6	79.8	51.8	68.1	9.7	6.4	EU15
EU27	64.1	68.9	68.6	73.8	46.3	62.7	71.1	73.7	75.6	78.7	49.7	65.7	9.7	6.5	EU27
EA17	64.2	69.0	68.4	74.1	45.7	63.8	71.4	74.0	75.9	79.2	49.3	67.0	10.1	6.7	EA17

Source: Commission services, EPC.

Table 2. 28 – Labour force projections: 2012 round - 2009 round (2010-2060)

	Employment rate 15-64		Employment rate 20-64		Employment rate 55-64		Participation rate 15-64		Participation rate 20-64		Participation rate 55-64		Unemployment rate 55-64		
	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	2010	2060	
AT	-0.3	0.0	-0.1	0.1	2.7	1.1	-0.1	-0.1	0.2	0.1	2.6	0.6	0.2	-0.2	AT
BE	-0.8	-1.9	-0.8	-1.7	-0.2	-0.6	-0.2	-1.3	-0.2	-1.0	0.0	-0.4	0.9	1.1	BE
BG	-4.7	-1.6	-4.9	-1.1	0.6	8.0	-0.9	0.2	-0.9	0.8	3.1	9.5	5.8	2.6	BG
CY	-3.8	-0.8	-3.7	-0.7	-0.6	3.0	-1.4	0.0	-1.3	0.1	0.8	3.7	3.3	1.1	CY
CZ	-2.8	-1.6	-2.9	-1.2	-3.9	3.8	-0.8	-0.5	-0.9	0.0	-2.6	4.9	2.9	1.6	CZ
DE	0.1	-0.8	0.2	-0.6	3.4	1.4	-0.6	-0.9	-0.4	-0.7	2.6	1.0	-0.8	-0.1	DE
DK	-3.7	-1.5	-3.3	-1.2	-1.1	3.2	-0.3	-0.2	0.0	0.1	0.7	3.8	4.3	1.5	DK
EE	-10.6	-1.8	-10.8	-1.4	-7.3	6.3	-0.4	1.1	0.0	1.8	1.4	9.4	13.8	3.8	EE
ES	-8.3	-0.7	-8.2	-0.5	-4.4	2.0	0.1	0.1	0.6	0.5	-0.5	2.4	11.4	1.1	ES
FI	-2.7	-3.4	-2.2	-3.1	1.9	-1.9	-0.7	-2.9	-0.2	-2.6	2.9	-2.0	2.8	0.8	FI
FR	-0.5	2.1	-0.4	2.3	2.8	12.8	0.6	3.1	0.9	3.4	3.7	14.1	1.6	1.1	FR
GR	-3.1	2.7	-3.1	3.4	-0.8	16.6	0.2	3.8	0.4	4.6	0.6	17.8	4.7	1.1	GR
HU	-3.2	1.2	-3.4	1.2	-6.0	8.6	-1.0	2.1	-1.0	2.1	-4.9	9.6	3.5	1.1	HU
IE	-10.2	-9.2	-9.8	-8.7	-5.6	-5.6	-4.3	-9.0	-3.5	-8.3	-2.4	-5.2	8.7	1.0	IE
IT	-3.1	-3.2	-3.0	-3.2	-1.7	-0.9	-1.4	-2.3	-1.3	-2.2	-1.3	-0.5	2.8	1.5	IT
LT	-8.6	1.9	-9.3	2.8	-8.5	10.1	1.8	4.8	2.0	6.0	-2.1	12.0	14.6	3.7	LT
LU	1.1	0.9	0.9	0.6	3.6	0.2	1.0	0.7	0.9	0.4	3.7	0.3	-0.2	-0.4	LU
LV	-11.1	0.7	-11.1	1.2	-8.7	4.3	-0.7	2.7	-0.1	3.4	-1.8	6.1	14.1	2.4	LV
MT	0.8	5.2	1.4	6.1	4.4	8.3	1.3	5.8	2.0	6.9	4.9	8.2	0.7	0.4	MT
NL	-1.6	-0.6	-1.3	-0.4	2.3	5.0	-0.5	-0.3	-0.2	-0.1	2.8	5.0	1.5	0.4	NL
PL	-0.9	-0.1	-0.8	0.2	2.8	0.1	1.8	0.9	2.0	1.2	4.1	0.8	3.9	1.4	PL
PT	-3.8	-0.5	-3.6	-0.4	-4.1	1.0	-1.1	0.4	-0.7	0.6	-2.7	1.6	3.8	1.1	PT
RO	-1.2	-0.8	-1.2	-0.7	-2.7	0.4	-0.2	-0.4	-0.1	-0.2	-2.2	0.8	1.6	0.7	RO
SE	-2.9	-1.1	-2.6	-0.9	-0.3	0.8	-0.9	-0.7	-0.6	-0.3	0.8	1.1	2.6	0.6	SE
SI	-1.8	2.0	-1.9	2.5	-0.3	12.1	0.1	2.8	0.1	3.4	0.0	12.4	2.7	1.0	SI
SK	-3.6	-4.0	-3.8	-3.8	-2.5	-2.2	-1.5	-3.4	-1.5	-3.2	-1.6	-2.3	3.3	1.1	SK
UK	-2.2	-2.0	-1.7	-1.6	0.4	-1.1	-0.3	-2.0	0.3	-1.4	1.4	-1.1	2.6	0.2	UK
NO	0.3	0.6	0.4	0.8	2.6	2.7	-0.1	0.0	0.2	0.4	2.5	2.5	-0.5	-0.8	NO
EU12	-2.4	-0.4	-2.5	-0.1	-1.0	2.6	0.3	0.6	0.5	0.9	0.5	3.4	4.1	1.4	EU12
EU15	-2.5	-1.1	-2.2	-0.9	0.4	2.8	-0.4	-0.6	-0.1	-0.3	1.2	3.1	2.8	0.7	EU15
EU27	-2.4	-1.0	-2.3	-0.8	0.1	2.7	-0.3	-0.5	0.0	-0.1	1.1	3.1	3.1	0.8	EU27
EA17	-2.5	-0.9	-2.4	-0.7	0.4	3.6	-0.5	-0.3	-0.2	-0.1	1.2	4.0	2.9	0.8	EA17

Source: Commission services, EPC.

Using a simple identity, Table 2.29 provides a breakdown of changes in employment projections (between rounds 2009 and 2012).[54] Although the situation varies considerably across Member States, on average in the EU27, employment levels were revised upward for 2060 by 1.1% (approximately more 2 million persons) between the 2009 and 2012 projection exercises. This revision results from an increase of 2.6% in population projections, partly offset by a reduction in participation rates (-0.6%) and an increase in the unemployment rate (+0.8).[55]

[54] The employment identity: $L \equiv E + U$ can be written as: $E \equiv P * PR * [1 - UR]$.
where L is the labour force; E is employment; U is unemployment; P is population; PR is the participation rate; and UR the unemployment rate.
Taking the logarithm of the above expression, revisions in employment level projections can be approximately broken down as: $\log(\frac{E_1}{E_0}) \approx \log(\frac{P_1}{P_0}) + \log(\frac{PR_1}{PR_0}) - (UR_1 - UR_0)$.
where indices 0 and 1 refer to two distinct projection exercises.

[55] Although being based on an approximation, the results of this breakdown can be used because of the small errors involved.

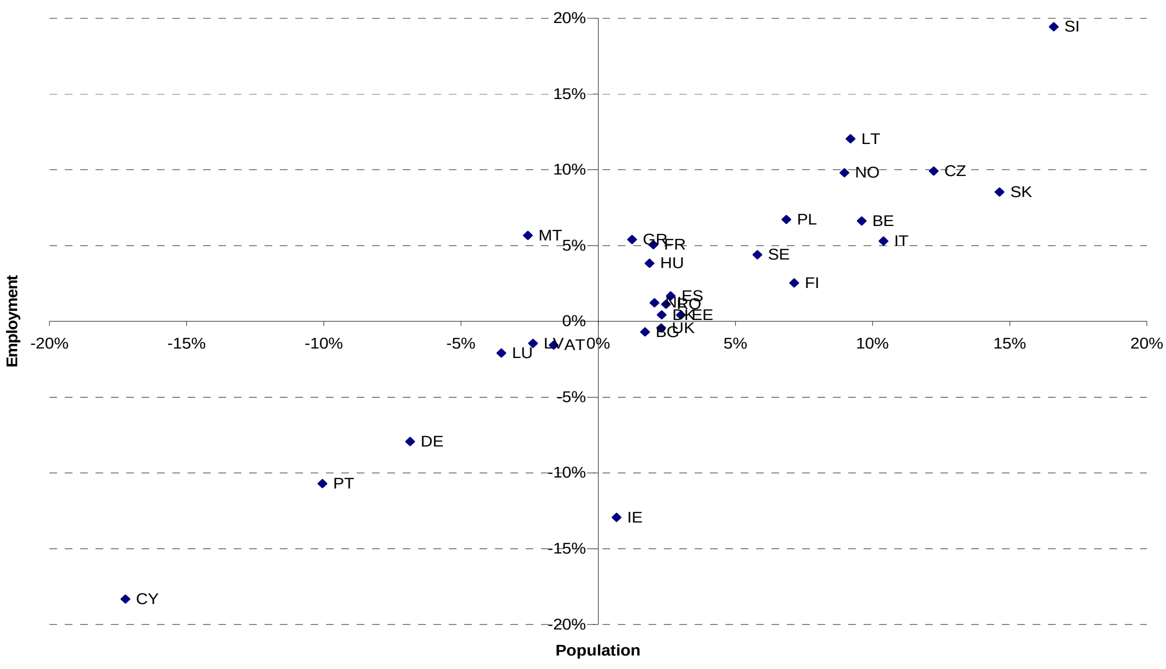
Table 2. 29 – Breakdown of revisions in employment projections (2012 round – 2009 round), 2060

	Employment (15-64) (1)≈(2)+(3)–(4)	Population (15-64) (2)	Participation rate (15-64) (3)	Unemployment rate (15-64) (4)	Discrepancy
AT	-1.6%	-1.6%	-0.1%	-0.2%	0.0%
BE	6.6%	9.6%	-1.8%	1.1%	-0.1%
BG	-0.7%	1.7%	0.3%	2.6%	-0.2%
CY	-18.3%	-17.2%	0.0%	1.1%	0.0%
CZ	9.9%	12.2%	-0.6%	1.6%	-0.1%
DE	-7.9%	-6.9%	-1.1%	-0.1%	0.0%
DK	0.4%	2.3%	-0.3%	1.5%	-0.1%
EE	0.4%	3.0%	1.4%	3.8%	-0.2%
ES	1.7%	2.6%	0.2%	1.1%	-0.1%
FI	2.5%	7.1%	-3.8%	0.8%	-0.1%
FR	5.1%	2.0%	4.2%	1.1%	-0.1%
GR	5.4%	1.2%	5.3%	1.1%	-0.1%
HU	3.8%	1.9%	3.1%	1.1%	-0.1%
IE	-12.9%	0.7%	-12.6%	1.0%	-0.1%
IT	5.3%	10.4%	-3.5%	1.5%	-0.1%
LT	12.0%	9.2%	6.8%	3.7%	-0.2%
LU	-2.1%	-3.5%	1.0%	-0.4%	0.0%
LV	-1.5%	-2.4%	3.5%	2.4%	-0.2%
MT	5.7%	-2.6%	8.7%	0.4%	0.0%
NL	1.2%	2.1%	-0.4%	0.4%	0.0%
PL	6.7%	6.9%	1.4%	1.4%	-0.1%
PT	-10.7%	-10.0%	0.5%	1.1%	-0.1%
RO	1.1%	2.5%	-0.6%	0.7%	0.0%
SE	4.4%	5.8%	-0.8%	0.6%	0.0%
SI	19.4%	16.6%	3.9%	1.0%	-0.1%
SK	8.5%	14.6%	-4.9%	1.1%	-0.1%
UK	-0.4%	2.3%	-2.5%	0.2%	0.0%
NO	9.8%	9.0%	0.0%	-0.8%	0.0%
EU12	5.2%	5.9%	0.9%	1.4%	-0.1%
EU15	0.4%	1.9%	-0.8%	0.7%	0.0%
EU27	1.1%	2.6%	-0.6%	0.8%	-0.1%
EA17	0.5%	1.9%	-0.4%	0.8%	-0.1%

Source: Commission services, EPC.

This breakdown illustrates again the close link between employment/labour force and population variables. In fact, there is a high cross-country correlation between revisions in employment and population projections (see Graph 2.8).

Graph 2.8 – Revisions of population and employment projections, 2012 round – 2009 round, 2060 (percentage changes)



Source: Commission services, EPC.

Given the important role played by participation rate projections, Table 2.30 and Graph 2.9 focus on the extent of their revisions by age groups between the 2009 and 2012 exercises. Using the year 2060 for comparison, in the EU27 participation rates are revised downwards for young (15-24) and prime age (25-54) workers, while being revised upwards for older workers (55-64). The downward revision of the participation rate for young workers can largely be attributed to base year effects (i.e. the 2008-2009 economic recession).[56] As already mentioned in section 2.6 (Graph 2.4), in the framework of the CSM, a present reduction in young workers' participation rate is likely to cause future reductions in the participation rate of prime age workers. Likewise, Graph 2.9 suggests that a downward revision in participation rate projections for young workers today is likely to be associated with a downward revision in future participation rate projections for prime age workers.

Since the 2009 Ageing Report, many EU Member States have legislated additional pension reforms (see Box 2.1), which are projected to raise further the participation rate of older workers. Graph 2.10 clearly shows this projected upward revision for ages 55 and above. In addition, the upward revision of participation rates for women is more pronounced than that for men, indicating the continuation of a convergence process (e.g. the convergence of women's lower statutory retirement age to that of men's).

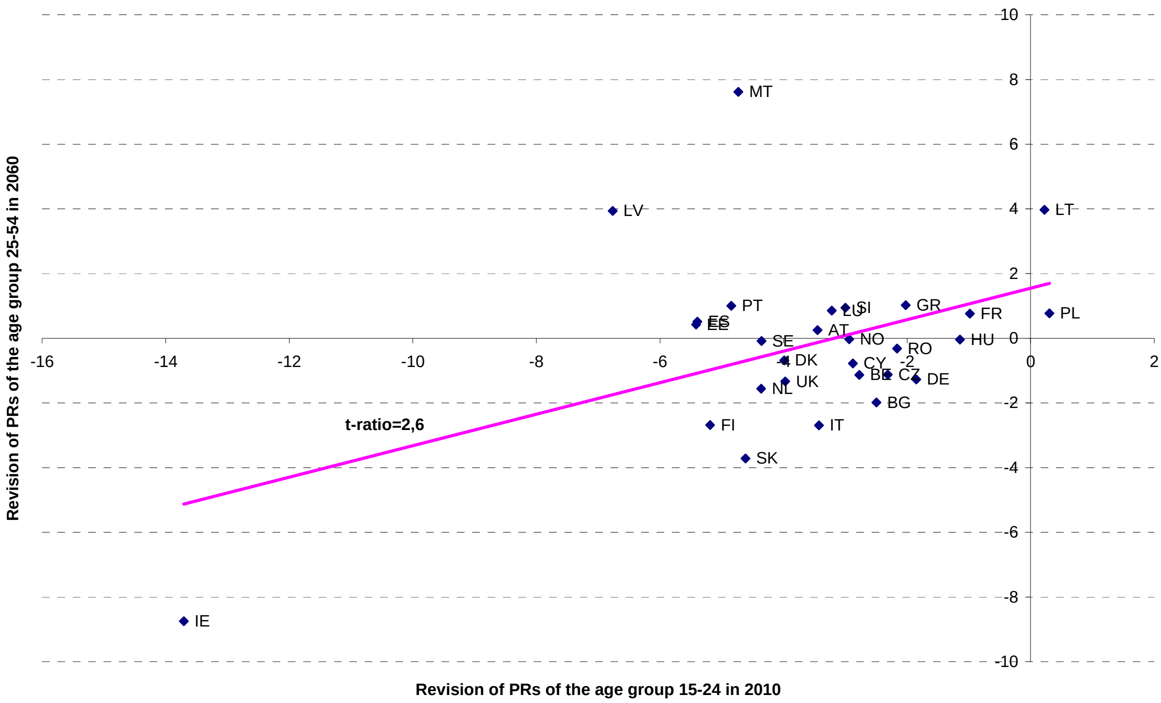
Table 2.30 – Revision of participation rate projections, 2012 round - 2009 round, 2060

	15-64	20-64	15-24	25-54	55-64	
AT	-0.1	0.1	-2.0	0.2	0.6	AT
BE	-1.3	-1.0	-2.3	-1.1	-0.4	BE
BG	0.2	0.8	-1.8	-2.0	9.5	BG
CY	0.0	0.1	-1.5	-0.8	3.7	CY
CZ	-0.5	0.0	-2.3	-1.1	4.9	CZ
DE	-0.9	-0.7	-1.6	-1.3	1.0	DE
DK	-0.2	0.1	-3.2	-0.7	3.8	DK
EE	1.1	1.8	-4.4	0.4	9.4	EE
ES	0.1	0.5	-4.9	0.5	2.4	ES
FI	-2.9	-2.6	-4.7	-2.7	-2.0	FI
FR	3.1	3.4	-0.6	0.8	14.1	FR
GR	3.8	4.6	-2.1	1.0	17.8	GR
HU	2.1	2.1	-0.9	0.0	9.6	HU
IE	-9.0	-8.3	-12.0	-8.7	-5.2	IE
IT	-2.3	-2.2	-3.1	-2.7	-0.5	IT
LT	4.8	6.0	0.3	4.0	12.0	LT
LU	0.7	0.4	-1.1	0.9	0.3	LU
LV	2.7	3.4	-5.7	3.9	6.1	LV
MT	5.8	6.9	-4.5	7.6	8.2	MT
NL	-0.3	-0.1	-2.8	-1.6	5.0	NL
PL	0.9	1.2	0.4	0.8	0.8	PL
PT	0.4	0.6	-3.9	1.0	1.6	PT
RO	-0.4	-0.2	-2.1	-0.3	0.8	RO
SE	-0.7	-0.3	-3.5	-0.1	1.1	SE
SI	2.8	3.4	-1.9	0.9	12.4	SI
SK	-3.4	-3.2	-4.4	-3.7	-2.3	SK
UK	-2.0	-1.4	-3.9	-1.3	-1.1	UK
NO	0.0	0.4	-2.8	0.0	2.5	NO
EU12	0.6	0.9	-1.2	0.1	3.4	EU12
EU15	-0.6	-0.3	-3.0	-1.0	3.1	EU15
EU27	-0.5	-0.1	-2.8	-0.9	3.1	EU27
EA17	-0.3	-0.1	-3.0	-1.0	4.0	EA17

Source: Commission services, EPC.

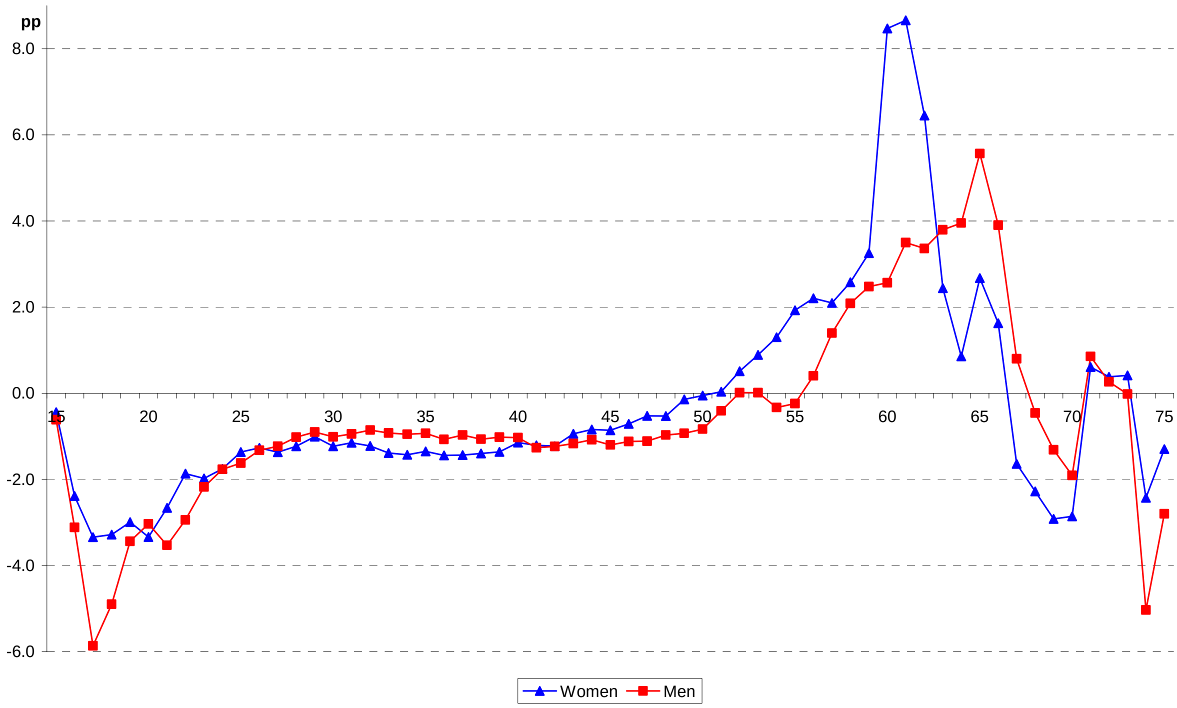
[56] And possibly also further lengthening of schooling.

Graph 2.9 – Revision of participation rates of age group 25-54 in 2060 against the revision of participation rates of age group 15-24 in 2010 (2012 round -2009 round)



Source: Commission services, EPC.

Graph 2.10 – Revision of participation rates age profiles by gender, 2012 round - 2009 round, 2060 (percentage point changes)



Source: Commission services, EPC.

Annex 2.1: Projecting labour force developments using the cohort simulation model (CSM)

Overall approach of the CSM

The CSM calculates entry and exit rates in the labour market by gender and cohort. The methodology was initially developed at the OECD[57], but its implementation in the Ageing Report follows Carone (2005), namely the use of single ages instead of the average of 5-years age groups.

The dynamic cohort approach is based on the estimates of exit and entry rates in the labour market of a "synthetic" generation/cohort. The cohort is "synthetic" because, due to lack of individual longitudinal data on labour market transitions, the same individual cannot be followed over time. Instead, it is assumed that those individuals aged x+1 at year t+1 are representative of the same generation observed in the previous year (aged x at time t). Due to the lack of specific information on each individual's behaviour, this assumption neglects inflows and outflows from the labour market that cancel out.[58]

Participation rate projections are produced by applying the average entry and exit rates observed over the period 2001-2010 by gender and single age to the period 2011-2060. Specifically, average entry rates for the period 2001-2010 are kept constant over the entire projection period. For example, average entry rates for persons aged x, calculated for the period 2001 to 2010 (with x varying between 15 and 74 years of age), are applied to persons aged X over the projection horizon of 2011 to 2060 in order to calculate future participation rates. In this way, the CSM captures "cohort effects", namely the one resulting from the stronger attachment of younger women of latest cohorts to the labour market.

The CSM is also able to incorporate a broad typology of pension reforms, inter alia, increases in the statutory retirement age, the convergence of women's lower statutory retirement age to that of men's, the linking of the statutory retirement age to changes in life expectancy, the tightening of conditions for early retirement, and changes in (price) incentives affecting the retirement decision. The likely impact of pension reforms is incorporated in the labour force projections by appropriately changing average labour market exit probabilities calculated for the period 2001 to 2010.

The calculation of entry rates

Entry rates into the labour market from inactivity are calculated as follows.

The calculation of the number of persons that enter the labour market (coming from inactivity) takes into account the size of each gender/age group. It can be expressed as:

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57 See Burniaux et al. (2003), and Sherer (2002), which developed a dynamic version of Latulippe (1996) methodology.

58 For example, this means that if in year t there are 100 persons aged x in the labour force and next year (when aged x+1) these same individuals leave the labour force (for whatever reason, such as discouragement, having died or emigrated), but they are replaced by other 100 individuals aged x+1, previously out of the labour force, we do not observe any change in the size of our "synthetic" cohort. As a consequence, our calculated net rates of exit and entry are equal to zero, while the actual (gross) value is 100 per cent.

$$NLF_x^{t+1} = (Pop\max_{wa} - LF_x^t) - (Pop\max_{wa} - LF_{x+1}^{t+1})$$

$$\text{where } LF_x^t + NLF_{x+1}^{t+1} \leq Pop\max_{wa}$$

where NLF is the number of people expected to become active between ages x and x+1; Popmax_{wa} is the maximum population in working age that can potentially enter the labour force (which is usually slightly lower than the overall civilian population in working age, due for example to illness/inability) and LF is the number of active persons (in labour force) aged x in year t and aged x+1 in year t+1.

By multiplying and dividing for the population aged x at time t (which is supposed to remain the same as the population aged x+1 at time t+1), the following equation is obtained:

$$NLF_x^{t+1} = [\ (\Pr_{\max} - \Pr_x^t) - (\Pr_{\max} - \Pr_{x+1}^{t+1})\ ] * Pop_x^t$$

where $\Pr_{\max}$ is the upper limit to the participation rate (we assume 0.99 for both male and female[59]). Thus, we can calculate the rate of entry, *Ren* by dividing the number of people expected to become active by the number of people inactive at time t, that is:

$$Ren = \frac{NLF_x^{t+1}}{Pop_{\max_{wa}} - LF_x^t} = [\ (\Pr_{\max} - \Pr_x^t) - (\Pr_{\max} - \Pr_{x+1}^{t+1})\ ] * \frac{Pop_x^t}{Pop_{\max_{wa}} - LF_x^t}$$

which, taking into account that $PR_x^t = \frac{Pop_x^t}{LF_x^t}$ and $\Pr_{\max}= = \frac{Pop\max_{wa\,x}^{\;t}}{Pop_x^t}$ can be reformulated as:

$$Ren_{x+1} = [\ (\Pr_{\max} - \Pr_x^t) - (\Pr_{\max} - \Pr_{x+1}^{t+1})\ ] * \frac{1}{(\Pr_{\max} - \Pr_x^t)}$$

or $\quad Ren_{x+1} = [\ 1 - \frac{(\Pr_{\max} - \Pr_{x+1}^{t+1})}{(\Pr_{\max-}\ \Pr_x^t)}\ ] \geq 0$

or $\quad Ren_{x+1} = \frac{(\Pr_{x+1}^{t+1} - \Pr_x^t)}{(1 - \Pr_x^t)}\ ] \geq 0$ when $\Pr_{max}=1$

And re-arranging we obtain the analytical formulation used for projecting participation rates. Thus, projections of participation rates based on these entry rates are:

$$PR_{x+1}^{t+1} = \mathrm{Re}\,n_{x+1} * (PR\max - PR_x^t) + PR_x^t \rfloor$$

Thus, projections of participation rates for each single-year cohort (x+1) can be calculated by applying the entry rates observed in a given year or period over the period of projections (t=2011-2060). In practical terms, the entry rates for each age has been calculated on the basis of the average of the participation rates observed over the period 2001-2010.

[59] Burniaux et al (2003) used as maximum value for participation rate ($PR_{\max}$) 0.99 for male and 0.95 for female.

The calculation of exit rates

In the same way, when participation rates for two adjacent single-year age groups are falling, we calculate an *exit rate* (that is the net reduction in the labour force relative to the number of people who were initially in the labour force in the same cohort the year before) as follows.

The number of persons that leave the labour market at time t+1 is equivalent to:

$$OP_x^{t+1} = LF_x^t - LF_{x+1}^{t+1}$$

where OP are the number of individual expected to become inactive between age x and x+1, and LF is the number of active persons (in labour force) aged x in year t and aged x+1 in year t+1.

By multiplying and dividing for the population aged x at time t, which is supposed to remain the same as the population aged x+1 at time t+1, we get:

$$OP_x^{t+1} = \left(PR_x^t - PR_{x+1}^{t+1} \right) * Pop_x^t$$

where PR are the participation rates.

Thus, we can calculate the (conditional) rate of exit, R*ex* by dividing the number of people that become inactive at time t+1 by the number of people active at time t, that is,

$$Rex = \frac{OP_x^{t+1}}{LF_x^t} = \left(PR_x^t - PR_{x+1}^{t+1} \right) * \frac{Pop_x^t}{LF_x^t}$$, which can also be re-arranged as:

$$Rex = \frac{OP_x^{t+1}}{LF_x^t} = 1 - \frac{PR_{x+1}^{t+1}}{PR_x^t}$$

Thus, we can use this ***Rex*** to project participation rates of older workers as:

$$PR_{x+1}^{t+1} = (1 - \mathrm{Re}\, x_{x+1}) * PR_x^t \text{ and}$$

$$PR_{x+n}^{t+n} = (1 - \mathrm{Re}\, x_{x+1})(1 - \mathrm{Re}\, x_{x+2})(1 - \mathrm{Re}\, x_{x+3}) * .... * (1 - \mathrm{Re}\, x_{x+n-1}) * PR_x^t$$

Annex 2.2: Estimation of the average exit age from the labour market

Average exit age from the labour force[60]

In order to estimate the "average exit age" (or the effective retirement age) from the labour force, the CSM is used, which is basically a probabilistic model using gender/single year participation rates. The "average exit age" is included in the list of the structural indicators to monitor progress towards Lisbon and Barcelona targets (in particular: "*the progressive increase of about five years in the effective average age at which people stop working in the European Union by 2010"*) and originally applied to five-year age cohort. The methodology is based on the comparison of labour force participation rates over time.

The conditional probability for each person to staying in the labour force at age *a* in year t, (conditional upon staying in the labour force in year t-1), can be calculated using the observed activity rates (Pr) as follows:

Probability to stay = $cProb_{a,t}^{stay} = \frac{\Pr_a^t}{\Pr_{a-1}^{t-1}}$ where $0 \le c\Pr ob_{a,t}^{stay} \le 1$

Thus, at time *t*, the conditional probability for each person to exit at age *a* ($cProb^{ex}_{a,t}$) is simply equal to:

Probability of exit= $cProb_{a,t}^{ex} = 1 - \frac{\Pr_a^t}{\Pr_{a-1}^{t-1}} = 1 - cProb_{a,t}^{stay}$ where $0 \le cProb_{a,t}^{ex} \le 1$

Assuming that nobody retires before the minimum age *m* (e.g. before m=60), the (unconditional) probability that any person will still be in the labour force (that is the probability of not retiring before a given age *a* can be calculated as the product of all the conditional probabilities to stay in the labour force from age *m* to age *a-1*:

Probability of not retiring before = $Prob_{a,t}^{notret} = \prod_{i=m}^{a-1} cProb_i^{stay}$

Thus, the probability of retiring at age *a* can be calculated as the product of the unconditional probability of not retiring from age *m* to *a* and the (conditional) probability of exit, that is:

Probability of retiring = $Prob_{a,t}^{ret} = Prob_{a,t}^{notret} cProb_{a,t}^{ex}$

By assuming that everybody will be retired at a given age *M* (e.g. *M= 74),* the sum of the probability of retiring between the minimum age *m* and the maximum age *M* is equal to 1:

$\sum_{a=m}^{M} \Pr ob_a^{ret} = 1$. The "average exit age" or effective age of retirement from the labour market is then calculated as the weighted sum of the retirement ages (between the minimum and the maximum age of retirement , say 60-74), where the weights are the probability of retiring at each age *a*, as follows:

Average exit age = Aea $= \sum_{a=m}^{M} \Pr ob_a^{ret} * a$

[60] See Carone (2005).

3. Labour productivity and potential GDP

3.1. Background and general approach

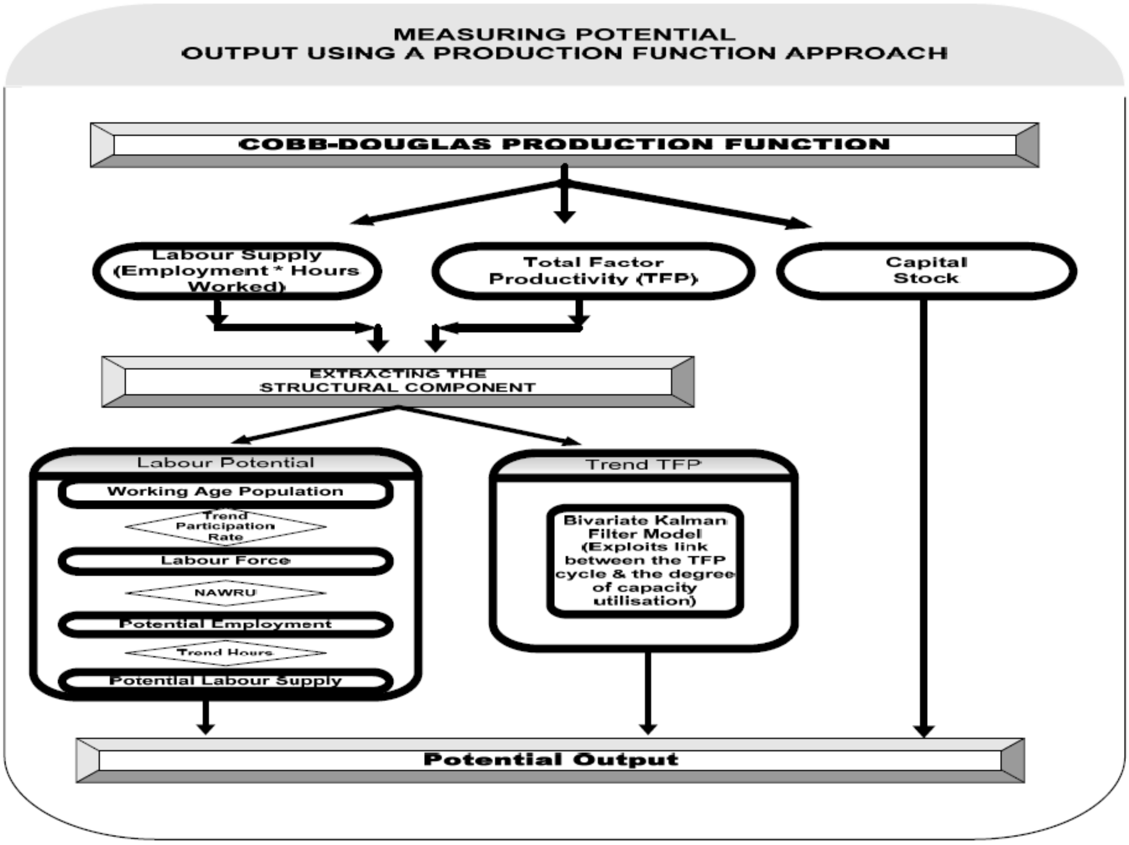
3.1.1. A production function approach for the long-term projection exercise

A production function framework is used in the long-term projection exercise to project long term GDP growth, as it was done in the 2009 Ageing Report. In this framework, demographic projections are crucial for the projection exercise of economic and budgetary developments over the long-term. Indeed, the assumptions used for the population projections have a profound impact on projections for the labour force and thus for economic growth. In addition to assumptions for the population projections, it is necessary to make some specific statistical assumptions regarding long-run developments in each of the growth components. This framework enables looking at the drivers of labour productivity growth (namely total factor productivity and the capital stock per worker) while being fully consistent with the methodology developed by the EPCs Output Gap Working Group (OGWG), and used in the work by other Council committees, notably to assess structural budgetary developments within the framework of the Stability and Growth Pact (SGP).[61] A key assumption for the long-term projection is that on the productivity growth rate: the EPC agreed that all countries should converge to the same total factor productivity growth rate (1%) at the end of the projection period (in 2060).

As in the previous 2009 projection exercise, total hours worked are used as labour input (as opposed to the number of persons employed used in the 2006 Ageing Report), in line with the incorporation of this variable in the production function used by the EPCs Output Gap Working Group (OGWG). In this way, the approaches by the EPCs working groups, the OGWG and the AWG, are fully aligned. Graph 3. 1 illustrates the building blocks of the production function used in the projection. The methodology is described below.

[61] See European Commission (2010), 'Public finances in the EMU' for a discussion on the Stability and Growth Pact.

Graph 3. 1 - Overview of the production function approach



Source: D'Auria et al. (2010).

3.2. Methodology used to project potential output

3.2.1. Description of the production function framework

By using a standard specification of the Cobb-Douglas production with constant returns to scale, potential GDP can be expressed formally as total output represented by a combination of factor inputs multiplied with total factor productivity (TFP), which embeds the technological level.[62]

$$Y = TFP * L^{\beta} * K^{1-\beta} = \left(TFP^{\frac{1}{\beta}} * L \right)^{\beta} * K^{1-\beta} = (E * L)^{\beta} * K^{1-\beta}$$

where:

Y is total output (GDP);

L is the supply of labour (total hours worked);

[62] See D'Auria, F., C. Denis, K. Havik, K. Mc Morrow, C. Planas, R. Raciborski, W. Röger, A. Rossi, 'The production function methodology for calculating potential growth rates and output gaps', European Economy Economic Papers No. 420, 2010.

K is the stock of capital;

E is the labour-augmenting technical progress (i.e. Harrod-neutral technical progress).

$E.L$ is then interpretable as total labour in efficiency units. TFP and the labour-augmenting technical progress are linked with a simple relationship: $TFP = (E)^{\beta}$

β is the labour share, i.e. the share of labour costs in total value-added. It is set at 0.65.[63]

As a result, potential labour productivity growth comes down to the following expression (where Y, L, E and TFP denote potential output, potential labour, trend labour-augmenting technical progress and trend TFP):

$$\dot{\left(\frac{Y}{L}\right)} = \dot{TFP} + (1-\beta)\dot{\left(\frac{K}{L}\right)} = \beta\dot{E} + (1-\beta)\dot{\left(\frac{K}{L}\right)}$$

Thus, the projection of TFP growth and the growth in capital per hour worked, so called *capital deepening*, are the key drivers of projected labour productivity over the medium run.

In the long-run, according to the neo-classical growth model (Solow model), the economy should reach its equilibrium, also called steady state or balanced growth path, where the ratio of capital stock to labour expressed in efficiency unit, K/(L.E), remains constant over time. As a result, the capital stock per hour worked grows at the same pace as labour augmenting technical progress E. Therefore, labour productivity growth (i.e. output per hour worked growth) coincides with TFP growth divided by the labour share:

$$\dot{\left(\frac{Y}{L}\right)} = \dot{\left(\frac{K}{L}\right)} = \dot{E} = \frac{\dot{TFP}}{\beta}$$

It should also be noted that, in the steady state, the contribution of capital deepening to output growth is a simple function of TFP[64], which becomes the single driver of labour productivity.[65]

$$contrib\dot{\left(\frac{K}{L}\right)} = (1-\beta)\dot{\left(\frac{K}{L}\right)} = \frac{(1-\beta)}{\beta}\dot{TFP}$$

[63] Although there is some debate about the recent and observed decline of the labour share, most economists assume that it will remain broadly constant in a long run perspective. The AWG agreed to assume that real wages will grow in line with labour productivity and, thus, the wage share will be constant over the projection period. However, a variation in the short-term up to 2012 was introduced, specifically allowing for a variation in the wage share up to 2012. This simple rule is uniformly applied to all Member States in order to allow for consistent cross-country comparisons of the results. The assumption is also well-founded in economic theory. If the real wage is equal to the marginal productivity of labour, it follows that under the standard features of the production function, real wage growth is equal to labour productivity growth and real unit labour costs remain constant.

[64] With the assumption of a long-run TFP growth rate equivalent to 1% per annum (see section 1.5), this implies a long-run contribution of capital deepening to labour productivity growth equal to 0.5% and hence a labour productivity growth rate of 1.5%.

[65] This in turn implies that, in the long run, the growth rate of the capital stock is set equal to the sum of the growth rate of labour and labour-augmenting technological progress, the so-called “capital rule”.

As all these variables can be influenced by the business cycle in the short term, it is safer to project the potential output, i.e. the output adjusted for cyclical movements in the economy. This requires estimating the trend components for the individual production factors, except for the capital stock, which can only adjust in the long run.

Estimating potential output therefore amounts to removing the cyclical component from both TFP and labour. Trend TFP is obtained using a detrending technique. Potential labour input is the total labour obtained when the unemployment rate equals the structural unemployment rate (NAWRU). It equals *LF*(1-NAWRU)*Hours*, where *LF* stands for total labour force and *Hours* for average hours worked per worker. The potential output denoted Y_P can be expressed in logarithm as the sum (in logarithm) of *trend TFP,* potential labour input weighted by the labour share in total value-added and the total capital stock multiplied by one minus the labour share. More formally, we get:

$$Log(Y_P)=Log(trendTFP)+\beta Log(LF*(1-Nawru)*Hours)+(1-\beta)logK)$$

3.3. Specific assumptions on the components of the production function in the short term (2011-2015)

The production function approach is applied to historical (starting in the mid-1960s) and forecast data. The series have been taken from ECFIN's AMECO databank, and for the years 2011-12 the Commission services spring 2011 forecasts was used and for the years 2013-15 the medium-term extension was used.[66]

3.4. Specific assumptions on the components of the production function in the longer run (2016-2060)

Three principles were adhered to when carrying out the long term projections:

[66] The EPC decided that the long-term projections for the 2012 Ageing Report should take as a starting point for the potential growth projections the spring 2011 forecast by the Commission until 2012, and also to use the extrapolation for the following three years (up to 2015) using the agreed OGWG methodology,. The potential growth estimates using the OGWG methodology includes a medium-term extension (for the years t+3 to t+5) on the basis of a number of assumptions, including transparent ARIMA procedures, specifically: (i) the TFP trend is estimated from the Solow residual by using a bivariate Kalman filter method that exploits the link between the TFP cycle and capacity utilization; (ii) the trend for the NAWRU is estimated according to the following rule: $NAWRU_{t+1} = NAWRU_t + 0.5 * (NAWRU_t - NAWRU_{t-1})$; (iii) the population of working age follows Eurostat's latest demographic projection; (iv) the average hours worked series is extended using an ARIMA process; (v) the investment to potential GDP series is used as an exogenous variable, while investment itself is made endogenous, using an AR process that allows for a constant and a time trend. For a constant investment to GDP ratio, investment responds to potential output with an elasticity equal to one. As regards the NAWRU estimation, it has been shown to exhibit a considerable degree of persistence. Given the recent financial crisis-induced increased of the NAWRU in various countries this rule implies a further increase of the NAWRU in the medium-term.

- First, the need to ensure consistency between the medium term projection based on country-specific trends and the long-run projection based on convergence rules toward the same value of labour productivity at the end of the projection horizon. There is also an overriding constraint to ensure comparability across the EU through the use of a common methodology for all Member States.

- Second, as the cross-country comparability of results entails similar assumptions of productivity at the end of the projection, a key issue is whether this convergence should be achieved in growth rates or levels. While economic theory shows that real convergence is conditional upon crucial parameters such as the savings rate and demographic developments, the empirical literature does not support the idea of absolute convergence in levels between countries.[67] Thus, the AWG decided to continue assuming that there should be convergence in *growth rates* over the long-term projection exercise. However, the GDP level matters as well, through its influence on the convergence speed (see Table 3.2 below).

- Third, there were large differences of opinion regarding the need for strict convergence to the same growth rate of labour productivity in the long-term across countries. On the one hand, it could be argued that a convergence rule is important to ensure comparability of the age-related pension expenditure calculations. On the other hand, it could be reasonable to assume persistent differences also in the very long-term, with these differences reflecting the different starting levels and growth rates of respective countries; different assumptions on convergence in growth rates; and finally the huge diversity in the EU. As a compromise, the EPC-AWG decided that the TFP projections should converge to the same growth rate in the long-term. At the same time, account should be taken of the catching-up potential in Member States with a relatively low income levels by allowing for a certain period of 'fast' convergence.

3.5. The key assumption on Total Factor Productivity developments

In the long run, the growth in labour productivity (output per hour worked) broadly coincides with TFP growth divided by the labour share (set at 0.65). A prudent assumption for TFP would hence be that country-specific TFP growth rates would converge to a long-term historical average TFP growth rate recorded in the EU, of 1%, which represents a slight downward revision of 0.1 pp relatively to the assumption made in the previous round. As a result of this assumption, the growth rate in labour productivity is projected to be 1.5% in the long-term.

The Ageing Working Group held a series of discussions in 2010-11 on the crucial assumptions on productivity growth. Specifically, the relative merits of whether there should be a convergence in productivity growth rate or in productivity levels were discussed at great length. In particular, should one assume that a convergence would actually materialize, and if so, should that convergence be in terms of levels or in the growth rate.

[67] Some exercises were run in the AWG that showed some convergence in levels in past periods but the growth rate needed to allow for this convergence in the projections would not be plausible in the short and medium-term.

As a result of the discussion, it was decided that the speed of convergence to this long-run TFP growth rate is to be determined by the relative income position in the different Member States. Specifically, it was assumed that the lower the GDP per capita at present, the higher the real catching up potential.

Table 3. 1 – Potential GDP per capita (2010)

Country	GDP per capita (PPS)	in % of EU27
LU	56.4	257
NL	28.8	131
SE	28.8	131
IE	28.6	130
AT	28.4	130
FI	27.2	124
DK	26.9	123
BE	26.6	121
UK	26.0	119
DE	25.3	115
FR	24.1	110
EA	23.6	108
IT	22.2	101
EU27	***21.9***	***100***
ES	21.0	96
EL	20.6	94
SI	20.4	93
CY	19.6	89
MT	18.1	82
CZ	17.8	81
PT	16.0	73
SK	15.4	70
EE	13.9	63
PL	13.6	62
HU	13.6	62
LT	13.1	60
LV	11.7	53
BG	9.2	42
RO	8.1	37

Note: This is the potential GDP per capita expressed in 2000 PPS, estimated on the basis of the Commission's spring 2011 forecast.
Source: Commission services, EPC.

As regards the transition to this long-term rate, Member States with per capita GDP higher than the EU average would converge to this long-term growth rate by 2025. Simultaneously, to allow for the catching-up potential (the real convergence process) for countries with below-average per-capita GDP , real convergence would be allowed at a pace that depends inversely on the gap to the "leaders", but not involving an excessive amount of "leapfrogging" (see Table 3.2). The assumptions agreed by the EPC in spring 2011 were as follows:

- the *'leader'* is the group of countries that have a GDP per capita above the EU27 average in 2010. For these countries, TFP growth is assumed to converge to a 1% growth rate by 2025;

- the *'follower'* group of countries are those with GDP per capita below the EU-27 average in 2010. For this group of countries, a differentiation is made depending on the distance to the EU-27 average in 2010, as reported in Table 3. 1.

Table 3. 2 - Assumptions on speed of convergence and criteria for selection

	Countries	Years (from/to)	Values	Years (from/to)	Values	Years (from/to)	Values
"**Leaders**" (per capita GDP higher than the EU average)[68]							
Above 100%	AT, BE, DE, DK, FI, FR, IE, IT, LU, NL, NO, SE, UK	2016 (t+6) to 2025	From value in 2015 (t+5) to 1%, by linear interpolation	2026 to 2040	1%	2041 to 2060	1%
"**Followers**", per capita GDP relative to the EU average							
Between 50% and 100%	CY, CZ, EE, ES, GR, HU, LT, LV, MT, PL, PT, SI, SK	2016 (t+6) to 2030	From value in 2015 (t+5) to $2\% - \frac{GDP_{i,t+5}}{GDP_{eu,t+5}}$, by linear interpolation[69]	2031 to 2040	$2\% - \frac{GDP_{i,t+5}}{GDP_{eu,t+5}}$	2041 to 2060	From $2\% - \frac{GDP_{i,t+5}}{GDP_{eu,t+5}}$ to 1%, by linear interpolation
Below 50%	BG, RO	2016 (t+6) to 2030	From value in 2015 (t+5) to 1½%, by linear interpolation	2031 to 2040	1½%	2041 to 2060	From 1½% to 1%, by linear interpolation

Source: Commission services, EPC.

[68] Potential real per capita GDP expressed in PPS (DG ECFIN spring 2011 Economic Forecasts).

[69] Between 1% and 1½%; where $GDP_{i,t}$ is per capita GDP in country *i* and year *t*, and $GDP_{eu,t}$ is average per capita output in the EU in year *t*.

Originally, this formula was presented as $\frac{1.5\% * \left(1 - \frac{GDP_{i,t+5}}{GDP_{eu,t+5}}\right) + 1\% * \left(\frac{GDP_{i,t+5}}{GDP_{eu,t+5}} - 0.5\right)}{0.5}$, which can be simplified to $2\% - \frac{GDP_{i,t+5}}{GDP_{eu,t+5}}$.

For sake of simplicity, the assumptions on TFP growth are not taking into account specific effects of ageing population, as TFP is supposed to be exogenous. In particular, while rising participation, which is likely to benefit to less skilled workers or those without work experience, may depress TFP, the projected rise in educational attainment can be expected to enhance TFP growth. Likewise, the change in the age structure of working population may weigh down on TFP, given the observed age profile of productivity. Nonetheless, available studies suggest that older workers are not systematically less productive than younger ones, the main factor being the level of education.[70] Some also argue that older workers may be less flexible and more reluctant to innovations and technological changes. Given a great deal of uncertainty attached to this, this dimension has not been included in productivity projections.

3.6. Capital formation

Up to 2015, the so-called "*Investment Rule*" is applied: capital stocks are derived from the ratio of investment to GDP ratio until 2015, taking duly into account depreciation. This scenario may work very well for EU15 Member States also in the medium- and long-term, but would lead to excessively optimistic investment performances in a number of new EU Member States, since it would imply extrapolating forward very high investment rates which are associated with the structural transition process. Moreover, this rule is fine provided that the user's cost of capital remains stable, which should not be the case with a declining economic growth rate associated with ageing. Lastly, this rule may lead to fluctuating capital deepening at the end of the projection horizon, while neoclassical growth model predicts that the capital stock per worker should broadly follow the labour-augmenting technical progress in the long-run.

Therefore, it is assumed in the projections that in the long-run, the capital stocks adjust to the steady state path according to the *"Capital Rule":* the growth rate of the capital stock is set equal to the sum of growth rate of labour and labour augmenting technical progress. As seen in section 3.2, this fulfils the steady state property, as the ratio of capital stock to labour expressed in efficiency unit remains constant over time. Consequently, the labour productivity growth coincides with that of labour-augmenting technical progress.

Nonetheless, this would lead to very sharp shifts in investment rates for a large number of countries in the year in which the rule is introduced. For example, the introduction of the rule in 2016 would result in pessimistic productivity projections for a large number of the catching-up Member States whilst making little difference for those countries which are already close to their long run TFP growth rate.

Therefore, a transition between the investment rule and the capital rule is applied to smooth the profile of investment. The following pattern for capital formation has been used:

- the capital stock dynamics is derived from the investment/GDP ratio until 2015 *("investment rule")*;

70 For a survey of the literature and some estimates of the potential impact of ageing on productivity, see Carone G., Denis C., McMorrow K., Mourre G. and W. Röger (2006) and European Commission (2005).

- the transition to the constant capital/labour (in efficiency units) ratio assumption is introduced gradually in the period 2016-2020 in a linear manner *("transition rule")*;

- the capital/labour (in efficiency units) ratio is constant from 2021 onwards*("capital rule")*.

3.7. Taking account of the cyclical position of the economy in the long-term projections

Over a short-to-medium term horizon, there is a need to take account of the cyclical position of the economy, so as to bridge the current situation and the longer-term prospects. This is of particular importance at the current juncture, where nearly all Member States have large output gaps. In terms of the preparation of the long-term projection exercise, the issue of the cyclical position was highlighted in the work programme for the 2012 long-run budgetary projection exercise. [71] Specifically, *"linking the starting point (base year) with the assumed longer-term potential GDP growth may be considered, by e.g. assuming that a (possible) output gap should be closed over a number of years, country by country"*.

A procedure for closing the output gap so as to better take account of the cyclical position of the EU economies in the short run has been agreed by the AWG and endorsed by the EPC.

In relation to the need to produce actual, as opposed to potential, growth rate projections, the following operational rules will be applied by the AWG for closing the output gap. Firstly, the default rule is that the output gap is closed at the end of the medium term (i.e. 2015 based on the spring 2011 Commission forecast). Secondly, in circumstances where the output gap is small at the end of the short term forecasts (2012), the gap could be closed by 0.5 p.p. a year. Finally, when the output gap is particularly large (i.e. more than double the EU average), a longer period of closure would be allowed, up to a maximum of two additional years. Specifically, on the basis of the spring 2011 forecast, all Member States are assumed to close the output gap in 2015 except Greece, where it is assumed to be closed in 2017.

3.8. Main results of baseline GDP projections

Table 3. 3 to Table 3. 8 present the outcome of the projections for potential growth rates up to 2060 as well as its determinants. In the EU as a whole, the annual average potential GDP growth rate is projected to remain quite stable over the long-term (see Table 3.3). After an average potential growth of 1.5% up to 2020, a slight increase to 1.6% is projected in the period 2021-30 and over the remainder of the projection period up to 2060 a slow down to 1.3% emerges. Over the whole period 2010-2060, output growth

[71] See 'Work programme for the 2012 long-run budgetary projection exercise', ECFIN/EPC/2010//46671-REV, 05/03/2010, adopted by the EPC on 4 March 2010.

rates in the euro area are very close to those in the EU27 (though consistently lower by about 0.1 percentage point), as the former represents more than 2/3 of the EU27 total output. Notwithstanding this, the potential growth rate in the euro area is projected to be slightly lower than for the EU27 throughout the projection period.

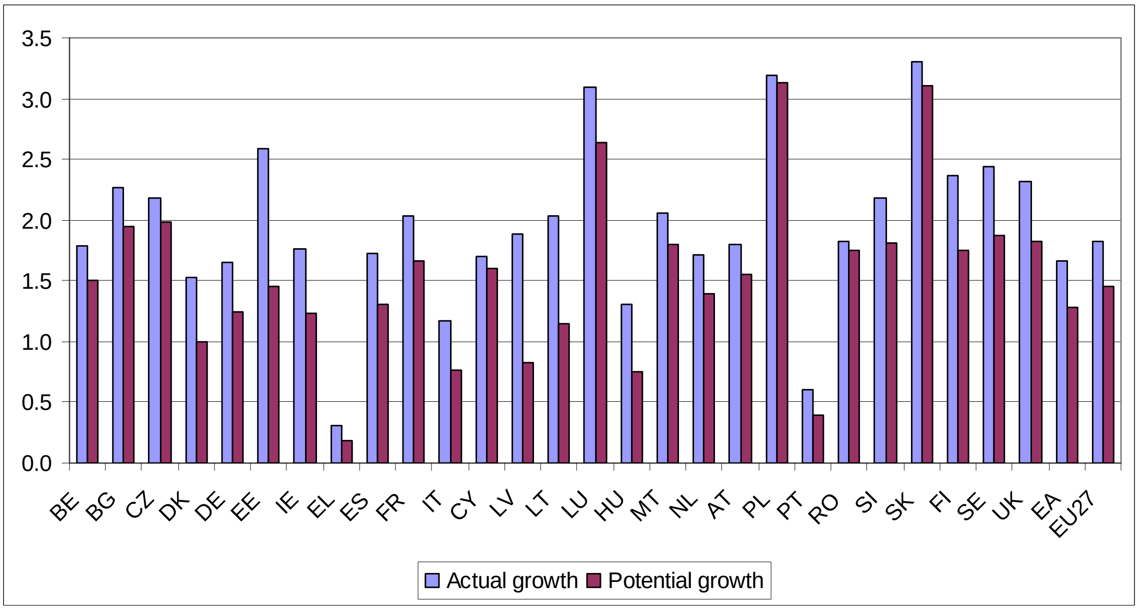
Table 3. 3 - Projected potential growth rates (annual average growth rates)

Country	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*
BE	1.5	1.5	1.7	1.7	1.7	*1.6*
BG	1.9	1.3	1.4	0.9	0.9	*1.3*
CZ	2.0	1.7	1.6	1.3	1.1	*1.5*
DK	1.0	1.5	1.5	1.7	1.6	*1.4*
DE	1.2	0.7	0.6	0.8	0.8	*0.8*
EE	1.4	2.2	1.8	1.1	0.9	*1.5*
IE	1.2	3.2	2.2	1.7	2.2	*2.1*
EL	0.2	1.2	1.2	1.1	1.3	*1.0*
ES	1.3	2.6	1.5	1.1	1.4	*1.6*
FR	1.7	1.8	1.6	1.6	1.6	*1.7*
IT	0.8	1.4	1.2	1.3	1.4	*1.2*
CY	1.6	2.0	2.3	1.8	1.5	*1.8*
LV	0.8	2.3	1.5	0.7	0.5	*1.1*
LT	1.1	1.8	1.7	1.2	0.7	*1.3*
LU	2.6	1.8	1.8	1.7	1.7	*1.9*
HU	0.8	1.8	1.4	1.0	0.9	*1.2*
MT	1.8	1.9	1.7	1.1	0.8	*1.4*
NL	1.4	1.1	1.2	1.4	1.3	*1.3*
AT	1.6	1.3	1.4	1.4	1.3	*1.4*
PL	3.1	1.7	1.4	0.8	0.6	*1.5*
PT	0.4	1.9	1.5	1.2	1.1	*1.2*
RO	1.7	1.3	1.2	0.7	0.5	*1.1*
SI	1.8	1.5	1.2	0.9	1.1	*1.3*
SK	3.1	2.3	1.2	0.7	0.8	*1.6*
FI	1.7	1.4	1.6	1.5	1.4	*1.5*
SE	1.9	1.8	1.8	1.7	1.6	*1.8*
UK	1.8	1.9	1.9	1.9	1.7	*1.9*
NO	2.4	1.9	1.8	1.8	1.7	*1.9*
EA	1.3	1.5	1.2	1.2	1.3	*1.3*
EU27	1.5	1.6	1.4	1.3	1.3	*1.4*

Note: For Ireland, Greece and Portugal, the potential GDP projections do not incorporate the impact of the measures that are envisaged to be implemented under the economic adjustment programmes agreed with the EU-IMF-ECB.
Source: Commission services, EPC.

Taking account of the negative output gaps prevailing in the EU Member States, GDP growth is assumed to be higher than the potential growth rates until the output gap is closed (in 2015, see section 3.7). For the EU as a whole and the euro area, GDP growth is assumed to be 0.4 p.p. higher than the potential growth rates over the period 2010-2020. There are however significant differences across Member States (see Graph 3.2).

Graph 3. 2 - Actual and potential GDP growth (2010-2020)



Source: Commission services, EPC.

For the EU27, labour productivity growth is projected to increase in the period to the 2020s and remain fairly stable at around 1 ½ % thereafter throughout the projection period (see Table 3.4). The small increase in the period up to 2040s is due to the assumed higher productivity growth in the MSs assumed to have a catching-up potential. Eventually, in 2060, all MSs are assumed to reach the same productivity growth of 1.5%. Since the starting point of productivity growth in the euro area is below the assumed long-term EU average of 1 ½ % annual growth, this leads to a higher assumed increase in productivity growth up to the 2030s.

Table 3. 4 - Determinants of potential growth: labour productivity per hour (annual average growth rates)

Country	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*
BE	1.0	1.5	1.5	1.5	1.5	*1.4*
BG	2.9	2.3	2.3	2.1	1.7	*2.3*
CZ	2.2	1.9	1.8	1.8	1.6	*1.9*
DK	1.1	1.5	1.5	1.5	1.5	*1.4*
DE	1.2	1.5	1.5	1.5	1.5	*1.5*
EE	2.5	2.1	2.1	2.0	1.7	*2.1*
IE	1.9	1.6	1.5	1.5	1.5	*1.6*
EL	-0.2	1.2	1.6	1.6	1.6	*1.1*
ES	1.0	1.2	1.6	1.6	1.6	*1.4*
FR	1.3	1.5	1.5	1.5	1.5	*1.5*
IT	0.4	1.4	1.5	1.5	1.5	*1.3*
CY	0.8	1.3	1.7	1.7	1.6	*1.4*
LV	2.5	2.1	2.3	2.1	1.7	*2.1*
LT	2.0	1.9	2.2	2.0	1.7	*1.9*
LU	1.4	1.5	1.5	1.5	1.5	*1.5*
HU	1.1	1.6	2.1	2.0	1.7	*1.7*
MT	1.5	1.7	1.8	1.7	1.6	*1.7*
NL	1.3	1.5	1.5	1.5	1.5	*1.5*
AT	1.4	1.5	1.5	1.5	1.5	*1.5*
PL	2.8	2.2	2.1	2.0	1.7	*2.2*
PT	0.3	1.5	2.0	1.8	1.6	*1.4*
RO	2.3	2.1	2.3	2.1	1.7	*2.1*
SI	1.8	1.5	1.7	1.6	1.6	*1.6*
SK	3.3	2.3	2.0	1.9	1.6	*2.3*
FI	2.0	1.6	1.5	1.5	1.5	*1.7*
SE	1.4	1.5	1.5	1.5	1.5	*1.5*
UK	1.7	1.6	1.5	1.5	1.5	*1.6*
NO	1.8	1.6	1.5	1.5	1.5	*1.6*
EA	1.1	1.4	1.6	1.6	1.5	*1.4*
EU27	1.3	1.6	1.6	1.6	1.6	*1.5*

Source: Commission services, EPC.

Labour input – total hours worked - in the EU and in the euro area is projected to be positive up to the late 2020s. Thereafter, the projected demographic changes, with a reduction in the size of the labour force stemming from the decline in the working-age population, are projected to lead to negative labour growth for the remainder of the projection period up to 2060. Hence, labour will act as a drag on growth in both the EU and the euro area, and most Member States, from 2030 onwards. The only exceptions are Belgium, Ireland, Spain, France, Cyprus, Luxembourg (thanks to cross-border workers), Sweden, and the United Kingdom.

Table 3. 5 - Determinants of potential growth: total hours worked (annual average growth rates)

Country	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*
BE	0.5	0.0	0.2	0.2	0.2	*0.2*
BG	-0.9	-1.0	-0.9	-1.2	-0.8	*-1.0*
CZ	-0.2	-0.2	-0.3	-0.5	-0.5	*-0.3*
DK	-0.1	0.0	-0.1	0.2	0.0	*0.0*
DE	0.0	-0.8	-0.9	-0.7	-0.8	*-0.6*
EE	-1.0	0.1	-0.3	-0.8	-0.7	*-0.6*
IE	-0.6	1.6	0.6	0.2	0.7	*0.5*
EL	0.4	0.0	-0.4	-0.5	-0.2	*-0.1*
ES	0.3	1.4	-0.1	-0.5	-0.1	*0.2*
FR	0.3	0.3	0.1	0.0	0.1	*0.2*
IT	0.3	0.0	-0.3	-0.2	-0.1	*-0.1*
CY	0.8	0.7	0.6	0.1	-0.1	*0.4*
LV	-1.6	0.2	-0.8	-1.4	-1.2	*-1.0*
LT	-0.8	-0.1	-0.5	-0.8	-1.0	*-0.7*
LU	1.2	0.3	0.2	0.2	0.1	*0.4*
HU	-0.4	0.2	-0.7	-1.0	-0.8	*-0.5*
MT	0.2	0.2	-0.2	-0.7	-0.8	*-0.2*
NL	0.0	-0.4	-0.3	-0.1	-0.2	*-0.2*
AT	0.1	-0.2	-0.1	-0.2	-0.3	*-0.1*
PL	0.4	-0.6	-0.8	-1.2	-1.1	*-0.6*
PT	0.0	0.4	-0.4	-0.6	-0.5	*-0.2*
RO	-0.5	-0.8	-1.1	-1.4	-1.2	*-1.0*
SI	0.0	0.0	-0.4	-0.7	-0.5	*-0.3*
SK	-0.2	0.0	-0.8	-1.2	-0.9	*-0.6*
FI	-0.3	-0.2	0.0	-0.1	-0.1	*-0.1*
SE	0.5	0.2	0.3	0.2	0.0	*0.2*
UK	0.1	0.3	0.4	0.4	0.2	*0.3*
NO	0.8	0.3	0.3	0.3	0.2	*0.4*
EA	0.2	0.1	-0.3	-0.3	-0.2	*-0.1*
EU27	0.1	0.0	-0.3	-0.3	-0.3	*-0.2*

Source: Commission services, EPC.

Table 3.6 and Table 3.7 show the contribution of the main determinants of labour productivity (per hour worked), i.e. TFP growth and capital deepening. Trends in TFP growth explains most of productivity growth per hour worked. The increase in TFP growth in the EU as a whole follows from the assumption that countries with a catching up potential are assumed to experience a period of higher TFP growth during the projection period, primarily between 2030 to 2040 (see Section 3.5). This follows from the fact that in the long-run, the capital deepening contribution follows TFP growth (times the labour share). By assumption, TFP growth converges toward the rate of 1% by 2060 for all Member States. Given the use of the “capital rule”, this implies a labour productivity growth rate of 1 ½ % for all Member States in 2060.

For the countries with a relatively low GDP per capita (see Section 3.6), the capital deepening contribution is very high in the first part of the projection period, reflecting the assumed catching-up process of converging economies. Then, the contribution gradually declines to the steady state value of 0.5 p.p., as the growth in the capital stock adjusts to growth in hours worked.

Table 3. 6 - Determinants of labour productivity: Total Factor Productivity (annual average growth rates)

Country	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*
BE	0.7	1.0	1.0	1.0	1.0	*0.9*
BG	1.3	1.5	1.5	1.4	1.1	*1.4*
CZ	1.3	1.2	1.2	1.1	1.0	*1.2*
DK	0.6	1.0	1.0	1.0	1.0	*0.9*
DE	0.7	1.0	1.0	1.0	1.0	*0.9*
EE	1.1	1.4	1.4	1.3	1.1	*1.2*
IE	1.1	1.0	1.0	1.0	1.0	*1.0*
EL	0.1	0.8	1.1	1.0	1.0	*0.8*
ES	0.2	0.8	1.0	1.0	1.0	*0.8*
FR	0.8	1.0	1.0	1.0	1.0	*0.9*
IT	0.2	0.9	1.0	1.0	1.0	*0.8*
CY	0.2	0.8	1.1	1.1	1.0	*0.8*
LV	1.0	1.4	1.5	1.3	1.1	*1.2*
LT	0.7	1.2	1.4	1.3	1.1	*1.1*
LU	0.7	1.0	1.0	1.0	1.0	*0.9*
HU	0.2	1.0	1.4	1.3	1.1	*1.0*
MT	1.0	1.1	1.2	1.1	1.0	*1.1*
NL	0.9	1.0	1.0	1.0	1.0	*1.0*
AT	0.9	1.0	1.0	1.0	1.0	*1.0*
PL	1.5	1.4	1.4	1.3	1.1	*1.3*
PT	0.2	1.0	1.3	1.2	1.1	*0.9*
RO	1.0	1.4	1.5	1.4	1.1	*1.3*
SI	0.8	1.0	1.1	1.1	1.0	*1.0*
SK	2.0	1.5	1.3	1.2	1.1	*1.4*
FI	1.4	1.1	1.0	1.0	1.0	*1.1*
SE	0.9	1.0	1.0	1.0	1.0	*1.0*
UK	1.1	1.0	1.0	1.0	1.0	*1.0*
NO	1.2	1.0	1.0	1.0	1.0	*1.1*
EA	0.6	0.9	1.0	1.0	1.0	*0.9*
EU27	0.7	1.0	1.1	1.0	1.0	*1.0*

Source: Commission services, EPC.

Table 3. 7 - Determinants of labour productivity: capital deepening

Country	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*
BE	0.4	0.5	0.5	0.5	0.5	*0.5*
BG	1.5	0.8	0.8	0.7	0.6	*0.9*
CZ	0.9	0.7	0.6	0.6	0.6	*0.7*
DK	0.4	0.5	0.5	0.5	0.5	*0.5*
DE	0.5	0.5	0.5	0.5	0.5	*0.5*
EE	1.4	0.7	0.7	0.7	0.6	*0.8*
IE	0.8	0.5	0.5	0.5	0.5	*0.6*
EL	-0.3	0.4	0.6	0.6	0.5	*0.3*
ES	0.8	0.4	0.6	0.6	0.5	*0.6*
FR	0.6	0.5	0.5	0.5	0.5	*0.5*
IT	0.2	0.5	0.5	0.5	0.5	*0.5*
CY	0.5	0.4	0.6	0.6	0.6	*0.5*
LV	1.5	0.7	0.8	0.7	0.6	*0.9*
LT	1.3	0.7	0.8	0.7	0.6	*0.8*
LU	0.7	0.5	0.5	0.5	0.5	*0.6*
HU	0.9	0.6	0.7	0.7	0.6	*0.7*
MT	0.5	0.6	0.6	0.6	0.6	*0.6*
NL	0.5	0.5	0.5	0.5	0.5	*0.5*
AT	0.5	0.5	0.5	0.5	0.5	*0.5*
PL	1.3	0.8	0.7	0.7	0.6	*0.8*
PT	0.2	0.5	0.7	0.6	0.6	*0.5*
RO	1.2	0.7	0.8	0.7	0.6	*0.8*
SI	1.0	0.5	0.6	0.6	0.5	*0.7*
SK	1.3	0.8	0.7	0.7	0.6	*0.8*
FI	0.6	0.6	0.5	0.5	0.5	*0.6*
SE	0.5	0.5	0.5	0.5	0.5	*0.5*
UK	0.6	0.5	0.5	0.5	0.5	*0.6*
NO	0.5	0.6	0.5	0.5	0.5	*0.5*
EA	0.5	0.5	0.6	0.6	0.5	*0.5*
EU27	0.6	0.6	0.6	0.6	0.6	*0.6*

Source: Commission services, EPC.

Table 3.8 presents the projections for GDP per capita growth rates over the period 2010-2060. As expected, following the projected increase in output per capita in both the EU27 and the euro area up to the late 2030s, the projected per capita growth is somewhat higher than the projected potential output growth, since total population is projected to become smaller from that point onwards.

Table 3. 8 - Projected GDP per capita growth rates (period averages)

Country	GDP per capita growth rate						GDP per capita (PPP)	
	2010-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2010-2060*	2010	2060
BE	1.0	1.0	1.3	1.4	1.5	*1.2*	26.6	48.4
BG	2.5	2.1	2.0	1.5	1.6	*1.9*	9.2	24.1
CZ	1.7	1.7	1.7	1.3	1.3	*1.6*	17.8	38.3
DK	0.6	1.2	1.3	1.6	1.5	*1.2*	26.9	50.7
DE	1.4	1.0	1.0	1.4	1.4	*1.3*	25.3	47.2
EE	1.6	2.5	2.1	1.4	1.3	*1.8*	13.9	34.1
IE	0.5	2.3	1.3	1.0	1.7	*1.3*	28.6	56.9
EL	-0.3	1.2	1.2	1.1	1.6	*0.9*	20.6	34.3
ES	0.9	2.2	1.1	0.9	1.5	*1.3*	21.0	40.8
FR	1.0	1.4	1.3	1.5	1.5	*1.4*	24.1	48.2
IT	0.3	1.2	1.0	1.3	1.6	*1.1*	22.2	38.3
CY	0.2	1.1	1.7	1.3	1.1	*1.0*	19.6	34.3
LV	1.4	2.9	2.1	1.3	1.2	*1.8*	11.7	28.5
LT	1.6	2.2	2.1	1.6	1.2	*1.7*	13.1	31.2
LU	1.2	1.0	1.1	1.2	1.3	*1.2*	56.4	101.6
HU	0.7	2.0	1.7	1.3	1.2	*1.4*	13.6	27.6
MT	1.8	1.9	1.9	1.3	1.0	*1.6*	18.1	39.6
NL	0.9	0.9	1.2	1.5	1.5	*1.2*	28.8	53.3
AT	1.2	1.0	1.3	1.4	1.4	*1.3*	28.4	53.7
PL	2.9	1.9	1.8	1.2	1.1	*1.8*	13.6	33.0
PT	0.3	1.8	1.6	1.4	1.4	*1.3*	16.0	30.7
RO	2.0	1.7	1.6	1.2	1.2	*1.5*	8.1	17.2
SI	1.4	1.5	1.3	1.1	1.4	*1.3*	20.4	39.1
SK	2.8	2.3	1.4	1.0	1.2	*1.8*	15.4	36.3
FI	1.3	1.2	1.5	1.5	1.4	*1.4*	27.2	54.0
SE	1.1	1.3	1.5	1.4	1.3	*1.3*	28.8	55.7
UK	1.0	1.3	1.5	1.5	1.4	*1.4*	26.0	51.9
NO	1.3	1.1	1.3	1.4	1.4	*1.3*	28.6	54.9
EA17	1.0	1.3	1.2	1.3	1.5	*1.2*	23.6	44.4
EU27	1.1	1.4	1.3	1.4	1.5	*1.4*	21.9	43.5

Source: Commission services, EPC.

3.9. Cross-country differences

While almost all EU Member States are projected to experience a more or less marked slowdown in their potential growth rates in the future, owing to the adverse impact of demographic developments, growth rates differ substantially from country to country, as shown in Table 3.3. In the first half of the projection period, productivity growth is the main source of discrepancy across countries, reflecting different productivity growth rates at the outset of the projection and the assumed differentiated paths of productivity growth, reflecting the catching-up potential. In the latter part of the projection period, developments in labour input have a more dominant role, primarily due to different demographic developments and the assumptions made on productivity growth rate convergence.

3.10. Sources of growth

The sources of GDP growth will alter dramatically. Labour will make a positive contribution to growth in both the EU and the euro area up to the 2020s, but turn significantly negative thereafter (see Table 3.5). Over time, productivity will become the dominant source of growth.

Table 3. 9 - Decomposition of potential GDP growth, 2010-2060

		Due to:								
	GDP growth in 2010-2060	***Labour productivity*** *(GDP per hour worked)*	*TFP*	*Capital deepening*	***Labour input***	*Total population*	*Employment rate*	*Share of Working age population*	*change in average hours worked*	**GDP per capita growth in 2010-2060**
Country	**1=2+5**	**2=3+4**	*3*	*4*	**5=6+7+8+9**	*6*	*7*	*8*	*9*	**10=1-6**
BE	**1.63**	**1.42**	0.9	0.5	**0.22**	0.4	-0.1	-0.1	0.01	**1.24**
BG	**1.32**	**2.27**	1.4	0.9	**-0.95**	-0.6	0.0	-0.3	-0.01	**1.94**
CZ	**1.55**	**1.87**	1.2	0.7	**-0.32**	0.0	0.0	-0.3	0.01	**1.56**
DK	**1.45**	**1.43**	0.9	0.5	**0.02**	0.2	0.0	-0.1	0.01	**1.25**
DE	**0.84**	**1.46**	0.9	0.5	**-0.62**	-0.4	0.1	-0.3	-0.02	**1.25**
EE	**1.50**	**2.07**	1.2	0.8	**-0.57**	-0.3	-0.1	-0.2	0.03	**1.76**
IE	**2.10**	**1.62**	1.0	0.6	**0.48**	0.8	-0.1	-0.2	-0.04	**1.34**
EL	**1.00**	**1.13**	0.8	0.3	**-0.13**	0.1	0.0	-0.3	0.03	**0.93**
ES	**1.58**	**1.38**	0.8	0.6	**0.20**	0.3	0.2	-0.3	0.01	**1.32**
FR	**1.65**	**1.49**	0.9	0.5	**0.17**	0.3	0.0	-0.1	-0.01	**1.36**
IT	**1.22**	**1.27**	0.8	0.5	**-0.05**	0.2	0.0	-0.2	0.01	**1.06**
CY	**1.83**	**1.38**	0.8	0.5	**0.45**	0.8	-0.2	-0.2	0.03	**1.05**
LV	**1.14**	**2.13**	1.2	0.9	**-0.99**	-0.6	0.0	-0.3	-0.08	**1.75**
LT	**1.29**	**1.95**	1.1	0.8	**-0.66**	-0.4	-0.1	-0.2	0.14	**1.74**
LU	**1.93**	**1.50**	0.9	0.6	**0.43**	0.8	-0.1	-0.2	-0.07	**1.16**
HU	**1.16**	**1.69**	1.0	0.7	**-0.53**	-0.2	0.0	-0.2	-0.02	**1.37**
MT	**1.45**	**1.69**	1.1	0.6	**-0.24**	-0.1	0.2	-0.2	-0.07	**1.59**
NL	**1.29**	**1.49**	1.0	0.5	**-0.21**	0.1	-0.1	-0.2	-0.03	**1.21**
AT	**1.39**	**1.52**	1.0	0.5	**-0.13**	0.1	0.0	-0.2	-0.04	**1.26**
PL	**1.52**	**2.16**	1.3	0.8	**-0.64**	-0.3	-0.1	-0.3	-0.01	**1.78**
PT	**1.21**	**1.43**	0.9	0.5	**-0.22**	-0.1	0.0	-0.2	0.04	**1.28**
RO	**1.10**	**2.11**	1.3	0.8	**-1.00**	-0.4	-0.3	-0.3	0.01	**1.53**
SI	**1.32**	**1.64**	1.0	0.7	**-0.32**	0.0	0.0	-0.3	0.01	**1.31**
SK	**1.64**	**2.26**	1.4	0.8	**-0.62**	-0.1	-0.2	-0.3	0.00	**1.75**
FI	**1.53**	**1.65**	1.1	0.6	**-0.13**	0.2	-0.1	-0.2	0.00	**1.37**
SE	**1.75**	**1.51**	1.0	0.5	**0.24**	0.4	0.0	-0.2	0.02	**1.32**
UK	**1.86**	**1.58**	1.0	0.6	**0.28**	0.5	0.0	-0.2	-0.03	**1.36**
NO	**1.96**	**1.59**	1.1	0.5	**0.37**	0.6	-0.1	-0.1	0.00	**1.35**
EA	**1.32**	**1.43**	0.9	0.5	**-0.11**	0.1	0.0	-0.2	0.01	**1.25**
EU27	**1.39**	**1.54**	1.0	0.6	**-0.15**	0.1	0.1	-0.2	-0.07	**1.31**

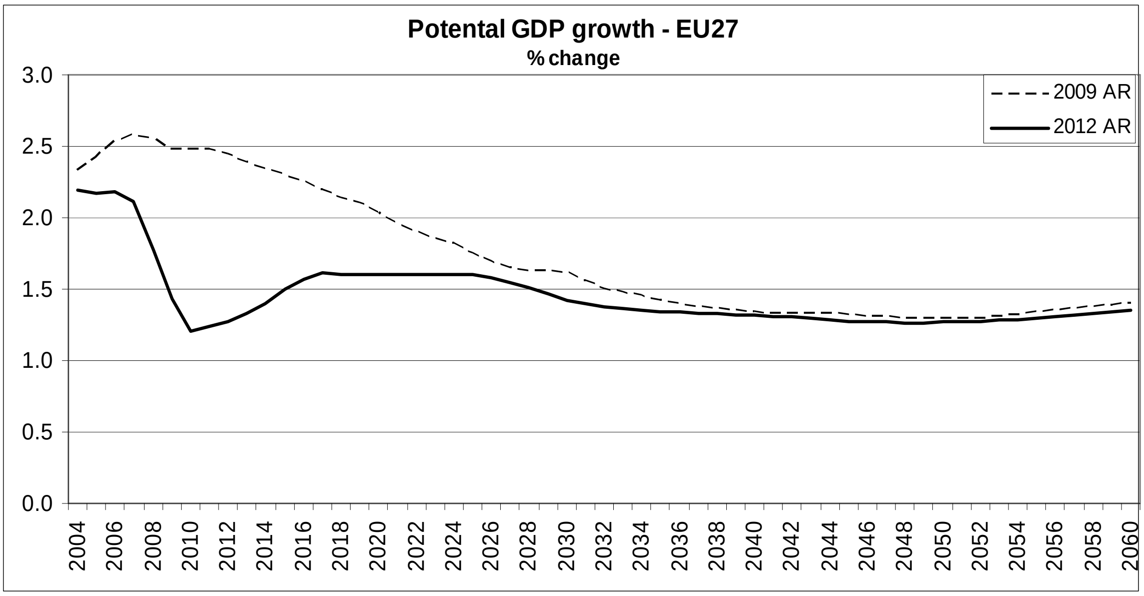
Source: Commission services, EPC.

In order to assess the relative contribution to GDP growth of its two main components, labour productivity and labour utilisation, the standard growth accounting framework is shown in Table 3.9. For the EU and for the euro area, a slight increase in the size of the total population over the entire projection period makes a positive contribution to average potential GDP growth. However, this is more than offset by a decline in the share of the working-age population, which is a negative drag on growth (by an annual average of -0.2 percentage points). As a result, labour input contributes negatively to output growth on average over the projection period (by 0.15 p.p. and 0.1 p.p., respectively in the EU and in the euro area). Hence, labour productivity growth becomes the sole source for potential output growth in both the EU and the euro area.

3.11. Comparison with the previous 2009 long-term budgetary projection exercise

Following the largest economic crisis in many decades, potential GDP growth has been revised downwards in 2009 and the surrounding years, compared with the baseline projection in the 2009 Ageing Report (see Graph 3.3). The current projections indicate that potential growth in the EU as a whole should only gradually approach the growth rates projected in 2009 before the crisis.

Graph 3. 3 - Potential GDP growth compared



Source: Commission services, EPC.

Table 3.10 shows a comparison between the current projection of potential GDP growth and its components and the projection in the 2009 exercise. Annual average potential GDP growth over the period 2010-2060 in the EU27 is projected to be 1.4%, compared with 1.6% in the 2009 projection. A similar picture emerges for the euro area (with slightly lower potential growth of 1.3% currently being projected, i.e. 0.3 p.p. lower compared with the projection in the 2009 Ageing Report). The lower average potential growth rate in the EU can mainly be attributed to the new assumption of convergence to a labour productivity growth rate of 1.5%, compared with an assumption of 1.7% in the 2009 Ageing Report. As regards labour input, although there are differences between Member States, the different trends cancel out at the EU aggregate level. This entails that the projected labour input trends on average over the entire projection period do not change in the current projection compared with the 2009 Ageing Report.

Table 3. 10 - 2012 and 2009 projections compared, 2010-2060 (% points)

	GDP growth in 2010-2060	Due to growth in: *Productivity* (GDP per hour worked)	*TFP*	*Capital deepening*	***Labour input***	*Total population*	*Employment rate*	*Share of Working age population*	*change in average hours worked*	GDP per capita growth in 2010-2060
Country	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	**-0.18**	**-0.28**	-0.2	-0.1	**0.10**	0.1	-0.1	0.1	0.02	**-0.30**
BG	**-0.30**	**-0.37**	-0.1	-0.3	**0.07**	0.0	0.0	0.0	-0.01	**-0.32**
CZ	**-0.03**	**-0.23**	-0.1	-0.1	**0.20**	0.2	-0.1	0.1	0.02	**-0.19**
DK	**-0.27**	**-0.29**	-0.2	-0.1	**0.02**	0.0	-0.1	0.0	0.02	**-0.32**
DE	**-0.36**	**-0.23**	-0.2	-0.1	**-0.14**	-0.1	0.0	0.0	0.00	**-0.24**
EE	**-0.28**	**-0.42**	-0.2	-0.2	**0.14**	0.1	0.0	0.0	0.03	**-0.34**
IE	**-0.21**	**-0.11**	-0.1	0.0	**-0.10**	0.0	-0.1	0.1	-0.04	**-0.18**
EL	**-0.65**	**-0.83**	-0.4	-0.4	**0.18**	0.1	0.0	0.0	0.04	**-0.74**
ES	**-0.26**	**-0.47**	-0.4	-0.1	**0.21**	0.0	0.1	0.1	0.03	**-0.28**
FR	**-0.18**	**-0.21**	-0.1	-0.1	**0.03**	0.0	0.0	0.0	-0.01	**-0.19**
IT	**-0.22**	**-0.34**	-0.3	-0.1	**0.13**	0.2	-0.1	0.0	0.01	**-0.39**
CY	**-0.87**	**-0.55**	-0.4	-0.2	**-0.32**	-0.2	-0.2	0.1	0.03	**-0.68**
LV	**-0.27**	**-0.37**	-0.2	-0.2	**0.10**	0.0	0.1	0.1	-0.08	**-0.24**
LT	**-0.16**	**-0.50**	-0.3	-0.2	**0.34**	0.1	0.0	0.1	0.14	**-0.25**
LU	**-0.62**	**-0.25**	-0.2	-0.1	**-0.37**	0.0	-0.3	0.0	-0.07	**-0.59**
HU	**-0.51**	**-0.53**	-0.4	-0.1	**0.03**	0.1	-0.1	0.1	-0.02	**-0.57**
MT	**-0.17**	**-0.24**	-0.1	-0.1	**0.07**	-0.1	0.2	0.1	-0.06	**-0.07**
NL	**-0.20**	**-0.22**	-0.1	-0.1	**0.02**	0.1	-0.1	0.0	-0.01	**-0.26**
AT	**-0.24**	**-0.19**	-0.1	-0.1	**-0.06**	0.0	-0.1	0.1	-0.03	**-0.22**
PL	**0.04**	**-0.17**	0.0	-0.2	**0.22**	0.1	0.0	0.1	0.00	**-0.09**
PT	**-0.62**	**-0.50**	-0.3	-0.2	**-0.12**	-0.2	0.0	0.0	0.06	**-0.45**
RO	**-0.67**	**-0.61**	-0.3	-0.3	**-0.05**	0.0	-0.2	0.1	0.02	**-0.69**
SI	**-0.10**	**-0.51**	-0.3	-0.2	**0.41**	0.3	0.0	0.1	0.03	**-0.37**
SK	**-0.07**	**-0.14**	-0.1	-0.1	**0.07**	0.2	-0.3	0.1	0.01	**-0.29**
FI	**-0.10**	**-0.13**	0.0	-0.1	**0.03**	0.1	-0.1	0.0	0.00	**-0.22**
SE	**-0.13**	**-0.21**	-0.1	-0.1	**0.08**	0.1	-0.1	0.0	0.02	**-0.24**
UK	**-0.21**	**-0.17**	-0.1	-0.1	**-0.04**	0.1	-0.1	0.0	-0.02	**-0.29**
NO	**0.09**	**-0.09**	0.0	0.0	**0.18**	0.2	0.0	0.0	0.01	**-0.07**
EA	**-0.26**	**-0.30**	-0.2	-0.1	**0.04**	0.0	0.0	0.0	0.01	**-0.29**
EU27	**-0.24**	**-0.28**	-0.2	-0.1	**0.04**	0.0	0.0	0.0	-0.04	**-0.29**

Source: Commission services, EPC.

4. Interest rates

4.1. Background

In the 2009 projection exercise, the European Commission and the EPC decided:

- to assume a constant real interest rate in the baseline scenario with a prudent value of 3.0% over the entire projection period;[72] [73]

- to run a sensitivity test on the interest rate (see chapter 5).

Real interest rates: long-term developments

While interest rate developments have not been stable over time, rates have been close to 3% in most European countries and the US over the long term. Over the last forty years (1969-2009), average real interest rates have ranged from around 2.4% to 3.7% in most EU countries and the US. As shown in Table 4. 1, average rates were 3.7% in Belgium and Germany, between 3 and 3.4% in Austria, Finland, France and the Netherlands, and below 3% in Ireland, Italy, Sweden and the UK. Over the same time interval an average rate of 3% was reported for the US.

Table 4. 1 - Average real long-term interest rates (1969-2009)

1969-2009	AT	BE	DE	DK	FI	FR	IE	IT	NL	SE	UK	US
Real interest rate	3.4	3.7	3.7	4.6	3.1	3	2.6	1.8	3.2	2.8	2.4	3

Source: Ameco database.

Note: the real long-term interest rate corresponds to an aggregate measure of government bond yields (generally 10-year maturity), deflated using the GDP deflator.
Data for Western Germany until 1991; data for IE from 1971.

[72] For technical reasons some countries needed to introduce an assumption on inflation into their models, and in this event the EPC agreed that it should be 2% for all countries. Hence, the nominal long-term interest rate was 5%.

[73] It was also agreed that the same 3% assumption would apply to the discount rate to be used over the whole projection period in the context of sustainability assessments, and that the real rate of return on funded pensions should be equal to 3% for all Member States. The assumption on administrative costs is aligned to that made by the SPC and its Ageing Sub-Group. The 3% rate of return on funded pensions is therefore net of administrative costs (0.5%). In their ongoing work, the SPC further assumes an interest rate to calculate the annuity that is 0.8% lower than the assumed rate used during the accumulation phase in order to account for the cost of buying the annuity, administrative and managing expenses (given that for the base case the assumed rate is 3%, this gives an annuity rate of 2.2%).

4.2. Assumptions on interest rates to be used in the 2012 projection of age-related expenditure

In view of minimizing assumptions-driven revisions and thereby ensuring consistency between budgetary projection exercises, it has been decided that the real interest rate assumption of 3% for all countries should be maintained in the 2012 projection exercise and that inflation should be assumed to be 2%. To allow for an adequate degree of cross-country differentiation and avoid big jumps in the initial period of projections, it was decided to introduce a path of linear convergence in both real interest rates (convergence to the 3% rate by 2015, and constant rate thereafter till 2060) and inflation rates (convergence to the 2% rate by 2015, or later if the output gap is closed later, and constant rate thereafter). The rate of return on pension fund assets also remains at 3% (net of 0.5% of administrative costs) in the 2012 projections, with linear convergence to it assumed by 2015.

In view of the analysis of fiscal sustainability, an important aspect is the fulfilment of the dynamic efficiency condition.[74] The aforementioned assumptions indeed ensure that real interest rate-growth rate differentials are positive for most countries and most years over the projection period.[75] The dynamic efficiency condition is therefore ensured in the long-term for all countries in the Commission's analysis of fiscal sustainability making use of a time-varying interest rate/growth rate differential.[76]

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[74] Unless the interest rate is equal or higher than the output growth rate, a country may in part debt-finance public expenditures indefinitely, as the debt ratio would always be declining.

[75] Negative values are obtained mostly for catching-up economies and only for limited periods of time, consistently with historic evidence.

[76] See European Commission (2009), 'Sustainability Report 2009', European Economy, No. 9, 2009.

5. Sensitivity tests

5.1. Background

The baseline projections cannot capture all the direct and indirect channels through which ageing can influence economic growth as the projection exercise is carried out on the basis of commonly agreed and relatively simple assumptions in order to ensure comparability and clarity. However, given the uncertainty surrounding the assumptions underpinning long-run projections, it is necessary to carry out a number of sensitivity tests so as to quantify the responsiveness of projection results to changes in key underlying assumptions.

This is why in addition to running a baseline projection based on the assumptions outlined in the chapters 1 to 4 of this report, the European Commission and the EPC have also agreed to run a series of sensitivity tests, an overview of which can be seen on Table 5. 1. The sensitivity tests introduce a change or shock to a single underlying assumption/parameter in the projection framework. For each sensitivity tests, a uniform shock is applied to all Member States.

The sensitivity tests provide useful information on the robustness of the projections to feasible changes in the key underlying assumptions. The relative impact can also be read as a kind of 'elasticity' parameter. Thus, the sensitivity tests enable an assessment of the impact of any possible policy changes with an effect on key assumption variables.

For communication purposes, the sensitivity tests have been calibrated to deliver results of equivalent magnitude to the extent possible.[77]

[77] For the EU as a whole, the impact of varying the underlying assumptions on the projected change in pension expenditure (2007-2060) was as follows in the 2009 Ageing Report: higher employment rate of older workers (+5 p.p): -0.1365 p.p. of GDP; higher total employment rate (+1 p.p.): -0.1278 p.p. of GDP; positive labour productivity shock (+0.25 p.p.): -0.4077 p.p. of GDP; higher life expectancy (1 extra year): +0.2886 p.p. of GDP; zero migration: +1.7526 p.p. of GDP.

Table 5. 1 - Overview of sensitivity tests: difference in assumptions compared with the baseline scenario

Population		Labour force		Productivity	Interest rate
High life expectancy	**Lower migration**	**Higher employment rate**	**Higher employment rate older workers**	**Higher/lower labour productivity**	**Higher/lower interest rate**
A scenario with an increase of life expectancy at birth of one year by 2060 compared with the baseline projection.	A scenario with 10% less migration compared with the baseline projection.	A scenario with the employment rate being 1 p.p. higher compared with the baseline projection for the age-group 20-64. The increase is introduced linearly over the period 2016-2025 and remains 1 p.p. higher thereafter. The higher employment rate is assumed to be achieved by lowering the rate of structural unemployment (the NAWRU).	A scenario with the employment rate of older workers (55-64) being 5 p.p. higher compared with the baseline projection. The increase is introduced linearly over the period 2016-2025 and remains 5 p.p. higher thereafter. The higher employment rate of this group of workers is assumed to be achieved through a reduction of the inactive population.	A scenario with labour productivity growth being assumed to converge, to a productivity growth rate which is 0.1 percentage points higher/lower than in the baseline scenario. The increase is introduced linearly during the period 2016-2025, and remains 0.1 p.p. above/below the baseline thereafter.	A scenario with the real interest being 0.5 percentage point above resp. below that in the baseline scenario, i.e. 2.5% and 3.5%.

Source: Commission services, EPC.

5.2. Macro-economic assumptions under the different sensitivity scenarios

To produce the overall set of assumptions, a bottom-up approach was followed, i.e. from population projections through labour input and to GDP growth projections. Therefore, each sensitivity test may involve the recalculation of all assumptions and to run again the labour force and productivity function-based models, in order to keep a consistent macroeconomic framework. The macroeconomic assumptions under the different sensitivity scenarios are given in Table 5. 2 through Table 5. 6 below.[78]

[78] It should be noted that the sensitivity test on a higher real interest rate was assumed not to have an impact on the real economy, so it will only be applied to the pension projections, where feasible and appropriate.

Table 5. 2 - Sensitivity tests: higher employment rate of older workers

	GDP growth in 2010-2060	Due to growth in: Productivity (GDP per hour worked)	Labour input	Total population	Employment rate	Share of working age population	change in average hours worked	GDP per capita growth in 2010-2060
Country	1=2+3	2	3=4+5+6+7	4	5	6	7	8=1-4
BE	**1.66**	**1.42**	**0.25**	0.39	-0.04	-0.11	0.01	**1.27**
BG	**1.35**	**2.27**	**-0.92**	-0.61	0.01	-0.31	-0.01	**1.96**
CZ	**1.57**	**1.87**	**-0.30**	-0.01	0.00	-0.29	0.01	**1.58**
DK	**1.47**	**1.43**	**0.04**	0.19	-0.02	-0.15	0.01	**1.28**
DE	**0.86**	**1.46**	**-0.60**	-0.41	0.10	-0.27	-0.02	**1.28**
EE	**1.52**	**2.07**	**-0.55**	-0.26	-0.06	-0.25	0.03	**1.79**
IE	**2.12**	**1.62**	**0.50**	0.76	-0.04	-0.17	-0.04	**1.36**
EL	**1.03**	**1.13**	**-0.10**	0.07	0.06	-0.26	0.03	**0.96**
ES	**1.61**	**1.38**	**0.23**	0.26	0.23	-0.27	0.01	**1.35**
FR	**1.68**	**1.49**	**0.19**	0.30	0.04	-0.13	-0.01	**1.38**
IT	**1.25**	**1.27**	**-0.02**	0.16	0.04	-0.23	0.01	**1.09**
CY	**1.86**	**1.38**	**0.48**	0.78	-0.16	-0.18	0.03	**1.08**
LV	**1.17**	**2.13**	**-0.96**	-0.61	0.01	-0.29	-0.08	**1.77**
LT	**1.32**	**1.95**	**-0.63**	-0.45	-0.09	-0.23	0.14	**1.76**
LU	**1.96**	**1.50**	**0.46**	0.77	-0.08	-0.16	-0.07	**1.19**
HU	**1.19**	**1.69**	**-0.49**	-0.21	-0.02	-0.25	-0.02	**1.40**
MT	**1.48**	**1.69**	**-0.21**	-0.14	0.24	-0.24	-0.07	**1.62**
NL	**1.31**	**1.49**	**-0.18**	0.08	-0.05	-0.18	-0.03	**1.23**
AT	**1.42**	**1.52**	**-0.10**	0.13	0.01	-0.20	-0.05	**1.29**
PL	**1.55**	**2.16**	**-0.61**	-0.26	-0.06	-0.28	-0.01	**1.81**
PT	**1.24**	**1.43**	**-0.19**	-0.07	0.07	-0.23	0.04	**1.31**
RO	**1.14**	**2.11**	**-0.97**	-0.43	-0.27	-0.28	0.01	**1.57**
SI	**1.35**	**1.64**	**-0.29**	0.01	-0.01	-0.31	0.01	**1.34**
SK	**1.67**	**2.26**	**-0.59**	-0.11	-0.18	-0.29	0.00	**1.79**
FI	**1.55**	**1.65**	**-0.10**	0.15	-0.06	-0.19	0.00	**1.40**
SE	**1.77**	**1.51**	**0.26**	0.43	-0.01	-0.18	0.02	**1.34**
UK	**1.89**	**1.58**	**0.30**	0.51	-0.02	-0.15	-0.03	**1.38**
NO	**1.99**	**1.59**	**0.40**	0.62	-0.09	-0.14	0.00	**1.37**
EA	**1.35**	**1.43**	**-0.08**	0.07	0.05	-0.22	0.01	**1.28**
EU27	**1.42**	**1.54**	**-0.12**	0.08	0.09	-0.22	-0.07	**1.34**

Source: Commission services, EPC.

Table 5. 3 - Sensitivity tests: higher employment rate

Country	GDP growth in 2010-2060	Due to growth in: Productivity (GDP per hour worked)	Labour input	Total population	Employment rate	Share of working age population	change in average hours worked	GDP per capita growth in 2010-2060
	1=2+3	2	3=4+5+6+7	4	5	6	7	8=1-4
BE	**1.66**	**1.42**	**0.24**	0.39	-0.04	-0.11	0.01	**1.27**
BG	**1.35**	**2.27**	**-0.93**	-0.61	0.01	-0.31	-0.01	**1.96**
CZ	**1.57**	**1.87**	**-0.30**	-0.01	-0.01	-0.29	0.01	**1.58**
DK	**1.47**	**1.43**	**0.04**	0.19	-0.02	-0.15	0.01	**1.27**
DE	**0.86**	**1.46**	**-0.60**	-0.41	0.10	-0.27	-0.02	**1.27**
EE	**1.52**	**2.07**	**-0.54**	-0.26	-0.06	-0.25	0.03	**1.79**
IE	**2.12**	**1.62**	**0.50**	0.76	-0.04	-0.17	-0.04	**1.36**
EL	**1.02**	**1.13**	**-0.11**	0.07	0.05	-0.26	0.03	**0.95**
ES	**1.60**	**1.38**	**0.23**	0.26	0.22	-0.27	0.01	**1.34**
FR	**1.68**	**1.49**	**0.19**	0.30	0.04	-0.13	-0.01	**1.38**
IT	**1.25**	**1.27**	**-0.03**	0.16	0.03	-0.23	0.01	**1.09**
CY	**1.86**	**1.38**	**0.47**	0.78	-0.16	-0.18	0.03	**1.08**
LV	**1.16**	**2.13**	**-0.97**	-0.61	0.01	-0.29	-0.08	**1.77**
LT	**1.31**	**1.95**	**-0.63**	-0.45	-0.09	-0.23	0.14	**1.76**
LU	**1.96**	**1.50**	**0.46**	0.77	-0.08	-0.16	-0.07	**1.19**
HU	**1.19**	**1.69**	**-0.50**	-0.21	-0.02	-0.25	-0.02	**1.40**
MT	**1.48**	**1.69**	**-0.21**	-0.14	0.23	-0.24	-0.07	**1.62**
NL	**1.31**	**1.49**	**-0.19**	0.08	-0.06	-0.18	-0.03	**1.23**
AT	**1.41**	**1.52**	**-0.10**	0.13	0.01	-0.20	-0.05	**1.28**
PL	**1.55**	**2.16**	**-0.61**	-0.26	-0.07	-0.28	-0.01	**1.81**
PT	**1.23**	**1.43**	**-0.20**	-0.07	0.06	-0.23	0.04	**1.30**
RO	**1.13**	**2.11**	**-0.97**	-0.43	-0.28	-0.28	0.01	**1.56**
SI	**1.35**	**1.64**	**-0.30**	0.01	-0.01	-0.31	0.01	**1.33**
SK	**1.67**	**2.26**	**-0.59**	-0.11	-0.18	-0.29	0.00	**1.78**
FI	**1.55**	**1.65**	**-0.10**	0.15	-0.06	-0.19	0.00	**1.40**
SE	**1.77**	**1.51**	**0.26**	0.43	-0.01	-0.18	0.02	**1.34**
UK	**1.89**	**1.58**	**0.30**	0.51	-0.02	-0.15	-0.03	**1.38**
NO	**1.99**	**1.59**	**0.40**	0.62	-0.09	-0.14	0.00	**1.37**
EA	**1.35**	**1.43**	**-0.08**	0.07	0.05	-0.22	0.01	**1.27**
EU27	**1.42**	**1.54**	**-0.13**	0.08	0.08	-0.22	-0.07	**1.34**

Source: Commission services, EPC.

Table 5. 4 - Sensitivity tests: higher/lower productivity growth

		Due to growth in:						
	GDP growth in 2010-2060	*Productivity (GDP per hour worked)*	*Labour input*	*Total population*	*Employment rate*	*Share of working age population*	*change in average hours worked*	**GDP per capita growth in 2010-2060**
Country	**1=2+3**	**2**	**3=4+5+6+7**	*4*	*5*	*6*	*7*	**8=1-4**
BE	**1.71**	**1.50**	**0.22**	0.39	-0.07	-0.11	0.01	**1.32**
BG	**1.40**	**2.35**	**-0.95**	-0.61	-0.02	-0.31	-0.01	**2.01**
CZ	**1.63**	**1.95**	**-0.32**	-0.01	-0.03	-0.29	0.01	**1.64**
DK	**1.52**	**1.51**	**0.02**	0.19	-0.04	-0.15	0.01	**1.33**
DE	**0.92**	**1.54**	**-0.62**	-0.41	0.07	-0.27	-0.02	**1.33**
EE	**1.58**	**2.15**	**-0.57**	-0.26	-0.09	-0.25	0.03	**1.84**
IE	**2.18**	**1.70**	**0.48**	0.76	-0.07	-0.17	-0.04	**1.42**
EL	**1.08**	**1.21**	**-0.13**	0.07	0.03	-0.26	0.03	**1.01**
ES	**1.66**	**1.46**	**0.20**	0.26	0.20	-0.27	0.01	**1.40**
FR	**1.73**	**1.57**	**0.17**	0.30	0.01	-0.13	-0.01	**1.44**
IT	**1.30**	**1.35**	**-0.05**	0.16	0.00	-0.23	0.01	**1.14**
CY	**1.91**	**1.46**	**0.45**	0.78	-0.18	-0.18	0.03	**1.13**
LV	**1.22**	**2.21**	**-0.99**	-0.61	-0.02	-0.29	-0.08	**1.83**
LT	**1.37**	**2.03**	**-0.66**	-0.45	-0.11	-0.23	0.14	**1.82**
LU	**2.01**	**1.58**	**0.43**	0.77	-0.11	-0.16	-0.07	**1.24**
HU	**1.24**	**1.77**	**-0.53**	-0.21	-0.05	-0.25	-0.02	**1.45**
MT	**1.53**	**1.77**	**-0.24**	-0.14	0.21	-0.24	-0.07	**1.67**
NL	**1.37**	**1.57**	**-0.21**	0.08	-0.08	-0.18	-0.03	**1.28**
AT	**1.47**	**1.60**	**-0.13**	0.13	-0.01	-0.20	-0.04	**1.34**
PL	**1.60**	**2.24**	**-0.64**	-0.26	-0.09	-0.28	-0.01	**1.86**
PT	**1.29**	**1.51**	**-0.22**	-0.07	0.04	-0.23	0.04	**1.36**
RO	**1.18**	**2.19**	**-1.00**	-0.43	-0.31	-0.28	0.01	**1.61**
SI	**1.40**	**1.72**	**-0.32**	0.01	-0.04	-0.31	0.01	**1.39**
SK	**1.72**	**2.34**	**-0.62**	-0.11	-0.21	-0.29	0.00	**1.83**
FI	**1.61**	**1.73**	**-0.13**	0.15	-0.08	-0.19	0.00	**1.45**
SE	**1.83**	**1.59**	**0.24**	0.43	-0.03	-0.18	0.02	**1.40**
UK	**1.94**	**1.66**	**0.28**	0.51	-0.04	-0.15	-0.03	**1.44**
NO	**2.04**	**1.67**	**0.37**	0.62	-0.11	-0.14	0.00	**1.43**
EA	**1.40**	**1.51**	**-0.11**	0.07	0.02	-0.22	0.01	**1.33**
EU27	**1.47**	**1.62**	**-0.15**	0.08	0.06	-0.22	-0.07	**1.39**

	GDP growth in 2010-2060	**Due to growth in:**						**GDP per capita growth in 2010-2060**
		Productivity (GDP per hour worked)	*Labour input*	*Total population*	*Employment rate*	*Share of working age population*	*change in average hours worked*	
Country	**1=2+3**	**2**	**3=4+5+6+7**	*4*	*5*	*6*	*7*	**8=1-4**
BE	**1.55**	**1.34**	**0.22**	0.39	-0.07	-0.11	0.01	**1.16**
BG	**1.24**	**2.19**	**-0.95**	-0.61	-0.02	-0.31	-0.01	**1.86**
CZ	**1.47**	**1.79**	**-0.32**	-0.01	-0.03	-0.29	0.01	**1.48**
DK	**1.37**	**1.35**	**0.02**	0.19	-0.04	-0.15	0.01	**1.17**
DE	**0.76**	**1.38**	**-0.62**	-0.41	0.07	-0.27	-0.02	**1.17**
EE	**1.42**	**1.99**	**-0.57**	-0.26	-0.09	-0.25	0.03	**1.68**
IE	**2.02**	**1.54**	**0.48**	0.76	-0.07	-0.17	-0.04	**1.26**
EL	**0.92**	**1.05**	**-0.13**	0.07	0.03	-0.26	0.03	**0.85**
ES	**1.50**	**1.30**	**0.20**	0.26	0.20	-0.27	0.01	**1.24**
FR	**1.57**	**1.41**	**0.17**	0.30	0.01	-0.13	-0.01	**1.28**
IT	**1.14**	**1.20**	**-0.05**	0.16	0.00	-0.23	0.01	**0.98**
CY	**1.75**	**1.30**	**0.45**	0.78	-0.18	-0.18	0.03	**0.97**
LV	**1.06**	**2.05**	**-0.99**	-0.61	-0.02	-0.29	-0.08	**1.67**
LT	**1.21**	**1.87**	**-0.66**	-0.45	-0.11	-0.23	0.14	**1.66**
LU	**1.85**	**1.42**	**0.43**	0.77	-0.11	-0.16	-0.07	**1.08**
HU	**1.08**	**1.61**	**-0.53**	-0.21	-0.05	-0.25	-0.02	**1.29**
MT	**1.37**	**1.61**	**-0.24**	-0.14	0.21	-0.24	-0.07	**1.51**
NL	**1.21**	**1.42**	**-0.21**	0.08	-0.08	-0.18	-0.03	**1.13**
AT	**1.31**	**1.44**	**-0.13**	0.13	-0.01	-0.20	-0.04	**1.18**
PL	**1.44**	**2.08**	**-0.64**	-0.26	-0.09	-0.28	-0.01	**1.70**
PT	**1.13**	**1.35**	**-0.22**	-0.07	0.04	-0.23	0.04	**1.20**
RO	**1.03**	**2.03**	**-1.00**	-0.43	-0.31	-0.28	0.01	**1.46**
SI	**1.24**	**1.56**	**-0.32**	0.01	-0.04	-0.31	0.01	**1.23**
SK	**1.56**	**2.18**	**-0.62**	-0.11	-0.21	-0.29	0.00	**1.68**
FI	**1.45**	**1.57**	**-0.13**	0.15	-0.08	-0.19	0.00	**1.29**
SE	**1.67**	**1.43**	**0.24**	0.43	-0.03	-0.18	0.02	**1.24**
UK	**1.79**	**1.50**	**0.28**	0.51	-0.04	-0.15	-0.03	**1.28**
NO	**1.89**	**1.51**	**0.37**	0.62	-0.11	-0.14	0.00	**1.27**
EA	**1.24**	**1.35**	**-0.11**	0.07	0.02	-0.22	0.01	**1.17**
EU27	**1.31**	**1.46**	**-0.15**	0.08	0.06	-0.22	-0.07	**1.23**

Source: Commission services, EPC.

Table 5. 5 - Sensitivity tests: Higher life expectancy

	GDP growth in 2010-2060	Due to growth in: Productivity (GDP per hour worked)	Labour input	Total population	Employment rate	Share of working age population	change in average hours worked	GDP per capita growth in 2010-2060
Country	1=2+3	2	3=4+5+6+7	4	5	6	7	8=1-4
BE	**1.64**	**1.42**	**0.22**	0.43	-0.07	-0.14	0.01	**1.21**
BG	**1.33**	**2.27**	**-0.95**	-0.59	-0.02	-0.32	-0.01	**1.91**
CZ	**1.55**	**1.87**	**-0.32**	0.01	-0.03	-0.31	0.01	**1.54**
DK	**1.45**	**1.43**	**0.02**	0.21	-0.04	-0.16	0.01	**1.24**
DE	**0.84**	**1.46**	**-0.62**	-0.39	0.07	-0.29	-0.02	**1.23**
EE	**1.50**	**2.07**	**-0.56**	-0.24	-0.09	-0.26	0.03	**1.75**
IE	**2.10**	**1.62**	**0.48**	0.77	-0.08	-0.18	-0.04	**1.33**
EL	**1.00**	**1.13**	**-0.13**	0.06	0.06	-0.28	0.03	**0.94**
ES	**1.58**	**1.38**	**0.20**	0.28	0.20	-0.28	0.01	**1.30**
FR	**1.66**	**1.49**	**0.17**	0.30	0.03	-0.15	-0.01	**1.36**
IT	**1.22**	**1.27**	**-0.05**	0.18	0.01	-0.24	0.01	**1.05**
CY	**1.83**	**1.38**	**0.45**	0.75	-0.13	-0.20	0.03	**1.08**
LV	**1.15**	**2.13**	**-0.98**	-0.57	-0.03	-0.31	-0.08	**1.71**
LT	**1.29**	**1.95**	**-0.65**	-0.41	-0.13	-0.25	0.14	**1.71**
LU	**1.93**	**1.50**	**0.44**	0.77	-0.09	-0.18	-0.07	**1.16**
HU	**1.16**	**1.69**	**-0.52**	-0.20	-0.04	-0.26	-0.02	**1.37**
MT	**1.45**	**1.69**	**-0.24**	-0.11	0.19	-0.25	-0.07	**1.56**
NL	**1.29**	**1.49**	**-0.20**	0.09	-0.06	-0.20	-0.03	**1.20**
AT	**1.39**	**1.52**	**-0.12**	0.14	0.00	-0.22	-0.04	**1.25**
PL	**1.52**	**2.16**	**-0.64**	-0.26	-0.07	-0.30	-0.01	**1.78**
PT	**1.21**	**1.43**	**-0.22**	-0.05	0.03	-0.25	0.04	**1.26**
RO	**1.11**	**2.11**	**-1.00**	-0.40	-0.32	-0.29	0.01	**1.51**
SI	**1.33**	**1.64**	**-0.32**	0.03	-0.04	-0.33	0.01	**1.29**
SK	**1.64**	**2.26**	**-0.62**	-0.09	-0.21	-0.31	0.00	**1.74**
FI	**1.53**	**1.65**	**-0.12**	0.17	-0.08	-0.21	0.00	**1.36**
SE	**1.75**	**1.51**	**0.24**	0.44	-0.03	-0.19	0.02	**1.31**
UK	**1.87**	**1.58**	**0.28**	0.51	-0.03	-0.17	-0.03	**1.36**
NO	**1.97**	**1.59**	**0.38**	0.63	-0.10	-0.15	0.00	**1.34**
EA	**1.33**	**1.43**	**-0.11**	0.09	0.03	-0.24	0.01	**1.24**
EU27	**1.40**	**1.54**	**-0.15**	0.09	0.06	-0.24	-0.07	**1.30**

Source: Commission services, EPC.

Table 5. 6 - Sensitivity tests: lower migration

	GDP growth in 2010-2060	Due to growth in:						GDP per capita growth in 2010-2060
		Productivity (GDP per hour worked)	*Labour input*	*Total population*	*Employment rate*	*Share of working age population*	*change in average hours worked*	
Country	**1=2+3**	**2**	**3=4+5+6+7**	*4*	*5*	*6*	*7*	**8=1-4**
BE	**1.59**	**1.42**	**0.17**	0.36	-0.06	-0.13	0.01	**1.23**
BG	**1.32**	**2.27**	**-0.95**	-0.61	-0.02	-0.30	-0.01	**1.93**
CZ	**1.51**	**1.87**	**-0.37**	-0.05	-0.03	-0.30	0.01	**1.55**
DK	**1.42**	**1.43**	**-0.01**	0.16	-0.04	-0.15	0.01	**1.25**
DE	**0.80**	**1.46**	**-0.66**	-0.44	0.07	-0.27	-0.02	**1.24**
EE	**1.50**	**2.07**	**-0.57**	-0.27	-0.09	-0.25	0.03	**1.76**
IE	**2.05**	**1.62**	**0.43**	0.73	-0.08	-0.17	-0.04	**1.33**
EL	**0.95**	**1.13**	**-0.18**	-0.01	0.07	-0.27	0.03	**0.96**
ES	**1.51**	**1.38**	**0.14**	0.20	0.20	-0.27	0.01	**1.31**
FR	**1.64**	**1.49**	**0.15**	0.26	0.04	-0.14	-0.01	**1.38**
IT	**1.16**	**1.27**	**-0.12**	0.09	0.01	-0.23	0.01	**1.07**
CY	**1.76**	**1.38**	**0.38**	0.67	-0.13	-0.20	0.03	**1.09**
LV	**1.14**	**2.13**	**-0.99**	-0.60	-0.03	-0.29	-0.08	**1.74**
LT	**1.29**	**1.95**	**-0.66**	-0.43	-0.13	-0.23	0.14	**1.72**
LU	**1.86**	**1.50**	**0.36**	0.68	-0.08	-0.17	-0.07	**1.18**
HU	**1.12**	**1.69**	**-0.56**	-0.26	-0.03	-0.25	-0.02	**1.38**
MT	**1.41**	**1.69**	**-0.27**	-0.15	0.19	-0.24	-0.07	**1.57**
NL	**1.27**	**1.49**	**-0.22**	0.05	-0.06	-0.19	-0.03	**1.22**
AT	**1.33**	**1.52**	**-0.19**	0.07	0.00	-0.21	-0.04	**1.26**
PL	**1.51**	**2.16**	**-0.65**	-0.29	-0.07	-0.28	-0.01	**1.80**
PT	**1.16**	**1.43**	**-0.27**	-0.11	0.04	-0.24	0.04	**1.27**
RO	**1.10**	**2.11**	**-1.01**	-0.44	-0.31	-0.28	0.01	**1.53**
SI	**1.28**	**1.64**	**-0.36**	-0.03	-0.03	-0.31	0.01	**1.31**
SK	**1.62**	**2.26**	**-0.64**	-0.14	-0.21	-0.29	0.00	**1.76**
FI	**1.50**	**1.65**	**-0.15**	0.12	-0.07	-0.19	0.00	**1.38**
SE	**1.72**	**1.51**	**0.21**	0.39	-0.02	-0.18	0.02	**1.33**
UK	**1.82**	**1.58**	**0.24**	0.45	-0.02	-0.16	-0.03	**1.37**
NO	**1.93**	**1.59**	**0.34**	0.57	-0.09	-0.14	0.00	**1.36**
EA	**1.28**	**1.43**	**-0.15**	0.03	0.03	-0.23	0.01	**1.25**
EU27	**1.35**	**1.54**	**-0.19**	0.04	0.06	-0.22	-0.06	**1.32**

Source: Commission services, EPC.

PART II - Age-related expenditure items: coverage, projection methodologies and data sources

6. Pensions

6.1. Main features of pension projections

Since the beginning of the activity of the AWG, the diversified manifold of pension systems existing in the Member States has represented a challenging issue when dealing with expenditure projections. Notwithstanding different arrangements in health-care, long-term care, education and unemployment benefits systems, a common methodology is used to carry out long-term projections for these government budget's components using common models developed by the Commission services (DG ECFIN) in cooperation with the AWG (see Chapters 7 through 10 for detailed descriptions). On the contrary, the EPC decided that it would be preferable if projections of pension expenditure were carried out by the Member States using national models. The latter, on the basis of the commonly agreed underlying assumptions described in Part I of this report, more adequately reflect the institutional features of the pension systems in individual countries, highlighting those that should have relevant bearing on the future budgetary outcomes.

Using different, country-specific projection models may introduce an element of non-comparability of the projection results. Nevertheless, this approach was chosen by the Commission and EPC because pension systems and arrangements are very diverse in the EU Member States, making it extremely difficult to reliably project pension expenditure on the basis of one common model, to be used for all the 27 EU Member States.

In order to ensure high quality and comparability of the pension projection results, an in-depth peer review is carried out by the AWG members and the Commission. The projected figures are discussed and validated with regard to adherence to the agreed methodology and macroeconomic assumptions and interpretation of the legislation in force in the single Member State. When deemed necessary, the peer group can ask the Member State for a revision of the projection.

6.2. Coverage of pension projections

The core of the projection exercise is *the government expenditure on pensions* for *both the private and public sectors*, as in the 2009 pension projection exercise. According to the principle of not changing the modality of the variables that were classified as voluntary in the previous exercise, data on occupational schemes, private schemes (mandatory and non-mandatory), replacement rates (at retirement), benefit ratio and net pension expenditures will be classified as voluntary. Therefore, the reporting sheet consists of 156 variables to be projected; of which 65 to be provided on a voluntary base and 5 are input data provided by the Commission. In line with previous exercises, the members of the AWG agreed to provide pension projections for the following 4 items:

- Gross pension expenditure
- Number of pensions/pensioners

- Number of contributors
- Contributions to public pension schemes

In addition, as in the 2009 exercise, Member States can cover on a voluntary basis:

- Occupational and private (mandatory and non-mandatory) pension expenditure
- Replacement rates and benefit ratios
- Net pension expenditure

The Commission and the AWG decided that, for the 2012 pension projection exercise, Member States can provide on a voluntary basis:

- Assets of pension funds and reserves

Moreover, in order to simplify the reporting exercise and considering that figures on net pension can be provided, the AWG agreed that Member States do not project the following item:

- Taxes on pension

Finally, the members of the AWG agreed that, for the 2012 exercise, projections have to be made also on the following item:

- Public earning-related pension expenditure for new pensions

A complete list of the items covered by the 2012 pension projection exercise is presented in Annex 6.1.

Building up and extending the 2009 reporting framework

In the previous pension projection exercise, several improvements were introduced that form a solid point of departure for the current round of projections. Still, a few changes in the 2012 pension reporting framework are introduced. All of the amendments were duly discussed by AWG and EPC delegates, and reflect the need to better understand recent developments and the expected changes over the projection period as regards the main features of the pension systems in the Member States.

The amendments to the 2012 reporting framework mainly stem from the following considerations:

- The willingness to improve the information disclosure of the reporting framework and to enhance the transparency and the reliability of the projections by allowing for consistency and internal coherence checks. Enhanced data availability can have an impact on the effectiveness of the peer review process by facilitating information exchange, highlighting best practices, as far as projection methodologies are concerned, and facilitating benchmarking of Member States when it comes to judging the viability of projection results. Moreover, it will enrich the contents of the forthcoming 2012 Ageing and Sustainability reports.

- The disaggregation of the projected annual flow of earnings-related pensions to new pensions in their main drivers contributes to the understanding of the future functioning of pension systems and is a value added to the peer review and the transparency of the projection exercise. The AWG agreed to introduce some flexibility in the reporting of the breakdown of the expenditure drivers for new pensions and coverage rates to cater for country specificities.

- Projections on contribution years and accrual rates would help providing a clearer picture of the future drivers of the expenditure and the viability of the pension system as projected accrual rates might change over time and across different types of pensions. Pensionable earnings are essential to evaluate consistency between the development of pension expenditure and accruals. Over the coming years, some MSs have legislated extensions of the number of contributory years to be considered when calculating pensionable earnings. This should be documented and properly reflected in the projections.

- Many countries have introduced pension reforms that will increase the retirement age. To better understand the impact of these reforms on the coverage, and thus on pension spending, the reporting framework for the number of pensions and pensioners is extended to cover a wider range of current and future statutory (and effective) retirement and effective retirement age. The same information allows detaching the driving forces behind the projected dynamics of the benefit ratio and how they are affected by pension reforms.

- The distribution of pensioners by age and sex groups will help to increase consistency with projections of population and labour force across countries and over the projection period (as both statutory retirement and effective retirement age varies across countries and will change over time).

On this basis, the 2012 pension reporting framework has expanded compared with the 2009 version. In particular, Member States have agreed to provide information on public earnings-related pensions for new pensioners and their main driver, on pension expenditure and pensions by age group and data on pensioners broken-down by age and sex (taking into account difficulties arising from double-counting that may undermine comparability). When such data is not available, an estimate for the number of pensioners should be provided.

To sum up, the 2012 reporting sheet is organised in 9 broad groups of information to be provided:

- Pension expenditure

- Benefit ratio

- Gross average replacement rates (at retirement)

- Number of pensions

- Number of pensioners

- Contributions

- Number of contributors to pension schemes

- Assets of pension funds and reserves

- Decomposition of new public pensions (**<u>earnings-related pensions)</u>**

6.3. Definitions of the variables

6.3.1. Reporting norms and input data

Member States will run projections for the period **from 2011 up to 2060**. The data to be provided is annual data for each year of the projections. Both the statistical information for the years 2000-2010 and the projections for years 2011-2060 have to be presented in current prices. The base year of the projections is 2010.

The **GDP projections** for each country over the period 2011-2060 are those generated by the Commission services (DG-ECFIN) using the production function model on the basis of the agreed assumptions.

The change in **total gross wage** is projected for each country according with labour productivity growth and changes in the hours worked.[79]

The **average wages** are calculated as the ratio of total gross wages from national account data and employed persons (both employees and self-employed) of age 15 to 74. The average wage is projected to increase in line with the labour productivity growth rate.

All countries report **monetary values in millions of Euros**. For countries which are not part of the euro area, the conversion should be made on the basis of the average exchange rate for 2010, except for the ERM II countries for which the conversion is based on the central rates.

The level of pension expenditure should be adjusted to the official level of national accounts expenditure for the base year 2010.

Member States should report, in the Country fiche accompanying the pension projection data, outturn data back to 2000 and also comment on actual developments since 2000 to clarify the reasons behind specific changes and the overall evolution of pension spending in the past and their implications for the projections.

The pension projections include the impact of **the most recent pension reforms that will have entered into legislation before the cut-off date for the submission of the pension projections by delegates**. To this end, Member States will provide detailed descriptions of the projections, including recently introduced reforms, their implementation and their impact on the projection outcome in their updated country fiches.

6.3.2. Variables definitions and clarifications

Pension expenditure

Definition: Pensions expenditures should cover pensions and equivalent cash benefits granted for a long period (over one year) for old-age, early retirement, disability,

[79] In line with the assumption of constant labour share. Gross wages includes employers' social security contributions.

survivors (widows and orphans) and other specific purposes which should be considered as equivalents or substitutes for above-mentioned types of pensions, i.e. pensions due to reduced capacity to work or due to labour market reasons.

Clarification: Pensions should include earnings-related pensions, flat-rate, means-tested benefits that aim at providing a social minimum pension and supplements which are a part of the pension and are granted for an indefinite period on the basis of certain criteria but which are not directly linked to the remuneration of costs (i.e. supplements aimed at supporting the purchase of home or health care services). Pensions and benefits can be paid out from specific schemes or directly from government budgets. In particular, social assistance should be included if it is equivalent to minimum pension (as for non-earning-related minimum pension). Instead, housing subsidies should be excluded from pensions and considered as other means-tested social transfers.

Short-term disability benefits should be considered as sickness benefits, while prolonged unemployment benefits to older workers should be considered within unemployment benefits.

Pensions should not include (additional) benefits in the form of reimbursements for certain costs to beneficiaries or directly provided goods and services for the specific needs of beneficiaries. Also, they should not include social security contributions paid by pension schemes on behalf of their pensioners to other social protection schemes, notably to health schemes.

Pension expenditure by age

Many countries have introduced pension reforms that will increase the retirement age. To better understand the impact of these reforms, pension expenditure disaggregated by age groups between age 54 and 75+ will be provided by the MSs with regards to public pensions and all pensions. This break-down will increase transparency and consistency between population, labour force and pensioners projections.

New pensions

With the issue of targeting reforms and increasing transparency, MSs will provide annual projections on new pensions expenditure for each of the pension schemes.

Gross pension

Pensions should be recorded as **gross pension expenditure**, i.e. without a deduction by beneficiaries of tax and compulsory social security contributions paid on benefits. In those countries where pensions are non-taxable income, gross pensions are equal to net pensions.

Net pension

Pensions should be recorded as net pensions, once deducting tax on pensions and compulsory social security contributions paid by beneficiaries from gross expenditure.

Categories of pension expenditure

Many MSs have a multiplicity of pension schemes in place (e.g. for employees in different sectors). The parameters across systems might differ and the share of population covered by each system might change over time. To address these issues, MSs should fill the questionnaire for each scheme separately, in addition to the combined overall information.

Public schemes and other public pensions

Definition: Public schemes and other public pensions are the schemes that are statutory and that the general government sector administers.[80]

Clarification: The aim is to cover those pension schemes that affect public finances, in other words schemes that are considered to belong to the general government sector in the national account system. Usually, there is a specific or general social security contribution to the scheme, which is defined as part of total taxes in the national accounting system. However, the scheme can also be financed, either partially or fully, by general taxes. Thus, ultimately, the government bears the financial cost and risk attached to the scheme. The pensions provided by the social security schemes can be either earnings-related, flat-rate or means-tested. In addition, this category should cover pensions that are paid directly from the state or other public sector entity budget without forming a specific scheme such as special pensions to public sector and armed force's employees. Cash benefits equivalent to pensions, notably social assistance to older persons (people aged over statutory retirement age, usually 65 years), should be included in this category.

Regarding the borderlines between public and occupational pensions as well as the identification of pension schemes within these categories, see Table 6.3 "Coverage and specification of pension schemes in the 2012 projections".

The statutory funded part of old-age pension schemes that are attached to notional defined contribution schemes in some countries should be excluded from social security schemes and included in the private sector schemes in accordance with the Eurostat decision[81].

Occupational pensions

Definition: Pensions provided by occupational schemes are those that, rather than being statutory by law, are linked to an employment relationship with the scheme provider.

[80] In line with Eurostat (2004) "If a government unit is responsible for the management of a defined-contribution funded scheme for which no government guarantee exists for the risks of defaulting payments covering the majority of the participants, the scheme is not treated in the national accounts as a social security scheme in the government sector. In such schemes, the schemes are not financed by the government nor does the government define the level of pensions to be paid (the members have a say in how much they contribute and how their contributions are invested). Thus, the contributions and payments in respect of such schemes have no impact on the EDP deficit, as they are stripped out of general government revenue and general government expenditure, respectively". Moreover the same source, with regards to funded schemes underlines that "In recent years, some countries have set up defined-contributions funded pension schemes (or identifiable as such – see below) where a government imposes or encourages participation, collects contributions from employers and pays pension benefits to households, fixes the level of contributions and maybe change the rules, but where it is explicitly stated that pension benefits will predominantly depend on accumulated assets. Under these conditions, it seems that all ESA95 criteria for classifying such schemes as social security schemes are not fulfilled, as government is not fixing the level of the pension benefit and it is difficult to consider that it is "financing" the scheme. Further information can be find in Eurostat (2004). "Classification of funded pension schemes and impact on government finance", Economy and finance Collection: Methodologies and working papers, Luxemburg.

[81] Classification of funded pension schemes in case of government responsibility and guarantee, Eurostat 30/2004, 2 March 2004.

They are based on contractual agreements between employers and employees, either at the company level or their organisations at the union level. The schemes are run by private sector pension funds, insurance companies or the sponsoring companies themselves (in balance sheets).

Clarification: These schemes can be quasi-mandatory in the sense that, on the basis of a nation- or industry-wide bargaining agreement, the employers are obliged to provide an occupational pension scheme to their employees. On the contrary, participation of an individual remains voluntary. Occupational schemes can be equivalent to statutory earnings-related pension schemes or complementary to them. In particular, it is important to include in the projections the schemes that play a role equivalent to social security schemes in the pension provision. The AWG agreed that, for the projection of private pensions, the real rate of return on private funded pensions should be equal to the real interest rate (3%).

Private pensions

For the most part, private individual pension schemes are non-mandatory but they can be also mandatory.[82] The insured persons have the ownership of pension assets. This means that the owner enjoys the rewards and bears the risks regarding the value of the assets. The insurance contract specifies a schedule of contribution in exchange of which benefits will be paid when the members reach a specific retirement age. The scheme provider administers the scheme by managing the pension assets through a separate account on behalf of its members. The access to such a scheme does not require an employment relationship, even though in some cases the contribution may be set on the basis of the wage. The AWG agreed that, for the projection of private pensions, the real rate of return on private funded pensions should be equal to the real interest rate (3%).

Mandatory private pensions

Definition: Mandatory private pension schemes are similar to public schemes. Transactions occur between the individual and the insurance provider. Transactions are not recorded as government revenues or government expenditure and, therefore, do not have an impact on government surplus or deficit. Pension expenditure projections should cover the individual schemes that switch at least a part, either voluntarily or statutorily (especially to new entrants to the labour market), from the current social security scheme to private funds. Such schemes have an increasing relevance in a number of countries.

Clarification: In some cases, there are government guarantees to these pension schemes. Nevertheless, such a guarantee is a contingent liability by nature and these liabilities are not considered as economic transactions until they materialise. Thus, the Eurostat decision further specifies that a government guarantee is not an adequate condition to classify such schemes as social security schemes.

Non-mandatory private pensions

Definition: Non-mandatory private pensions are based on individual insurance contracts between the individual and the private pension scheme provider, usually an insurance company or a pension fund. The category of individual schemes includes pension schemes for which membership is not required by law and is independent of any employment link (even if members are mostly employed people). However, employers or

[82] See definitions of mandatory and non-mandatory pension funds below.

the State may in some cases contribute to the plan. Such schemes may also be adhered to through membership in an association.

Clarification: The main difficulty in analysing individual provision stems from the fact that it is difficult to distinguish among different types of savings those that are clearly for retirement purposes. Part of the savings that are not specifically labelled as pension savings may be used for retirement purposes, whereas part of the savings collected by retirement schemes may – depending on national rules – in fact be used for other purposes than providing periodic retirement income (one-off lump sums benefits, early withdrawal options). The extent to which these schemes are used for retirement savings depends notably on the conditions attached to them, e.g. tax incentives linked to the condition that the bulk of such savings must be used for a regular income (annuity) rather than for paying out a lump sum or the minimum age at which a person can access such retirement savings. In some cases, pension instruments are rather used as investment vehicles with noticeable tax advantages, for instance when a number of years are requested for the plan participation in order to benefit from the lower tax rate.

Breakdown of public pensions

Old-age and early pensions

Old-age and early pensions should be considered as a single category of pensions due to the fact that in many countries a proper distinction between these two components cannot be made, either because the early retirement is built-in in the old-age pension system, or because the standard retirement age varies between gender and will increase or become more flexible with time. Early pensions should include – in addition to genuine (actuarial) early retirement schemes – other early pensions schemes that are granted, primarily on the basis of reduced work capacity or labour market reasons, to a specified (age) group at an age below the statutory retirement age (different from disability pensions to be reported separately).

Moreover, with the aim of identifying earnings-related pension expenditures, the modality **"Non-earnings-related minimum pensions/minimum income guarantee for persons at or over statutory retirement age"** has been included in the reporting framework. In line with what stated with regards to the general definition of pension expenditure, social assistance, if equivalent to minimum pension and targeted to people aged over 55, must be included in the projections.

Earnings-related pensions to private sector employees

Within the category of old-age and early public pensions, a separation of earnings-related pensions to **public and private sector employees** is requested in order to follow the projected evolution of pensions between private and public sector employees. Flat-rate or means-tested minimum pensions that are not based on employment, but which only guarantee a certain social minimum, should be excluded by this category and reported elsewhere (while the minima of earnings-related pension schemes and supplements to reach the minimum should be included). If it is possible to follow the pension accrual of those persons who have worked both in the private and public sector, this distinction could be made both regarding the expenditure of pensions and the number of pensioners. Otherwise, estimates can be made on the basis of a full career in one of the sectors.

Earnings-related pensions to public sector employees

As above, employees of the public sector should include those working in the national, regional and municipal government bodies as well as social security institutions. In practice, where there are different pension schemes for public and private sector employees, the definitions of the schemes can be followed.

Disability pensions

Expenditures related with disability should consider both earnings-related pensions and flat-rate or means-tested minimum pensions of this type. Some countries for instance consider disability pensions (benefits) as part of their sickness insurance scheme while in others they belong to the pension scheme. While, in some countries, the pension retains the same classification from the time when it is first granted until payments end, in most countries, an early disability pension is transformed into an old-age pension when the beneficiary reaches the standard old-age retirement age.

In line with the agreement regarding to long-term care and health care projection methodologies (see chapter 8), care allowances (benefit paid to disabled people who need frequent or constant assistance to help them meet the extra costs of attendance) and economic integration of the handicapped (allowances paid to disabled people when they undertake work adapted to their condition, normally in a sheltered workshop, or when they undergo vocational training) have to be considered as long-term care expenditure and, hence, should not be included when calculating disability pensions.

Other pensions (survivors)

Other pensions should mostly include survivors' pensions without any age limit. These should include both earnings-related pensions and flat-rate or similar means-tested minimum pensions.

6.3.3. Benefit ratio and replacement rate at retirement

For a better understanding of projected expenditure, the following components of the reporting framework are key.

Benefit ratio

Definition: The benefit ratio is the average pension benefit divided by an economy-wide average wage, as calculated by the Commission.

Clarification: the evolution of the benefit ratio is crucial to analyse and understand the projection results as it reflects the features of the legal framework of pension systems as far as the calculation and indexation rules are concerned.

The benefit ratio captures several features at the same time. First, it reflects the assumed increases in average pensions due to indexation rules, the maturation of the pension system and longer contribution periods. Second, it reflects the changes in average wages driven by the assumptions on labour productivity growth rates. Third, it also captures the changes in the structure of the respective population groups, in particular the share of pensioners and wage earners in each year of the projection exercise.

Gross average replacement rate (at retirement)

Definition: The gross average replacement rate at retirement is the ratio of the first pension of those who retire in a given year over the average wage at retirement. The (economy-wide) average wage of old people at their retirement usually differs from the overall economy-wide average wage, unless a flat wage profile over the entire working career is assumed in the projection exercise.

Clarification: In case of social security pension schemes, the gross average replacement rate (at retirement) reflects only earnings related pensions.

Gross average replacement rates (at retirement) are provided for all schemes, if possible.

6.3.4. Decomposition into stock and flows of pension expenditure

New public earnings-related pensions

Definition: New pensions expenditure is to be calculated separately for those who retire in the considered year.

New pensions expenditures can be decomposed as follows:

$$P_{new} = \overline{C}_{new}\overline{A}_{new}\overline{P}\overline{E}_{new}N_{new} \qquad [1]$$

where P_{new} is the overall spending on new pensions, $\overline{C}_{new}$ is the average contributory period or the average years of service of the new pensions, $\overline{A}_{new}$ is the average accrual rate of the new pensions, $\overline{P}\overline{E}_{new}$ is the average pensionable earning over the contributory period related to the new pensions and N_{new} is the number of new pensions (pensioners).

Changes in the flows of pensions and pension expenditure over time should properly reflect the impact of recently legislated reforms in the functioning of pension systems and would provide useful insights on their impact.

Clarification: Publicly provided earnings-related pension schemes can be classified in the following three broad schemes: *defined benefit* (DB) *notional defined contribution* (NDC) and *points system* (PS). According to the Table 6. 1 - Pensions schemes across Member States, 19 out of 27 MSs have public DB schemes, 5 of them have NDC and 4 are based on a broadly PS.[83]

[83] Counting France twice: once into DB group and once in the PS group.

Table 6. 1 - Pensions schemes across Member States

Country	Type	Country	Type
BE	DB	LU	DB
BG	DB	HU	DB
CZ	DB	MT	Flat rate + DB
DK	DB	NL	DB
DE	PS	AT	DB
EE	DB	PL	NDC
EL	Flat rate + DB	PT	DB
ES	DB	RO	PS
FR	DB + PS	SI	DB
IE	Flat rate + DB	SK	PS
IT	NDC	FI	DB
CY	DB	SE	NDC
LV	NDC	UK	DB
LT	DB	NO	NDC

Source: Commission services.

In order to accommodate every single different scheme into the agreed reporting a simple and stylized version of these schemes can be used:[84]

For every single person who gets retired, a simple defined-benefit plan pays an average accrual rate, *a*, for each year of service. The accrual rate is calculated on (lifetime) average re-valued earnings. The pension benefit can therefore be written as:

Defined benefit

$$P = \sum_{t=0}^{T} w_t (1+v_t)^{T-t} a_t \qquad [2]$$

where *w* are individual earnings (or contribution bases) in year *t*, *T* is the year of retirement and *v* is the factor by which earlier years' earnings are re-valued.[85]

Notional defined contribution schemes In notional defined contribution schemes, the financing inflow over the contribution period is given by wages multiplied by the contribution rate (*c*). This notional capital is increased each year by the notional interest rate, *β*. At retirement, the accumulated notional capital is divided by a notional annuity factor, *A*. The pension benefit for a single person can be written as:

$$P = \frac{\sum_{t=0}^{T} w_t c_t (1+\beta_t)^{T-t}}{A_T} \qquad [3]$$

Points Systems

[84] The approach is largely based on Whitehouse (2010), "Decomposing National Defined-Contribution Pensions: Experience of OECD Countries' Reforms", *OECD Social, Employment and Migration Working Paper*, n. 109, OECD.

[85] In most MSs this is the growth of economy-wide average earnings.

In a points system, pension points (w/k) are calculated by dividing earnings (w) by the cost of the pension point (k). The pension benefit then depends on the value of a point (v) at the time of retirement. This last variable is upgraded over time according with the parameter δ in the following equation. Thus, the pension benefit can be written as:

$$P = \sum_{t=0}^{T} \frac{w_t v_t}{k_t} (1+\delta_t)^{T-t} \qquad [4]$$

If the rule for indexing earlier years' earnings in DB systems is the same as for notional interest rate and for the upgrading procedure for the pension point (i.e., $v = \beta = \delta$), then the structure of the three equations is similar. If this is the case, **the accrual rate (*a*)** under a generic defined-benefit scheme is equivalent to the **ratio of the pension-point value to its cost (*v/k*)** and to the **ratio of the notional-accounts contribution rate to the annuity factor (*c/A*)**. So, for $v = \beta = \delta$, then:

$$a = \frac{v}{k} = \frac{c}{A} \qquad [5]$$

Moreover, **pensionable earnings** in the three schemes are calculated as the **sum over the contributory period (years of service) of the valorised wages**. Finally **T** is the **contributory period**.

As underlined by Whitehouse (2010), this approach has two implications for the comparison of these three different types of earnings-related pension scheme:

1. it allows to calculate effective accrual rate for pension-point schemes and notional-accounts schemes;

2. the valorisation procedure in defined-benefit plans, the upgrading policy for the pension-point value and the setting of the notional interest rate are to be seen as similar policies.

To deal with the three different schemes, the following components have been introduced in the reporting framework (see Annex 6.1). *Block 9 – Decomposition of new public pension expenditure – earning related* is divided into three subgroups related to DB, PS and NDC schemes. MSs will provide information on their own system in accordance with the structure of the specific subgroup. In particular, for those who adopt a NDC or a PS, the components of the average accrual rate are to be provided: *point value (v)* and *point cost (k)* for MSs adopting a PS and *notional accounts contribution rate (c)* and *annuity factor (A)* for those who rely on NDC systems.

To assure the sustainability of their pension systems, several MSs introduced automatic balancing mechanisms that we referred to as **"sustainability/adjustment factors".** The way these factors operate has to be taken into account when dealing with new pension expenditure projections, according to their specific rules. MSs will also provide information about the evolution of the adjustment factors when reporting new pensions expenditures.

As not all the new pensioners get retired on the first of January, the simple formula proposed refers to the average monthly new pension. To be consistent with the data on the total expenditure on new pensions (line 16 in the reporting sheet – Annex 6.1), and to allow for a check of the reported data, MSs are asked to provide the **average number of**

months of pension paid the first year. If there is no specific constraint due to legislation, the new pensioners are spread over the year according to some distribution. If a symmetrical distribution over the year is assumed (or empirically fitted the data), the **average number of months of pension paid the first year** turns out to be 6. If the distribution is asymmetrical, the average should be calculated according with the distribution considered. If there is a single retirement date fixed by law, the **average number of months of pension paid the first year** turns out to be the difference with the end of the year. If more than one retirement date is fixed by law, the **Average number of months of pension paid the first year** should be calculated as an average of the remaining months (difference from 12 and the month of retirement), weighted by the number of people that get retired at each specific date (if available, or assuming a distribution of new retired among the dates).

Hence, independently of the type of scheme adopted by the MS, the following calculation should be effective and exploited as a check of the correctness of projections on new pensions expenditure (all numbers are referred to lines in the pension reporting sheet – See Annex 6.1):

$$\text{line}\,16 - [\text{line}\,152 \times \text{line}\,153 \times \text{line}\,154 \times \text{line}\,156 \times \text{line}\,151] = 0 \qquad [5]$$

An alternative use of the data on new public earning-related pension is that of analysing the development and internal consistency of the stock of old pensions (those already existing at the beginning of the year to be calculated as the difference of the total and the "new" pensions in the reporting sheet). At every point in time *t*, the projection of average pension expenditure related to "old pensions" must be close to the value of average pension expenditure at the year *t-1* indexed by the rule applied in each country and scheme, and thus:

$$\frac{(P_{t-1}/N_{t-1})(1+\varepsilon)}{P_t^{old}/N_t^{old}} \approx 1 \qquad [6]$$

where:

P_{t-1} is the projection of total public earning-related pensions expenditure at time *t-1*(line 15);

N_{t-1} is the number of pensioners entitled to a public earning-related pension at time *t-1*(line 93);

$(1+\varepsilon)$ is the pension indexation rule applied in each country and scheme;

P_t^{old} is the projection of the "old" pensions expenditure at time *t* [total public earning-related pensions expenditure (line 15) minus the expenditure related to "new" public earning-related pensions (line 16)].

N_t^{old} is the number of old pensioners at time *t.* This is to be calculated as the difference between total pensioners entitled to a public earning-related pension (line 93) minus the new pensioners in the same typology of pension (line 151), as reported in the last block of the reporting sheet.

Such an indicator is expected to take value close to 1 if projections are internally consistent and the distribution of the retired people has not been selected by mortality.[86]

6.3.5. Additional information on number of pensioners, contributors and contributions to pension schemes and assets of pension funds

The number of pensions

The number of pensions reflects the number of cases in which a pension is paid off to an individual. Each type of pension should be considered separately.

The number of all pensions and public pensions has to be reported by age groups. This break-down, whose provision is mandatory with regard to the public scheme, will increase transparency and consistency between population, labour force and pension projections.

The number of pensioners

The number of pensioners for each type of pension should be considered separately, allowing for the fact that the same person may be a recipient of several types of pensions, for instance, a recipient of a social security pension and a private mandatory pension. Thus, the detailed lines should reflect the number of the recipients of the specific pension but the figures on summary lines, in particular the number of all pensioners, are not likely to match the summing up of the subtotals. Ideally, the number of all pensioners (line 101) should be the number of persons who receive pension benefits but calculated only once in case of a receipt of multiple pensions. If an exact figure is not available, an estimate is preferred to the mere summing up. If such a rule is applied, a minimum requirement of the projections is that the number of pensioners should be smaller than the number of pensions.

The overall number of pensioners by age group should be consistent with agreed figures on labour force. The share of pensioners in each age group should be below but very close to the number of inactive population in the same group.

A break-down of pensioners by age and sex will be provided by MSs with regards to public pensions and all pensions. This break-down is needed to increase transparency and consistency between population, labour force and pensioners projections. In particular, it will allow for consistency check between gender-specific labour force participation rates and gender-specific pensioners. Some form of correlation should be evident, once mortality rates have been taken into account, between today's participation rates and pensioners groups projected 30/40 years in the future. These data should be particularly interesting when analysing the effects of reforms with regards to the effective retirement age. Also, the overall number of the pensioners can be compared with the number of inactive population, for different age-groups so as to gain further insights.

[86] If the assumption of orthogonally between mortality and pension distribution is removed, we are left with the empirical evidence that mortality rates are higher for older people, and that these people receive, on average, smaller pensions. This will results in P_t^{old} / N_t^{old} being larger than P_{t-1} / N_{t-1}. In terms of the proposed indicator a value smaller than 1 (but still close to) is to be expected.

The availability of data on pensioners (or pensions as a second best) is particularly relevant when decomposing pension expenditure on GDP. In particular they allow for the calculations of the **coverage ratio.**

The coverage ratio effect is defined as the number of pensioners of all ages to population over 65 years or any other defined age threshold. The analysis of the coverage ratio provides information about how the developments of the effective exit age and the percentage of population covered impact on pension spending. The coverage ratio should also be disentangled by age groups and be calculated in relation with inactive population (to check the consistency with labour force projections).

Contributions to pension schemes

Contributions to pension schemes paid both by employers and employees as well as self-employed persons provide information on whether or not there is a potential future financial gap in the pension system. If the pension contribution is part of a broader social security contribution rate, an estimate should be provided, if possible, for the share of the pension contribution, e.g. on the basis of the most recent expenditure structure. In case that the pension is financed by general tax revenues, no estimate should be provided here.

Estimates of pension contributions to public and private mandatory schemes, notably concerning the category of old-age and early pensions are relevant. As regards other pensions, such as disability and survivors' pensions, contributions should be reported separately only if these pensions are managed by separate specific schemes. In the case where they are part of the old-age pension scheme, no separation of contributions between different types of pensions is requested but the total contribution should be presented in the context of old-age and early pensions.

Number of contributors

As in the case of the number of pensioners, the number of contributors to each type of pensions should be considered separately, allowing for the fact that the same person may be a contributor to several schemes. This is the case, for instance, for pension systems in which a part from a public scheme is switched to a private (mandatory) pension scheme. However, the line of total pensions contributors should count contributors only once in case where the person contributes to more than one scheme at the same time. Thus, the number of contributors should be close to the number of employed persons or active-age population as projected by the Commission services and AWG.

As for contributions, it would be important to provide estimates of the numbers of contributors to social security and private mandatory schemes, notably concerning the category of old-age and early pensions. The number of contributors to other schemes should be presented only in case of separate schemes for these purposes.

The number of contributors should correspond to an estimate of the number of persons covered by pension schemes without regard to the amount of the contribution. Thus, a contributor in a short-term contract should count as a contributor in a permanent (full-time) contract. However, in practice, a contributor in a short-term contract may appear as a contributor several times during a year and it may not be possible to disentangle the number of contributors during a year from the number of contribution periods. Therefore, a better proxy for the number of persons covered by pension schemes should be the number of contributors at a given point of time, e.g. at the end of the year.

Assets of pension funds and reserves

The information on assets of pension's funds and reserves, including pre-financing to specific reserves within the government sector, is requested separately for public schemes, occupational pension schemes and private mandatory and non-mandatory pension schemes. This information is an important complement to the contribution information when the financial balance of the pension schemes is assessed.

As regards the government sector, a distinction needs to be made between national government bonds and other assets, since the former are netted out in the compilation of gross debt (Maastricht debt), while the latter are not.

It would be important for Member States to provide information on the current situation from 2000 up to the most recent year for which the information is available. It remains optional to make projections of assets evolution. This should take into account both the gross accumulation and the withdrawals for the payment of pensions. It is important to know the factors affecting the accumulation and the withdrawals, in particular, if the accumulation is not based on the surplus of pension contributions over pension payments and if the withdrawals are discretionary. For example, in some countries, accumulation of pension reserve funds (for social security schemes) is based on the surplus in the social security schemes or on deliberate decisions to put aside a fraction of government revenues. For the rate of return on assets the same value (3%) and dynamics (convergence up to 2015 for almost all MSs) of the real interest rate are assumed. This rate is assumed to cover also the administrative expenses of the fund. The information on the total value of the assets in pension funds, including pre-financing to specific reserves within the government sector, is provided separately concerning public pension schemes, occupational pension schemes and private pension schemes.

Table 6. 2 - Overview of the pension systems in the Member States		
	Public pensions (public sector schemes)	**Occupational pension schemes (private sector schemes)**
BE	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance (GRAPA-IGO) *Earnings-related Public pensions:* Separate schemes for private and public sector employees, self-employed; schemes cover old-age and survivors' pensions, and disability pensions in the case of civil servants (which are included in public (public) pensions in this report); These schemes include minimum pensions based on career conditions. The wage earner scheme includes the minimum claim per working year. Disability pension schemes for private sector employees and self-employed. Early retirement ("prepension") through an unemployment benefit and a supplement from the employer.	Legal framework has been established: the Law on additional pensions of 28 April 2003, centred on sectoral pension scheme, improving the access to them and giving more guarantees to workers. Pensions: 1.1% of GDP in 2007.
BG	*Minimum guarantee pensions:* Social pension for old age (means-tested). As of 2013 will be shifted to Social Assistance. *Earnings-related Public pensions:* One DB pension scheme covering all employees and self-employed. Earnings-related Old age, Disability and Survivors pensions including minimum pension amounts stipulated in the annual Law on the PSI Budget. *Non-contributory pensions:* Pensions at the State Budget expense: - Special merits pensions - Social pensions for old age - will be shifted to Social Assistance as of 2013 - Social pensions for disability - will be shifted to Social Assistance as of 2013 - Military Disability Pensions - Civil Disability Pensions - Special personal pensions - Some pensions under revoked laws	Supplementary voluntary pension funds under occupational schemes (3rd pillar).

CZ	*Minimum guarantee pensions:* No special scheme, it is embedded in the pension formula (flat-rate component). *Earnings-related public pensions:* One scheme covering the whole population, covering old-age, disability and survivors' pensions.	Do not exist.
DK	*Minimum guarantee pensions:* Universal flat-rate pensions for every citizen (subject to the time lived in DK), means-tested supplements to those without occupational pensions, tax-financed; Disability pensions to those below 65. *Earnings-related public pensions:* Voluntary early retirement pensions (requires 30 years of contributions; pension benefit dependent on age, not on contributions); Civil servants' pensions for central and local government employees (in coming years these schemes are replaced by ordinary labour market (occupational) pensions.	Labour market (occupational) pensions (private sector covering 90% of the employees); Labour market supplementary pensions (ATP); Labour market supplementary pensions for recipients of anticipatory pensions (SAP):; Employees' capital fund (LD); All these schemes are fully funded.
DE	*Minimum guarantee pensions*: No special scheme but disabled and older people without sufficient income are entitled to means-tested benefits (social assistance). *Earnings-related Public pensions:* General scheme covering private and public sector employees, the scheme covers old-age, disability, early retirement and widow's pensions; specific schemes for lifetime civil servants as well as farmers and miners.	Occupational pension provision existing; Benefits account for 1.3 % of GDP in 2009.
EE	*Minimum guarantee pensions:* National pension equal to the base amount of the pension ins. scheme, available to those not qualifying for insurance scheme. And have lived at least 5 years in Estonia. *Earnings-related public pensions:* One scheme covering the whole population; covering old-age, disability and survivors' pensions; benefits are flat-rate + a length-of-service supplement for careers before 1999, as of 1999 benefits are earnings-related.	Do not exist.
EL	*Minimum guarantee pensions:* Means-tested minimum pensions through OGA for uninsured old age beneficiaries beyond the age of 65. *Earnings-related social security pensions:* A great number of separate main pension insurance and auxiliary funds for different sectors and occupational groups; schemes cover old-age, early retirement, disability and survivors' pensions; benefit levels differ across schemes.	The few already existing occupational funds do not cover pensions except one which pays a 10 years' annuity.

ES	*Minimum guarantee pensions:* Means-tested minimum pension scheme (non-contributory);[1] Means-tested minimum pension (contributory). *Earnings-related public pensions:* One main social insurance scheme, covering the private sector employees, self-employed and the regional and local public administrations, providing earnings-related old-age, disability and survivors' pensions; Public sector employees' (contributory) pension scheme (CPE) for the civil servants of the central public administration and the military, providing mainly old-age, disability and survivors' pensions, though 5 different levels of pensions according to the career level. Starting 1-1 2011 all new civil servants are in the Public not in CPE. [1]This is a minimum income for the elderly and the disabled that have not contributed before. It includes old-age pensions (65+) and disability pensions (-64). The part of old-age is 57% of total non contributory pensions. It amounts to 0,1% of GDP in 2007. Total non contributory pensions amount to 2,119 million euro in 2007; 2,137 million euro in 2008	Voluntary enterprise pension schemes for private sector employees (funded DC schemes and collective insurance DB); Mandatory supplementary pension scheme for public sector employees of the central administration (funded DC scheme); Schemes are of some importance.
FR	*Minimum guarantee pensions :* Means-tested minimum pension. *Earnings-related Public pensions :* Several separate pension schemes for different sectors and occupational groups providing earnings-related pensions, additionally mandatory "second tier" supplementary funds that complement the pension provision; these schemes cover old-age and survivors' pensions. Disability pensions (benefits) covered by the health insurance scheme.	'Voluntary occupational pension schemes for private sector employees (PERE and PERCO) introduced by 2003 reform covering 400 thousands people for a cumulated amount of contributions of 2 billion € in 2008. Also an old occupational pension scheme (art. 82 and 83, and art. 39 of CGI) covering roughly 3.6 million of people for a cumulated amount of contributions of 76 billion € in 2008. Self employed occupational pension scheme (Madelin law n° 94 and law n°97) covering 1.3 million of people for a cumulated amount of contributions of 19 billion € in 2008.
IE	*Minimum guarantee pensions:* Means-tested minimum flat-rate pensions and age-related benefits (old-age, widows, disability, carers and blind persons and pre-retirement allowances) through non-contributory social assistance scheme. *Contributory social insurance pensions:* Contributory social insurance scheme provides flat-rate pensions and age-related benefits (old-age, transition, and widow(er)'s pensions, carers, invalidity and disability benefits). *Public service (occupational) pensions:* Public service occupational pension scheme.	Voluntary occupational schemes for private sector employees. 31.6% of current pensioners receive also occupational pensions, amounting to 24.2% of total pension income. Pension coverage for workers aged between 20 and 69 was 51% in the first quarter of 2009.

IT	*Public pension system* There is one main public pension system, based on NDC (contributions-based) regime, covering the whole population, providing old-age, early retirement, disability and survivors' pensions. It is financed according to the pay-as you go principle. It is flanked by the DB (earnings-related), Mixed regimes in the transitional phase. *DB and Mixed regimes* Old DB regime fully applies to workers with at least 18 years of contributions at the end of 1995. The Mixed regime (partly DB and partly NDC, according to the pro rata rule) applies to workers with less than 18 years of contribution in 1995. Means-tested topping-up to a minimum pension (6,088 euro per year, in 2011) is foreseen, subject to the fulfillment of the general eligibility requirements. *NDC regime* NDC regime fully applies to workers entering the labour market as of 1996. Means-tested topping-up to a minimum pension, foreseen under DB and Mixed schemes, is no longer provided. Pensions awarded to people below 65 must be at least 1.2 times the old age allowance. *Minimum income guaranteed to the elderly* Social assistance benefits are provided to low-income elderly above a given age, regardless of their contribution record. They are means-tested and include: old age allowance (5,435 euro per year, in 2011) and social assistance additional lump sums. They are provided to the elderly with a personal income (in case of a single) or couple's income (in case of married people), including public pensions, below certain limits and up to them. In 2011, personal income limits are 5,600 euro per year, in the age bracket 65-69, and 7,850 in the age bracket 70+. For married people, couple's income limits are 11,680 euro per year, in the age bracket (referring to the beneficiary) 65-69, and 13,290 in the age bracket 70+.	*Occupational pension schemes.* Occupational, supplementary pension schemes exist. They are funded and never mandatory. The 2004 reform (law 243/2004) and its 2005-implementation (law decree 252/2005 and Law 296/2006) increased the provisions for occupational pensions through the possibility to transform TFR (end-of-service allowance) into an occupational pension scheme. Contributors and contributions has increased significantly. Current pension expenditure is 0.1% as a share of GDP.
CY	*Minimum guarantee pensions:* Through the Minimum Pension under the General Social Insurance Scheme and through the Social Pension scheme and special allowances to pensioners. *Earnings-related Public pensions:* General social insurance scheme covering all employees and self-employed persons, providing old-age, disability, survivors' and orphans' pensions; and Government Employees Pension Scheme (paid from the Government budget).	Mandatory funded pension schemes for semi-state sector employees and for employees in certain professions. Voluntary funded pension schemes, including provident funds, for private sector employees.
LV	*Minimum guarantee pensions:* Through the state public benefit, if the person's insurance record <10 years. *Earnings- related Public pensions:* The minimum of the earning – related pension system is paid with a length-of-service supplement to the amount of the state security benefit, if the contribution record exceeds 10 years.	Do not exist.

	One social insurance old-age pension scheme, which is a defined-benefit scheme for those, retired before 1996 and notional defined contribution scheme for those retired as of 1996, providing old-age pensions. Also survivors' pensions are based on NDC contributions (except for those retired before 1996). Separate provisions for disability pensions, though under the general public system. Specific public sector service pensions (selected professions) paid from the state budget.	
LT	*Minimum guarantee pensions:* Through a social assistance pension (also to young disabled persons and orphans). *Earnings-related Public pensions:* One social insurance pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions, and early retirement pensions as of 2004. Special state (old-age, disability and survivors') pensions paid from the state budget to specific groups: scientists, judges, officials and military personnel). State pensions for meritorious persons and casualties: state pensions of the first and second degree of the Republic of Lithuania (State budget); state pensions of deprived persons.	Do not exist.
LU	*Minimum guarantee pensions:* Through means-tested minimum income provision (RMG). *Earnings-related public pensions:* A general social insurance pension scheme for private sector workers, providing old-age, disability and survivors' pensions. A special pension scheme for public sector employees (10% of pensioners).	Exists for some sectors such as banking and for large foreign companies.
HU	*Minimum guarantee pensions:* Through means-tested social assistance. *Earnings-related Public pensions:* One public pension scheme covering all employees and the self-employed, providing old-age, early retirement, disability and survivors' pensions.	Do not exist.
MT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance (non-contributory) scheme to persons not qualified for the contributory scheme *Earnings-related public pensions:* One public (contributory) pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions (apart from unemployment, sickness and work injury benefits).	Exists only to a minor extent.

NL	*Minimum guarantee pensions:* Social assistance to those not qualifying (not lived in NL for 50 years) to contributory flat-rate scheme. *Contributory social insurance pensions:* General flat-rate old-age pensions (AOW) to all citizens; Separate disability benefits (WIA) and survivors' pensions (ANW); flat-rate or earnings-related benefits.	A high number of funds (industry-wide, company-specific and professional group specific) for the provision of occupational old-age pensions and early retirement schemes (VUT), covering over 90% of employees.
AT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance scheme ("Ausgleichszulagen"). *Earnings-related Public pensions:* Harmonised public pension schemes covering all employees and the self-employed (gradually harmonised as of 2005), providing old-age, disability and survivors' pensions.	The New Severance Payment (Abfertigung Neu) is a compulsory system since 2002. The employer pays monthly contributions at a rate of 1,53% of gross wages. The employee can choose between a single payment at the end of the career and a transfer to a pension fund system. By end of 2010 assets have increased to 3.5 billion EUR. The pension fund system is an occupational system since 1990. By end of 2010 assets have increased to 14.9 billion EUR.
PL	*Minimum guarantee pensions:* Means-tested minimum pensions financed from the state budget, topping-up benefits paid out from mandatory pension schemes. *Earnings-related public pensions:* One social insurance pension scheme (ZUS), covering all employees and the self-employed (except farmers), which is a defined-benefit scheme to those born before 1949 and a notional defined contribution scheme to those born after 1948, providing old-age pensions. Separate schemes for disability and survivors' pensions under the social sec. system. A separate scheme for farmers (KRUS), providing old-age, disability and survivors' pensions. Specific public sector service pensions (armed forces, police, judges etc.) paid from the state budget. Pre-retirement benefits paid out from the state budget.	Exists only to a very minor extent, with a very low coverage (2% of employees).
PT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance scheme. It includes all types of minimum pensions (non-contributive/social pensions and contributive scheme (the pension amount depends on the contributive career length). *Earnings-related public pensions:* A general social security pension scheme covering all employees and the self-employed in the private sector and public sector employees since January 2006 providing old-age, disability and survivors' pensions (apart from short-term benefits). A separate pension scheme (CGA) for other public sector employees.	Exists mainly for banking, insurance and telecommunication sectors as a substitute for the general social security scheme. Also exists as complementary schemes for other DB and DC pensions.

RO	*Minimum guarantee pensions:* for PAYG and farmer pensioners only as annually set minimum threshold (350 RON in 2010). *Earnings-related public pensions:* One scheme, covering the public and private sector employees, self-employed), covering old age, disability, early retirement, survivors' pensions.	Draft of the law to be promoted. Lawyers pension scheme.
SI	*Minimum guarantee pensions:* National, means-tested pensions (for 15 years of insurance, pension can not be lower than 35% of the minimum pension rating base). National, means tested supplementary allowance paid to lower pensions through social assistance. *Earnings-related Public pensions:* One public pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions. Flat-rate pensions to farmers, military personnel of the Yugoslav army and for retirees from other republics of the former SFRY.	Mandatory supplementary insurance for some high-risk professions (about 42.000 workers, minor importance), voluntary collective supplementary pensions (covering half the employees).
SK	*Minimum guarantee pensions:* No special minimum pension scheme, minimum subsistence for old people and widows provided through means-tested social assistance paid out from the state budget. *Earnings-related Public pensions:* PAYG DB public pension scheme covering almost all employees and self-employed, providing old-age, early old-age, disability and survivors' pensions. First pillar of the pension scheme.	Do not exist.
FI	*Minimum guarantee pensions:* National pension scheme provides means-tested (against other pensions) minimum pensions to all citizens, a full national pension after 40 years of living in FI. Also means-tested housing allowances for pensioners. Guarantee pension provides pension if a total pre-tax pension income is less than EUR 687.74 per month (2011). *Earnings-related public pensions:* Several but harmonised public pension schemes for different sectors of employees and the self-employed, covering all gainfully employed, providing old-age, part-time, disability and survivors' pensions.	Supplementary occupational pensions, accounting for about 2 % of total pension benefits.

SE	*Minimum guarantee pensions*: National pension scheme provides means-tested (against other pensions) minimum pensions to all citizens, a full national pension after 40 years of living in SE. Also means-tested housing allowances for pensioners (BTP) and maintenance support for the elderly (ÄFS). *Earnings-related Public pensions:* The PAYG general public (NDC) pension scheme covering all employees and the self-employed, providing old-age pensions. The old earnings-related transitional DB scheme works in parallel during the phasing-in period of the new system. Disability pension for individuals (19-64 years) and Survivors' benefits, including widow's pension (applies only for women married before 1989).	Quasi-mandatory supplementary occupational old-age pensions for all sectors, covering approx. 90% of employees.
UK	*Minimum guaranteed and contributory social insurance pensions:* Flat-rate (contributory) state basic (old-age) pensions to all citizens and means-tested supplements through pension credits and Council taxes (financed out of taxes) *Earnings-related social security and other public pensions:* State second pension scheme, of which people can opt out of occupational pensions Public service pensions paid from the state budget. Separate disability and widows' allowance schemes.	A high number of funds for the provision of occupational pensions (about 60% of employees are contributing either to occupational or personal pension schemes).
NO	*Minimum guarantee old-age and disability pensions:* Minimum income guarantee. *Earnings-related Public old- age and disability pensions:* Earnings-related benefit.	Central government occupational pension scheme financed by employee contributions and transfers from State budget. Supplement to public old age pension. Local government occupational pension schemes are funded systems. Supplement to public old age pension. Mandatory private sector occupational schemes are funded defined contribution systems. Supplement to public old age pension.

Source: EPC - AWG delegates.

Table 6. 3 - Coverage and specification of pension schemes		
	Schemes covered in the projections *(*E-r = earnings-related)*	**Schemes not covered**
BE	***Public pensions: old age and early pensions:*** Means-tested minimum benefits: 65+ E-r old-age 60+ and widows, public sector E-r old-age 60+ and widows, private sector E-r old-age 60+ and widows, self-employed Early retirement embedded in the unemployment scheme (prepension) 60+, private sector Early retirement (prepension for heavy jobs): 58+, private sector Early retirement (prepension for labour market reasons): 52-55, private sector ***Public pensions: other*** Disability pensions -64, private sector Disability pensions -64, self-employed	Prepensions include only the part paid from unemployment benefit scheme, not the complement paid by the employer. ***Occupational pension schemes:*** (pensions 1.1% of GDP in 2007). ***Individual private pensions:*** (non-mandatory)
BG	***State public insurance - pensions related to employment:*** ***Old Age Pensions*** Old Age and Length of Service Pensions (including farmers, COOP, military officials) ***Disability Pensions*** Disability (including farmers, COOP, military officials) Disability due to Work Injury and Professional Disease (including farmers, COOP, military officials) ***Survivors Pensions according to relationship with the deceased*** Widows Children Parents	***State public insurance - Pensions not related to labour activity : - without numbers*** 1.Veterans of War Pensions 2.Military Disability Pensions 3.Special Merits Pension (art.28 - abolished) 4.Special Merits Pension (art.30A - abolished) 5.Pension for Special Merits 6.Civil Disability Pensions 7.Private Farmers Pensions 8. Pensions by Decree 9. Social Pensions for disability - as of 2013 will be shifted to Social Assistance. 10.Personal Pensions 11.Social Pensions old age - as of 2013 will be shifted to Social Assistance. ***Supplementary mandatory pension insurance*** 1. Universal Pension Funds (UPF) - supplementary life-long old-age pension 2. Professional Pension Funds (PPF) - Professional early retirement pension for a limited period for people working under the conditions of 1st and 2nd labour category; 3. Teachers Pensions ***Supplementary voluntary pension funds (VPF)*** 1. Personal Pensions - Personal old-age pension - for a limited

		period; - Personal disability pension - for a limited period; - Survivor's pension - for a limited period of time 2. Occupational Pensions
CZ	***Public pensions: old age and early pensions*** Minimum and e-r old-age pensions, 62+ (65+ as of 2030), all sectors Proportional old-age pensions, 65+, all sectors Widows and disability pensions, 62+ (65+ as of 2030) Early pensions (with permanent reductions) ***Public pensions: other*** Widows and disability pensions -62 (-65 as of 2030) Orphans pensions	
DK	***Public pensions: old age and early pensions*** Public flat-rate old-age pensions and means-tested supplements, all citizens 65+ Civil servants old-age pensions 65+, central and Local government Voluntary early retirement schemes, all wage earners ***Public pensions: other*** Disability and survivors' pensions, -64	***Occupational pensions*** Labour market pensions (e-r old-age, disability and spouse's pensions), private sector (ATP) Labour market pensions (e-r old-age, disability and spouse's pensions), new public sector schemes (ATP) Labour market supplementary pensions (SP) Special pension savings plan (SAP) Labour market supplementary pensions for recipients of anticipatory pension
DE	***Public pensions: old age and early pensions*** E-r old-age, widows and disability schemes, all ages General scheme and life-time civil servants Early pensions for long-time workers Early pensions for severely handicapped ***Public pensions: other*** (covered above; not shown separately)	Means tested minimum benefits to elderly (social assistance); 0.1% of GDP (2009) Farmers pensions (0.14% of GDP) (2009) ***Occupational pensions*** annual contributions Pension expenditure 1.3% of GDP in 2009. *Individual funded and state subsidised private pension (Riester-Rente)*, schemes at a building stage, only contributions to the schemes.
EE	***Public pensions: old age and early pensions*** Minimum flat-rate pensions, all citizens E-r old-age pensions; length-of-service component to 60+w and 63+m in 2007, 65+ for both sexes as of 2026, all sectors (Pension Ins. Fund) Early pensions (possible to retire 3 years before the statutory retirement age), all sectors ***Public pensions: other*** Disability and widows' pensions, all ages, all sectors (Pension Insurance Fund) ***Private mandatory pensions*** Mandatory funded pensions, mandatory for young persons born 1983	

EL	***Public pensions: old age and early pensions (<u>planned coverage</u>, projections not yet completed)*** Minimum pensions (State budget and EKAS (Pensioners Social solidarity Fund)) Old-age Basic pension branch (flat-rate) and Main pension branch pensions, farmers aged 65+ (OGA) Means tested flat rate pensions of uninsured over aged individuals 65+ Old-age pensions, other self-employed (TEVE) E-r old-age and supplementary old-age pensions, private sector (IKA and merged funds) E-r old-age pensions, public sector (civil servants, army, public power corporation), of all ages (some groups employed before 1983 had no age threshold)s E-r supplementary pensions, public sector (auxiliary funds) Disability pensions, all ages Widows pensions, all ages Early pensions, of all ages ***Public pensions: other*** Orphans pensions	Welfare benefits Occupational funds due to their minor financial importance Private pensions due to their minor financial importance
ES	***Public pensions: old age and early pensions*** E-r old-age and early retirement pensions for private sector employees, the self-employed, regional and local government Means-tested minimum pension supplements (contributory) Old-age and early retirement pensions for central government employees and the military, including war pensions. ***Public pensions: other*** Disability (-64) and survivors' pensions (all ages) for private sector employees, self-employed, regional, local and central government and the military. Means-tested minimum pension supplements (contributory). Private (supplementary and voluntary) pension schemes: occupational and individual. Means-tested minimum pension scheme (non-contributor**y)**	
FR	E-r private sector pensions scheme for private sector wage-earners and non-civil servants public sector workers (CNAV); E-r complementary pension scheme for private wage-earners (Agirc, for executives, and Arrco, for all workers); E-r agricultural sector pension scheme (MSA); E-r public sector pension schemes (CNRACL, for civil servants in local administrations, and FPE, for civil servants in state administration and military); E-r public sector complementary pension schemes (RAFP, for civil servants, and Ircantec, for non-civil servants public sector workers); E-r pension scheme for licensed workers (RSI, for professions such as craftsmen, tradesmen...); E-r pension scheme for law professions (CNAVPL, CNBF	Occupational and private pension schemes (PERP, PERCO, PERE, PREFON).

	specifically for lawyers); general "old age solidarity fund" scheme (FSV); small E-r pension schemes for specific professions (railwayman, etc.).	
IE	***Public pensions: old age and early pensions*** Minimum flat-rate old-age non-contributory pensions, 66+[1] (also includes widow(er)s non-contributory pensions, blind persons, lone parents, deserted wives, 66+), all sectors[2] Carers, 66+, all sectors[2] Flat-rate contributory 66+ and transition pensions, 65+(also includes invalidity) [1], private sector, self-employed and some civil servants[3] Widow(er)s contributory pensions, 66+, all sectors Carers and deserted wives, 65+, private sector, self-employed and some civil servants[3] ***Public pensions: others*** Widow(er)s non-contributory pensions, 65-, all sectors[2] Blind persons, carers, non-contributory, 65-, all sectors[2] Pre-retirement allowance, 55-65, all sectors [2] Disability pensions, 65-, and invalidity pensions 64-, private sector, self-employed, some civil servants [3] Carers, contributory, 64-, private sector, self-employed, some civil servants[3] Widow(ers) contributory pension, 65-, all sectors ***Public sector (occupational) pensions*** Pensions, lump sums and spouses, Civil service, defence, police, education, health and local authorities, non-commercial state bodies [1] Includes dependent adults of all ages. [2] While individuals from all sectors of the economy are eligible to apply for these pensions, some sectors may not be eligible to receive them due to the means-tested nature of the schemes. [3] "Public servants hired on or after 6 April 1995 pay the standard full-rate social insurance contribution, thereby (in general) becoming entitled on retirement to the contributory public pension, along with a public service occupational pension which is "integrated", i.e. reduced to reflect the public pension income. By contrast, most public servants hired before 6 April 2005 pay a lower "modified" social insurance contribution, but may qualify for some other social welfare benefits. Note: State pension (transition) which is currently payable at age 65 is set to be abolished in 2014 thereby standardising state pension age at 66. There after state pension age is set to increase to 67 in 2021 & to 68 in 2028.	*Occupational pensions:* Private sector schemes and public sector commercial bodies
IT	***Public Pension System - Public pensions and social assistance benefits (pay-as-you-go):*** - Old-age and early retirement pensions, - Disability pensions, - Survivors' pensions - Old age allowances and social assistance additional lump sums (State budget)	***Occupational pensions schemes (funded).*** They are not included in the definition of “Public pension system” (which is utilized for the analysis of the sustainability of public finances) insofar as: i) they are never mandatory; ii) they provide a supplement of pension which corresponds to a minor fraction of the pension guaranteed by the public pension system and never replace it. No risk is taken by the State on investment returns.

CY	***Public pensions: old age and early pensions*** General Social Insurance scheme covering e-r old-age, widows' pensions and orphan's pensions Early old-age pensions, 63-64 Invalidity and disablement pensions, -62 Government Employees Pension scheme covering old-age, widows' and disability pensions	***Public pensions*** Social pension scheme and special allowances to pensioners ***Occupational funded pension plans:*** i) DB pension schemes for semi-state and private sector employees ii) DC Provident funds for private sector employees
LV	***Public pensions: old age and early pensions:*** Old-age minimum guaranteed pension, 62+ E-r old age DB pensions, granted -1995 E-r old age NDC pensions, 62+, granted 1996+ (included early retirement during transition period) Service pensions (early pensions), selected professions, public sector (during the transition period). Disability pensions, granted – 1995 and not transformed to old-age pensions Survivor's pensions (for widows during the transition period) ***Public pensions: other*** Disability pensions, - 62, Survivor's pensions – 24 ***Private mandatory pensions:*** Individual funded old-age, mandatory for persons born 1971+	***Voluntary private funded pension scheme*** ***Social pension*** (public benefit, if the person's insurance record <10 years, paid from the state basic budget) ***Specific public sector service pensions schemes*** (paid from state basic budget)
LT	***Public pensions: old age and early pensions*** Social assistance pensions, w60+/m62.5+ (65+ as of 2026); (State budget) E-r old-age pensions, w60+/m62.5+ (65+ as of 2026), all sectors (Soc insurance scheme) Special public service (state) pensions for selected professions (scientists, judges) (State budget); state pensions of the first and second degree of the Republic of Lithuania (State budget); state pensions of deprived persons (State budget) w60+/m62.5+ (65+ as of 2026). Early retirement pensions (possible to retire 5 years before the statutory retirement age), all sectors (Soc insurance scheme). Officials and military personnel pensions for service, public sector (State budget); length of service pensions, compensation for extraordinary working conditions (Soc. insurance. scheme). ***Public pensions: disability pensions*** Social assistance disability pensions (State budget) E-r disability pensions, all sectors (Soc. Insurance scheme) Officials and military personnel disability pensions, public sector (State budget) ***Public pensions: other*** Social assistance survivors pensions (State budget) Survivors pensions, all sectors (Soc. Insurance scheme) Officials and military personnel survivors pensions, public	

	sector (State budget) ***Private mandatory pensions:*** Individual funded old-age pension, voluntary, all sectors	
LU	***Public pensions: old age and early pensions*** E-r old-age, early retirement and disability pensions, 65+, private sector & self-employed (RGAP (general pension insurance scheme) E-r old-age, early retirement and disability pensions, 65+ , public sector (RSP, special pension scheme), state budget ***Public pensions: other*** Disability (-64 years) and survivors' pensions, all sectors	Minimum benefits (RMG, social assistance)
HU	***Public pensions: old age and early pensions:*** Social allowances equivalent to pensions to persons 62+ E-r old-age and anticipatory old-age pensions, all sectors Survivors pensions, 62+, all sectors Disability pensions, 62+, all sectors ***Public pensions: other*** Disability pensions, -61, all sectors Survivors pensions, -61, all sectors Pension-like regular social allowances, -61 ***Private mandatory pensions:*** Individual funded pensions, voluntary to persons. People can choose whether they become the member of pure public pension system or pure private pension system. People entering the labour market before 2010 and chose the pure private pension system, also had taken part in the public system, thus they can have some entitlements also from that scheme.	Handicap support, political compensation allowances
MT	***Public pensions: old age and early pensions:*** Two-thirds pension scheme (incorporating two-thirds retirement pension, national minimum pension, increased national minimum pension, increased retirement pension, decreased national minimum pension), currently w60+/m61+, 62+ in 2012, 63+ in 2018, 64+ in 2022 and 65+ in 2026. ***Public pensions: other*** Pensions other than those listed above, notably disability and survivors' pensions and some pensions, which will be phased out over a transition period, to specific groups of pensioners	Treasury Pensions (A DB pension scheme open for Public officers who joined the Public Service of Malta prior to 15th January 1979). Closed to new members.
NL	***Public pensions: old age and early pensions:*** Public flat-rate old-age pensions, 65+, all citizens (AOW) Widows pensions, w55+, all sectors (ANW) ***Public pensions: other*** Disability benefits, all sectors (WIA) ***Occupational pensions*** Occupational old-age pensions, 65+, all sectors Occupational early retirement pensions, all sectors (VUT)	

AT	***Public pensions: old age and early pensions:*** E-r old-age and early retirement pensions, w60+/m65+, private sector (ASVG, gen. soc. ins. Scheme, also including farmers and self-employed) E-r old-age and early retirement pensions, w65+/m65+, public sector (civil service) ***Public pensions: other*** Survivors' pensions, all ages, all sectors Disability pensions, all ages, all sectors	***Public pensions: old age and early pensions:*** Minimum pensions (Ausgleichszulagen), financed by general taxes revenues. Other pension related expenditures: Some pension expenditures not directly linked to pension benefits (as for rehabilitation, administrative costs, etc.) are not included in the projections. These other pension expenditures make up for approximately 0.9% of GDP.
PL	***Public pensions: old age and early pensions*** E-r DB old-age, w60+/m65+, disability, widows and early retirement pensions, w55-59/m55-64, to persons born -1948 and to those people who earned fully their pension rights before the end of 2008, private and public sector, self-employed (ZUS, Social ins. Institution) E-r NDC old-age and anticipatory pensions, to persons born 1949- (with the exception of the transitional group), private and public sector, self-employed (ZUS, Social ins. Institution) E-r NDC bridging-pensions (employment in special conditions or character) w55/m60+ E-r DB old-age, disability and widows pensions, all ages, farmers (KRUS, Farmers social ins. scheme) Armed forces old-age pensions (State budget) ***Public pensions: other*** Disability and survivors' pensions, -54, private and public sector, self-employed (ZUS) ***Private mandatory pensions*** Individual funded old-age pensions, mandatory to persons born 1969+ and voluntary to those born 1949-68 joining the scheme by the end of 1999	***Public pensions: old age and early pensions:*** Minimum means-tested pensions (current rule of indexation leads to very low coverage of this benefit in the future) ***Occupational pensions*** (of minor importance)
PT	***Public pensions: old age and early pensions:*** Social pensions (minimum, means-tested and non-contributory), old-age, 65+, disability pensions, 65+. General Contributory (social insurance) scheme (employees and self-employed of the private sector and public employees since 2006): old-age and early pensions; disability pensions, 65+. Includes supplements to ensure minimum pensions value. RESSAA (Spec. soc. sec. scheme for agriculture workers): e-r old-age, 65+, disability pensions, 65+. CGA (Pension scheme of civil servants hired until December 2005): old-age and early pensions, disability pensions, all ages. Includes supplements to ensure minimum pensions value. ***Public pensions: other*** Social pensions, including *Complemento Solidário para Idosos* (income supplement for the elderly 65+) (means-tested non-contributory): disability pensions, -64, survivors' pensions, all ages. General contributory scheme & RESSAA: disability pensions, -64, survivors' pensions, all ages. CGA scheme: survivors' pensions, all ages. ***Occupational pensions:*** 1st pillar schemes for some sectors (banking and insurance for	***Private pensions:*** Individual (non-mandatory) private pension schemes (of minor importance).

	example) and complementary schemes for other DB and DC pensions.	
RO	***Public pensions Old Age Pensions*****:** w 59+/63, m 64+/65, standard contribution period w 28/30, m33/35 *Early and Partial early retirement and Survivors pensions* *Disability Pensions*: (including farmers, military); ***Private mandatory pension***	*Farmers pensions (as % in GDP)* *Non-mandatory pensions (pillar 3) (as % in GDP)* *Minimum pensions (as % in GDP)*
SI	***Public pensions: old age and early pensions:*** Old age pensions E-r old-age (w58-63+/m58-65+), Disability and widows pensions, all ages, all sectors Special compulsory pensions to workers in high-risk occupations, private and public sector ***Private non - mandatory pensions (collective, individual) (including mandatory pensions to workers in high risk occupations)*** Collective (semi - mandatory) and individual supplementary pensions	National (state) pensions (State budget) – from 1. June 2011 governed by public act (excluded from Pension and Disability Act) Flat-rate pensions for farmers, Pensions (supplements) for the military personnel of the Yugoslav army and retirees from other republics of former SFRY ***Occupational pensions:*** Collective supplementary pensions
SK	***Public pensions: old age and early pensions*** E-r old-age, w53-57+/m60+ (w62+ 2024 and m62+ 2008). ***Public pensions: other*** Disability, widows/er pensions, orphans pensions ***Private mandatory pensions*** Individual funded old-age pension, voluntary to persons entering labour market 2008+	Voluntary pension funded DC scheme introduced in 1996. Third pillar of the pension scheme.

FI	***Public pensions: old age and early pensions*** 1) National (minimum) pension (Nat. pension insurance) 65+ 2) Guarantee pension (guaranteed minimum amount) 62+ 1.3.2011-] 3) E-r old-age, 63+, early , private sector and the self-employed: TyEL (private sector employees), YEL (self-employed), MYEL (farmers), the public sector: (VEL (central government employees), KuEL (municipal sector employees), KiEL (church empl.), Unemployment pensions, 60-62, to be phased out by 2014. ***Public pensions: other*** National (minimum) disability and survivors' pension, -64; [guarantee pension, which guarantees a minimum amount to all (disability) pensioners 1.3.2011-] E-r disability -63 and survivors pensions, , all sectors (early pensions change into old- age pensions at the age of 63 and, then, included in the above category)	*Occupational and voluntary pensions:* Collective and voluntary supplementary schemes
SE	***Public pensions: old age and early pensions:*** Minimum pensions, housing supplement for pensioners and maintenance support for the elderly (State budget) E-r NDC old-age pensions, flexible age (including old transitional DB system), all sectors (Social insurance scheme) ***Public pensions: other*** Disability pensions, 19-64, and survivors benefits, all ages (State budget) ***Occupational pensions:*** Occupational (supplementary) pensions, all sectors (including old transitional DB systems) ***Private mandatory pensions:*** Individual mandatory funded old-age pensions ***Private non-mandatory pensions:*** Tax-deductible pension savings	
UK	***Public pensions (and other public) pensions: old age and early pensions*** Basic state (minimum) pensions + their additions (winter fuel allowance), State Pension Age and above, all citizens (National insurance scheme) Pension credits and Council tax benefits, 60+, all citizens (State budget) State second pension (S2P)/ State earnings-related pensions (SERPS), State Pension Age, all sectors (National insurance scheme)	***Public pensions*** Disability benefits to people below State Pension Age. Above State Pension Age all individuals are covered by social security pensions. ***Occupational pensions*** Supplementary old-age pensions, private sector; important part of the pension system

	Widows benefits are covered for individuals above State Pension Age E-r old-age pensions, 60+, public sector employees (State budget) ***Public pensions: other***	
NO	***Public pensions: old age and early pensions:*** Minimum income guarantee. Earnings-related benefits ***Public pensions: other*** Disability pensions.	Central government occupational pension scheme financed by employee contributions and transfers from State budget. Supplement to public old age pension Local government occupational pension schemes are funded systems. Supplement to public old age pension. Mandatory private sector occupational schemes are funded defined contribution systems. Supplement to public old age pension. Private non-mandatory defined benefits (and from 2001 also defined contribution schemes)

Source: EPC - AWG delegates

Table 6. 4 - Summary table on pension scheme

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
BE	**Public pensions**														
	1) Wage-earner	DB	60 - 35	65	45	full career	43,7% for head of a household with a dependent spouse; 35% in the other cases	1,67% for head of a household with a dependent spouse; 1,33% in the other cases (1) + bonus of 2,16 euro per day of effective work from the age of 62 (or after 44 years of career) up to the age of 65	24.77% (for all Social Security schemes)	13.07% (for all Social Security schemes)		The reference wage up to a ceiling is adjusted to the current prices by the CPI. Periods of unemployment, prepension or disability are valued at the last corresponding earned wage. A minimum claim per working year also exists: if the adjusted wage in a full time employment of one year of career is lower than a specific amount, then the pension for this year of career is calculated on basis of the minimum claim per working year.	Automatically adjusted to the CPI and partially adapted to living standards following the Generation Pact (2)	75% for head of a household with a dependent spouse; 60% in the other cases	
	2) Self-employed		60 - 35			full career	49,1% for head of a household with a dependent spouse; 37,6% in the other cases		in 2011: from 12,129.76 to 52,378.55: 22%; from 52,378.55 to 77,189.40: 14,16% (for all Social Security schemes)			The reference income (valued at a fixed income before 1984, and calculated on the basis of the business income as from 1984) up to an income ceiling is adjusted to the current prices by the CPI.			
	3) Civil servants		60 - 5			5 last years	51,7% for head of a household with a dependent spouse; 41,4% in the other cases	1,67% (1) +bonus of 1,5% if still working at 61 or 62 year each and a bonus of 2% if still working at 63, 64 or 65 year each		7.5% survivor pension (other rules for local authorities)		The wage is adjusted to the current prices by the CPI.	Automatically adjusted to the CPI and to the real wage increases of the working civil servants	75%; up to 90% including bonus and complements	
	4) Prepension (only the part paid from unemployment benefit scheme)		60 - 30 for men 35 in 2012; 26 for women 28 in 2012, 30 in 2016, 32 in 2020, 34 in 2024, 35 in 2028	60		last wage			24.77% (for all Social Security schemes)	13.07% (for all Social Security schemes)			Automatically adjusted to the CPI and partially adapted to living standards following the Generation Pact (2)	60%	
	5) Disability		no minimum age (between 18 and 64) minimum 120 days of work during the last 6 months for the wage-earner			last wage for the wage-earner; lump-sum benefit for the self-employed	wage-earner: 43,7% for head of a household; 35% for alone people; 30,6% for living together self-employed: 49,1% for head of a household; 37,6% for alone people; 30,7% for living together		24.77% (for all Social Security schemes)	13.07% (for all Social Security schemes)				65% for head of a household; 55% for alone people; 40% for living together	
	6) Assistance scheme	mean tested	65	65			20,9% for living together (individual amount); 31,3% for alone people		Financed by taxes						
	Occupational pensions														
	1) wage-earner: Law on additional pensions of 28 April 2003	majority of DB	65 with exceptions	65		dependent on the pension scheme		dependent on the pension scheme	dependent on the pension scheme					80%	
	2) self-employed: Law on additional pensions for the self-employed of 24 December 2002	DB, DC, hybrid							ordinary convention: maximum 8.17% of the professional income up to a ceiling social convention: maximum 9.40% of the professional income up to a ceiling						
	Non-mandatory private scheme														
	1) Pension fund	DC	contract of minimum 10 years, minimum 5 deposits	65											
	2) Life-insurance														
	Additional information	(1) Those accrual rates are not met in practice because of the various parameters of the calculation of the pension: minimum pension, minimum claim per working year, ceiling. (2) The adaptation to the living standards is made within a total budget corresponding to the necessary budget required for an increase (of all replacement benefits in the scheme) of 1,25% indexation of the wage ceilings +1% indexation of lump-sum benefits + 0,5% indexation of the earning-related benefits + 1,25% indexation of the minimum claim per year.														

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
BG 2010	**Public pensions**														
	1) State Public Insurance - I labour category		52 m, 47 f		at least 10 years and 100 points m, at least 10 years and 94 points f (1)										
	2) State Public Insurance - II labour category	DB	57 m, 52 f		at least 15 years and 100 points m, at least 15 years and 94 points f (1)	3 best years of insurance before 1.1.1997 + all insurance years after that	21,0%	1,1%	9.1% for persons born after 31.12.1959 and 11.9% for those born before 1.01.1960	4.9% for persons born after 31.12.1959 and 7.1% for those born before 1.01.1960	12,0%		none		
	3) State Public Insurance - III labour category		63 m, 60 f	63 m, 60 f	37 years and 100 points m, 34 and 94 points f (1)										
	4)Teachers Fund		60 m, 57 f		25 years f, 30 years m				4,3%						
	Occupational pensions														
	1) Supplementory voluntary pension funds under occupational schemes		55 both m and f	60 both m and f		full insurance period									
	Mandatory private scheme														
	1)Professional pension funds - I labour category		52 m, 47 f						12%						
	2)Professional pension funds - II labour category	DC	57 m, 52 f						7%						
	3)Universal pension funds - supplementary life-long old age pensions		58m, 55 f			full insurance period			2.8% - only for persons born after 31.12.1959	2.2% - only for persons born after 31.12.1959					
	Non-mandatory private scheme														
	1) Supplementory voluntary pension funds	DC	58m, 55 f	63 m, 60 f		full insurance period									
	Additional information	(1) The number of points equals age plus years of contributions													
BG 2060	**Public pensions**														
	1) State Public Insurance	DB		65 m, 63 f	40 years m, 37 f	full insurance period		1,2%	7,1%	5,7%	12%		50% Wages+50%		
	2)Teachers Fund		62 m, 60 f		28 years f, 33 years m				4,3%						
	Occupational pensions														
	1) Supplementory voluntary pension funds under occupational schemes	DC	60m, 58 f	60 both m and f		full insurance period									
	Mandatory private scheme														
	1)Professional pension funds - I labour category		57 m, 55 f		at least 10 years m+f				12%						
	2)Professional pension funds - II labour category	DC	62 m, 60 f		at least 15 years m+f				7%						
	3)Universal pension funds - supplementary life-long old age pensions		60m, 58 f			full insurance period			4,2% since 2017	2,8% since 2017					
	Non-mandatory private scheme														
	1) Supplementory voluntary pension funds	DC	60m, 58 f	65 m, 63 f		full insurance period									

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Government	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
CZ 2010	**Public pensions**														
	public system (PAYG)	DB	Minimum ret. age: 5 years before statutory age but not earlier than at age 60 Contributory period: min. 26 years, or 16 years at age 5 years higher than statutory	men: 62y 2m women - no child: 60y 8m 1 child: 59y 8m 2 children: 58y 8m 3 and 4: 57y 8m 5 and more: 56y 8m	min. 26 years, or 16 years at age 5 years higher than statutory	last 30 years of carreer, but only back to 1986	12.5%	1.5%	21.5%	6.5%	none	2 % (nominal wage growth; pensionable earning = wage)	min. valorization: CPI + 1/3 real wage growth	none	none
	Non-mandatory private scheme														
	Voluntary fully founded private pension	DC	none	none	min. 5 yeas	contributions	none	none	voluntary, subject to tax allowances	voluntary, subject to tax allowances	max. 71EUR per year. Depends on contributions.	Depends on pension fund performance. Pension funds must have non-negative yield	none	none	none
CZ 2060	**Public pensions**														
	public system (PAYG)	DB	Minimum ret. age: 5 years before statutory age but not earlier than at age 60 Contributory period: min. 35 years, or 20 years at age 5 years higher than statutory	men: 65y women with - no or 1 child: 65y 2 children: 64y 3 children: 63y 4 and more: 62y	min. 35 years, or 20 years at age 5 years higher than statutory	last 30 years of carreer	12.5 %	1.5%	21.5%	6.5%	none	Based on nominal wage growth	min. valorization: CPI + 1/3 real wage growth	none	none
	Non-mandatory private scheme														
	Voluntary fully founded private pension	DC	none	none	min. 5 yeas	contributions	none	none	voluntary, subject to tax allowances	voluntary, subject to tax allowances	max. 71EUR per year. Depends on contributions.	Depends on pension fund performance. Pension funds must have non-negative yield	none	none	none
DK	**Public pensions**														
	1) Public old-age pension	DB	65-na	65	40								Adjusted once a year on the basis of wage developments in the private sector (the area covered by the Danish Employers' Confederation), cf. the Rate Adjustment Percentage Act.		
	2) Civill servants old-age pension	DB	60-na	60-65	37 (empolyed as civil servant. There are no contributions)	Depends on tenure and final wage							Adjusted once a year on the basis of wage of (similar) civil servants, which are regulated according to agreements, in general bi-annually	57 (gross)	
	3) Voluntary early retirement	Mixed	60-15	60	30								Adjusted once a year on the basis of wage developments in the private sector (the area covered by the Danish Employers' Confederation), cf. the Rate Adjustment Percentage Act.		
	4) Disability pensions	DB	18-na										Adjusted once a year on the basis of wage developments in the private sector (the area covered by the Danish Employers' Confederation), cf. the Rate Adjustment Percentage Act.		
	Occupational pensions														
	1) Labour mkt. pensions (ATP)[a]	DC	65-na	65				Market return[c]	33	67	0				
	2) Special pensions savings plan (SAP)	DC	65-na	65				Market return[c]	0	33	67				
	3) Various old-age[b]	Mixed	60-na	65				Market return[c]							
	4) Various disability, spouses[b]	Mixed	18-na					Market return[c]							
	Additional information:	b) Many lobour market pension schemes are quasi-mandatory due to collective agreement between employer and labour organizations c) In the long run this is assumed to be 5.25 per cent.													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
DE 2010	Public pensions														
	1) Statutory pension system	point system	63 years / 5 years	65 years*	no explicit full pension	life-time			9.95	9.95		equal to pension indexation	wages plus sustainability factor	n.a.	change of relation pensioners to contributors
DE 2012	Public pensions														
	1) Statutory pension system	point system	63 years / 5 years	65 years and one month*	no explicit full pension	life-time			9.95	9.95		equal to pension indexation	wages plus sustainability factor	n.a.	change of relation pensioners to contributors
DE 2060	Public pensions														
	1) Statutory pension system	point system	63 years / 5 years	67 years*	no explicit full pension	life-time						equal to pension indexation	wages plus sustainability factor	n.a.	change of relation pensioners to contributors
	Additional information	Starting January 1, 2012 the statutory retirement age increases gradually from age 65 to age 67. During period 2012 to 2024 the statutory retirement age increases one month per year. During period 2025 to 2030 the statutory retirement age increases two month per year.													
EE 2010	Public pensions														
	State pension insurance (I pillar)	DB	Statutory minus 3 years	Men 63 Women 61 (2016 - both 63: 2026- both 65)	minimum contributory period -15 years	full career	16%	1%	16%	0%			20% CPI + 80% social tax revenue growth		
	Mandatory private scheme														
	Private mandatory funded pension (II pillar)	DC	Men 63 Women 61	Men 63 Women 61 (2016 - both 63: 2026- both 65)		full career		2,5% (real, used in projections)	4%	2%					
	Non-mandatory private scheme														
	Voluntary pension (III pillar)	DC	Men 55 Women 55	None		full career			voluntary	voluntary					
EE 2060	Public pensions														
	State pension insurance (I pillar)	DB	Statutory minus 3 years	65	minimum contributory period -15 years	full career	10%		16%	0%			20% CPI + 80% social tax revenue growth		
	Mandatory private scheme														
	Private mandatory funded pension (II pillar)	DC	65	65		full career		2,5% (real, used in projections)	4%	2%					
	Non-mandatory private scheme														
	Voluntary pension (III pillar)	DC	Men 55 Women 55	None		full career			voluntary	voluntary					

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings (1)	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
EL 2010-2015	Public pensions														
	1) IKA-ETAM	DB	No minimum retirement age, for 37 years of past service for pre 1993 insured people	various	various	The average of the best five years of the last decade, accordingly indexed by the pension indexation	-	2% and 3.3% For over 35 years of credits and age 65 until 2010. From 2011 Table II	6.67% until 2010. From 2011 and after see Table II	13.33% until 2010. From 2011 and after see Table II	(2)	Yearly decrees	According to yearly decrees depending on government economic policy	-	-
	2) PS		No minimum retirement age, for 17.5 years of past service for pre 1983 insured military married women or women with unmarried children	various	various	The average of the best five years of the last decade, accordingly indexed by the pension indexation	-	2% and 3.3% For over 35 years of credits and age 65 until 2010. From 2011 Table II	6.67%	-	-	Yearly decrees	According to yearly decrees depending on government economic policy	-	
	3) OAEE		No minimum retirement age, for 37 years of past service for pre 1993 insured people	various	various	Depending on the history of insurance classes	-	2% and 3.3% For over 35 years of credits and age 65 until 2010. From 2011 Table II	0.2		10% For insured after 1/1/1993	Yearly decrees	According to yearly decrees depending on government economic policy	-	
	4) OGA		65 years of age and 15(3) years of service	65	15	Depending on the history of insurance classes	-	0.02	0.07		0.14	According to pension indexation	According to yearly decrees depending on government economic policy	-	-
	Additional information	(1) Age and years of service requirements are interrelated. (2) 1% of GDP per year on average intended for all branches of IKA-ETAM; (3) May be reduced according to income or residential criteria													
EL 2016-2060	Public pensions														
	1) IKA-ETAM	DB	60 with 15* years of service	65 or 60	15 or 40	The average salary of all career years indexed accordingly with the salary escalation	-	According to the past credit from 0.8% to 1.5%	6.67% additional social transfer 0.96%	13.33%, additional social transfer 2.04%	(2)	Yearly decrees	Minimum of 1) 50% GDP change plus 50% CPI change 2) CPI change	-	The limits of retirement age will change for the period 1/1/2021 – 31/12/2023 by the change in the life expectancy in relation to age 65 for the decade 2010-2020. From 1/1/2024 the above limits will be determined anew every 3 years by joint ministerial decision of the Ministries of Finance and Labour and Social Security which will be issued the last year of every period based on the relative indicators that will be determined by the Greek Statistical
	2) PS		No age limit for people with 35 career years	65 or 60	15 or 40	The average salary of all career years indexed accordingly with the salary escalation	-	According to the past credit from 0.8% to 1.5%	6.67%	-	-	Yearly decrees	Minimum of 1) 50% GDP change plus 50% CPI change 2) CPI change	-	
	3) OAEE		60 with 40 years of service	65 or 60	15 or 40	Depending on the history of insurance classes	-	According to the past credit from 0.8% to 1.5%	0.2		10% For insureds after 1/1/1993	Yearly decrees	Minimum of 1) 50% GDP change plus 50% CPI change 2) CPI change	-	
	4) OGA		65 with 15(3) years of service	65	15	Depending on the history of insurance classes	-	0.02	0.07		0.14	According to pension indexation	Minimum of 1) 50% GDP change plus 50% CPI change 2) CPI change	-	-
	Additional information	(1) Age and years of service requirements are interrelated. (2) 1% of GDP per year on average intended for all branches of IKA-ETAM; (3) May be reduced according to income or residential criteria													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
ES	**Public pensions**														
	Public pensions (apply to 1, 2,3)	DB	The minimum is 15 years of contribution	Increase in the statutory age from 65 to 67 years from 2013 till 2027. 65 still possible with 38,5 years of contribution. "Pension reform Law 27/2011, August 1st".	37 years 38.5 years. "Pension reform Law 27/2011, August 1st".		The minimum contributory pension is between 115% and 88% of the minimum wage depending on family charges (10152 Euros per year in 2010 for a person aged 65+ with dependent spouse). The non contributory pension is lower, 4500 Euros (annual) on average in 2010. Both under means-test.		TOTAL general contribution not earmarked only to public retirement pensions			The contribution base is the monthly earned income within thresholds regulated by the Annual Budget Law. Evolution with wages, but the maximum contributory base is normally closer to CPI inflation. Contribution bases corresponding to the 24 months prior to retirement are computed in nominal terms. The remaining CBs are adjusted according to the evolution of the Consumer Price Index	CPI inflation	Maximum pension 34527 (euros per year in 2010)	After 2027 parameters will change with life expectancy at 67, revisions every 5 years. "Pension reform Law 27/2011, August 1st".
	1) Social Security Employees (private sector) general regime		Immediate 2 year increase for early retirement 2013. Reduction coefficients apply. 63 age for early retirement and 33 years minimum contribution 61 in limited cases of economic crisis. "Pension reform Law 27/2011, August 1st".			Gradual 10 year increase till 2022 (from 15 to 25 last years). "Pension reform Law 27/2011, August 1st".		With 15 years of contribution: 50% of pensionable earnings. Linear increase till 100% with 37 years of contribution. Reduction and increasing coefficients for early (7.5-6.5%) or late retirement (2-4%). "Pension reform Law 27/2011, August 1st".	23.6%	4.7%					
	2) Social Security Self-employed		Immediate 2 year increase for early retirement 2013. Reduction coefficients apply. 63 age for early retirement and 33 years minimum contribution."Pension reform Law 27/2011, August 1st".						29.8%						
	3) Civil servants scheme Central government employees and military		60 age for early retirement / and 30 years minimum contribution. Civil servants special scheme is closed for new entrants since 1-1-2011.			entire working life		Different % accrued by year worked applied to a base by professional level		3.86%	Imputed payments				
	Additional information	Other special regimes exist, of less quantitative relevance.													
FR	**Public pensions**														
	E-r private sector pensions scheme CNAV	DB	62[(2)], no requirement on contributory years	67[(2)]	41.25 years[(3)] under 67[(2)]	25 best annual wages (under the SSC***)	:	1,2% (in 2010)	8.30% up to the SSC[(4)], plus 1.60% on the full wage	6.65% up to the SSC[(4)], plus 0.10% on the full wage	not relevant	prices	prices		not relevant
	E-r complementary pension scheme 'Agirc(1)	points	55, no requirement on contributory years			all wages (under 8 SSC***)	:	1,4% (in 2010)	5.70% up to the SSC[(4)], plus 13.90% between one and four SSC[(4)], plus 12.60% between four and eight SSC[(4)], plus 0.22% up to eight SSC[(4)]	3.80% up to the SSC[(4)], plus 8.60% between one and four SSC[(4)], plus 7.70% between four and eight SSC[(4)], plus 0.13% up to eight SSC[(4)]		wages - 1.5%	wages - 1.5%		
	E-r complementary pension scheme 'Arrco(1)					all wages (under 3 SSC***)	:	0,5% (in 2010)	5.70% up to the SSC[(4)], plus 13.30% between one and three SSC[(4)]	3.80% up to the SSC[(4)], plus 8.90% between one and three SSC[(4)]		wages - 1.5%	wages - 1.5%		
	E-r public sector pension scheme FPE	DB	62[(2)], except for some specific categories such as police and military. 2 years of contributory years, otherwise CNAV pension	67[(2)], except for some specific categories such as police and military.		last wage (without bonuses and other emoluments)	:	1,9% (in 2010)	not relevant	10.55%[(5)]	65.39%[(6)]	not relevant	prices		
	Additional information	(1) Parameters fixed by the last agreement (2011). According to this last agreement, valorisation of pensionable earnings and indexation of pensions will be changed from a system "wage / price" to a system "wage - 1.5% / wage - 1.5%". (2) since the 2010 pension reform. For the 1956 generation and the next ones. (3) for the 1954 generation. Since the 2003 pension reform, the contributory period for full pension is planned to increase in line with increases in life expectancy, so that the ratio of period of pension payment to the contributory period remains constant. After age 67, the full pension is reached, independently of the contributory period. (4) SSC : "social security ceiling", wage ceiling which determines the contribution rate level. In 2011, the SSC is 2946 €/month. (5) The 2010 pension reform plans an increase from 7.85% in 2010 to 10.55% in 2020. (6) for civil servants in 2011.													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
IE	**Public pensions**														
	State pension - contributory	Flat rate	65	66	Career average 48+cons	Flat Rate	34%	N/A	N/A	Av. 9%	4%	N/A Flat Rate	Discretionary	N/A Flat Rate	Increase retirement age and tighten link between contributions and benefits
	Public sector (occupational) pensions	DB	55		40 yrs	Full career									
	Occupational pensions														
		DB	55	65	40 yrs	Career average + Full Career			15%	5%	tax relief at marginal rate	yes	scheme rules		
		FDC	55	65					8%	5%					
	Non-mandatory private scheme														
		FDC	50	60	scheme rules			Rate of return			tax relief at marginal rate				
IT	**Public pensions**														
	Public sector employees	1. Earnings-related (DB): workers with at least 18 years of contribution at the end of 1995 2. Mixed: workers with less than 18 years of contribution at the end of 1995 3. Contributions-based (NDC): new workers insured after 1995	Early retirement. Retirement before the statutory retirement age (old age pension) is allowed with: a) 40 years of contributions regardless of age or, alternatively, b) 35 years of contribution at the age of 61 in 2012 increasing to 62 from 2013. The age requirement is 1 year lower with 36 years of contributions. Indexation of age requirements. Starting from 2013, the age requirements are indexed to changes in life expectancy, every three years. Exit windows. Payment of pension (and, then, actual retirement age) is further postponed by 1 year once the age and/or contribution requirements are met (15 months, starting from 2014, for retirement with 40 years of contributions)	Statutory retirement age (2): 65 for man and women with a minimum contribution requirement (20 years in DB and mixed regimes) Indexation of age requirements. Starting from 2013, the age requirements are indexed to changes in life expectancy, every three years. Exit windows. Payment of pension (and, then, actual retirement age) is further postponed by 1 year once the age and/or contribution requirements are met	Earnings-related (DB): 40 years Mixed: 40 years Contributions-based (NDC): full career	Earnings-related (DB): last monthly wage, for the contribution period up to 1992; last 10 years, thereafter Mixed: last monthly wage, for the contribution period up to 1992; gradual increasing for the contribution period 1993-1995. For the contribution period after 1995, see NDC method below Contributions-based (NDC): full career	Minimum income guaranteed to the elderly Social assistance benefits. Means-tested old age allowance (5,435 euro per year, in 2011) and social assistance additional lump sums Beneficiaries. Social assistance benefits are provided to the elderly with a personal or couple's income (including social security pensions) below certain limits and up to them. Size, in case of singles. In 2011, the income limit is 5,600 euro per year, in the age bracket 65-69, and 7,860 in the age bracket 70+. In any case, social assistance benefits are provided up to these income limits Size, in case of married people. In 2011, social assistance benefits are provided as long as the total income of the couple falls below 11,680 euro per year, in the age bracket 65 69, and 13,290 in the age bracket 70+ and. In any case, social assistance benefits are provided up to these income limits	Earning-related (DB): generally 2% of the reference wage (average of pensionable earnings) Contribution-based (NDC): approximately the product of the transformation coefficient and the contribution rate (3).	33% of which 1/3rd paid by the employee			Earnings-related (DB): prices Mixed: prices for the DB component, nominal GDP for NDC component Contributions-based (NDC): nominal GDP (5 year moving average)	Price inflation which is differentiated by pension brackets: a) 100% of the inflation rate for the amount of pension up to 3 times the minimum pension, b) 90% for the amount between 3 and 5 times the minimum and c) 75% for the part above 5 times the minimums; For the two-year period 2012-2013 and limited to pensions above 5 times the minimum pension, the, indexation to price inflation is reduced to 70% and only applied to the part of pension up to 3 times the minimum.	Earnings-related (DB): 80% Mixed: 80% for the DB component, no upper limit for the NDC component Contributions-based (NDC): no upper limit	Transformation coefficients 3 year revision according to changes in life expectancy. Next update in 2013 Age requirements 3 year revision according to changes in life expectancy. First t update in 2013;
	Private sector employees			Statutory retirement age (2): 65 for man and 60 women with a minimum contribution requirement (20 years in DB and mixed regimes). As for women, the statutory retirement age will be gradually equalized to that of men over the period 2014 to 2026. Indexation of age requirements. Starting from 2013, the age requirements are indexed to changes in life expectancy, every three years. Exit windows. Payment of pension (and, then, actual retirement age) is further postponed by 1 year once the age and/or contribution requirements are met		Earnings-related (DB): last 5 year wages, for the contribution period up to 1992; last 10 years, thereafter Mixed: 5 year wages, for the contribution period up to 1992; gradual increasing for the contribution period 1993-1995. For the contribution period after 1995, see NDC method below Contributions-based (NDC): full career			33% of which 1/3rd paid by the employee						
	Self-employed		Early retirement. Age requirements are 1 year higher than those foreseen for public and private sector employees (see above) Indexation of age requirements. As for public and private sector employee (see above) Exit windows. Payment of the pension (and, then, the actual retirement age) is further postponed by 1 year and a half, once the age and/or contribution requirements are met (21 months starting from 2014 for retirement with 40 years of contributions)	Statutory retirement age (2): As for private sector employees (see above). Indexation of age requirements: As for private sector employees (see above). Exit windows. Payment of pension (and, then, actual retirement age) is further postponed by 1 year and half once the age and/or contribution requirements are met		Earnings-related (DB): last 10 year wages, for the contribution period up to 1992, last 15 years, thereafter Mixed: last 10 year wages, for the contribution period up to 1992; gradual increasing for the contribution period 1993-1995. For the contribution period after 1995, see NDC method below Contributions-based (NDC): full career			20%						
	Atypical workers	Contributions-based (NDC) New workers insured after 1995			Contributions-based (NDC): full career	Contributions-based (NDC): full career			26% of which 1/3rd paid by the employee (3)						
	Additional information	(1) There are several different regimes for professionals which account for a minor part of the public pension system (2) Old age pension (3) Assuming as a reference wage/earnings full career average contribution base capitalized with GDP growth. The implicit accrual rate varies over time and by age of retirement. (4) In case of professionals, contribution rate is entirely paid by the insured. The contribution rate is reduced to 17% in case the worker is either entitled to a direct pension or insured in other schemes													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
CY	**Public pensions**														
	General Social Insurance Scheme	DB – point system	63 14.85 years at 65	65	47.5 years	Full insurance period	85% of Basic Insurable Earnings	1.5%	6.8% of earnings up to maximum insurable earnings (MIE)		4.3% of earnings up to MIE	Wage indexation	Basic part: wage indexation Supplementary part: price indexation	60% of MIE	N/A
	Government Employee Pension Scheme	DB – final salary	58 5 years	63	33.33 years	Last annual pensionable salary	-	1.5%	PAYG			Not applicable	Wage indexation	50% of final salary	N/A
	Mandatory private scheme														
	Semi-state and private sector employee/self-employed Pension Schemes	DB	58-60 5-30 years	63-65	30-40 years	Varies	-	1.5%	Varies		-	Not applicable	Varies	Varies	N/A
	Mandatory private scheme														
	Private sector	DC		63-65	Full career	-		-	6.5%						
LV	**Public pensions**														
		NDC	Normally – 62; Included early retirement schemes, where minimum retirement age – 48.Contrib. years for rights - 10	62	10 years – for old age pension rights	full	11% (from average gross salary in the State)	Contribution wage sum index	20% - together, if no participant of 2tier;18% - if participant of 2nd tier, 14% from 2013			Contribution wage sum index	No indexation until 2013. From 2014 – with CPI		Indexation with contribution wage sum index, even if it is negative
	Mandatory private scheme														
		FDC	Accordance with retirement age in NDC	Accordance with retirement age in NDC		full		Rate of return	2% - together, 6% from 2013				If choose refunding, then no indexation until 2013. From 2014 – with CPI		
	Non-mandatory private scheme														
		Voluntary private funded pension scheme	5	55 and over		full		Rate of return	Free choice						

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
LT	**Public pensions**														
		DB	5 years before statutory retirement age; 15 years minimum contribution period (30 years in case of early retirement)	w60/m62.5 (65 as of 2026)	30	5 best from the period 1984-1993 and 25 best years after 1994	no minimum pension	0.5% for earnings related part+basic pension (estimated accrual rate is 1%)	0,233	3% (1% for participant in the second pillar)	0	discretionary	discretionary	does not exist (insurable income coefficient is capped at 5)	-
	Mandatory private scheme														
		DC	-	according to statutory retirement age	-	full career	-	-	-	0,02	0	market rate of return	-	-	-
	Non-mandatory private scheme														
		DC	-	-	-	full career	-	-	-	Free choise	-	market rate of return	-	-	-
LU	**Public pensions**														
	1) General and special pension schemes	DB	57 with 40 years of contribution	65	40	Full career	90% of the social minimum wage (1785 euros in 2010)	1,85% per year	8% (only for the general scheme)	8%	8% (only for the general scheme)	price evolution, wage evolution if sufficient financial resources available	price evolution, wage evolution if sufficient financial resources available	Not applicable	-
HU	**Social security pensions**														
	1) Old age pension	DB	62 (minimum conributory years 15 for partial pension, 20 for full pension)	62	20	All income from 1988	Minimum pension: HUF 28,500; Gross average wage: HUF 202,576 (2010); Net awerage wage: HUF 132,628 (2010) 21,5%	1,22%	24%	10%		net wage	If the real GDP growth is below 3%: 100% CPI; if the GDP growth is between 3.0%-3.9%: 80% CPI and 20% net wage if the GDP growth is between 4.0%-4.9%: 60% CPI and 40% net wage if the GDP growth is 5% or above: 50% CPI and 50% net wage	No maximum, though there are limits in the pension calculation system (degressive methods in calculation)	
	2) General early pension		60	60	40										
	3) Women with 40 years real contribution period				40 year (included the working years and max. 8 childcare years)										
	3) Miners, artist pension		60 (minimum contributory years 10 for man, 8 for women)	60	minimum contributory years 10 for man, 8 for women										
	4) Early pension subsidized by the employer		57	57	20		Minimum pension: HUF 28,500; Gross average wage: HUF 202,576 (2010); Net average wage: HUF 132,628 (2010) 21,5%								
	5) Disability pensions				depends on the age		I.group:HUF 30,850; II.group: HUF 29,800;III.group:HUF 28,500								
	6) Survivors pensions						Minimum orphan benefit: 24,250 HUF; widow(er)'s pension 30 % or 60 % of pension of dead; parental pension equal the widow(er)'s pension								
	Mandatory private scheme														
		DC	same as old age pension (62) and 15 years (lump sum payment)	62					24%	10%			minimum CPI		
	Non-mandatory private scheme														
	Voluntary Pension Fund	DC	same as old age pension, life annuity or after 10 years lump sum payment-taxable	62											

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
MT	**Public pensions**														
	Contributory scheme	2/3 pension scheme (DB scheme)	Presently, the full pension is paid to those who have paid an average of 50 contributions over a 30-year contributions period upon reaching pension age. Fewer years of contribution result in linearly reduced pensions, with the minimum years of contributions paid required to collect a pension set at around 10 years. Following the 2006 pension reform, a person who has reached the age of 61yrs but has not yet reached pension age, may after reaching 61yrs claim a pension in respect of retirement if such person is no longer gainfully occupied. In this case, it is necessary that since the 18th birthday the claimant has had a total of : - 2,080 (or 40 yrs) paid or credited contributions for those born on or after 1 Jan 1962, or - 1,820 (or 35 yrs) paid or credited contributions for those born during 1952-1961.	Currently w60+/m61+, 62+ in 2012, 63+ in 2018, 64+ in 2022 and 65+ in 2026.	Presently the full rate of the two-thirds pension is equal to 2/3 of pensionable income for a claimant who has paid or been credited with a yearly average of 50 contributions over 30 years. Following the 2006 Pension reform, the period of contribution is as follows: - 30 yrs for those born on or before 31 Dec 1951; - 35 yrs for those born during 1952-1961; - 40 yrs for those born on or after 1 Jan 1962	Presently, the pension for employees is determined on the basis of the yearly average of the basic wage3 during the best 3 yrs of the last 10 yrs, while the pension for the self-occupied persons is worked out on the basis of the best 10 yrs. Following the 2006 pension reform, for those born on or after the 1 January 1962, the pension will be determined by taking yearly average of the basic wage/salary/net income/net earnings during the best 10 calendar years within the last 40 years preceding retirement or invalidity.	The full rates of the Contributory National Minimum Pension are calculated at 4/5ths of the National Minimum Wage in the case of a married person who is maintaining a spouse and at 2/3rds in the case of any person, as provided in article 50 of the Social Security Act (Cap. 318). The national minimum pension for a married person who is maintaining a spouse is €122.08 per week and for any other person is €101.94 per week. Thus, minimum pension as a ratio of the average wage for a married person who is maintaining a spouse for 2010 is equal to: 2010: Annual Minimum Pension: €122.08*52 = €6,348.16 Average Wage (National Accounts): €16,264.58 Ratio: = 39.0% 2010 National Minimum Pension for any other person: €101.94*52 = €5,300.88 Average Wage: €16,264.58 Ratio: 32.6% Following the 2006 Pensions reform, a persons born on or after 1 January 1962 shall be entitled to a Guaranteed National Minimum Pension, payable at a rate of not less than 60% of National Median Income.		Class 1 contr: 10% of the basic salary of the employee	Class 1 contr: 10% of the basic salary of the employee Class 2 contr.: self-employed pays 15% of the annual income that is subject to the same ceiling that applies for employees1	Class 1 contr: 10% of the basic salary of the employee Class 2 contr.: Govt. pays 7.5% of the annual income that is subject to the same ceiling that applies for employees1	Pensionable earnings are valorised on the basis of the Cost of Living Adjustment (COLA).4 This may represent a strong or weak indexation to inflation depending on the pension level since as explained in footnote IV, COLA is a flat sum. For the years 2004-2010, it is estimated that COLA valorisation represented around 58% of the Inflation Rate.	Persons born before 1 January 1962 (including present retirees) have their pension updated on the basis of increases in wages presently awarded through collective bargaining to the occupation or salary scale previously occupied by the person in retirement. Pensions of persons in occupations not covered by collective agreement have their pensions indexed on the basis of COLA. Following the 2006 pension reform, persons born on or after the 1 January 1962 will have their pension updated annually by such sum that corresponds to 70% of the increase in the national average wage and 30% of the inflation rate as published by the NSO.	Expressing the Maximum Pension as a proportion of the average wage in 2010: Maximum pensionable income5 as a share of the current average wage. In 2010 the highest rate of two-thirds pension was €219.83 per week Expressed as a % of the Average Wage: MRR = 70%	
	Non contributory scheme (2)	Means tested minimum pension through social assistance scheme to persons not qualified for the contr. Scheme.	Payable to citizens of Malta over 60 years of age.	Payable to citizens of Malta over 60 years of age	Under this type of scheme the main rule is that: a person who is married and who did not contribute enough to be eligible for the minimum pension would receive no social security benefit and would rely on the income of the spouse. On the other hand, a single person with a poor contributory record would be eligible for a non-contributory old-age pension, subject to satisfying the means-testing criteria.								As from 2008, pensions under this category are indexed on the basis of current law that is full indexation to COLA	Under the non-contributory Old-Age Pension scheme the rate depends on whether the pensioner is married or single, whereby: • A married couple where both qualify for a pension under the Social Security Act would have a highest rate of €108.08 per week; • A married couple where only one of the spouses qualifies for a pension under the Social Security Act would have the highest rate of €66.36 per week; and • Widowed, single persons or a married person where the spouse is in receipt of a State Financed Residential Service in terms of the Social Security Act would have the highest rate of €83.97 per week.	
	Occupational pensions														
	Exists only to a minor extent														
	Additional information	1 A self-occupied person is defined by the Social Security Act as 'a self-employed person who is engaged in any activity through which earnings exceeding €910 per annum are being derived'. 2 The basic wage refers to the gross wage or salary that is payable to an employed person by or on behalf of his employer excluding any remuneration for overtime, any form of bonus, any extra allowances, any remuneration in kind and commissions. 3 COLA is a flat amount in money terms that is calculated as the multiple of the 12-month moving average inflation rate as at end of September and the base wage (a wage level which is higher than the minimum wage but much lower than the average wage. The base wage is updated annually by the COLA granted in the previous period. 4 It is important to point out that as a result of the pension reform there will be different maximum pension regimes for three groups of persons – those born before 31st December 1951; persons born during calendar years 1952 and 1961; and persons born on or after 1st January 1962.													
NL	**Public pensions**														
	Social security pensions (AOW)	flat-rate	65	65	50 years of residency	not applicable	not applicable	2	0	17,9	0	not applicable	wages	30	
	Occupational pensions														
	Supplementary private pensions (quasi-mandatory, average scheme)	mixed	±60	65	full career	not applicable	not applicable	±2	±13,3	±6,7	0	not applicable	wages/prices	62	
	Additional information	Occupational pensions are for the most part quasi-mandatory private pension schemes. The total maximum gross replacement rate for the average worker retiring at age 65 after 40 working years equals 92% (=30%+62%). Both public and private pension schemes do not contain minimum contributory years.													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
AT	**Public pensions**														
		Mixed (emphasis on DB)	min. 15 years of contribution	m: 65 f 2010: 60 f 2060: 65 (gradual linear increase between 2024-2033	45 years	2010: 22 best 2011: 23 best ... 2028: 40 best ... 2060: 40 best	37,9% of gross wage 54,0% of net wage	1,78% p.a.	Employed: 12,55%	Employed: 10,25% Self-employed: 17,50% Farmers: 16,00%	Employed: - Self-employed: 5,30% Farmers: 6,80%	Benchmark: Average insured wage	Benchmark: Consumer Price Index	80% (can potentially increase for people working beyond the statutory retirement age)	-
PL 2010	**Public pensions**														
	1) General Pension System	NDC / DB	65 M / 60 F; contributory years: NDC not relevant, DB 25 M / 20 F	65 M / 60 F	DB 25 M/ 20 F	In NDC (full career), in DB (10 consecutive years from 20 years or 20 years from full career)	about 20%	0.67%	9,76%*	9,76%*	-	growth of the c. revenue	CPI + at least 20% of wage growth		
	2) Farmer's Pension System	DB	65 M / 60 F & 25 contributory years or 60 M / 55 F & 30 contributory years		20 years	general minimum pension & contributory period			-	10% of general minimum pension	-	not relevant			
	3) Security Provision Systems		No minimum age (excluding judges: 65 years) and 15 contributory years	Not relevant	Not relevant	75% of the last wage			-	-	-				
	4) Pre-retirement		61 M / 56 F & 25 M / 20 F contributory years		25 M / 20 F	not relevant	about 25%								
	5) Bridging Pensions	NDC	60 M / 55 F; contributory years 25 M / 20 F including at least 15-year period of employment in special conditions or in special character	60 M/ 55 F	25 M / 20 F	full career	about 20%		1.50%	-		growth of the c. revenue			
	Mandatory private scheme														
	1) Open Pension Funds (OFE)	DC	65 M/ 60 F, contributory years - not relevant	65 M/ 60 F	Not relevant	full career	-		9,76%*	9,76%*		market rate of return			
	Additional information	*employees and employer pay together 19,52% from which in NDC scheme: 12,22% is provided for the General pension system (ZUS) and 7,3% for the Mandatory private scheme. In DC scheme 19,52% is destinated for ZUS. Security Provision System, Pre-retirement and Bridging Pensions are financed from the State budget (Bridging Pensions additionally from contributions paid by employers 1,5%). Pre-retirement is a flat amount Growth of the C (contribution) revenue means nominal increase of the sum of the old age contributions													
PL 2060	**Public pensions**														
	1) General Pension System	NDC	65 M / 60 F; contributory years: NDC not relevant	65 M / 60 F		full career	about 20%		9,76%*	9,76%*	-	growth of the c. revenue	CPI + at least 20% of wage growth		
	2) Farmer's Pension System	DB	65 M / 60 F & 25 contributory years or 60 M / 55 F & 30 contributory years		20 years	general minimum pension & contributory period			-	10% of general minimum pension	-	not relevant			
	3) Security Provision Systems		No minimum age (excluding judges: 65 years) and 15 contributory years	Not relevant	Not relevant	75% of the last wage			-	-	-				
	4) Pre-retirement		61 M / 56 F & 25 M / 20 F contributory years		25 M / 20 F	not relevant	about 25%								
	Mandatory private scheme														
	1) Open Pension Funds (OFE)	DC	65 M/ 60 F, contributory years - not relevant	65 M/ 60 F	Not relevant	full career	-		9,76%*	9,76%*		market rate of return			
	Additional information	From May 2011 r. 2.3% (not 7,3%) is diverted to the funded scheme. The rest 5% is placed in a special individual subaccount. This proportion will change gradually to 2017, until it reach 3.8% (subaccount in ZUS) and 3.5% (open pension funds). The subaccount collected capital is the subject to inheritance. The newly created subaccounts will be indexed according to the average of the previous 5 years' nominal GDP growth (excluding any decline in GDP).													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
PT 2010	**Public pensions**														
	1) General contributory (social insurance) scheme: old-age and early pensions	DB	55 age & 30 cont. (1) or 65 & 15	65	40	10 out of 15 + full career (transition) (2)	60% (2009)	2-2.3%	23,75%	11%	-	CPI	CPI & GDP & Pension amount (3)	+/- 80.9% (4)	98.35% (2010)
	2) General contributory (social insurance) scheme: disabilty pensions		- & 3	-			70% ("relative disabilty", 2009)				-				-
	3) General contributory (social insurance) scheme: survivor pensions		- & 3 (for the pension producer)	-			-	-	23.75% (for the pension producer)	11% (for the pension producer)	-	CPI (for the pension producer)		+/- 48.5% (60% of 80.9%) (4)	98.35% (2010) (5)
	4) RESSAA (Spec. Soc. Sec. Scheme for Agriculture Workers) scheme: old-age, disability, survivor	Closed scheme (no new pensioners expected)													
	5) Social pensions: old age (means tested)	-	65 & <15	65	-	-	-	-	-	-	-	-	CPI & GDP (3)	-	-
	6) Social pensions: disability (means tested)	-	18 & <3	18	-	-	-	-	-	-	-	-		-	-
	7) Other social assistance: social supplement for the elderly (means tested)	-	65 & -	65	-	-	-	-	-	-	-	-	not automatically indexed	-	-
	8) CGA (pension scheme for civil servants hired until Dec. 2005) - old age, disability, survivors	DB	62,5 & 38,5	62,5	38,5	last wage 2005 (with valorization)+full career (transition) (2)	-	-	15% (28,4% according to national accounts)	10%	-	CPI	CPI & GDP & Pension amount (3)	81% (6)	98.35% (2010)
	Occupational pensions														
		1st pillar DB plans & other DB plans & DC plans	For 1st pillar DB plans: 40 years of service before 65 years old or 35 years of service with over 60 years old For other DB plans: 65 years (usually)	65	For 1st pillar DB plans: minumum 35 years For other DB plans: between 30 and 40 years	There is no common formula for DB benefits (final salary is the most common)	There is no standard minimum pension	DB plans: first 10 contributory years, employees are entitled to 20% of a fixed salary level. Then, this percentage is increased by 3 to 4 p.p., according to the number of contributory years, until it reach 100%. DB plans: which are integrated with Social Security system, the accrual rate is commonly around 2% per year. DC plans: the effective accrual rate (defined as the ratio of the contribution rate to the annuity factor) is estimated to be around 0,4% (7).	DB plans: it depends on the market fluctuation in terms of the real return on assets and interest rates. DC plans: estimated around 4% (on the basis of data 2009 and 2010)	For 1st pillar DB plans: 5% For DC Plans: 1% (average employee contribution)	-	Rule not established	CPI for 1st pillar DB plans and other DB plans defined under collective bargaining agreements. Not guaranteed for other type of pension provision (indexation is made on a discretionary basis)	Not defined	–
	Mandatory private scheme														
	1) 1st pillar pensions for the banking sector	Closed scheme in what concerns new workers since 2009 (new pensioners are expected, but new workers are compulsorily registered under the social security schemes since 2009).													
	Additional information	(1) Early pensions subject to penalties. (2) During the transition period, pension formulae weight "10 best of 15" and the full career (max: 40) (3) Indexation is done according to CPI but there are bonus/maluses according to GDP growth defined brackets. Due to deflation this rule was partly bypassed in 2010. Due to the crisis, there was no indexation in 2011. (4) Before the sustainability factor. This replacement rate is only attainable in lower pensions (below 1.1xSocial Support Index). The estimation of the maximum replacement rate in 2010 takes into account the weighting of the previous and the new pension formulae, assuming constant wages during the entire working career. (5) The survivors pension is derived from the pension the deceased relative (the "pension producer") was receiving (A) or would be entitled to at the year of death (B). Thus, the 2010 sustainability factor is only applyable in case B or case A if the producer started the pension in that year. For pensions the producer started earlier, previous FS would be implicit. (6) Source: 2009 Ageing Report. (7) given a contribution rate of 4% (simple average of the real contribution rate, determined dividing current contributions by the gross salaries, observed in years 2009 and 2010) and an annuity factor of 13,826.													
PT 2060	**Public pensions**														
	1) General contributory (social insurance) scheme: old-age and early pensions	DB	55 age & 30 cont. or 65 & 15	65	40	full career (max: 40)	-	-	23,75%	11%	-	CPI	CPI & GDP & Pension amount (1)	92% (2)	76,15 (3)
	2) General contributory (social insurance) scheme: disabilty pensions		- & 3	-			-	-			-				-
	3) General contributory (social insurance) scheme: survivor pensions		- & 3 (for the pension producer)	-			-	-	23.75% (for the pension producer)	11% (for the pension producer)	-	CPI (for the pension producer)		55.2% (60% of 92%) (2)	76,15 (3)
	4) Social pensions: old age (means tested)	-	65 & <15	65	-	-	-	-	-	-	-	-		-	-
	5) Social pensions: disability (means tested)	-	18 & <3	18	-	-	-	-	-	-	-	-		-	-
	6) Other social assistance: social supplement for the elderly (means tested)	-	65 & -	65	-	-	-	-	-	-	-	-	not automatically indexed	-	-
	7) CGA (pension scheme for civil servants hired until Dec.2005) - old age, disability, survivors	Closed scheme (no new pensioners expected)													
	Additional information	(1) Indexation is done according to CPI but there are bonus/maluses according to GDP growth defined brackets. (2) Before the sustainability factor. This replacement rate is only attainable in lower pensions (below 1.1xSocial Support Index). (3) Sources: INE and EUROPOP 2010.													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
SL 2010	Public pensions														
	Public pension scheme	DB	58y - M, 56y 8m - W pension period: 40 - M, 37y 3m - W	63 M, 61 W	Period of effective contributory work: 40 - M, 38 - W	best consecutive 18 years	ranging from 45,16% to 45,44 % (net average wage) / from 29,20% to 29,38% (gross average wage)*	15 years of insurance period 35% (men), 38% (women); each additional year 1,5%	8,85%	15,50%		growth of average wage and pensions	wage growth	acrrual rate in 2010 79,5% of pension rating base (full contributory period)	mechanisem on lower indexation of pensions for persons retired before 2000
	Non-mandatory private scheme														
	Voluntary supplementary pension	DC with minimum yield guarantee		58											
SL 2060	Public pensions														
	Public pension scheme	DB	58y - M, W pension period: 40 - M, 38Y - W	63 M, 61 W	Period of effective contributory work: 40 - M, 38 - W	best consecutive 18 years	n.a.	15 years of insurance period 35% (men), 38% (women); each additional year 1,5%	8,85%	15,50%		growth of average wage and pensions	wage growth	acrrual rate in 2060 72,5% of pension rating base (in case of full contributory period)	mechanisem on lower indexation of pensions for persons retired before 2000
	Non-mandatory private scheme														
	Voluntary supplementary pension	DC with minimum yield guarantee		58											
	Additional information	* Old age pension for full pensionable period (40 years) - man - assessed from minimum pension rating base.													
RO	Public pensions														
	1) Public pension system (2010)	PAYG, calculation formula based on pension points	Minimum retirement age not regulated by the law; minimum contributory period for men and women in January 2010 - 12,6	January 2010: men - 63.9; women-58,9	January 2010: Men - 32.6; Women - 27.6	Contributory scheme, full career	Minimum guaranteed social pension represents aprox. 19% of the average gross wage used for state budget grounding in 2010		Normal work conditions 20,8%; difficult work conditions 25,8%; special work conditions 30,8%	Individual social insurance contribution 10,5%			Starting with the 1st of January 2010, no indexation of the pension point value; it is set by the law on the state social insurance budget, according to macroeconomic indicators		
	2) Public pension system (2011)		Minimum retirement age not regulated by the law; minimum contributory period for men and women in January 2011 - 13	January 2011: men - 64; women-59	January 2011: men-33; women-28		Minimum indemnity for pensioners represents aprox. 17% of the average gross earnings used for state budget grounding in 2011		Normal work conditions 20,8%; difficult work conditions 25,8%; special work conditions 30,8%						
	3) Public pension system (2012)		Minimum retirement age not regulated by the law; minimum contributory period for men and women in January 2012 - 13,6	January 2012: men - 64,3; women-59,3	January 2012: men-33,6; women-28,6								Pension point value is increased annually by 100% inflation rate plus 50% of the real growth of the average gross earnings for the previous year		
	Mandatory private scheme														
	1) Privately administered pension funds	DC with investment guarantees (hybrid)	The same as the statutory retirement age in the public pension system							2010 - 2,5% of the individual social contribution from Pillar I and 3% in 2011 (gradual increase by 0.5% per year					
	Non-mandatory private scheme														
	1) Voluntary pensions	DC	60 years for men and women and minimum contributory period 90 months						Up to 15% of monthly gross earnings, can be shared bet. employer and employee	Up to 15% of monthly gross earnings, can be shared bet. employer and employee					

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
SK 2010	**Public pensions**														
	Public pension scheme	DB - points	early retirement possible 2 years before statutory retirement age. Minimum contributory period is 15 years.	62 M/ W (for women gradually increasing until 2024)	no limit	lifetime average (starting in year 1984 due to data availability)	no minimum pension	1,25%	21.75% (14% = pension contribution + 3% = disability contribution + 4.75% = reserve solidarity fund)	7% (4% = pension contribution + 3% disability contribution)	26% (18% pension contribution + 6% disability contribuiton + 2% solidarity reserve fund; only for certain groups defined by law)	wages	Swiss indexation (½ % inflation + ½ % average wage growth)	-	
	Mandatory private scheme														
	Mandatory fully funded private scheme	DC	early retirement possible 2 years before statutory retirement age. Minimum contributory period is 15 years.	62 M/ W (for women gradually increasing until 2024)	no limit	-	no minimum pension		9%	0	9%	-	-		
SK 2060	**Public pensions**														
	Public pension scheme	DB - points	early retirement possible 2 years before statutory retirement age. Minimum contributory period is 15 years.	62 M/ W	no limit	lifetime average (starting in year 1984 due to data availability)	no minimum pension	1,25%	21.75% (14% = pension contribution + 3% = disability contribution + 4.75% = reserve solidarity fund)	7% (4% = pension contribution + 3% disability contribution)	26% (18% pension contribution + 6% disability contribuiton + 2% solidarity reserve fund; only for certain groups defined by law)	wages	Swiss indexation (½ % inflation + ½ % average wage growth)	-	
	Mandatory private scheme														
	Mandatory fully funded private scheme	DC	early retirement possible 2 years before statutory retirement age. Minimum contributory period is 15 years.	62 M/ W	no limit	-	no minimum pension		9%	0	9%	-	-		
FI	**Public pensions**														
	1) national pensions	means tested	other than early pensions: 65	65	40	n.a.	about 25 %	n.a.	abolished in 2010				100 % prices	n.a.	
	2) guarantee pensions							n.a.					100 % prices	n.a.	
	3) earnings-related pensions	DB	old-age pension 63; early old-age pension 62; contributory period 18-68	63-68	n.a., no full pension	full career (ages 18 - 68)	n.a.	1,5 ages 18 - 52; 1,9 ages 53 - 62; 4,5 ages 63 - 68	average 16,9 (TyEL) in 2010	employees 18-52 years 4,5 (2010) and 53-68 years 5,7 (2010)	-	80 % wages, 20 % prices	80 % prices, 20 % wages	n.a.	life expectancy coefficient
	Occupational pensions														
		DB and DC													
	Non-mandatory private scheme														
		DC	New legislation from 1.1.2010: 62												

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
SE	**Public pensions**														
	Public pensions							17.21%	10.21%	7.00%					
	1) Income pension	NDC	61 / 1	No limit	no limit	0,423 PBA < gross pensionable earnings < 8,07 IBA	n.a.	14.88%	8.83%	6.05%	The "employer contribution" for social insurances e.g. unemployment benefits	IBA + inheritance gains	Change of IBA -1.6%	n.a	Annuity factor based on unisex life expectancy at the date of retirement. Also an automatic balancing mechanism that is activated in case of financial imbalance in the system
	2) Old transitional supplementary pension (for individuals born before 1954)	DB	61 / 3		30 years	average of 15 best	n.a.	14.88%	8.83%	6.05%		IBA	Change of IBA -1.6%	n.a.	Bonus 0,7%/month or malus 0,5%/month if retirement age other than 65.
	3) Guarantee pension	top-up to income pension	65 / 3		40 years	Minimum pension 2.13 price base amounts (PBA) for singles and 1.90 PBA:s for cohabitants. Benefits are reduced with 100% for pension income below the minimum level and with 48% above the minimum level.	n.a.	0	0	0	General taxes	n.a	PBB	n.a	No
	Occupational pensions														
	1) Private blue-collar	DC	normally 65 / 1	65			n.a								
	2) Private white-collar	mixed													
	3) Local government	mixed													
	4) Central government	DB													
	Mandatory private scheme														
	1) Premium pension	FDC	61 / 1	No limit	no limit	0,423 PBA < gross pensionable earnings < 8,07 IBA	n.a.	2.33%	1.38%	0.95%	The "employer contribution" for social insurances e.g. unemployment benefits	Market return on individual chosen mutual funds, net of administration	A fixed or variable annuity, calculated on actuarial principles	n.a	Annuity factor based on unisex life expectancy at the date of retirement
	Non-mandatory private scheme														
	1) Tax deductable pensions savings	FDC	55	No limit	n.a.	Maximum 12000 SEK / year for employees	n.a.		n.a.		n.a.	Market return on individual chosen mutual funds, net of administration	A fixed or variable annuity, calculated on actuarial principles	n.a	Minimum 5 years
	Additional information	In 2010 the price base amount (PBA) = 42 400 SEK and the income base amount (IBA) = 51 100 SEK. Using the exchange rate 9.5373 SEK per EUR as assumed in the Reporting framework the PBA = 4 446 EUR and the IBA = 5 358 EUR.													

Country	Pension scheme	Type	Minimum retirement age and contributory years	Statutory retirement age	Contrib. period for full pension	Pensionable earning reference	Minimum pension as a share of the average wage	Accrual rate (for non-DB systems effective accrual rate)	Contrib. rate: Employers	Contrib. rate: Employees	Contrib. rate: Gov.	Valorisation of pensionable earnings*	Indexation of pensions in payment	Maximum replac. rate	Sust. factor
UK	**Public pensions**														
	Social security pensions		In 2010, SPA of 60 for women, 65 for men, currently legislating to increase to 66 for men and women by 2020, Already legislated for 68 for men and women by 2046												
	Basic State Pension - Flat rate scheme	DB - PAYG	Each year of National Insurance contributions count for new pensioners since April 2010		30 qualifying years	n/a	no minimum					Highest of Earnings, CPI, 2.5%	Highest of Earnings, CPI, 2.5%		
	Additional Pension - Earnings related scheme				From 16 to SPA, first scheme ran until 1975, current scheme began in 1978		no minimum					Earnings	CPI		
	Pension Credit	low income protection	Income related benefit		n/a	n/a	34.0% - 2011 Guarantee Credit Singles rate £137.35 divided by ASHE 2010 median gross weekly earnings for all of £404					Earnings	Earnings		
	Occupational pensions														
	Occupational pensions	DB	55 (some members are lower due to legacy rules) & 0	n/a	Varies	Varies	n/a	Varies	Varies	Varies	Tax relief, corporation tax relief, contracted-out out rebate, national insurance relief - so contribution rate varies	Varies	Varies - currently lower of CPI or 2.5%, subject to 0% floor	n/a	Very low - most closed
		DC	55 (some members are lower due to legacy rules) & 0	n/a	n/a	Varies	n/a	Varies	Varies	Varies	Tax relief, corporation tax relief, contracted-out out rebate, national insurance relief - so contribution rate varies	Varies	Varies	n/a	Very high
	Mandatory private scheme														
	Mandatory private scheme	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Non-mandatory private scheme														
	Non-mandatory private scheme	DC	55 (some members are lower due to legacy rules) & 0	n/a	n/a	Varies	n/a	Varies	Varies	Varies	Tax relief, corporation tax relief, contracted-out out rebate, national insurance relief - so contribution rate varies	Varies	Varies	n/a	Very high
	Additional information	Please note that responses are high level and should be used for general information only. The detail on State rules is too complicated for such a table.													
NO	**Public pensions**														
	1) Old age	NDC	62 and between age of 13 and 75 years	67 (reference)	No explicit full pension	Full career[1)]	31%	1,35 [2)]					Wagegrowth - 0,75 pp		
	2) Disability														
	Additional information	1) From 2011 there are flexible retirement for the age group 62-75 years base on actuarial neutrality. Pension entitlements are accumulated through income between the age of 13 and 75 years. The individual will each year increase their pension entitlements corresponding to 18.1 % of their pensionable income, up to a ceiling equal to 7.1 basic amounts (G, NOK 74721 for 2010). 2) There is no explicit accrual rate in the new old age pension scheme. Pension entitlements are accumulated at a rate of 18.1% of yearly pensionable income and are converted to yearly pension through division number reflecting life expectancy at the age of retirement. The correspondence is 18.1/1.35=13,41 reflecting the reference cohort 1943 when 67 years of age.													

Source: EPC - AWG delegates

Annex 6.1: Pension projection reporting sheet

European Commission
DG ECFIN Unit C2
Draft reporting framework: Pension expenditure and contributions - in billions EUROs, current prices

Country:
Scenario:
Pension scheme:
Voluntary

A. Fixed table

			2000	…	2009	2010	2020	…	2060	Control variable (1-0)
			Outturn data in current prices			Base year				
		GDP (ECFIN projection, in current prices - billions EUR)								
	1	GDP (used in projections, in current prices)								
	2	GDP deflator								
	3	Gross wage (used in projections, in current prices - billions EUR)								
	4	Average wage (used in the projections, in current prices - 1000 EUR)								
	5	Consumer price inflation								
		1 - PENSION EXPENDITURES (Gross and Net, in millions €)								
	6	Public pensions scheme, gross								
		Of which:								
	7	aged -54								
	8	aged 55-59								
	9	aged 60-64								
	10	aged 65-69								
	11	aged 70-74								
	12	aged 75+								
	13	Old-age and early pensions								
	14	*Of which: new pensions*								
	15	*Of which: earnings-related pensions*								
	16	*new pensions*								
	17	*Private sector employees*								
	18	*Public sector employees*								
	19	*Of which: non-earning-related minimum pensions / minimum income guarantee for persons over statutory retirement age*								
	20	Disability								
	21	*Of which: new pensions*								
	22	Other pensions (survivors)								
	23	*Of which: new pensions*								
Vol	24	Occupational scheme, gross								
Vol	25	*Of which: new pensions*								
Vol	26	Private scheme gross								
Vol	27	*Of which: new pensions*								
Vol	28	Mandatory private scheme								
Vol	29	*Of which: new pensions*								
Vol	30	Non-mandatory private scheme								
Vol	31	*Of which: new pensions*								
	32	Total pension expenditure, gross								
		Of which:								
	33	aged -54								
	34	aged 55-59								
	35	aged 60-64								
	36	aged 65-69								
	37	aged 70-74								
	38	aged 75+								
Vol	39	Public pensions scheme, net								
Vol	40	*Of which: non-earning-related minimum pensions / minimum income guarantee for persons over statutory retirement age*								
Vol	41	Occupational scheme, net								
Vol	42	Private scheme, net								
Vol	43	Total pension expenditure, net								
		2 - BENEFIT RATIO								
Vol	44	Public pensions								
Vol	45	Occupational pensions								
Vol	46	Private mandatory pensions								
Vol	47	Private non-mandatory pensions								
Vol	48	Total benefit ratio								
		3 - GROSS AVERAGE REPLACEMENT RATES (at retirment)								
	49	Public pensions (earnings related)								
Vol	50	Occupational pensions								
	51	Private mandatory pensions								
Vol	52	Private non-mandatory pensions								
Vol	53	Total gross replacement rate								

		4 - NUMBER OF PENSIONS (in 1000)								
	54	**Public pensions**								
		Of which:								
	55	aged -54								
	56	aged 55-59								
	57	aged 60-64								
	58	aged 65-69								
	59	aged 70-74								
	60	aged 75+								
	61	Old-age and early pensions								
	62	*Of which: earnings-related pensions*								
	63	*Private sector employees*								
	64	*Public sector employees*								
	65	Disability								
	66	Other pensions (survivors)								
Vol	67	**Occupational scheme**								
Vol	68	**Private scheme**								
Vol	69	Mandatory private scheme								
Vol	70	Non-mandatory private scheme								
	71	**Non-earning-related minimum pensions**								
	72	**All pensions**								
		Of which:								
Vol	73	aged -54								
Vol	74	aged 55-59								
Vol	75	aged 60-64								
Vol	76	aged 65-69								
Vol	77	aged 70-74								
Vol	78	aged 75+								
		5 - NUMBER OF PENSIONERS (in 1000)								
	79	**Public pensions**								
		Of which:								
	80	aged -54								
	81	*Of which: female*								
	82	aged 55-59								
	83	*Of which: female*								
	84	aged 60-64								
	85	*Of which: female*								
	86	aged 65-69								
	87	*Of which: female*								
	88	aged 70-74								
	89	*Of which: female*								
	90	aged 75+								
	91	*Of which: female*								
	92	Old-age and early pensions								
Vol	93	*Of which: earnings-related pensions*								
Vol	94	*Private sector employees*								
Vol	95	*Public sector employees*								
Vol	96	Other pensions (disability, survivors)								
Vol	97	**Occupational scheme**								
Vol	98	**Private scheme**								
Vol	99	Mandatory private scheme								
Vol	100	Non-mandatory private scheme								
	101	**Pensioners receiving non-earning-related minimum pensions**								
	102	**All pensioners**								
		Of which:								
	103	aged -54								
	104	*Of which: female*								
	105	aged 55-59								
	106	*Of which: female*								
	107	aged 60-64								
	108	*Of which: female*								
	109	aged 65-69								
	110	*Of which: female*								
	111	aged 70-74								
	112	*Of which: female*								
	113	aged 75+								
	114	*Of which: female*								

	6 - CONTRIBUTIONS (employee+employer, in millions €)								
115	**Public pensions**								
116	Old-age and early pensions								
117	*Of which: earnings-related pensions*								
118	*Private sector employees*								
119	*Public sector employees*								
120	Other pensions (disability, survivors)								
121	**Occupational scheme**								
122	**Private scheme**								
123	Mandatory private scheme								
124	Non-mandatory private scheme								
125	**Total pension contributions**								
	7 - NUMBER OF CONTRIBUTORS (employees, in 1000)								
126	**Public pensions**								
127	Old-age and early pensions								
128	*Of which: earnings-related pensions*								
129	*Private sector employees*								
130	*Public sector employees*								
131	Disability								
132	Other pensions (survivors)								
133	**Occupational scheme**								
134	Average contribution period, years								
135	**Private scheme**								
136	Mandatory private scheme								
137	Average contribution period, years								
138	Non-mandatory private scheme								
139	Average contribution period, years								
140	**All pensions**								
	8 - ASSETS OF PENSION FUNDS AND RESERVES (in millions €)								
141	**Public pensions**								
142	Liquid assets (Non-consolidated)								
143	Liquid assets (Consolidated)								
144	Other assets								
145	*Savings to the funds*								
146	*Payments from the funds*								
147	**Occupational scheme**								
148	**Private mandatory scheme**								
149	**Private non-mandatory scheme**								
150	**All pensions**								
	9 - DECOMPOSITION OF NEW PUBLIC PENSIONS EXPENDITURES - EARNINGS RELATED (Refer to line 16)								
	Defined Benefit schemes (BE BG CZ DK EE EL ES FR IE CY LT LU HU MT NL AT PT SI FI UK)								
151	**Number of new pensions (in 1000)**								
152	**Average contributory period (in years)**								
153	**Average accrual rate**								
154	**Average pensionable earning**								
155	**Sustainability/adjustment factors**								
156	**Average number of months paid the first year**								
	Point schemes (DE FR RO SK)								
151	**Number of new pensions (in 1000)**								
152	**Average contributory period (in years)**								
153	**Average accrual rate (=*V/K*)**								
153a	Point value (*V*)								
153b	Point cost (*K*)								
154	**Average pensionable earning**								
155	**Sustainability/adjustment factors**								
156	**Average number of months paid the first year**								
	Notional defined contribution (IT LV PL SE NO)								
151	**Number of new pensions (in 1000)**								
152	**Average contributory period (in years)**								
153	**Average accrual rate (=*c/A*)**								
153a	Notional-accounts contribution rate (*c*)								
153b	Annuity factor (*A*)								
154	**Average pensionable earning**								
155	**Sustainability/adjustment factors**								
156	**Average number of months of pension paid the first year**								
	B. Additional information								

Source: Commission services.

7. Health care

7.1. Introduction

This chapter presents the methodology to project public expenditure on health care in the 27 Member States of the EU and Norway up to 2060. Health care services represent a high and growing share of government spending and of total age-related expenditure. The ageing of the EU population may entail additional government expenditure. This puts the issue of public spending on health care and long-term care at the centre of the debates on the long-term sustainability of public finances.

The projections for public expenditure on health care are made on the basis of the baseline assumptions on population projections provided by Eurostat (EUROPOP2010) and assumptions on labour force, labour productivity, GDP and interest rates agreed by the EPC. These are outlined in the chapters 1 to 4 of this report. The sensitivity tests described in chapter 5 are also reflected in the projections of public expenditure on health care. Note that separate projections will be made for public expenditure on long-term care. These are described in chapter 8.

In preparation for the 2012 Ageing Report, Commission Services (DG ECFIN) issued two notes describing the methodology and the different scenarios used to project public expenditure on health care. Notes were circulated to the delegates of the AWG and subsequently discussed at AWG meetings. The general methodology and the various scenarios are explained below.

7.2. General methodology to project public expenditure on health care

The methodology and scenarios to be used in the forthcoming 2012 Ageing Report are similar to those in the previous 2009 EPC-EC projection exercise.[87] As in 2009, macro-simulation models are used to project health expenditure. The exception is when the effect of technology and other non-demographic determinants of expenditure is estimated using econometric analysis. Some small refinements and additional sensitivity tests are added to the 2009 methodology and an additional scenario is considered. This approach ensures comparability of the results over time, while allowing for some innovation.

Macro-simulation models assume that the whole population is divided into groups with certain characteristics (e.g. age, gender, per capita expenditure, health status…). Changes in the size and features of these groups lead to expenditure changes overtime. These types of models are widely used in long-term expenditure projections. Note that such methodology tries to identify the impact of each quantifiable determinant separately on the basis of

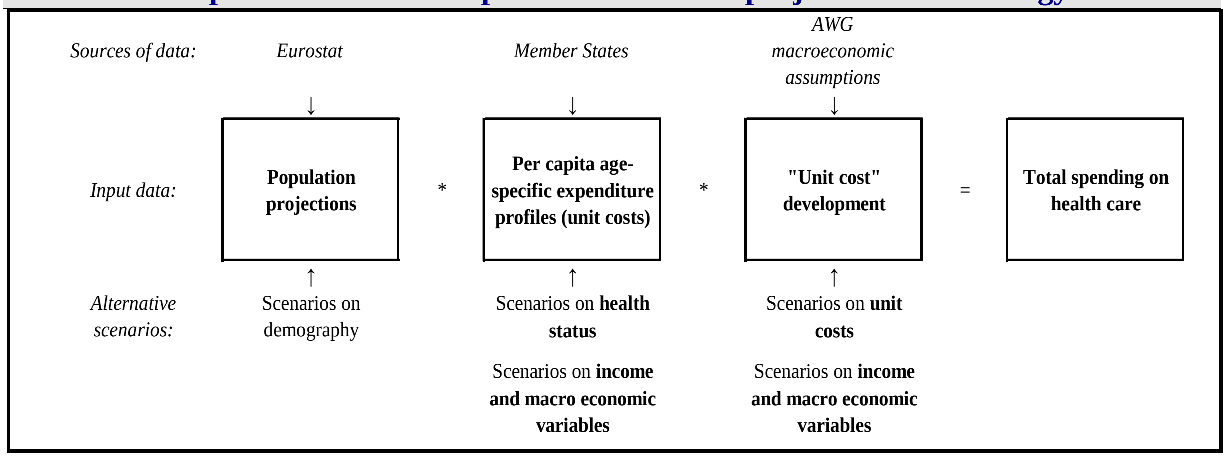
[87] The previous projection exercise is described in the 2009 EPC-EC Ageing report and the associated report on underlying assumptions and projection methodologies. The reports can be found at http://ec.europa.eu/economy_finance/publications/publication_summary14911_en.htm

hypothetical assumptions (an estimated guess, or a "what if" situation). Therefore, the results of the projections should not be interpreted as forecasts of expenditure.

The general methodology used to project public expenditure on health care is articulated as follows:

- STEP 1: take baseline population projection (i.e. number of individuals) by age and gender provided by Eurostat for each year up to 2060;
- STEP 2: take age/gender specific public expenditure per capita on health care i.e. the so called age/gender specific expenditure profiles provided by Member States;
- STEP 3: calculate age/gender expenditure profiles for each projection year up to 2060 on the basis of various assumptions i.e. the projection scenarios;
- STEP 4: for each projection year, multiply the projected number of people in each age/gender group by the respective age/gender expenditure profiles;
- STEP 5: for each projection year, sum all the groups' expenditure to obtain total projected public expenditure on health care.

Graph 7. 1 – Schematic presentation of the projection methodology



Source: Commission services.

7.3. Main drivers of health care expenditure and projection scenarios

To understand the various scenarios used, and therefore the assumptions made in relation to the long-term evolution of age/gender expenditure profiles, it is important to understand the determinants of public expenditure on health care. Public expenditure on health care is determined by a complex set of demand and supply side factors. These include:

- the population size, age and, more importantly, population health status;

- economic growth and development (national income);
- new technologies and medical progress;
- the organisation, financing and delivery of the health care services (institutional features of the health system);
- health care resource inputs, both human and capital.

Building on the 2009 EPC/EC projections exercise, this projection exercise considers a number of different projection scenarios to be able to analyse the possible impact of each factor separately and in a quantifiable way. These scenarios try to capture the above-mentioned demand and supply-side factors and therefore demographic and non-demographic variables. Nevertheless, the methodology and the scenarios used in the Ageing Report reflect mainly demand-side factors such as demographic structure, health status and income of the population. A couple of scenarios (labour intensity, sector specific composite indexation and non-age related costs / technology scenario) attempt to identify the impact of supply-side and non-demographic factors. The econometric analysis tries to estimate the effects of technology and institutional settings, while controlling for income and the demographic structure of the population.

In fact, the methodology and the choice of the scenarios to commonly apply to 27 Member States and Norway depend on the availability, comparability and quality of health care data. Many of the determinants of expenditure described are either not quantifiable or depend on ad-hoc policy decisions. Therefore, the methodology and scenarios used to project public expenditure on health care may not capture all the relevant factors identified as determinants of public expenditure on health care. Data availability, comparability and quality have nevertheless improved since the last round of projections. Moreover, the EC and the AWG delegates will ensure the highest possible consistency through the use of common databases to the largest possible extent.

As in past projection exercises, most scenarios for long-term budgetary projections illustrate the policy-neutral situation. This is the situation where future, not yet legislated, changes in government policy are not considered. In other words, potential future institutional or legal changes to the financing and organisation of health care systems are not reflected in the methodology used for projecting expenditure. Instead, the only changes modelled in these projections are those deemed automatic responses to new needs resulting directly from changes in population structure, health status or income. Therefore, the determinants of expenditure considered in the projections can be seen as mostly independent of potential future changes in government activity or public policy.

The overview of the scenarios is presented in Table 7. 1. The various scenarios are explained below.

Table 7. 1 – Overview of different scenarios to project public expenditure on health care

	Pure demographic scenario	High life expectancy scenario	Non-demographic determinants scenario	Constant health scenario	Death-related costs scenario	Income elasticity scenario	EU27-average cost convergence scenario	Labour intensity scenario	Decomposed indexation scenario
	I	II	III	IV	V	VI	VII	VIII	IX
Population projection	EUROPOP2010	Alternative higher life expectancy scenario (+ 1 year)	EUROPOP2010	EUROPOP2010	EUROPOP2010	EUROPOP2010	EUROPOP2010	EUROPOP2010	EUROPOP2010
Age-related expenditure profiles	2010 profiles held constant over projection period	2010 profiles held constant over projection period	2010 profiles held constant over projection period	2010 profiles shift in line with changes in age-specific life expectancy	2010 profiles held constant but split into profiles of decedents and survivors	2010 profiles held constant over projection period	Individual EU27 profiles converging to the EU27 average age profiles over the projection period	2010 profiles held constant over projection period	2010 profiles held constant over projection period
Unit cost development	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per hours worked	Input-specific indexation
Income elasticity of demand	1	1	econometric estimates	1	1	1,1 in 2010 converging to 1 by 2060	1	1	1

Source: Commission services.

7.3.1. Pure demographic scenario

The *"pure demographic scenario"* aims to isolate the effect of an ageing population on future public expenditure on health care. It assumes that age/gender-specific health status (i.e. morbidity rates, disability) and the provision of health services do not change over time. Morbidity and disability rates and the health services provision are the same as today. Only mortality rates and life expectancy change over time and therefore the number of people in each age/gender group. As a result, this scenario assumes that if there is a gradual increase in life expectancy on the basis of underlying population projections, such gains in life expectancy are implicitly assumed to be spent in bad health. The number of years spent in good health remains constant. In other words, a higher proportion of people with health problems survive to an older age.[88] As such, this scenario is in line with the *expansion of morbidity* hypothesis, which postulates that falling mortality is accompanied by an increase in morbidity and disability.[89]

To calculate future public expenditure on health care, the population in each age/gender group is multiplied by the respective age/gender-specific public expenditure per capita in each projection year. Age/gender groups change each year in line with the population projections up to 2060. This scenario assumes that the age/gender-specific public expenditure per capita in each projection year evolves in line with GDP per capita growth but otherwise remains constant over the whole projection period. In other words, the age/gender profile of a 50-year old person in 2060 is still the same as a 50-year old person today, only adjusted for GDP per capita growth Such development, when applied to the baseline age/gender specific expenditure profiles, can be considered to be neutral in macroeconomic terms – e.g. if no change in the age structure of the population occurred, the share of public expenditure on health care to GDP would remain the same over the projection period.

Formal illustration

First, over the time horizon of the projection exercise, the age/gender specific public expenditure profiles (showing the average public spending on health care per capita for each year of age (from 0 to 100, according to data availability) are assumed to grow in line with income, i.e. GDP per capita. Therefore, the per capita cost (expenditure) in a projected year *t* is:

$$c^{pd}_{g,a,t} = c_{g,a,t-1} \Delta Ypc_t \qquad [1]$$

88 This relationship works mainly through three mechanisms: (1) thanks to medical interventions, the prolonged survival of chronically ill people increases their lifespan but it does not improve their health state. Consequently, extra years of life expectancy are, at least partially, spent in bad health; (2) increased survival means that a larger part of population is elderly and more vulnerable to chronic diseases: moreover, the causes of disability are shifting from fatal to non-fatal diseases which are more prevalent in older age cohorts; (3) chronic disease can act as a risk factor for other illnesses. For example, a disease earlier in lifetime can have negative consequences later on: a non-fatal disease may not translate directly into higher mortality but into higher morbidity and disability.

89 The "expansion of morbidity" hypothesis was first developed by Gruenberg (1977), followed by Verbrugge (1984) and Olshansky et al. (1991). It claims that the decline in mortality is largely due to a decreasing fatality rate of diseases, rather than reduction in their prevalence/incidence. Consequently, falling mortality is accompanied by an increase in morbidity and disability. Robine and Michel (2004) and Robine et al, (2003a, 2003b) present an overview of the main theories on population ageing based on data on life expectancy, morbidity changes, disability trends and mortality.

where:

pd stands for pure demographic scenario

$c_{g,a,t-1}$ is the cost per capita of a person of a given gender *g* and age *a* in period *t-1*;

ΔYpc_t is GDP per capita growth rate in year *t*,

$$\Delta Ypc_t = \left(\frac{Y_t}{\sum p_{g,a,t}} - \frac{Y_{t-1}}{\sum p_{g,a,t-1}} \right) \Big/ \left(\frac{Y_{t-1}}{\sum p_{g,a,t-1}} \right) \qquad [2]$$

With Y_t representing GDP in projection year *t*;

And $p_{g,\,a,\,t}$ the projected population of a given gender *g* and age *a* in year *t*.

Hence, this "adjusted" per capita cost, $c^{pd}_{g,a,t}$, is the cost per capita of a person of gender *g* and age *a* in year *t* of the projection period, following the adjustment to GDP per capita growth.

Second, in each year the respective unit cost is multiplied by the projected population of each age group (using the baseline population projections) to obtain the total public spending for each age/gender group:

$$S^{pd}_{g,a,t} = c^{pd}_{g,a,t} \, p_{g,a,t} \qquad [3]$$

where:

$S^{pd}_{g,a,t}$ is public spending on health care for all persons of gender *g* and age *a* in year *t*.

Next, the resulting total public spending on health care is divided by the projected GDP in order to obtain the public health care expenditure as a percentage of GDP:

$$T_t^{pd} = \frac{\sum S^{pd}_{g,a,t}}{Y_t} \qquad [4]$$

where:

T^{pd}_t is the ratio of total public spending on health care to GDP in year *t* computed according to the pure demographic scenario.

7.3.2. High life expectancy

The "*high life expectancy scenario*" is a variant and indeed a sensitivity test to the "*pure demographic scenario*". It tries to measure the impact of alternative assumptions on mortality rates. This scenario assumes, as in the sensitivity tests used for pension projections, that life expectancy at birth in 2060 is higher (by one year) than the projected life expectancy used in the "*pure demographic scenario*". This scenario is methodologically identical to the "*pure demographic scenario*", but alternative demography data and GDP data are used. Indeed, this scenario assumes a slightly different structure of the population over the projection period with consequences for several macroeconomic variables and therefore GDP.[90]

Formal illustration

The mathematical formulation used in the previous scenario still applies, except that the number of individuals in each age/gender group up to 2060 is replaced by the new population assumptions and so is the value for several macroeconomic variables as a consequence.

7.3.3. Estimating the impact of non-demographic drivers (NDD) on health care expenditure

Since the second half of the 20th century, health care expenditure has been growing faster than income. Econometric studies show that demographic factors (e.g. the age distribution of the population) have only a secondary role in explaining this development when compared with other drivers, such as income, technology, institutional settings and individual behaviour.[91]

In the 2009 Ageing Report, a first attempt to estimate the impact of NDD on health care expenditure[92] was reported in Annex 2 "*Quantifying the impact of technology on health care expenditure: econometric analysis of past trends and projections*". In the 2012 Ageing Report, the methodology to assess the impact of NDD on health care expenditure has been refined and due prominence will be given to health care expenditure projections based on the econometric analysis , alongside the other (demographic) scenarios.

Ignoring the effect of NDD on health care expenditure corresponds to making the very strong assumption that past trends of health care expenditure will shift downwards and flatten out in future (see Graph 7. 2).

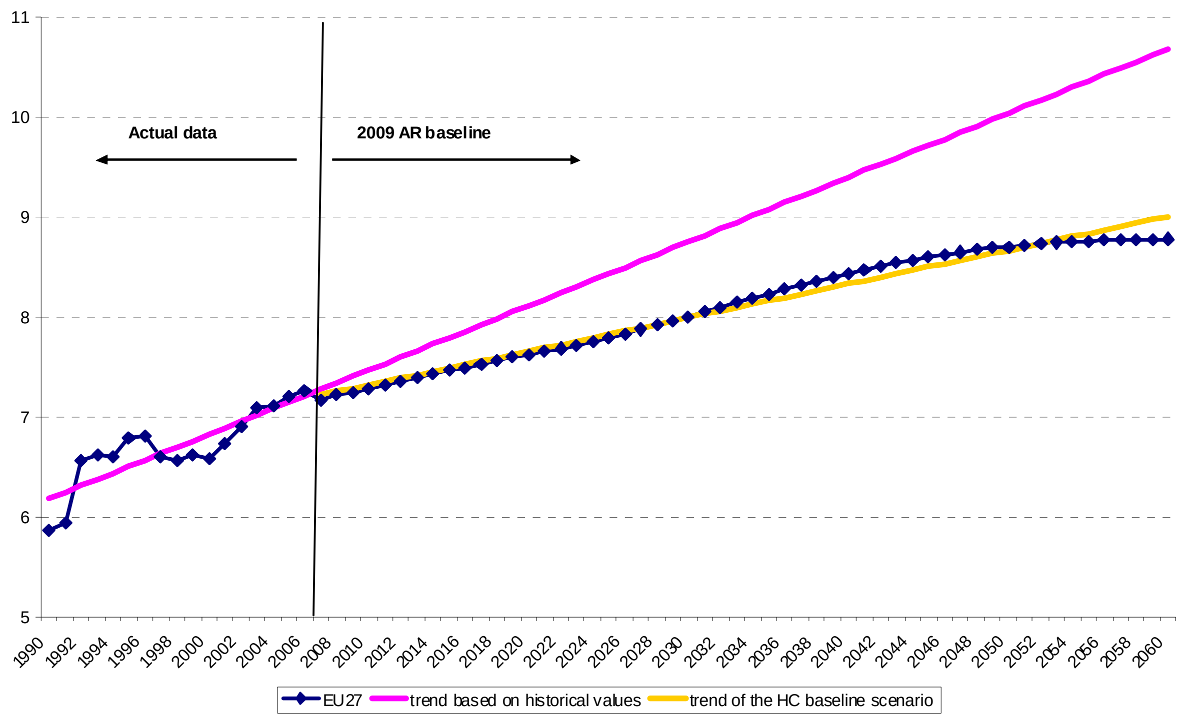
---

[90] Since GDP data also captures the life expectancy change through its impact on the labour force projections.

[91] OECD (2006), "Projecting OECD health and long-term care expenditures: What are the main drivers?, *Economics Department*, WP No. 447.
IMF (2010), Jenkner E., Karpowicz I., Kashiwase K., Shang B., Soto M., Tyson J., "Macro-Fiscal Implications of Health Care in Advanced and Emerging Economies", prepared by the IMF Fiscal Affairs Department.

[92] Then named "technological effects".

Graph 7. 2 - Public expenditure on health care as % of GDP in the EU27 (baseline scenario of the 2009 AR) and trends, 1990-2060



Source: Commission services.

Formal illustration

In order to address this critical aspect of past projection exercises, and following analytical work carried out for the 2009 Ageing Report[93], Commission Services (DG ECFIN) carried out some additional work on the NDD of health care.[94] It uses the *residual approach* to identify the impact of NDD on health care expenditure. In practice, the effect of demographic changes is subtracted from the total increase in expenditure and the remaining part (i.e. the residual) is attributed to the impact of NDD.[95]

Based on recent IMF work, Commission Services used panel regression techniques to estimate country-specific indicators of the NDD of health care.[96] The impact of NDD on health care can be equivalently expressed as either the excessive growth in real per capita health expenditure over the growth in real per capita GDP (c), after controlling for demographic change; or equivalently, as the country-specific income elasticity of health care expenditure (η).

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[93] Dybczak K., and B. Przywara (2010), "The role of technology in health care expenditure in the EU", European Economy, Economic Papers No. 400.

[94] "Alternative scenarios for assessing the impact of non-demographic factors on health care expenditure", ECFIN/C2/Ares save (2011)720472.

[95] Ideally, in order to identify the impact of NDD on health care expenditure one should also control for other variables, such as the health status, relative prices, and institutional variables. However, limitations on data coverage (and collinearity problems) prevent in practice the use a broader set of regressors.

[96] In the IMF paper this is called excess cost growth (ECG).

The two (equivalent) indicators (c, η) are derived from the estimates of the following regression equation:

$$\Delta \log h_{i,t} = \alpha + \mu_i + \beta * \Delta \log g_{i,t} + \gamma * \Delta \log x_{i,t} + D_{1995} + \varepsilon_{i,t} \qquad [1]$$

where Δ is the first difference operator (i.e. $\Delta y_t = y_t - y_{t-1}$); $h_{i,t}$ is real per capita (public) health care spending for country i in year t; $g_{i,t}$ is real per capita GDP; $x_{i,t}$ represents demographic composition; μ_i denotes country-fixed effects; and $\varepsilon_{i,t}$ is a random term error.

Equation [1] assumes that real per capita growth in (public) health care expenditure is a function of a common growth rate across all countries (α), a country-specific growth rate differential (μ), real per capita GDP (*g*), the change in the demographic composition (*x*), and a dummy variable (D_{1995}) that could capture a shift in the common trend after 1995.[97] [98]

Using estimates of equation [1], the indicators of interest (c, η) are calculated as:

$$\hat{c}_i = \frac{\sum_{t=1}^{T_i} \frac{\Delta \hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}{\hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}}{T_i} - \frac{\sum_{t=1}^{T_i} \frac{\Delta g_{i,t}}{g_{i,t}}}{T_i} \approx \frac{\sum_{t=1}^{T_i} \Delta \log \hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}{T_i} - \frac{\sum_{t=1}^{T_i} \Delta \log g_{i,t}}{T_i} \qquad [2a]$$

where T_i denotes the number of years of data available for country *i*.

In equation [2a], the excessive growth in real per capita health care expenditure over the growth in real per capita GDP (*c*) is calculated as the difference between the (geometric) average growth rate of estimated real per capita (public) health care spending, after controlling for the impact of demographic composition, minus the (geometric) average growth rate of real per capita GDP.

Alternatively, results can be expressed in terms of country-specific income elasticities of health care expenditure (η):

[97] For the 2009 Ageing Report, Dybczak and Przywara (2010) estimated equation 1 in **levels**. A number of reasons can be listed for preferring a specification in **first differences**:

- Health care expenditure is non-stationary, which could lead to spurious and unreliable results (Dybczak and Przywara (2010) assume co-integration);
- However, co-integration tests are unreliable for short series (Hewartz and Theilen, 2002) and frequent structural breaks in the data lower the power of those tests (Clemente et al., 2004);
- In addition, using data in first-differences facilitates addressing the issue of frequent breaks in the OECD's Health Database.

[98] The finding of a significant negative dummy after 1995 could be identifying a deceleration in expenditure growth following an initial acceleration associated with the setting up and expansion in coverage of health care systems.

$$\hat{\eta}_i = \frac{\dfrac{\sum_{t=1}^{T_i} \dfrac{\Delta \hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}{\hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}}{T_i}}{\dfrac{\sum_{t=1}^{T_i} \dfrac{\Delta g_{i,t}}{g_{i,t}}}{T_i}} \approx \frac{\dfrac{\sum_{t=1}^{T_i} \Delta \log \hat{h}_{i,t}\big|_{\Delta x_{i,t}=0}}{T_i}}{\dfrac{\sum_{t=1}^{T_i} \Delta \log g_{i,t}}{T_i}} \qquad [2b]$$

Extensive robustness checks were carried out. First, two datasets were explored: OECD Healthcare database, and COFOG data. Second, multiple model specifications were tried using the two datasets, namely estimates including and excluding country-fixed effects and a period dummy.

Econometric results obtained in the preparation for the 2012 Ageing Report are on the lower end of other recent estimates (IMF, 2010; Dybczak and Przywara, 2010). In addition, results suggest a slight deceleration in the pace of expenditure growth after 1995.

As regards the implementation of the NDD scenario, and based on the technical work carried out by Commission Services for the 2012 Ageing Report, the AWG decided to use a common expenditure-to-income elasticity (η) of 1.3[99] throughout the projection period, which will be reduced to 1 in 2060.

7.3.4. Constant health scenario: considering improvements in the health status of elderly citizens

The *pure demographic* scenario may be pessimistic in that it implicitly assumes that all gains in life expectancy up to 2060 would be spent in bad health. The "*constant health scenario*" is inspired by the *dynamic equilibrium* hypothesis and aims to capture the potential impact of improvements in the health status (i.e. reduction in morbidity and disability) that may accompany projected declines in mortality rates and consequent increases in life expectancy.[100] It assumes that the number of years spent in bad health during a life time remains constant over the whole projection period, i.e. all future gains in life expectancy are spent in good health. The health status (i.e. morbidity rates) and the age/gender-specific expenditure profiles are realigned with the decline in the mortality rate.

As before, to calculate future public expenditure on health care, the population in each age/gender group is multiplied by the respective age/gender-specific public expenditure per capita in each projection year. The size of each age/gender group changes each year in line with the population projections up to 2060. The difference with the "*pure demographic scenario*" lies in the way we assume age/gender specific public expenditure per capita evolves over time. As before, we assume that age/gender-specific expenditure profiles grow in line with GDP per capita growth. However, and contrary to the previous scenarios, for each

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[99] Corresponding to the weighted average of country-specific estimates.

[100] The "dynamic equilibrium" hypothesis was first developed by Manton (1982) and suggests counterbalancing the effects of two phenomena: decreasing prevalence/incidence of chronic diseases on the one hand, and decreasing fatality rates of diseases leading to longer prevalence of disability, on the other. More recent papers looking at whether people live longer and healthier include: Dolbhammer and Kytir (2001), Nusselder (2003), Mor (2005), Fries (1980, 1989, 2005), Jagger et al., (2007), Lafortune and Balestat (2007) and Suhrcke et al. (2010). Evidence is mixed regarding trends in healthy life expectancy.

projection year and for relevant age/gender groups[101], the age/gender specific expenditure profiles[102] is progressively shifted to older age groups in direct proportion to the projected gains in age/gender-specific life expectancy.

Given the lack of quantifiable measures of health status (morbidity), this approach is feasible only with an assumption that age-related expenditure profile is a proxy for morbidity profile, i.e. higher per capita spending at the higher ages is proportional to the increased frailty and worse health status at the end of a person's lifespan.

Formal illustration

In practical terms, one starts by calculating, for each projection year, the change in life expectancy in relation to the base year. For example, life expectancy for a 50-year-old man is expected to increase by, say, 4 years (from 30 years in year *t* to 34 years in year *t+20*) in a specific Member State. Then, the scenario assumes that in *t+20*, in that Member State, a 50-year-old man will have a per capita public expenditure profile of a (50-4) = 46-year old men in year *t*, adjusted to annual GDP per capita growth rate over the last 20 years.

In mathematical terms the change in life expectancy of a person of gender *g* and age *a* in relation to the base year (say, 2010) for each year of the projections, using the Eurostat population projections (EUROPOP2010)[103] is given by:

$$\Delta LE_{g,a,t,2010} = LE_{g,a,t} - LE_{g,a,2010} \qquad [5]$$

where:

$\Delta LE_{g,a,t,2010}$ is the additional life expectancy of a person of gender *g* and age *a* in year *t* compared to a person of gender g and age a in 2010,

$LE_{g,a,t}$ is the life expectancy of a person of gender *g* and age *a* in year *t* and

$LE_{g,a,2010}$ is life expectancy of an average person of gender *g* and age *a* in 2010.

Then, for each year *t* of the projections we find, for a person of gender *g* and age *a*, the 2010 per capita cost of a person of gender *g* but of the age which corresponds to the age in year *t* minus the years gained in life expectancy.[104] This is done only for those sections of the age-

[101] The method is applied to those age/gender groups where expenditure per capita is growing. For the young and the oldest old, the reference age/gender and therefore age/gender per capita public expenditure profile remains the same over the whole projection period.

[102] As in the previous scenarios and in practical terms, it is assumed that age/gender specific expenditure profiles proxy health status (i.e. morbidity). In other words, higher expenditure captures higher morbidity.

[103] In the *constant health scenario* the total number of years spent in bad health during a person’s life time is assumed to remain the same while life expectancy increases, so the morbidity rate must evolve in line with mortality rate for each age cohort. Thus, if between time *t* and *t+1*, total life expectancy increases by *n* years for a cohort of age *a*, healthy life expectancy for that very same age cohort must also increase by *n* years in order for the dynamic equilibrium hypothesis to be valid. If healthy life expectancy increases by *n* years, then the health status (and consequently health care spending) of this cohort of age *a* at time *t+1* will be the same as the health status (and health care spending) of cohort of age *a-n* at time *t*..

[104] Changes in life expectancy and therefore shifts in the age profile from one year to another are sometimes very small (in a range of a tenth part of a year). However, the data gathered by the Member States does not provide detailed information on costs per capita by single year of age (the most detailed item available is a 5-year average), so an additional calculation needs to be performed. To solve this problem, the intermediate values

profile where the cost per capita is growing.[105] The precise value of cost per capita assigned to person of gender g and age a in time t is therefore:

$$c^{ch}_{g,a,t} = c_{g,a-\Delta LE_{g,a,t,2010}} \qquad [6]$$

where:

ch stands for constant health scenario

$c_{g,a,t}$ is cost per capita assigned to a person of gender g and age a in year t of the projection period and

$c_{g,a-\Delta LEg,a,t,2010}$ is the 2010 cost per capita assigned to a person of gender g and of age a minus the years gained in life expectancy by a person of gender g and *age a* between year t and year 2010, as defined in equation [5] and specified with a precision to a decimal part of a year in the base year 2010.

This cost per capita is further adjusted to reflect changes in income per capita over the years using the same indexation system as in the previous scenario i.e. cost per capita grows in line with GDP per capita growth.

$$c^{ch}_{g,a,t} = c^{ch}_{g,a,t-1} \Delta Ypc_t \qquad [7]$$

ΔYpc_t is GDP per capita growth rate in year t,

As before, in each year the respective unit cost is multiplied by the projected population in each age group age (using the baseline population projections) to obtain the total public spending for each age/gender group:

$$S^{ch}_{g,a,t} = c^{ch}_{g,a,t} p_{g,a,t} \qquad [8]$$

where:

$S^{ch}_{g,a,t}$ is public spending on health care for all persons of gender g and age a in year t.

Next, the resulting total public spending on health care is divided by the projected GDP in order to obtain the public health care expenditure as a percentage of GDP:

$$T^{ch}_t = \frac{\sum S^{ch}_{g,a,t}}{Y_t} \qquad [9]$$

where:

T^{ch}_t is the ratio of total public spending on health care to GDP in year t.

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can be obtained by simple extrapolation/trend-smoothening method from the existing average figures. In this way it is possible to assign a concrete value of cost per capita to each tenth part of a year of age.

[105] For the young and the oldest old the reference age remains the same over the whole projection period.

7.3.5. Death-related costs scenario

The "*death-related costs scenario*" employs an alternative method to project public expenditure on health care. The methodology links per capita public expenditure on health care to the number of remaining years of life. Indeed, there is empirical evidence that a large share of the total expenditure on health care during a person's life is concentrated in the final years of life.[106] In practical terms, an average profile of *death-related costs by age* is constructed based on available empirical data supplied by Member States in a similar manner to that used in the 2009 EPC-EC Ageing Report.[107] This is constructed as follows:

- Using age/gender specific mortality rates as probabilities, each age group is split into the two sub-groups according to the number of remaining years of life: 1) that of decedents, i.e. those who are expected to die within a certain number of years (e.g. 2 years) and 2) that of survivors, i.e. those who are not expected to die within those years (e.g. 2 years).

- Each sub-group of decedents and survivors within each age/gender group is assigned a specific and different per capita public expenditure profile – the *death-related costs* profiles on the basis of data provided by national authorities.

- Then the number of individuals in each subgroup of decedents and survivors is multiplied by its respective per capita public expenditure profile. This gives the total public expenditure of each age group in each year.

- Summing the total expenditure of each age group in a given year corresponds to the total public expenditure on health care in that year.

- The death-related costs profiles are as usual indexed to GDP per capita growth as in the previous scenarios.

Formal illustration

In the "*death-related costs scenario*", the population of each gender-age group is divided into subgroups according to the number of remaining years of life using mortality rate as a weighting factor (e.g. number of people aged *a* expected to die within two years from year *t* is calculated as population aged *a* in year *t* multiplied by the probability of dying within two years which is expressed as: the probability of surviving year *t* by persons aged *a* times the probability of surviving year *t+1* by persons aged *a+1* times the probability of dying in year *t+2* by persons aged *a+2*).

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[106] For an overview of empirical studies, see Raitano (2006). Specific country examples include: Gabriele S. et al. (2005) for IT, Ahn N. et al. (2005) for ES, Polder et al. (2006) for NL and Czypionka et al. (2007) for AT. More recently van Elk et al. (2009) used this method to model health care expenditure.

[107] In the 2009 EPC-EC Ageing Report the average death-related costs profile used for all the countries was constructed as a simple average of the profiles provided by nine Member States (Belgium, Czech republic, Spain, France, Italy, the Netherlands, Austria, Poland, Finland) and completed with data coming from academic sources covering four other countries (see: Madsen (2004) for Denmark; Busse, Krauth and Schwartz (2002) for Germany; Batljan and Lagergren (2004) for Sweden; Seshamani and Gray (2004) for the UK). The profiles were expressed as the ratio between the costs borne by a decedent (a person that is going to die within a certain amount of time) and a survivor (a person that is going to survive that amount of time). The reported individual country-specific profiles differed significantly (due to different samples, methodologies, definition of "time close to death", etc.) so that using them instead of an average would have negatively affected comparability of the results.

Each subgroup is assigned a different unit cost, being an adjustment of the "normal" unit cost with the ratio of health care expenditure borne by a person of a given age and gender who is in her terminal phase of life to health care expenditure borne by a survivor. The number of people in each subgroup is thus multiplied by its respective cost per capita to get the total spending of each subgroup. The sum of total spending borne by the two subgroups is the total spending on health care in a given year.

Mathematically, we have the following formulation:

First, the total population of each gender and age is divided into subgroups, according to the number of remaining years of life. Consequently, there are z subgroups of decedents (those who are going to die within 0, 1, 2, …, or z years) and one group of survivors (those who are going to survive the z^{th} year). In order to obtain the size of each subgroup, the probability of dying in each gender, age and year of projection period are calculated.

The probability that a person of gender g and age a in a given year t will die in the x^{th} year after a given year t can be expressed by the following equation:

$$d_{g,a,t,x} = \left[\prod_{i=0}^{x-1} (1 - M_{g,a+i,t+i}) \right] \cdot M_{g,a+x,t+x} \qquad [10]$$

where:

$M_{g,a+i,t+i}$ is the mortality rate of people of gender g, aged $a+i$ in the i^{th} year after given year t and: $x \in (0,1,2...z)$,

and z is the highest number of years considered as time "close to death" and for which data on costs is available.

The probability that a person of gender g and age a in a given year t will survive z^{th} year can be expressed in a following way:

$$s_{g,a,t} = \prod_{i=0}^{z} (1 - M_{g,a+i,t+i}) \qquad [11]$$

So, the number of persons of gender g and age a who are going to die in x^{th} year from a given year t can be expressed in the following way:

$$Nd_{g,a,t,x} = d_{g,a,t,x} \cdot p_{g,a,t} \qquad [12]$$

where:

$p_{g,a,t}$ is projected population of gender g and age a in a given year t

The number of those who are going to survive x^{th} year is:

$$Ns_{g,a,t} = s_{g,a,t} \cdot p_{g,a,t} \qquad [13]$$

Second, the unit health care cost of each person in a population is calculated. Contrary to the general approach, per capita cost is not the same for all the individuals, but varies depending on whether a person is in her terminal phase of life or not. One must find the cost per capita of a person of gender *g* and age *a*, who is going to die within *x* years from year *n*, as well as the cost per capita of a person of the same gender *g* and age *a* surviving the x^{th} year.

The ratio between the two costs is taken as the input data from the country-specific information and background studies and may be expressed as:

$$f_{g,a,x} = \frac{cd_{g,a,x}}{cs_{g,a}} \qquad [14]$$

where:

$cd_{g,a,x}$ is health care cost per capita of a person of gender *g* and age *a* dying in the x^{th} year from the current year;

$cs_{g,a}$ is health care cost per capita of a person of the same gender *g* and age *a* surviving the period considered as time "close to death" from the current year.

To obtain the two costs, one must use the average cost per capita of a person of a given gender *g* and age *a* as given in the "age-related expenditure profiles" provided by the AWG delegates. It may be defined as an average of the per capita costs borne by all the subgroups of decedents and survivors, weighted by the size of each subgroup:

$$c_{g,a} = \frac{\sum_{x=0}^{z} cd_{g,a,x} \cdot Nd_{g,a,x,2010} + cs_{g,a} \cdot Ns_{g,a,2010}}{p_{g,a,2010}} \qquad [15]$$

It must be borne in mind that the unit costs of decedents and survivors are calculated for the base year 2010 (thus index *2010* used in the equations) and are kept constant over the whole projection period.

Substituting for $cd_{g,a,x}$ using [11], one gets:

$$c_{g,a} = \frac{\sum_{x=0}^{z} f_{g,a,x} \cdot cs_{g,a} \cdot Nd_{g,a,x,2010} + cs_{g,a} \cdot Ns_{g,a,2010}}{p_{g,a,2010}} \qquad [16]$$

or:

$$c_{g,a} = \frac{cs_{g,a}\left(\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2010} + Ns_{g,a,2010}\right)}{p_{g,a,2010}} \qquad [17]$$

This way, both $cs_{g,a}$ and – coming back to equation [12] - $cd_{g,a,x}$ can be calculated:

$$cs_{g,a} = \frac{c_{g,a} \cdot p_{g,a,2010}}{\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2010} + Ns_{g,a,2010}} \quad [18]$$

$$cd_{g,a,x} = f_{g,a,x} \cdot \frac{c_{g,a} \cdot p_{g,a,2010}}{\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2010} + Ns_{g,a,2010}} \quad [19]$$

As in the "*pure demographic scenario*" and in the scenarios on health status, for the time horizon of the projection exercise (2008-60) the age-related expenditure profiles – showing the average health care spending per capita for each year of age (from 0 to 100 or less, according to data availability) – are assumed to grow in line with the same cost assumption, i.e. GDP per capita. Therefore:

$$cd^{drc}_{g,a,x,t} = cd_{g,a,x,t-1} \cdot \Delta Ypc_t \quad [20a]$$

And

$$cs^{drc}_{g,a,t} = cs_{g,a,t-1} \cdot \Delta Ypc_t \quad [20b]$$

where:

drc stands for death related costs scenario

$cd^{drc}_{g,a,x,t}$ is the cost per capita of a person of gender *g* and age *a* who is going to die within *x* years, in year *t* of the projection period, adjusted to the GDP per capita growth;

$cs^{drc}_{g,a,t}$ the per capita cost in year *t* of a person of gender *g* and age *a* that survives the z^{th} year i.e. the per capita cost of the subgroup of survivors

ΔYpc_t is GDP per capita rate growth in year *t*, as in equation [2]

Third, by multiplying the size of each subgroup by its respective cost per capita, the total cost can be calculated. Total public expenditure on health care borne by those of a given gender *g* and age *a*, who are going to die within *x* years from a given year *t* can be expressed in the following way:

$$ed_{g,a,x,t} = Nd_{g,a,x,t} \cdot cd_{g,a,x,t} \quad [21]$$

and total expenditure of those of gender *g* and age *a* who are going to survive z^{th} year:

$$es_{g,a,t} = Ns_{g,a,t} \cdot cs_{g,a,t} \quad [22]$$

Adding total expenditures of all the subgroups (those dying within *0, 1, 2,…, z* years plus those surviving z^{th} year) gives total expenditure on health care borne by the entire population of gender *g* and age *a* in year *t*:

$$E_{g,a,t} = \sum_{x=1}^{z} ed_{g,a,n,x} + es_{g,a,n} \qquad [23]$$

Finally, total expenditure on health care T_t borne by the entire population in a given year t, expressed as a share of the country's GDP, is calculated as follows:

$$T_t = \frac{\sum_g \sum_a E_{g,a,t}}{Y_t} \qquad [24]$$

7.3.6. Income elasticity scenario

This scenario attempts to capture the effect of changes in national income on demand for health care goods and services. This effect is the result of a number of factors: higher living standards, the fulfilment of the basic needs and therefore growing expectations and social pressure to catch-up with the health care quality and coverage provided in richer neighbouring countries.[108]

To calculate the possible effect of income, one can use different levels of income elasticities to the basic GDP per capita evolution path. More specifically, the "*income elasticity scenario*" shows the effect of an income elasticity of demand higher than 1, i.e. $\varepsilon = 1.1$, on the evolution of public expenditure on health care. An income elasticity exceeding 1 is an indicator that health care is considered by society as a 'luxury good'. An elasticity of 1.1 at the beginning of the period is chosen on the basis of existing reviews of empirical evidence gathered over the recent decades.[109] It is the same as in the 2009 EPC-EC Ageing Report. It is also assumed that economic growth and process of real convergence between countries over the long run drive elasticity down towards common unity level, by 2060.[110]

In practical terms, this scenario is identical to the "*pure demographic scenario*" except that the income elasticity of demand is set equal to 1.1 in the base year (rather than 1 in the case of the *"pure demographic scenario"*), converging in a linear manner to 1 by the end of projection horizon in 2060.

Formal illustration

The methodology used to project health care spending is the same as for the "*pure demographic scenario*", except in the way per capita public expenditure on health care is evolving over the projection period. Income elasticity is taken into account by replacing equation [1] by the following equation [25], so that the per capita cost of a person of gender *g* and age *a* in year *t* of the projection period, $c^{ie}_{g,a,t}$, is adjusted to the GDP per capita growth with an elasticity that goes from 1.1 to 1 in 2060:

$$c^{ie}_{g,a,t} = c_{g,a,t-1} \Delta Ypc_t \varepsilon_t \qquad [25]$$

[108] The demand for higher quality care may translate into demand for the most modern medical knowledge and technologies. In this context the impact of income could to a certain extent capture the impact of technology. The impact of technological development is assessed in a separate scenario, using econometric analysis of past trends in public expenditure on health care, demographic, income and non-income variables.
[109] See Getzen (2000).
[110] This is also a common technical assumption in many long-run projection models, to avoid "explosive" path of some of the variables used in the exercise.

where:

ie stands for income elasticity scenario

$c_{g,a,t-1}$ is the cost per capita of a person of gender *g* and age *a* in year t-1;

ΔYpc_t is GDP per capita growth rate in year *t*;

ε_t is income elasticity of demand, assumed to converge from ε_{2010} to ε_{2060} in 2060 according to the following formulation:

$$\varepsilon_t = \varepsilon_{2010} - (t-2010) \cdot \frac{\varepsilon_{2010} - \varepsilon_{2060}}{2060-2010} \qquad [26]$$

In the specific case where income elasticity of demand converges from 1.1 in 2010 to 1 in 2060, the value will be the following:

$$\varepsilon_t = 1.1 - (t-2010) \cdot \frac{0.1}{50} \qquad [26a]$$

The other steps of the projections are the same as in equations [3] and [4] (or [8] and [9]).

7.3.7. EU27 average cost convergence scenario

The "*cost convergence scenario*" is meant to capture the possible effect of a convergence in real living standards across EU countries on public expenditure on health care. In other words, this scenario proposes to take into account the convergence of citizens' expectations (and per capita income) towards a similar basket of (health) goods.

The 2012 Ageing Report considers a slightly different "cost convergence scenario" than that in the 2009 Ageing Report. Indeed, the 2009 "*EU12 cost convergence scenario*" concerned only the most recently acceded Member States (EU12) in which spending on health care (as a % of GDP and per capita) was then below the levels observed in the EU15 countries. The scenario started with the EU12 lower and flatter age/gender-specific per capita public expenditure profiles observed in the base year. It then assumed that these age/gender-specific per capita public expenditure profiles, *as a share of GDP per capita*, would progressively increase to the average age/gender-specific per capita public expenditure profiles, *as a share of GDP per capita*, of the EU15 countries by 2060.

The current socio-economic situation is more diversified and some convergence has taken place. Therefore, the 2009 scenario is adjusted to consider the convergence of all countries (be it EU15 or EU12) that are below the EU27 average per capita public expenditure (*as a share of GDP per capita*) to that same EU27 average. This would be illustrated as follows: the relative age/gender per capita public expenditure profiles below the corresponding (calculated) EU27-average age/gender per capita public expenditure *as a share of GDP per capita* in the base year would be assumed to progressively increase to this EU27-average. The convergence will be achieved by 2060. As a result, the convergence speed for all the countries below the EU27 average would take into account the differences in the initial situation, i.e. the extent of the initial gap between country-specific and EU27-average profile.

Formal illustration

To project public spending on health care, we build on the methodology used for the "*pure demographic scenario*". Indeed, for those countries whose age/gender per capita public expenditure *as a share of GDP per capita* (relative per capita spending) is equal to or above the EU27 average (relative per capita spending), equations [1] to [4] from the pure demographic scenario to project public spending on health care are used.

For those countries whose age/gender per capita public expenditure *as a share of GDP per capita* is below the EU27 average in the baseline year of 2010, we assume a different evolution path for this variable. We assume it evolves over the projection period so as to reach the EU27 average in 2060. The real convergence to EU27 average is assumed to follow the following path, based on an adjustment of equation [1] of the pure demographic scenario:

$$c^{cc}_{g,a,t,i} = c_{g,a,t-1,i}\left(\Delta Ypc_{t,i} + g_{t,i}\right) \qquad [27]$$

where:

cc stands for cost convergence

$c^{cc}_{g,a,t,i}$ is cost per capita of a person of gender *g* and age *a* in year *t* of the projection period, in country *i*, adjusted to the GDP per capita growth and a catch-up effect if country *i* is below the EU27 average ;

$c_{g,a,t-1,i}$ is cost per capita of a person of gender *g* and age *a* in year *t-1* in country *i*;

$\Delta Ypc_{t,i}$ is GDP per capita rate growth in year *t* of country *i* and

$g_{t,i}$ is a hypothetical rate of growth of per capita costs which is higher than zero for those countries below the EU27 average and equal to zero for those countries at or above the EU27 average. To close the gap, $g_{t,i}$ evolves according to the following mechanism.[111] :

$$g_{t,i} = \left[\left(\frac{\overline{rc}_{g,a,EU27,2010}}{rc_{g,a,i,2010}}\right)^{\frac{1}{2060-2010}}\right] - 1 \qquad [28]$$

where:

$\overline{rc}_{g,a,EU27,2010}$ is the weighted EU27 average relative cost per capita of gender *g* and age *a* calculated in the baseline year of 2010 and

$rc_{g,a,i,2010}$ is the relative cost per capita of gender *g* and age *a* for country *i* (if below the EU27 average cost per capita) calculated in the baseline year of 2010 defined as

[111] Assumptions for different convergence paths according to the initial country-specific situation - comparing to the EU27-average age profile - will be explored further as soon as data is made available to calculate the new age profiles.

$$rc_{g,a,i,2010} = \left(\frac{c_{g,a,i,2010}}{Ypc_{g,a,i,2010}} \right) \text{ and}$$

$$\overline{rc}_{g,a,EU27,2010} = \left(\frac{\bar{c}_{g,a,EU27,2010}}{\overline{Ypc}_{g,a,EU27,2010}} \right)$$

Where $\bar{c}_{g,a,EU27,2010}$ is the weighted EU27 average cost per capita of gender g and age a calculated in the baseline year of 2010 and $\overline{Ypc}_{g,a,EU27,2010}$ is the average GDP per capita in the EU27 calculated in the baseline year of 2010.

After country-specific per capita cost has been calculated, corresponding equations [3] and [4] are used to obtain total age/gender group expenditure and total public expenditure on health care in each projection year.

7.3.8. Labour intensity scenario

This scenario tries to capture the role of labour costs in the evolution of public expenditure on health care The "*labour intensity scenario*" is an attempt to estimate the evolution of public expenditure on health care taking into account that the health sector is and will remain a highly labour-intensive sector. Consequently, in this scenario, unit costs in the health care sector are seen as strongly driven by increases in wages and salaries. In practical terms, unit costs (and therefore the age/gender specific per capita public expenditure profiles) are assumed to evolve in accordance to changes in wages which in turn are assumed to evolve in line with labour productivity, rather than growth in GDP per capita. In technical terms this scenario is similar to the "*pure demographic scenario*" except that unit costs are assumed to evolve in line with the evolution of GDP per hours worked (which is usually higher than GDP per capita).[112]

Note that this scenario assumes that wages in the health sector grow at the same rate as wages in the whole economy, and that wages in the whole economy generally follow the trend of economy-wide productivity. Hence, expenditures per head are assumed to grow at the same rate as productivity in the whole economy.

Formal illustration

The only difference between this scenario and "*pure demographic scenario*" is the change in the development pattern of unit costs. The growth in GDP per capita is replaced by the growth in GDP per hours worked, so that equation [1] becomes:

$$c^{li}_{g,a,t} = c_{g,a,t-1} \Delta Yphw_t \qquad [29]$$

where:

li stands for labour intensity scenario

$\Delta Yphw_t$ is the rate of growth of GDP per hours worked in year *t*,

[112] Note that the "*labour intensity scenario*" in the 2009 Ageing Report used GDP per worker.

$$\Delta Yphw_t = \left(\frac{Y_t}{\sum hw_t} - \frac{Y_{t-1}}{\sum hw_{t-1}} \right) \Big/ \left(\frac{Y_{t-1}}{\sum hw_{t-1}} \right) \qquad [30]$$

Corresponding equations [3] and [4] are then used to calculate total age/gender group expenditure and total public expenditure on health care in each projection year.

7.3.9. Sector-specific composite indexation scenario

Given the special character of the health care sector (high level of government regulation, investment in new technologies, high labour intensity) it might be more appropriate to use sector-specific rather than economy-wide elements as determinants of unit costs in the model. While a significant share of public expenditure on health corresponds to expenditure on staff (wages), we would consider other inputs and therefore components of public expenditure on health care, thereby enhance the quality of the projections exercised to better reflect reality. These components have usually evolved at a pace different from that of wages. The scenario called "sector-specific *composite indexation*" tries to capture the importance and evolution of various inputs to health care provision. The "*sector-specific composite indexation scenario*" looks at each of these different components separately and indexes each of them in a separate/different way, creating a sort of composite indexation for "unit cost development".

In order to capture the importance and evolution of various inputs, a set of such inputs is chosen – mostly on the basis of data availability – and their respective share in public expenditure on health care is calculated. Expenditure on health care can be disaggregated in different inputs: 1) staff, to which corresponds expenditure on wages, 2) pharmaceuticals, 3) therapeutic appliances, 4) capital investment, and 5) other factors. For each of these inputs, its share in total public expenditure on health care is calculated and applied to the age-specific per capita expenditure. In doing this, each age-specific per capita expenditure is divided into 5 sub-items of expenditure.

The past evolution of public expenditure on each of those inputs is used to calculate the average annual growth of the expenditure associate to each of those inputs for the past 10 years. The ratio of each of these growth rates to the growth rate of GDP per capita is calculated and multiplied by each sub-item of the age-specific per capita expenditure.[113] This allows for different evolution patterns for each component of expenditure so that in the future the share of each of these components is allowed to change, something which was not captured by previous scenarios. It is also assumed that the growth ratio multiplying each sub-item of expenditure converges to 1 in a certain year in the future (i.e. grows at the same pace as productivity or GDP per capita).

To provide an example, let us assume that per capita public expenditure on health care for 20-year old men is €2000 in year *t*. Assume too, that in line with total public expenditure on health care, 40% is wages, 5% capital investment, 15% pharmaceuticals, 2% therapeutic appliances and 38% other inputs. Therefore, per capita public expenditure is divided into 5 sub-items: €800 in wages, €100 capital investment, €300 in pharmaceuticals, €40 in therapeutic appliances, €760 in other inputs. Then, in year *t+1* expenditure increases as follows (numbers are just illustrative): €800x1.2 + €100x1.4 + €300x1.3 + €40x1.1 + €760x1, where 1.2, 1.4, 1.3, 1.1 and 1 are the (past observed) growth ratios of each component.

[113] The data is available in EUROSTAT, WHO, OECD/SHA (see details with tables).

As to the pattern of convergence, past observations are used to determine the convergence pattern of the growth ratios. It is assumed that for all components the ratio converges to 1 in 2060. Different convergence patterns for each component can also be assumed.[114]

Formal illustration

In mathematical terms, the different steps of the projection exercise are as follows: The share of each component in total public expenditure on health care in each year *t* of available data, up to the baseline year of 2010 is calculated as follows. Assuming 5 inputs:

$$s_{i,t} = \frac{PE_{i,t}}{\sum_{i=1}^{5} PE_{i,t}} \qquad [34]$$

where $S_{i,t}$ is the share of public expenditure on component or input *i* at each time *t* to total public expenditure on health care,

$PE_{i,t}$ is total public expenditure on component or input *i* at each time *t* and

$\sum_{i=1}^{5} PE_{i,t}$ is total public expenditure on health care expressed as the sum of the public expenditure on each of the five components or inputs.

The average share of the ten past observations, up to 2010, $\bar{s}_{i,t}$ of each component is calculated as

$$\bar{s}_i = \frac{\sum_{t=1}^{10} s_{i,t}}{10} \qquad [35]$$

These average shares are combined with the age/gender specific per capita expenditure in 2010 so that this is the sum of the expenditure on the above five components

$$c_{g,a,2010} = \sum_{i=1}^{5} \bar{s}_i c_{g,a,2010} \qquad [36]$$

To calculate the annual growth rate of public expenditure for each of the five components or inputs, the growth rate of public expenditure for component *i* at time *t* of available data up to the baseline year of 2010 included is:

$$\Delta PE_{i,t} = \left(\frac{PE_{i,t} - PE_{i,t-1}}{PE_{i,t-1}} \right) \qquad [37]$$

and the average annual growth rate of public expenditure for component *i* for the last past 10 years up 2010, which is:

[114] When etrapolating past trends, caution is called for in its interpretation as there may be methodological breaks in the series or policy changes, affecting e.g. pharmaceuticals.

$$\overline{\Delta PE_i} = \frac{\sum_{t=1}^{10} \Delta PE_{i,t}}{10} \qquad [38]$$

Now, recall that the annual growth rate of GDP per capita is ΔYpc_t as defined in equation [2]. We then calculate the average annual growth rate of GDP per capita for the past ten years of available data (up to 2010 inclusive) as

$$\overline{\Delta Ypc} = \frac{\sum_{t=1}^{10} \Delta Ypc_t}{10} \qquad [39]$$

The ratio of average annual grow rate of expenditure on each component to the average annual growth rate of GDP per capita is calculated by dividing equation [38] by equation [39].

Following these calculations the per capita cost is assumed to evolve in the following manner:

$$c_{g,a,t}^{di} = \sum_{i=1}^{5} \left(\bar{s}_i c_{g,a,t-1}\right) \frac{\overline{\Delta PE_i}}{\overline{\Delta Ypc}} \Delta Ypc_t \qquad [40]$$

where:

di stands for decomposed indexation scenario and

ΔYpc_t is the GDP per capita rate of growth in year *t* for each country.

Each of the five ratios of growth rates (the $\frac{\overline{\Delta PE_i}}{\overline{\Delta Ypc}}$) converges to 1 by a specified date, 2060. Again, corresponding equations [3] and [4] are then used to calculate total age/gender group expenditure and total public expenditure on health care in each projection year.

7.4. Data sources

7.4.1. Data collection

The data required to run long-term public expenditure projections in the field of health care includes:

- public expenditure on health care;
- per capita public expenditure on health care by gender and age cohorts i.e. age/gender-specific expenditure profiles;
- per capita public expenditure on health care decomposed by the number of remaining years of life required to run the *death-related costs* scenario.

The data-collection procedure has taken two steps. First, Commission Services (DG ECFIN) pre-filled a data on the basis of existing international databases managed by international organisations (Eurostat, OECD, WHO, AMECO). The questionnaire was then circulated to the Member States, to endorse the pre-filled figures and complement these with data from national sources if no data was available from international sources. The completed data questionnaires were used for conducting the projections.

Note that age/gender specific per capita public expenditure on health care and per capita public expenditure on health care decomposed by the number of remaining years of life were not available in any common international databases. Therefore, they were provided exclusively by AWG delegates.

7.4.2. Computing public expenditure on health care

For the EU Member States and Norway, for which health accounts data is available on the basis of the joint OECD/Eurostat/WHO System of Health Accounts (SHA) questionnaire, public expenditure on health care is computed as the sum of all "core" health care SHA categories (HC.1 to HC.9), excluding long-term nursing care category (HC.3), and adding capital investment in health (HC.R.1). Data are available on both the OECD Health Data and Eurostat Cronos. More specifically the SHA categories used are:

- services of curative care (HC.1);
- services of rehabilitative care (HC.2);
- ancillary services to health care (HC.4);
- medical goods dispensed to outpatients (HC.5);
- prevention and public health services (HC.6);
- health administration and health insurance (HC.7);
- on services not allocated by function (HC.9) plus,
- investment in medical facilities (HC.R.1),

For the EU countries for which data on the basis of joint SHA questionnaire is not available, ESSPROS is used to compute a proxy for public expenditure on health care. This is computed as the sum of:

- expenditure on benefits in kind in the sickness/health care function i.e. the sum of public expenditure on in-patient health care and out-patient health care (including pharmaceutical products);
- expenditure on other benefits in kind in the family/children function;
- expenditure on rehabilitation of alcohol and drug abusers in the social exclusion function.
- expenditure on capital formation either from the OECD Health Data or from a national source is added.

Expenditure on health-related cash benefits from ESSPROS taken from the sickness/healthcare function is added to this aggregate computed on the basis of SHA or ESSPROS data. These health-related cash benefits consist of periodic sick leave benefits, other periodic cash benefits and lump sum cash benefits related to sickness/health care.

8. Long term care

8.1. Short overview of the projection methodology

The methodology to project long-term care (LTC) expenditure is based on a simple macro-simulation model. This is the same procedure used in previous projection exercises conducted jointly by the European Commission (EC) and the Ageing Working Group (AWG). Such a macro-simulation model assumes that the whole population is divided into groups which are assigned certain characteristics (e.g. age, gender, per capita expenditure, health status, type of care/support…). Changes in the (relative) size or features of these groups lead to expenditure changes overtime. These types of models are widely used in long-term expenditure projections, especially when the precise micro information on the individuals and their transition rates from one health status to another is missing or not reliable.

The choice of methodology and various scenarios is heavily constrained by the availability, accessibility and quality of long-term care data. The set of data to be used in the projection exercise is the SHA data when available – complemented with some proxies calculated on the basis of ESSPROS categories.[115,116] Therefore, the models may not include all the relevant factors identified as affecting health and long-term care spending.

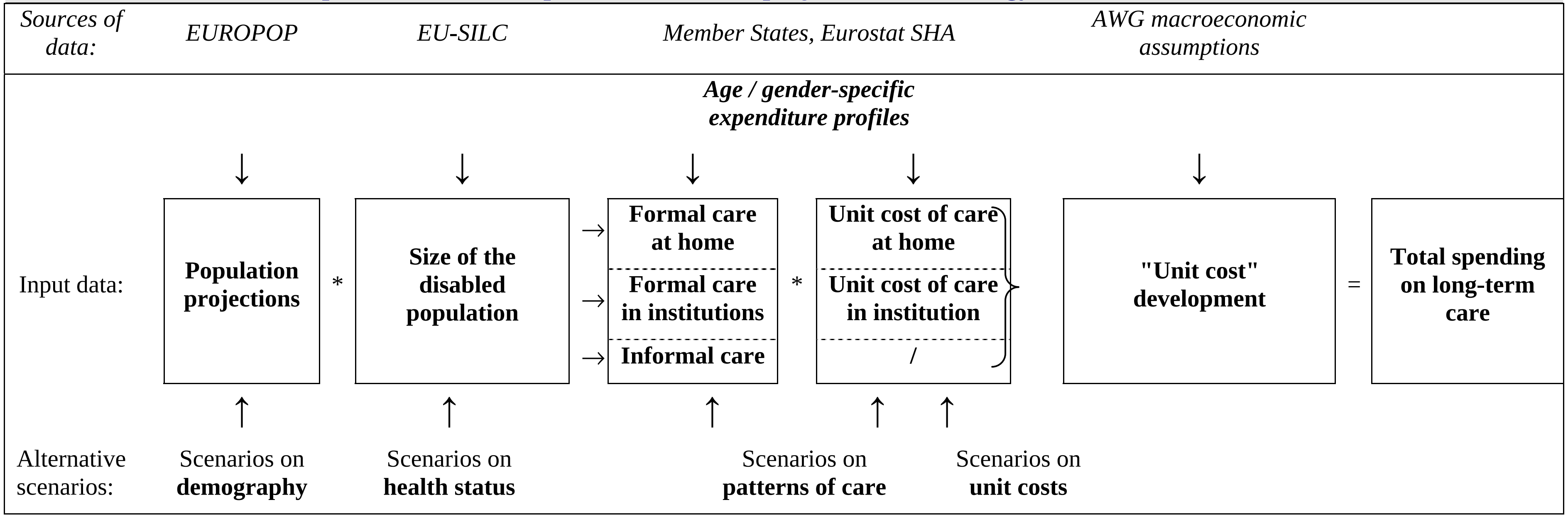
The 2006 projection exercise model, based on a proposal by Comas-Herrera et al. (2005), will continue to be used. The approach aims to maximise the numbers of factors affecting future LTC expenditure that can be examined. At the same time, it has to make sure that a large number of Member States can provide the data necessary to run the projections. A schematic presentation can be found in the Graph 8. 1 below. Specifically, the methodology aims at analysing the impact of changes in the assumptions made about:

- the future numbers of elderly people (through changes in the population projections used);
- the future numbers of dependent elderly people (changes to the prevalence rates of dependency);
- the balance between formal and informal care provision (assuming a given shift in demand or exogenous changes in the availability of informal carers);
- the balance between home care and institutional care within the formal care system;
- the unit costs of care.

[115] See Annex 8.2.

[116] For disability rates, the measure relies on the EU-SILC data (EU-SILC: The European Union Statistics on Income and Living Conditions; see the Eurostat website at: http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc)

Graph 8. 1 - Schematic presentation of the projection methodology / in-kind LTC benefits



Source: Commission services.

Note: As in 2009, the projections need to be viewed in the context of the overall projection exercise. Consequently, the common elements of all scenarios will be the population projections provided by Eurostat (EUROPOP2010) and the baseline assumptions on labour force and macroeconomic variables agreed by the EC and the AWG-EPC. The age and gender-specific per capita public expenditure (on long-term care) profiles are provided by Member States. They are applied to the demographic projections provided by Eurostat to calculate nominal spending on long-term care.

Note 2: This schematic representation shows the methodology for projecting in-kind benefits. Total public expenditure on long term care is the sum of public expenditure on long-term care in-kind plus public expenditure on long-term care in cash benefits. Therefore, to the projections of long-term care expenditure on benefits in kind, one needs to add the projected cash benefits calculation.

The methodology allows projecting the future need for long-term services in terms of numbers of people who are assumed to need long-term care services. This is done by using dependency rates, to estimate the fraction of the elderly population which is dependent, i.e. has some disability which requires the provision of a care service.

First, a projection is made of the dependent population, on the basis of the baseline population projection and disability rates. Second, the dependent elderly population is split, by age and gender, following the type of care received (informal, formal at home, formal in institutions). Third, average expenditure (i.e. age-gender profiles) are calculated for both types of formal care, and then multiplied by the projected number of recipients to obtain the projected public expenditure. More specifically, the necessary steps are:

Step 1: taking the baseline population projection (by age and gender), a projection is made of the dependent population, who are assumed to need some form of long-term care service, and the non-dependent population who are assumed not to be in need of long-term care services. This is made by taking age and gender-specific dependency ratios at the value observed in the base year estimated using existing indicators of disability from comparable sources) and applying them to the baseline population projection. More specifically, dependency rates refer to the concept of ADL-dependency which refers to difficulties in performing at least one Activity of Daily Living (ADL) (Katz et al., 1963).[117] EU-SILC data are used to obtain a proxy of "ADL-dependency" rates.

Step 2: the projected dependent elderly population is split, by age and gender, into three groups depending on the type of care they receive, namely (i) informal care, which is assumed to have no impact on public spending, (ii) formal care at home and (iii) formal care in institutions (both of which impact on public spending but their unit costs may differ). The model implicitly assumes that all those receiving home care or institutional care have difficulties with one or more ADLs, and that all persons deemed ADL-dependent either receive informal care, home care or institutional care. The split by type of care received is made by calculating the “probability of receiving different types of long-term care by age and gender”. This is calculated for a base year using data on the numbers of people with dependency (projected in step 1), and the numbers of people receiving formal care at home and in institutions (provided by Member States). It is assumed that the difference between the total number of dependent people and the total number of people receiving formal care (at home or in institutions) is the number of people who rely exclusively on informal care.

Step 3: average expenditure (i.e. "*age-gender profiles of expenditure*") are calculated for a base year using data on total public expenditure in home care and institutional care and the numbers of people receiving formal care at home and in long-term care institutions (provided by Member States). Two assumptions are required:

- it is implicitly assumed that current expenditure in services divided by the number of users equals the long-run unit costs of services;

[117] *Activities of Daily Living* (ADL) are the things people normally do in daily living including any daily activity they perform for self-care (such as feeding ourselves, bathing, dressing, grooming), work, homemaking and leisure (see: Webster's New World Medical Dictionary, Wiley Publishing, 2008). If a person has difficulty in performing at least one of them, he is considered as ADL-dependent.

- it is assumed that average expenditure per user increases with the age of the user.[118]

Step 4: involves the calculation of public spending for the two types of formal long-term care services, by multiplying the number of people receiving formal care (at home and in institutions) by the average age-specific public expenditure (respectively at home and in institutions) per year and per user. By adding up the expenditure on formal care at home and in institutions, **total public expenditure on long-term care services** ("in-kind benefits") is obtained.

Step 5: public expenditure on cash benefits for people with ADL-dependency is added to the expenditure on services, in order to obtain **total public expenditure on long-term care**. Note that cash benefits are assumed to grow in line with the numbers of people with dependency.[119]

Overall, given the availability of a numerical measure of disability, the projection methodology described above is more precise than that used for health care expenditure where there is no direct indicator of health status and the age-related expenditure profile is used as a proxy. However, an important caveat to note is that while dependency rates are an indicator of the need for care, those needs may not necessarily translate into actual public expenditure, for at least two reasons.

Firstly, the links between disability levels and demand/use of long-term care are not straightforward. Each step involves some uncertainty. There are many people with some form of disability who can lead completely independent lives without the need for care services. Further, disability also depends on a person's perception of their ability to perform activities associated with daily living. On the one hand, survey data can underestimate some forms of disability. People may not report certain socially stigmatised conditions, such as alcohol and drug related conditions, schizophrenia, and mental degeneration. On the other hand, disability data can be too inclusive and measure minor difficulties in functioning that do not require provision of community care.[120] In order to clarify the relation and to follow the usual eligibility conditions of public schemes, it is commonly accepted that the disability levels accounted for are those categorized as "severe".[121]

Secondly, most long-term care is still provided by unpaid informal carers. Expenditure profiles contain information about the propensity to receive paid formal care, which depends on a number of factors other than dependency that affect demand for paid care such as household type, availability of informal carers, income or housing situation. Most of these factors, in turn, are also correlated with age.

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[118] In practice, average expenditure (aged 15 and above), for each type of service, is decomposed into average expenditure by age groups, by assuming the same rate of increase in spending by age as in the age-related expenditure profile. It is important to note that the age-related expenditure profile provides information on spending in formal care by age, without distinction between care provided at home and in institutions (unless newly provided by Member States). The model uses average public expenditure in formal care and in institutional care to project future expenditure in both types of services.

[119] For more details on the cash benefits data, see Section 8.3.2 below.

[120] See Productivity Commission (2005).

[121] As these people are in most need of income support and services, such as long-term care.

8.2. Scenarios carried out in the projection exercise

The advantage of the methodology described above is that it allows examining different scenarios regarding the evolution of dependency rates, unit costs and policy settings. Consequently, a series of scenarios and sensitivity tests assess the potential impact of each of the determinants of long-term care expenditure on future public expenditure on long-term care. Building on the 2009 EPC-EC projections exercise[122], the present exercise maintains most of the existing scenarios and sensitivity tests while attempting to improve the specification of some of the scenarios, and runs one new scenario. The overview of the scenarios is presented in Table 8. 1 below. The analysis tries to identify the impact of each quantifiable determinant separately, on the basis of hypothetical assumptions like an estimated guess or a "what if" situation. Therefore, the results of the projections should not be interpreted as forecast of expenditure as for example particular policy/institutional settings in Member States or policy reforms are not taken into account.

The AWG and EPC will choose a baseline/reference scenario for long-term care expenditure n connection with the release of the final 2012 Ageing Report, containing the budgetary projections, as was the case in the 2006 and 2009 Ageing Reports.

Table 8. 1 - Overview of the different scenarios to project long-term care expenditure

	Pure demographic scenario	Base case scenario	High life expectancy scenario	Constant disability scenario	Shift from informal to formal care	Coverage-convergence scenario	Cost- convergence scenario
	I	II	III	IV	V	VI	VII
Population projection	EUROPOP2010	EUROPOP2010	Alternative higher life expectancy scenario	EUROPOP2010	EUROPOP2010	EUROPOP2010	EUROPOP2010
Age-related expenditure profiles / Dependency status	2010 profiles / disability rates held constant over projection period	2010 profiles / disability rates held constant over projection period	2010 profiles / disability rates held constant over projection period	2010 disability rates change in line with changes in age-specific life expectancy	2010 profiles / disability rates held constant over projection period	2010 profiles / disability rates held constant over projection period	Individual EU27 profiles converging to the EU27 average age profiles over the projection period
Policy setting / Care mix	Probability of receiving each type of care held constant at 2010 level	Probability of receiving each type of care held constant at 2010 level	Probability of receiving each type of care held constant at 2010 level	Probability of receiving each type of care held constant at 2010 level	Gradual decrease of the number of persons receiving informal care for the first ten years; correspondent increase in the number of persons receiving formal care at home and/or in institutions	Probability of receiving formal care converging to the EU-27 average	Probability of receiving each type of care held constant at 2010 level
Unit cost development	GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita	In-kind: GDP per hours worked; cash benefits: GDP per capita

Source: Commission services.

[122] See Economic Policy Committee and European Commission (EPC/EC) (2009), The 2009 Ageing Report: economic and budgetary projections for the EU-27 Member States (2008-2060), European Economy, No. 2/2009, Directorate General Economic and Financial Affairs, European Commission 2009. Available at: http://ec.europa.eu/economy_finance/publications/publication14992_en.pdf.

8.2.1. Pure demographic scenario

The "*pure demographic scenario*" assumes that the shares of the older disabled population who receive either informal care, formal care at home or institutional care are kept constant over the projection period. Those constant shares are then applied to the projected changes in the dependent population. Since the prevalence of ADL-dependency is also kept constant over the projection horizon, the dependent population evolves precisely in line with the total elderly population. This implies that in practice all gains in life expectancy are spent in bad health/with disability. Arguably, it is a pessimistic scenario with respect to disability status, since it assumes that average lifetime consumption of long-term care services will increase over time. It is a "no policy change scenario" as the probability of receiving care (either at home or in an institution) is assumed to remain constant at the 2010 (base year) level. The scenario is similar to the analogous scenario for health care expenditure, and costs are also assumed to evolve in line with GDP per capita growth (for all types of long-term care expenditure).

8.2.2. Base case scenario

While in the above-mentioned elements the scenario is similar to the analogous scenario for health care expenditure, the actual "*base case scenario*" is slightly different, as it was agreed already in the 2009 exercise to link long-term care unit cost to GDP per worker, rather than to GDP per capita. Indeed, there exists a current imbalance of care mix, with a relative deficit of formal care provision. Further, this sector is highly labour-intensive and productivity gains can be expected to be particularly slow in this sector. Therefore, public expenditure on long-term care is expected to be rather more supply- than demand-driven. For that reason, GDP per worker (which is also assumed to reflect wage evolution in all sectors, including in the care sector), rather than GDP per capita had been chosen as the main driver of unit costs. In this sense, it is more similar to the "*labour intensity scenario*" run for the health care expenditure projections.

For the 2012 projections exercise, it has been agreed to differentiate two kinds of unit costs. The projections will link unit cost to GDP per hours worked[123] for in-kind benefits (services), while unit cost of cash benefits will evolve in line with GDP per capita growth (as cash benefits are more related to a form of income support). This was also the assumption of the 2009 AWG reference scenario.

8.2.3. High life expectancy scenario

The "*high life expectancy scenario*" presents the budgetary effects of an alternative demographic scenario which assumes life expectancy to be higher for all ages than in the baseline scenario. In terms of methodology, the scenario does not differ from the "*base case scenario*", apart from the fact that the baseline demographic projections (structure of the population evolving over the projection period as well as the consequent evolution in the macroeconomic assumptions) used as input data are replaced with the alternative, high life expectancy, variant (the same used to assess the sensitivity of pension spending). The rationale is twofold. First, the marked increase in public expenditure with older age (i.e. 80 and more). In fact, the age profile for long-term care expenditure is much steeper than that for health expenditure, partly because the costs related to long-term care are very high for

[123] We propose to use GDP per hours worked, where the 2009 exercise used GDP per worker, to stay in line with the macroeconomic assumptions and the other parts of the projections.

institutionalised individuals, and the share of institutionalised individuals increases sharply among persons aged over 80. Second, the higher age groups are also the part of the demographic projections which are likely to be the most uncertain.

8.2.4. Constant disability scenario

This scenario reflects an alternative assumption about trends in age-specific ADL-dependency rates. Being inspired by the so-called "*dynamic equilibrium hypothesis*", it is analogous to the "*constant health scenario*" performed in the framework of health care expenditure projections. The profile of age-specific disability rates shifts in line with changes in life expectancy (disability rate in the future is equal to that of a younger - by the same number of years as the change in age-specific life expectancy - age cohort today), resulting in a gradual decrease over time in disability prevalence for each age cohort.

8.2.5. Scenario assessing the effect of a shift from informal to formal care

Ultimately, the public funding of long-term care – and the policy orientation – will determine whether future needs for long-term care translate into (direct) public expenditure or not, as neither informal care provision nor private expenditure on long-term care are formally part of public expenditure on long-term care.

Indeed, pressure for increased public provision and financing of long-term care services may grow substantially in coming decades, especially in Member States where the bulk of long-term care is currently provided informally. To illustrate the impact of possible future policy changes, such as Member States deciding to provide more formal care services to the elderly, additional scenarios have been prepared.

This policy-change scenario is run to assess the impact of a given – demand-driven – increase in the (public) provision of formal care replacing care provided in informal setting. In particular, this sensitivity test examines the budgetary impact of a progressive shift into the formal sector of care of 1% per year of disabled elderly who have so far received only informal care. This extra shift takes place during the first ten years of the projection period only, thus it sums up to about 10.5% shift from informal to formal care. Only one of the three alternative options considered in the 2009 Ageing Report will be analysed: 50% of the "new" beneficiaries will be considered to move into institutional care, while the other 50% will be assumed to receive formal care at home.

8.2.6. Coverage convergence scenario

This scenario assumes that the exchange of best practices and growing expectations of the populations will drive an expansion of publicly financed formal care provision into the groups of population that have not been covered by the public programmes so far. Note that "formal coverage" covers any of the three types of formal long-term care: institutional care, formal home care, and cash benefits. The remaining number of "dependent" people is assumed to receive informal care. Similarly to the scenario assessing the effect of a shift from informal to formal care, this scenario should also be considered as a policy-change scenario, as it assumes a considerable shift in the current long-term care provision policy, while aiming to take into account the high diversity of country-specific current care-mix. It assumes a coverage convergence to the EU27 average by 2060. More specifically, the Member States where the formal coverage rate – i.e. referring to any of the three types of formal care described above – is below the EU27 average in the starting year are assumed to converge to this average by 2060.

8.2.7. Cost convergence to EU27 average scenario

This new scenario is run in parallel with the analogous scenario on health care expenditure projections. For those Member States with high levels of informal care, and therefore relatively low costs for long-term care, an increase in public expectations for more formal care (and therefore an increase in the average cost of long-term care) might be expected. For example, an increase in the costs of care (as percent of GDP per capita) towards the average for EU Member States could perhaps be expected. The "*cost convergence scenario*" is meant to capture the possible effect of a convergence in real living standards on long-term care spending. It assumes an upward convergence of the relative age-gender specific per beneficiary expenditure profiles (as percent of GDP per capita) of all countries below the corresponding EU27 average to the EU27 average. This is done for each type of formal care coverage (i.e. formal care in institutions, formal care at home, cash benefits).

8.3. Data sources

As in the case of health care, in order to assure the best possible comparability of data used in the projections, it was already decided for the 2009 projections exercise[124] to use as much as possible the definitions agreed at the international level and the figures available in the databases constructed on the basis of those definitions and classifications. To build the basic set of data, it was already agreed in the previous projections exercise to rely, to the extent possible,

a) on common methodologies and definitions (i.e. the System of Health Accounts - SHA) agreed by international institutions (Eurostat, OECD and WHO) and

b) on the data gathered through the joint data collection exercise (i.e. joint OECD-Eurostat-WHO questionnaire) and reported in Eurostat (Cronos) and OECD (Health Data) databases.[125]

For the 2012 exercise, the aim is to improve further the level of consistency as compared to that of the 2006 and even 2009 rounds of projections. Nevertheless, the choice of the best option is still dependent on the availability of data in the international databases. When information is missing in the international databases, it has to be provided by each Member State individually. The detailed analysis of available data and classifications carried out[126] led to the following agreement. The definitions and data sources should remain very similar to those used in the 2009 Ageing Report, but for this exercise data availability and comparability are improved. Indeed, SHA data is provided in more details and covers a larger number of countries. Annex 8.2 gives an overview of the combinations of data sources for the 2012 projections exercise.

The data collecting procedure covers the same steps as for health care (see section 7.4.1 above), with the same questionnaire being used to report the data required for both health and long-term care expenditure projections.

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[124] See Economic Policy Committee and European Commission (EPC/EC) (2009), the 2009 Ageing Report.

[125] See the SHA Manual – System of Health Accounts 1.0. The manual contains guidelines for reporting health expenditure according to an international standard. It proposes a common boundary of health care as well as a comprehensive and detailed structure for classifying the components of total expenditure on health.

[126] See the note for the attention of the Ageing Working Group of the EPC: European Commission–DG ECFIN (2011a), "Health and long-term care expenditure projections: availability/collection of data", ECFIN/C2(2011)128176.

For the Commission Services (DG ECFIN) to be able to calculate the proposed scenarios and run the relevant sensitivity tests, the AWG delegates provide the following information in the framework of the long-term care expenditure projections:

- total numbers of dependent people receiving long-term care a) in institutions and b) at home, by sex and single age or five-year cohorts;

- total numbers of recipients of long-term care-related cash benefits, by sex and single age or five-year cohorts, and the eligibility conditions;

- possible overlapping between the recipients of cash benefits and the recipients of LTC services (legal possibility + numbers, if available);

- public expenditure per user (patient) on long-term care, by sex and single age or five-year cohorts (so-called "age-related expenditure profiles");

In addition, the Commission Services (DG ECFIN) pre-filled (according to the data availability) the following items, which the AWG delegates had to verify/confirm:

- total public spending on long-term care, disaggregated, if possible, into services of long-term nursing care (classified as HC.3 in the System of Health Accounts) and social services of long-term care (classified as HC.R.6.1);

- further disaggregation of total public spending on long-term care into spending on services in kind and spending on long-term care-related cash benefits, by sex and single age or five-year cohorts;

- further disaggregation of total public spending on services in kind into spending on services provided in the institutions (HC.3.1 + HC.3.2) and services provided at home (HC.3.3), by sex and single age or five-year cohorts;

- disability rates by sex and five-year cohorts (based on EU-SILC data).

The following sections describe shortly the data available in the common databases (public expenditure on long-term care, split between services in kind and cash benefits, split between institutional and home care, disability rates), which are used to pre-fill the questionnaires circulated to the Member States for validation and integration where necessary. The remaining items (age profiles of long-term care, number of LTC beneficiaries and cash benefits recipients) are provided directly and exclusively by the Member States.

8.3.1. Public expenditure on long-term care

According to the System of Health Accounts classification, public expenditure on long-term care is defined as the sum of the following publicly financed items:

- services of long-term nursing care (HC.3) (which is also called "the medical component of long-term care" or "long-term health care", and includes both nursing care and personal care services), and
- social services of long-term care (HC.R.6.1), which is the "assistance services" part, relating primarily to assistance with IADL tasks.

These mainly represent the in-kind benefits allocated to dependent people.

The medical component of *long-term care* (HC.3) is a range of services required by persons with a reduced degree of functional capacity, physical or cognitive, and who are consequently dependent on help with basic activities of daily living (ADL), such as bathing, dressing, eating, getting in and out of bed or chair, moving around and using the bathroom. The underlying physical or mental disability can be the consequence of chronic illness, frailty in old age, mental retardation or other limitations of mental functioning and/or cognitive capacity. In addition, it comprises help with monitoring status of patients in order to avoid further worsening of ADL status.

This main personal care component is frequently provided in combination with help with basic medical services such as help with wound dressing, pain management, medication, health monitoring, prevention, rehabilitation or services of palliative care. Depending on the setting in which long-term care is provided and/or national programme design, long-term care services can include lower-level care of home help or help with instrumental activities of daily living (IADL) more generally, such as help with activities of housework, meals, shopping, transport and social activities.

The notion of long-term health care services usually refers to services delivered over a sustained period of time, sometimes defined as lasting at least six months.

Social services of long term care (HC.R.6.1) comprise services of home help and residential care services: care assistance which are predominantly aimed at providing help with IADL restrictions to persons with functional limitations and a limited ability to perform these tasks on their own without substantial assistance, including supporting residential services (in assisted living facilities and the like).

As in the case of health care, the figures on public expenditure on long-term care are available in two separate databases: EUROSTAT database available at NewCronos Website and a parallel OECD database "OECD Health Data". SHA data on HC.3 and HC.R.6 is available for 16 Member States. For 6 other Member States and Norway, SHA data on HC.3 is available, but data on HC.R.6 is missing. As a proxy to HC.R.6 data, the agreement is to use ESSPROS items, comprising the benefits in kind from three ESSPROS functions:

- the sickness function;
- the disability function;
- and the old-age function.[127]

For the four remaining countries, there is no SHA data available.[128] In this case, it has been agreed to fully rely on a proxy for HC.R.6 based on the ESSPROS items, in parallel to the data on health care expenditure (see above, section 7.4.2). The proxy for public expenditure on long-term care is therefore calculated as the sum of: a) *sickness/health care* function – "other benefits in kind"; b) *disability* function – "benefits in kind" ("accommodation" + "rehabilitation" + "home help/assistance in carrying out daily tasks" + "other benefits in

[127] It is possible that the proxy for HC.R.6 includes some data which corresponds to HC.3.3 in the SHA joint questionnaire. Therefore, whenever the ESSPROS proxy for expenditure on LTC home care is higher than that reported in HC.3.3, we deduct HC.3.3 expenditure from the ESSPROS measure.
[128] Note that SHA data for Italy should be made available soon.

kind"); c) *old age* function – "benefits in kind" ("accommodation" + "home help/assistance in carrying out daily tasks" + "other benefits in kind").

8.3.2. Public spending on cash benefits

Public spending on cash benefits is projected separately from expenditure on long-term care services, or "benefits in kind", provided at home or in an institution. The cash benefits include social programmes offering care allowances. Care allowances were introduced in a number of countries in order to allow households for more choice over care decisions, and to support care provided at home. They are mainly addressed to persons with long-term care needs who live in their own homes. However, the design of these programmes varies widely across countries, which reduces the comparability between them. Illustrating this variety of systems, it is noteworthy that some countries account for nursing allowances in the HC.3 category.

At least three types of cash-benefit programmes and/or consumer-choice programmes can be distinguished:

- personal budgets and consumer-directed employment of care assistants;
- payments to the person needing care who can spend it as she/he likes, but has to acquire sufficient care;
- payments to informal caregivers as income support.

Data from two databases are combined. Indeed, the HC.R.7 SHA category (health-related cash benefits) does not allow for a clear differentiation between health care related and long-term care related cash benefits. Moreover, the relevant data is missing for many countries. LTC-related cash benefits as a % of GDP are available for the same year as of SHA joint questionnaire data (or for the latest year available) within two ESSPROS functions: *disability* and *old age*. Both periodic and lump-sum parts of care allowances and economic integration in the *disability* function, as well as periodic care allowance in the *old-age* function, are added as cash benefits to the HC.3+HC.R.6 sum or to the correspondent ESSPROS sum in order to get total spending on long-term care.

8.3.3. Home care and institutional care spending

Long-term care is provided in a variety of settings. It can be provided at home and in the community, or in various types of institutions, including nursing homes and long-stay hospitals. Mixed forms of residential care and (internally or externally provided) care services exist in the form of assisted living facilities, sheltered housing, etc., for which a wide range of national arrangements and national labels exist.

Services at home include services provided by external home care providers, both public and private, in a person's private home on a long-lasting basis. This includes living arrangements in specially designed or adapted flats for persons who require help on a regular basis, but where this living arrangement still guarantees a high degree of autonomy and self-control over other aspects of a person's private life. Also included are services received on a day-case basis or in the form of short-term stays in institutions, for example in the form of respite care. During these stays, persons are not considered as 'institutionalised', but rather receiving temporarily services, which support their continued stay at home.

Services in institutions include services provided to people with moderate to severe functional restrictions who live permanently or for an extended period of time (usually for six months or longer) in specially designed institutions, or in a hospital-like setting where the predominant service component is long-term care, although this may frequently be combined with other services (basic medical services, help with getting meals, social activities, etc.). In these cases, eligibility is often explicitly assessed and defined by level (severity) of dependency and level of care needs.

A necessary step for the purpose of the long-term projections is therefore to calculate the amount of long-term care expenditure associated with institutional care and that associated with home care. This requires some further data reclassification. For all the countries (but two, NL and PT) reporting expenditure using the SHA joint questionnaire data, information on HC.3 (Services of long-term nursing care) is available for: HC.3.1 (In-patient long-term nursing care); HC.3.2 (Day-cases of long-term nursing care) and HC.3.3 (Long-term nursing care: home care). As in the 2009 projections exercise, categories HC.3.1 and HC.3.2 are classified as care in institutions while HC.3.3 is classified as home care. On this basis, the part of HC.3 which is home care expenditure and the part which is expenditure on institutional care can be readily computed.[129]

For the two countries which do not report HC.3 in disaggregated terms, a more indirect method is needed. One way is to look at expenditure on HC.3 (Services of long-term nursing care) for certain providers. Indeed, summing HC.3 expenditure for hospitals (HP.1), nursing and residential care facilities (HP.2) and providers of ambulatory health care except providers of home health care services (HP.3-HP.3.6) is another way of computing HC.3.1+HC.3.2, expenditure on institutional care. Summing HC.3 expenditure for providers of home health care services (HP.3.6) and private households as providers of home care (HP.7.2) gives then a measure of HC.3.3, expenditure on home care.

As regards the part of HC.R.6 which constitutes home care and the part which constitutes institutional care, there are two types of countries. For the countries which did not report HC.R.6 using the SHA joint questionnaire, a HC.R.6-proxy has already been calculated using ESSPROS. The mere process also provides an approximation for both amounts: expenditure on home care and expenditure on institutional care.

For the other countries – reporting HC.R.6 – a more indirect step is followed. A proxy for HC.R.6 is also calculated as described in detailed in the previous section (8.3.2) and then the respective shares of home care and institutional care are calculated in that proxy. These shares are then applied to the information provided by the countries according to the SHA joint questionnaire for HC.R.6. While not fully accurate it is the best way currently available to divide HC.R.6 expenditure into home and institutional care.

For the countries not reporting SHA joint questionnaire data at all, ESSPROS data readily allows to allocate LTC expenditure to home care or institutional care. As in the previous exercise, it is assume that *"home help/assistance in carrying daily tasks"* was provided at home, while *"accommodation"* referred to the institutional care. The other items remain unclear, such as *"rehabilitation"* (disability function) and *"other benefits in kind"* (all three functions) which can be provided either at home or in institutions. Given the relatively small share of those items in total LTC expenditure, a simplified assumption on the split between

[129] Whenever the ESSPROS proxy for expenditure on institutional care was higher than that reported in HC.3.1 + HC.3.2, we deducted (HC.3.1 + HC.3.2) expenditure from the ESSPROS measure. This is because some long-term nursing care in institutions may be included in the accommodation categories of ESSPROS. The procedure may not be fully accurate but it removes any possibility for double counting.

the two types of care is used (e.g. allocating "*rehabilitation*" to institutional care and "*other kinds of benefits*" to home care).

8.3.4. Disability rates

Compared to the previous exercise, the use of the EU-SILC database information on disability rates should substantially improve the accuracy of the projections. Indeed, some weaknesses of the 2009 exercise will be removed. First, the coverage is extended to young and prime-aged groups and second, comparability is improved by using only a single data source. Finally, the measure of dependency given by SILC is fully adequate and the results of the survey are official and endorsed by Member States.

EU-SILC currently covers the 27 EU countries as well as Norway and is implemented by means of a legal basis.[130] The EU-SILC is based on the idea of a common framework consisting in common procedures, concepts and classifications and harmonised lists of target variables to be transmitted to Eurostat.

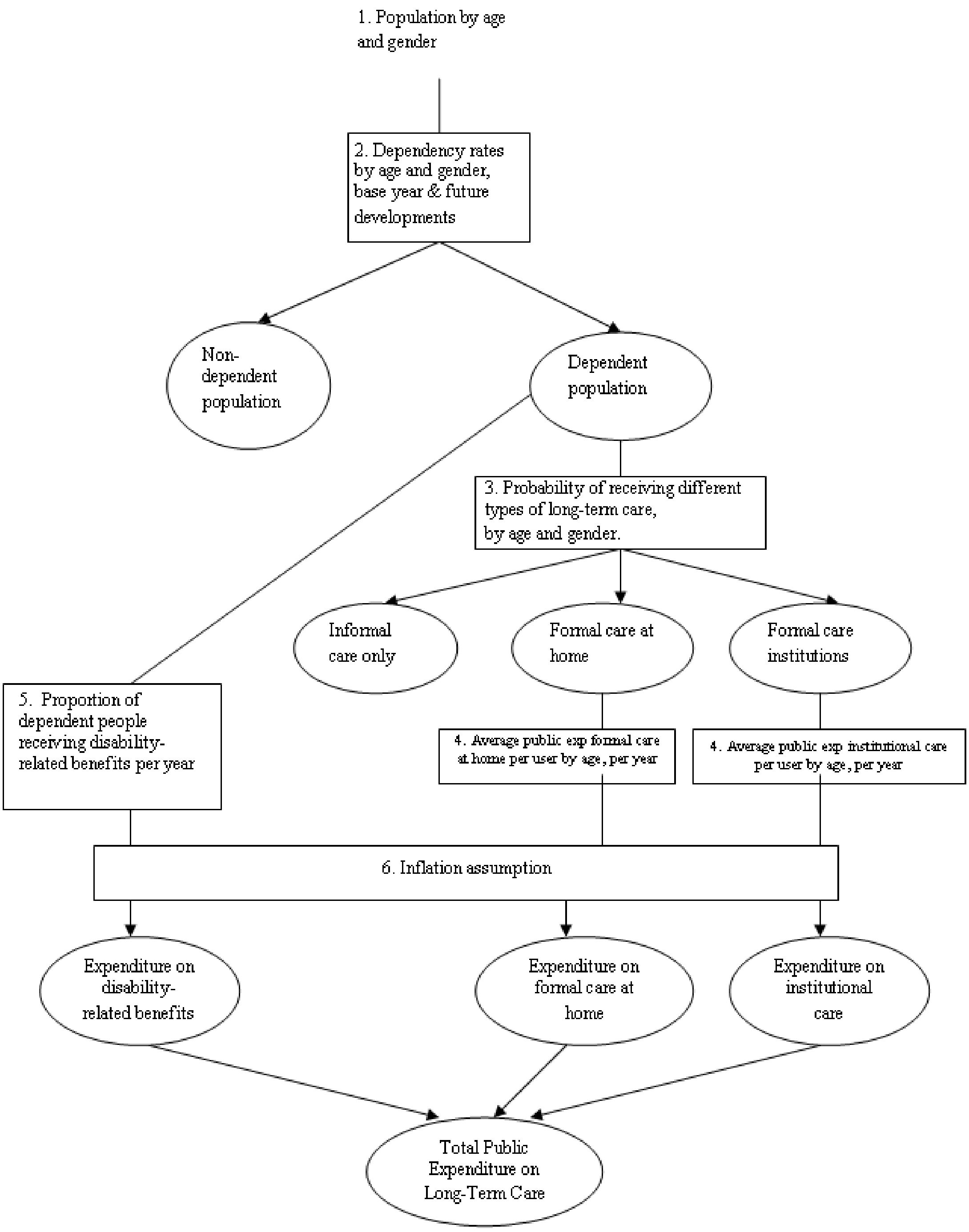
It measures among others the number of people who have "Limitation in activities because of health problems [for at least the last 6 months]".[131] The latter is consequently an adequate measure of dependency and is available up to 2009 for people aged 15+. The AWG decided to use this measure in order to calculate the base year disability/dependency rates for the 2012 projection exercise.

[130] Regulation (EC) No 1177/2003.

[131] The person's self-assessment of whether they are hampered in their daily activity by any ongoing physical or mental health problem, illness or disability. An activity is defined as: *"the performance of a task or action by an individual"* and thus activity limitations are defined as *"the difficulties the individual experience in performing an activity"*. Limitations should be due to a health condition. The activity limitations are assessed against a generally accepted population standard, relative to cultural and social expectations by referring only to activities people usually do. This is a self-perceived health question and gives no restrictions by culture, age, gender or the subject's own ambition. The purpose of the instrument is to measure the presence of long-standing limitations, as the consequences of these limitations (e.g. care, dependency) are more serious. A 6 months period is often used to define chronic or long-standing diseases in surveys.

Annex 8.1: Long-term care model structure

The graph below provides an overview of the model structure. The square boxes indicate data used in the model, while the round boxes indicate calculations that are performed for each year of the projection period.



Annex 8.2: Sources of data to compute health care and long-term care according to data availability

Preferred solution: SHA, when data is available (CZ, DE, EE, ES, FR, CY, LV, LT, LU, PL, RO, SI, SK, FI, SE)

HC	LTC – "medical" component	LTC – "social" component	LTC – institutional care	LTC – home care	LTC – cash benefits
SHA: HC.1-HC.2 + HC.4-HC.9 + HC.R.1 + **ESSPROS**: Health-related cash benefits	**SHA**: HC.3	**SHA**: HC.R.6	**SHA**: HC.3.1 + HC.3.2 + HC.R.6 divided according to the split in benefits in kind in **ESSPROS** data	**SHA**: HC.3.3 + HC.R.6 divided according to the split in benefits in kind in **ESSPROS** data	**ESSPROS**: cash benefits from **disability** and **old-age** functions

Alternative 1: When data on HC.R.6 - "social" component of LTC is not available in SHA (BE, BG, DK, HU, AT, NO)

		LTC – "social" component			
		ESSPROS: benefits in kind from 1) **sickness**, 2) **disability** and 3) **old-age** functions			

Alternative 2: When SHA lacks data on institutional/home care, i.e. sub-categories of HC.3 (NL, PT)

			LTC – institutional care	LTC – home care	
			SHA health providers classification: HP.1, HP.2 and HP.3, except for HP.3.6	SHA health providers classification: HP.3.6 and HP.7.2.	

Alternative 3: When SHA data is not available (IE, EL, MT, UK)

HC	LTC – "medical" component AND "social" component	LTC – institutional care	LTC – home care	
ESSPROS: Benefits in kind (in-patient + out-patient) and cash benefits in **sickness** function + other benefits in kind in **family** function + exp. on rehabilitation in **social exclusion** function	Estimated on the basis of ESSPROS data: benefits in kind from **sickness**, **disability** and **old-age** functions + cash benefits in **disability** and **old-age** functions	Estimated on the basis of ESSPROS data	Estimated on the basis of ESSPROS data	

Note: For IT, SHA data should be made available soon.

Annex 8.3: Mathematical illustration of the long-term care scenarios

General definitions

Let's define $N_{g,\,a,\,t}$ the population of a given gender *g* and age *a* in year *t*. Following the main steps of the general methodology process presented in Section 8.1, the following definitions are derived.

STEP 1: dependent / non-dependent population

The ratio of dependent (resp. non-dependent) persons in the base year *t=b* (e.g. 2010) is derived from the EU-SILC data, for each age – actually, 5-year age groups (15+) – and gender group: $d_{g,a\,b}$ (resp. 1- $d_{g,a,b}$). Therefore, the projected dependent population of a given gender *g* and age *a* in a projected year *t* is:

$$D_{g,a,t} = d_{g,a,b} N_{g,a,t} \qquad \textbf{[1]}$$

STEP 2: split into types of care

To be able to differentiate the impact of different scenarios according to the respective behaviour of the different types of care, one needs to split the projected dependent population into three groups: those receiving formal care at home, those receiving formal care in institutions, and those receiving only informal care. The category of those receiving cash benefits will be considered at a later stage, given that age profiles for this category of long-term care benefits are not available.

Therefore, one defines $DFh_{g,\,a,\,t}$, $DFi_{g,\,a,\,t}$, $DI_{g,\,a,\,t}$ the projected dependent population of a given gender *g* and age *a* in a projected year *t* receiving respectively formal care at home (*DFh*), formal care in institutions (*DFi*), and informal care (*DI*), as follows:

$$DFh_{g,a,t} = D_{g,a,t}\, p^{Fh}_{g,a,b} \qquad \textbf{[2]}$$

$$DFi_{g,a,t} = D_{g,a,t}\, p^{Fi}_{g,a,b} \qquad \textbf{[3]}$$

$$DI_{g,a,t} = D_{g,a,t}(1 - p^{Fh}_{g,a,b} - p^{Fi}_{g,a,b}) \qquad \textbf{[4]}$$

Where $p^{Fh}{}_{g,a,b}$ is the probability for a dependent person of gender *g* and age *a* to receive formal care at home, in the base year *b* (e.g. 2010). Similarly, $p^{Fi}{}_{g,a,b}$ is the correspondent probability of being taken care of formally in institutions, while $p^{I}{}_{g,a,b}$ – the probability of being take care of informally – is defined as not receiving any formal care service.

STEP 3: age-gender profiles of expenditure

Average expenditure are calculated for a base year *b*, to define the long-run unit costs of services. If the data is available (through the SHA joint questionnaire and/or provided by

Member States), unit costs for formal care at home and formal care in institutions are calculated separately[132]:

$$c_{g,a,b}^{Fh} = \frac{S_b^{Fh}}{N_{g,a,b}^{Fh}} \qquad \textbf{[5]}$$

where:

S_b^{Fh} is public spending on formal care at home in the base year *b* (e.g. 2010);

and $N_{g,a,b}^{Fh}$ is the number of recipients of a given gender *g* and age *a* of formal care at home, for the same year.

Similarly, the unit cost per beneficiary of a given gender *g* and age *a* of formal care in institution is:

$$c_{g,a,b}^{Fi} = \frac{S_b^{Fi}}{N_{g,a,b}^{Fi}} \qquad \textbf{[5b]}$$

Note that two adjustments are made to the derived unit costs. The first one applies when age profiles are not provided separately for the two types of formal care. The age profiles provided by Member States for public expenditure on formal care services are then used in order to "re-calibrate" the unit costs. In other words, the relative size of the amounts provided for each gender/age group is applied to respective "total" public expenditure aggregates of formal care at home (S_b^{Fh}) and formal care in institutions (S_b^{Fi}).

In other words, adjusted unit costs follow the actual gender-age structure of unit costs, as provided by Member States in country-specific age-profiles. For a country *i*, age profiles provide the relative size of unit cost per beneficiary of a given gender *g* and age *a* of formal care as a proportion x^{PF} – where *P* stands for "profiles" and *F* for "formal" – such as:

$$x_{g,a,b}^{PF} = \frac{c_{g,a,b}^{PF}}{S_b^{PF} / N_b} \qquad \text{and} \qquad \sum_{g,a} x_{g,a,b}^{PF} = 1$$

The unit costs adjusted to the age profiles are therefore calculated as:

$$c_{g,a,b}^{AFh} = x_{g,a,b}^{PF} \frac{S_b^{Fh}}{N_{g,a,b}^{Fh}}, \text{ and:}$$

$$c_{g,a,b}^{AFi} = x_{g,a,b}^{PF} \frac{S_b^{Fi}}{N_{g,a,b}^{Fi}}$$

Second, the unit costs evolve in time with the GDP growth, as will be explained in the next section of this annex (see equation [9]).

STEP 4: total public expenditure on long-term care services

[132] Otherwise, an average is used.

For a projected year *t*, public spending on both types of formal care is then computed as:

$$TS^{Fh}_{g,a,t} = c^{AFh}_{g,a,t} DFh_{g,a,t} \quad \textbf{[6]}$$

where: $TS^{Fh}_{g,a,t}$ (resp. $TS^{Fi}_{g,a,t}$) is public spending on formal care at home (resp. in institution) for all persons of gender *g* and age *a* in year *t*.

Hence, for all age and gender groups:

$$TS^{Fh}_{t} = \sum TS^{Fh}_{g,a,t}$$

And:

$$TS^{Fi}_{t} = \sum TS^{Fi}_{g,a,t} \quad \textbf{[7]}$$

STEP 5: total public expenditure on long-term care (services and cash)

Therefore, total public expenditure on both types of formal long-term care services are added to long-term care related cash benefits, so as to obtain TS^{LTC}_{t} for a projected year *t*:

$$TS^{LTC}_{t} = TS^{Fh}_{t} + TS^{Fi}_{t} + TS^{C}_{t} \quad \textbf{[8]}$$

These general definitions apply to the general, "basic" model structure. In order to run more accurate scenarios, general and scenario-specific assumptions are being applied. These assumptions are illustrated in the following section.

Assumptions for the different scenarios

Pure demographic scenario

As mentioned above, the first assumption added to the general model is the following: for the time horizon of the projection exercise, the age-gender specific public expenditure profiles (showing the average public spending on long-term care per beneficiary for each year of age – or 5-year age group, from 15 to 85+ or more, according to data availability) are assumed to grow in line with income, i.e. with GDP per capita.

Therefore, the adjusted per beneficiary cost (expenditure) in a projected year *t* is:

$$c'^{F}_{g,a,t} = c^{AF}_{g,a,t-1} \Delta Ypc_{t} \quad \textbf{[9]}$$

where:

$c'^{F}_{g,a,t}$ is the cost per beneficiary of a given gender *g* and age group *a* in period *t* of formal care *F – Fh* for formal care at home, *Fi* for formal care in institution;

ΔYpc_t is GDP per capita growth rate in year *t*, i.e.:

$$\Delta Ypc_{t} = \left(\frac{Y_t}{\sum N_{g,a,t}} - \frac{Y_{t-1}}{\sum N_{g,a,t-1}} \right) \Big/ \left(\frac{Y_{t-1}}{\sum N_{g,a,t-1}} \right) \quad \textbf{[10]}$$

With Y_t representing GDP in projection year t;

And $N_{g,a,t}$ the projected population of a given gender g and age a in year t.

Hence, the adjusted per beneficiary cost, $c'^{F}_{g,a,t}$, is the formal care cost per beneficiary of a person of gender g and age a in year t of the projection period, following the adjustment to GDP per capita growth.

Equation [6] above becomes [6'] as the adjusted unit cost c' is considered, i.e.:

$$TS^{Fh}_{g,a,t} = c'^{Fh}_{g,a,t} DFh_{g,a,t} \qquad \text{[6']}$$

And of course, for formal care in institution:

$$TS^{Fi}_{g,a,t} = c'^{Fi}_{g,a,t} DFi_{g,a,t} \qquad \text{[6b']}$$

Similarly for cash benefits, total public spending becomes TS'^{C}_{t}, and an adapted equation [8] gives adjusted total public spending on long-term care, i.e.:

$$TS'^{LTC}_{t} = TS'^{Fh}_{t} + TS'^{Fi}_{t} + TS'^{C}_{t} \qquad \text{[8']}$$

Base case scenario

For the "*base case scenario*", the assumption on unit cost development is slightly different from the "*pure demographic scenario*". Indeed, it has been agreed to differentiate two kinds of unit costs. The projections will link unit cost to GDP per hours worked[133] for in-kind benefits (services), while unit cost of cash benefits will evolve in line with GDP per capita growth. Therefore, the age-gender specific public expenditure profiles are assumed to grow in line with:

1) GDP per capita for cash benefits;

2) GDP per hours worked for benefits in kind.

The situation is unchanged for cash benefits, i.e. TS'^{C}_{t}, whereas GDP per hours worked will be used to adjust total public spending on formal care services. Equation [9] becomes:

$$c''^{Fc}_{g,a,t} = c^{Fc}_{g,a,t-1} \Delta Yphw_t \qquad \text{[9']}$$

where:

$\Delta Yphw_t$ is the rate of growth of GDP per hours worked in year t,

$$\Delta Yphw_t = \left(\frac{Y_t}{\sum hw_t} - \frac{Y_{t-1}}{\sum hw_{t-1}} \right) \Bigg/ \left(\frac{Y_{t-1}}{\sum hw_{t-1}} \right) \qquad \text{[11]}$$

133 We propose to use GDP per hours worked, where the 2009 exercise used GDP per worker, to stay in line with the macroeconomic assumptions and the other parts of the projections.

Corresponding equations [6'] and [6'b] are then used and coupled with $TS_t^{\prime C}$ as calculated in the "*pure demographic scenario*" to calculate total age/gender group expenditure and total public expenditure on long term care in each projection year.

$$TS_t^{\prime\prime LTC} = TS_t^{\prime\prime Fh} + TS_t^{\prime\prime Fi} + TS_t^{\prime C} \qquad \textbf{[8'']}$$

High life expectancy scenario

The "*high life expectancy scenario*" presents the budgetary effects of an alternative demographic scenario which assumes life expectancy to be higher for all ages than in the *pure demographic* and in the *base case* scenarios. In terms of methodology, the scenario does not differ from the "*base case scenario*", apart from the fact that the baseline demographic projections used as input data are replaced with the alternative, high life expectancy, variant (the same used to assess the sensitivity of pension spending). Therefore, the mathematical illustration of the previous scenario only changes in $N_{g,\ a,\ t}$, i.e. the number of individuals in each age/gender group up to 2060 (replaced by the new population assumptions in equation [1] and [10]).

Constant disability scenario

This scenario reflects an alternative assumption about trends in age-specific ADL-dependency rates. The profile of age-specific disability rates shifts in line with changes in life expectancy (disability rate in the future is equal to that of a younger - by the same number of years as the change in age-specific life expectancy - age cohort today), resulting in a gradual decrease over time in disability prevalence for each age cohort, i.e. affecting the variable $D_{g,\ a,\ t}$.

In practical terms, it follows the same reasoning as for the similar health care "*constant health scenario*". One starts by calculating, for each projection year, the change in life expectancy in relation to the base year. For example, life expectancy for a 50-year-old man is expected to increase by, say, 4 years: from 30 years in year *t* to 34 years in year *t+20* in a specific Member State. Then, the scenario assumes that in *t+20*, in that same Member State, a 50-year-old man will have a disability prevalence of a (50-4) = 46-year old man in year *t*.

Hence, the change in life expectancy of a person of gender *g* and age *a* in relation to the base year *b* (say, 2010) is first calculated for each year of the projections, using the Eurostat population projections (EUROPOP2010)[134]:

$$\Delta LE_{g,a,t,b} = LE_{g,a,t} - LE_{g,a,b}$$

where:

$\Delta LE_{g,a,t,b}$ is the additional life expectancy of a person of gender *g* and age *a* in year *t* compared to a person of gender *g* and age *a* in the base year *b*,

$LE_{g,a,t}$ is the life expectancy of a person of gender *g* and age *a* in year *t* and

[134] In the "*constant disability scenario*" the total number of years spent with disability during a person's life time is assumed to remain the same while life expectancy increases. Thus, if between time *t* and *t+1*, total life expectancy increases by *n* years for a cohort of age *a*, "disability-free" life expectancy for that very same age cohort must also increase by *n* years in order for the dynamic equilibrium hypothesis to be valid. If "disability-free" life expectancy increases by *n* years, then the disability prevalence of this cohort of age *a* at time *t+1* will be the same as the disability prevalence of cohort of age *a-n* at time *t*.

$LE_{g,a,b}$ is life expectancy of an average person of gender g and age a in the base year b.

For year t of the projections, the "adjusted" disability prevalence for the cohort of gender g and age a is then based on equation [1] adjusted such as:

$$D'_{g,a,t} = d_{g,a-\Delta LE_{g,a,t,b}} N_{g,a,t} \quad \textbf{[1']}$$

And the adjusted projected dependent population $D'_{g,a,t}$ will therefore replace former $D_{g,a,t}$ in the subsequent equations [2] to [4], and then [9'] and [8"], to follow the subsequent steps of the "*base case scenario*".

Scenario assessing the effect of a shift from informal to formal care

Building on the "*base case scenario*", this policy-change scenario is a sensitivity test that examines the budgetary impact of a progressive shift into the formal sector of care of 1% per year of disabled elderly who have so far received only informal care. This extra shift takes place during the first ten years of the projection period, thus it sums up to about 10.5% shift from informal to formal care. One of the three alternative options considered in the 2009 Ageing Report will be analysed: 50% of the "new" beneficiaries will be considered to move into institutional care, while the other 50% will be assumed to receive formal care at home. The variables $DFh_{g,a,t}$, $DFi_{g,a,t}$, and $DI_{g,a,t}$ will be adjusted to the new assumptions.

The projected dependent population of a given gender g and age a in a projected year t receiving respectively formal care at home (*DFh*), formal care in institutions (*DFi*), and informal care (*DI*), calculated in equations [2] to [4], will be changed as follows. For $t \in [b+1, b+10]$ – let's say, for the first ten years of the projection period, i.e. 2011-2020:

$$DI'_{g,a,t} = DI_{g,a,t-1} - 0.1 \times DI_{g,a,t-1} = 0.9 \times DI_{g,a,t-1}$$

$$DFh'_{g,a,t} = DFh_{g,a,t-1} + 0.5 \times 0.1 \times DI_{g,a,t-1}$$

$$DFi'_{g,a,t} = DFi_{g,a,t-1} + 0.5 \times 0.1 \times DI_{g,a,t-1}$$

These adapted projected numbers of dependents / recipients of formal care are then injected in equations [6'], [6b'] and [8"] to calculate the total public spending on long-term care, as it was done in the "*base case scenario*". For the rest of the projection period – 2021-2060 – the baseline equations are used as above.

Coverage convergence scenario

This policy-change scenario assumes an expansion of publicly financed formal care provision into the groups of population that have not been covered by the public programmes so far. "Formal coverage" covers any of the three types of formal long-term care: institutional care, formal home care, and cash benefits. In order to illustrate this scenario, a "new" probability of being "formally taken care of" through cash benefits, i.e. $p^{C}_{g,a,b}$, has to be introduced. Alternatively, the number of persons receiving long-term care related cash benefits is available.[135] The assumption is that all recipients of long-term care are dependent. It means

[135] Hopefully provided by Member States. The issue of double counting is taken care of as much as possible given the availability of detailed data.

that the equations [2] to [4] become four equations, with probabilities now changing over time, i.e. depending on *t*, but also country-specific (for a country *i*). Further, $DI_{g,\ a,\ t,\ i}$ the projected dependent population of a given gender *g* and age group *a* in a projected year *t* receiving informal care (*DI*) is simply "converted" into $DN^F_{g,\ a,\ t,\ i}$:, i.e. the probability of not being covered by formal long-term care coverage.

$$DFh_{g,a,t,i} = D_{g,a,t,i} p^{Fh}_{g,a,t,i} \qquad \textbf{[12]}$$

$$DFi_{g,a,t,i} = D_{g,a,t,i} p^{Fi}_{g,a,t,i}$$

$$DC_{g,a,t,i} = D_{g,a,t,i} p^{C}_{g,a,t,i}$$

$$DN^F_{g,a,t,i} = D_{g,a,t,i}(1 - p^F_{g,a,t,i})$$

where:

$DC_{g,a,t,i}$ is the projected dependent population of a given gender *g* and age group *a* in a projected year *t* receiving cash benefits;

$p^F_{g,a,t,i}$ is the probability of receiving any type of formal care, defined as:

$$p^F_{g,a,t,i} = p^{Fh}_{g,a,t,i} + p^{Fi}_{g,a,t,i} + p^{C}_{g,a,t,i}$$

The scenario envisaged is a coverage convergence to the EU27 average. It is meant to take into account the high diversity of country-specific current care-mix. The Member States where the formal coverage rate is below the EU27 average in the starting year are assumed to converge to this average by 2060.

The "*base case scenario*" steps are used for the countries whose formal coverage (i.e. $p^F_{g,a,t,i}$) is the same or greater than the EU27 average $\overline{p}^F_{g,a,2010,EU27}$ in the base year *b* (2010). For those countries whose formal coverage is below the EU27 average, $p^F_{g,a,t,i}$ is assumed to converge to $\overline{p}^F_{g,a,2060,EU27}$. It therefore implies that each type of formal care converges at a different pace, making up for the respective relative gaps to the EU27 average. This scenario allows a country to grow faster the relatively less-developed type of formal care.

Cost convergence to EU27 average scenario

This new scenario is run in parallel with the analogous scenario on health care expenditure projections. The "*cost convergence scenario*" is meant to capture the possible effect of a convergence in real living standards on long-term care spending. It assumes an upward convergence of the relative age-gender specific per beneficiary expenditure profiles (as percent of GDP per capita) of all countries below the corresponding EU27 average to the EU27 average. This is done for each type of formal care coverage (i.e. formal care in institutions, formal care at home, cash benefits).

To run this scenario, one builds on the methodology used for the "*base case scenario*". For those countries whose per beneficiary costs are equal to or above the EU27 average the steps illustrated above are followed.

For those countries below the EU27 average per beneficiary costs in the baseline year *b* (2010)a further change in the way cost per beneficiary is evolving over the projection period is assumed, so as to reach the EU27 average of per beneficiary costs. Building on the equations [9] – for cash benefits – and [9'] – for in-kind benefits – the real convergence to EU27 average is assumed to follow the adjusted equations:

$$c'^{C}_{g,a,t,i} = c^{C}_{g,a,t-1,i}\left(\Delta Ypc_{t,i} + g_{t,i}\right) \qquad \textbf{[alt.9]}$$

$$c''^{F}_{g,a,t,i} = c^{AF}_{g,a,t-1,i}\left(\Delta Yphw_{t,i} + g_{t,i}\right) \qquad \textbf{[alt.9']}$$

where:

$c''^{F}_{g,a,t,i}$ is the country *i*-specific cost of in-kind benefits per beneficiary of a given gender *g* and age *a* in period *t* – *Fh* for formal care at home, *Fi* for formal care in institution – adjusted to the GDP per hours worked growth and a catch-up effect if country *i* is below the EU27 average;

$\Delta Yphw_{t,i}$ is GDP per hours worked growth rate in year *t*, for country *i* and

$g_{t,i}$ is a hypothetical rate of growth of per beneficiary costs. It is higher than zero for countries whose per beneficiary costs are below the EU27 average and equal to zero for those countries whose per beneficiary costs are equal or above the EU27 average. If the base year *b* is 2010, it evolves according to the following mechanism[136]:

$$g_{t,i} = \left[\left(\frac{\overline{rc}_{g,a,EU27,2010}}{rc_{g,a,i,2010}}\right)^{\frac{1}{2060-2010}}\right] - 1 \qquad \textbf{[13]}$$

where:

$\overline{rc}_{g,a,EU27,2010}$ is the weighted EU27 average relative cost per beneficiary of gender *g* and age *a* calculated in the baseline year of 2010 and

$rc_{g,a,i,2010}$ is the relative cost per beneficiary of gender *g* and age *a* for country *i* (if below the EU27 average cost per beneficiary) calculated in the baseline year of 2010 defined as:

$$rc_{g,a,i,2010} = \left(\frac{c''_{g,a,i,2010}}{Yphw_{g,a,i,2010}}\right)$$

and

$$\overline{rc}_{g,a,EU27,2010} = \left(\frac{\bar{c}_{g,a,EU27,2010}}{\overline{Yphw}_{g,a,EU27,2010}}\right)$$

[136] Assumptions for different convergence paths according to the initial country-specific situation - comparing to the EU27-average age profile - could be explored further when data is made available.

where:

$\bar{c}_{g,a,EU27,2010}$ is the weighted EU27 average cost per beneficiary of gender *g* and age *a* calculated in the baseline year (2010); and

$\overline{Yphw}_{g,a,EU27,2010}$ is the average GDP per hours worked in the EU27 calculated in the baseline year (2010).

The same type of reasoning can be run with the corresponding equations for cash benefits, adjusted to GDP per capita growth instead of GDP per hours worked growth.

The after country-specific per beneficiary cost has been calculated, subsequent corresponding equations are used to obtain total age-gender group expenditure and then total public expenditure on long-term care in each projection year, as in equation [8"].

9. Education

9.1. Introduction

On average in the 2002-2008 period, education expenditure represented 5.3% of GDP in the EU27 (or 11.3% of total general government expenditure).[137] Expenditure-to-GDP ratios vary considerably across Member States, from a minimum of 3.8% in Greece to a maximum of 7.3% in Denmark (see Table 9. 1).

A comprehensive assessment of long-term budgetary prospects requires also careful consideration of expenditure on education. A common view seems to be that the effects of demographic changes on education expenditure are not as clear-cut as those on pensions and health care, and could even be (slightly) favourable. On the one hand, the expected decline in the number of young people is likely to allow for savings, but on the other, the trend of higher enrolment rates and longer periods spent in education might put upward pressure on expenditure. A careful quantitative assessment is therefore necessary to evaluate net effects of ongoing and prospective trends, and eventually validate (or not) the common-sense conjecture that the costs of ageing due to higher expenditure on pensions, health and long-term care can be partly offset (even if only to a very limited extent) by lower expenditure on education.

Projection of education expenditure requires consideration of a number of important issues, namely (i) the definition (or perimeter) of education activities; (ii) that studying can take place on a part-time basis after compulsory education; and (iii) that there are various outlays for public spending on education.

Firstly, it is necessary to define the perimeter of education activities. As in the 2009 Ageing Report, this projection exercise will cover public expenditure for schooling and tertiary education. Secondly, for individuals older than a minimum legal age for compulsory education, time will be divided between schooling, labour market and leisure activities. Aggregate constraints on the use of time (by age) link AWG's participation rate assumptions with enrolment rates, meaning that all else equal, changes in participation rates affect enrolment rates in the opposite direction. Thirdly, public education expenditure can take mainly three forms: (i) direct purchases by the government of education resources to be used by educational institutions (e.g. direct payment of teachers' wages by the education ministry); (ii) payments by the government to educational institutions that have the responsibility for purchasing educational resources themselves (e.g. a block grant to a university); and (iii) transfers to students and their families through scholarships or public loans.

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[137] The projection of education expenditure uses the UNESCO-UIS/OECD/Eurostat (UOE) Data Collection on Education Statistics, while COFOG (Classification of the functions of government) data are only used to compare the relative size of government outlays.
In the 2002-2008 period, health expenditure represented 6.5% of GDP (and 14% of total general government expenditure), while 'social protection' represented 18.3% (and 39.3% of total general government expenditure). 'Social protection' includes the 'old age' (pensions) function.

9.2. Methodology used to project expenditure on education

This round of long-term budgetary projections basically uses the 2009 Ageing Report's methodology with minor adjustments. The methodology is "quasi-demographic", in the sense that not only demographic data (i.e. EUROPOP2010) but also participation rate projections are used. A strong point of this methodology is the use of the UOE[138] Data Collection, which covers enrolment rates, staff levels, the labour force status of students (i.e. part- vs. full-time), and detailed data on total public expenditure. Data are disaggregated by single age and ISCED levels.

Projections are run separately for four ISCED groupings,[139] representing primary education (ISCED 1), lower secondary education (ISCED 2), upper secondary education (ISCED 3 and 4), and tertiary education (ISCED 5 and 6). In order to simplify, it is assumed that enrolment in primary and lower secondary education levels is compulsory (ISCED 1 and 2), while enrolment in upper secondary and tertiary education levels depends on labour market outcomes, as changes in participation rates affect enrolment rates in the opposite direction.[140]

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[138] UNESCO-UIS/OECD/Eurostat Data Collection on Education Statistics.

[139] The formal definitions of the levels of education covered by this exercise are: Level 1 is the start of compulsory education (the first stage of basic education), with a legal age of entry usually not lower than five years old and higher than seven years old. This level covers in principle six years of full-time schooling. Level 2 is lower secondary school (or the second stage of basic education). This stage usually ends after the ninth year of schooling, often coinciding with the end of compulsory education. It includes general education (as well as pre-vocational or pre-technical education and vocational and technical education). Level 3 is upper secondary school and the entry age is typically 15 or 16 years old. It also includes vocational and technical education. Level 4 is post-secondary, non-tertiary education, which programmes are typically designed to prepare students to the following level (university). Level 5 covers at least two years of education and the minimal access requirement is the completion of levels 3 or 4. Level 6 is a cycle of at least 3 full-time years of education leading to the award of an advanced research qualification. However, a Master course that implies up to 6 years of tertiary education is included in level 5.

[140] In the baseline scenario, enrolment rates for the two compulsory groupings are fixed at their respective historical levels. However, in practical terms the borders between compulsory and non-compulsory education are not as clear-cut as the simple rule of thumb above suggests. See Annex 9.1, for an overview of the legal age limits of compulsory education and their overlap with ISCED levels in all EU Member States.

Table 9. 1 - Education expenditure-to-GDP ratios (in percentage)

	2002	2003	2004	2005	2006	2007	2008	avg. 2002-2008
Belgium	5.9	6.0	5.8	5.9	5.8	5.8	6.0	5.9
Bulgaria	3.8	4.2	4.1	4.4	3.7	3.8	4.1	4.0
Czech Republic	5.2	5.2	4.8	4.8	4.9	4.7	4.7	4.9
Denmark	7.7	7.7	7.6	7.3	7.0	6.7	7.0	7.3
Germany	4.3	4.3	4.3	4.2	4.1	4.0	4.1	4.2
Estonia	6.8	6.5	6.3	6.0	6.0	5.9	6.7	6.3
Ireland	4.5	4.6	4.6	4.6	4.6	4.8	5.4	4.7
Greece	2.9	4.0	3.9	3.9	4.0	4.0	4.1	3.8
Spain	4.4	4.4	4.4	4.3	4.3	4.4	4.6	4.4
France	6.4	6.3	6.2	6.1	6.0	5.9	5.8	6.1
Italy	4.7	4.9	4.6	4.7	4.6	4.6	4.5	4.7
Cyprus	6.0	6.8	6.5	6.4	6.4	6.3	6.7	6.4
Latvia	5.7	5.5	6.1	5.6	6.0	5.8	6.5	5.9
Lithuania	6.1	5.7	5.8	5.5	5.4	5.2	5.8	5.6
Luxembourg	4.8	4.9	4.9	4.7	4.4	4.2	4.4	4.6
Hungary	5.6	6.2	5.8	5.9	5.7	5.3	5.2	5.7
Malta	6.0	6.2	5.8	5.7	5.7	5.4	5.3	5.7
Netherlands	5.0	5.2	5.2	5.1	5.1	5.2	5.2	5.1
Austria	5.9	6.0	5.8	5.8	5.2	5.2	5.3	5.6
Poland	6.1	6.1	5.7	6.1	6.0	5.7	5.7	5.9
Portugal	6.7	6.6	6.8	6.9	6.6	6.2	6.3	6.6
Romania	4.0	3.5	3.6	3.6	4.1	3.9	4.5	3.9
Slovenia	6.5	6.5	6.5	6.6	6.4	5.9	6.1	6.4
Slovakia	3.6	4.3	3.9	4.0	3.9	3.9	3.5	3.9
Finland	6.1	6.4	6.3	6.2	6.0	5.7	5.9	6.1
Sweden	7.3	7.2	7.1	7.0	6.9	6.7	6.8	7.0
United Kingdom	5.6	5.8	5.9	6.2	6.1	6.2	6.4	6.0
EU27	5.3	5.3	5.3	5.3	5.2	5.2	5.2	5.3
Norway	6.3	6.7	6.2	5.7	5.4	5.4	5.3	5.9

Source: Eurostat, COFOG data.

Projections are broken down in three components: (i) number of students; (ii) direct expenditure per student; and (iii) public transfers to households.

9.2.1. Number of students

Compulsory levels

For the compulsory levels considered (ISCED 1 and 2), enrolment rates per single age are assumed to remain constant at the level observed in a base period/year.[141] In order to obtain the projected number of students enrolled in ISCED levels 1 and 2, demographic projections are multiplied by enrolment rates.

Non-compulsory levels

Enrolment rates for ISCED groupings 3-4 and 5-6 take into account labour market developments according to the formula (see Annex 9.1 for the derivation):

$$e_{i,t} = \frac{1 - p_{i,t} - i_{i,t}^{*}}{1 - \alpha_{i,t}} \qquad \textbf{[1]}$$

[141] This corresponds to the baseline projection.

where $e_{i,t}$ is the total enrolment rate (both full and part-time students) for the single age cohort *i* in period *t*; $p_{i,t}$ is the participation rate; $\alpha_{i,t}$ is the fraction of part-time students in the total; and $i^*_{i,t}$ is the fraction of inactive minus full-time students over the total population.

In practice, equation [1] will be implemented in terms of differences to a base period (*b*):

$$e_{i,t} - e_{i,b} = -\frac{\overline{\kappa}_{i,b}}{1-\overline{\alpha}_{i,b}} * \left(p_{i,t} - p_{i,b}\right)$$

where **[2]**

$$0 \leq \overline{\kappa}_{i,b}, \overline{\alpha}_{i,b} \leq 1$$

where $\overline{\kappa}_{i,b}$ is the ratio between full-time students and total inactive individuals; and $\overline{\alpha}_{i,b}$ is the fraction of part-time students in the total number of students. These ratios are assumed to remain constant throughout the projection period.

All else equal, an increase in the participation rate leads to a decrease in the enrolment rate.[142]

Enrolment rates per age are then broken down by ISCED groupings (3-4 and 5-6), based on student shares in the base period/year.

9.2.2. Direct expenditure per student

Annual expenditure per student on public educational institutions varies significantly across education level and country (see Table 9. 2). In 2007, spending per student ranged from €1807 (in PPS) for secondary education (ISCED 2-4) in Romania to €17412 (in PPS) for tertiary education in Cyprus. This variability reflects a number of factors, such as labour costs of teachers and non-teaching staff, different class sizes, differences in capital expenditure, as well as particular national circumstances.[143]

[142] To the extent that individuals entering the labour force are likely to have been previously involved in education activities. The LFS variable MAINSTAT, which describes the main labour status, was used to assess the distribution of inactive individuals by age, distinguishing between schooling and other forms of inactivity, such as retirement and domestic tasks. Given that MAINSTAT is an optional variable, there are no data for DE and the UK.

[143] For example, small EU Member States tend to send abroad a higher proportion of their tertiary students. Other things being equal, this tends to raise government expenditure.

Table 9. 2 - Annual expenditure on public educational institutions per pupil in EUR PPS (a) in 2007

	ISCED 1	ISCED 2-4	ISCED 5-6	Total
Belgium	6851	8332	12120	8015
Bulgaria	1892	1816	3838	2247
Czech Republic	2775	4557	7402	4550
Denmark	7991	8227	13689	8512
Germany	4590	5237	11991	6252
Estonia	3378	4168	5270	3579
Ireland	5715	7404	10991	7211
Greece	na	na	na	na
Spain	6203	8542	10886	7872
France	5302	8454	10997	7240
Italy	6138	6654	7160	6569
Cyprus	6763	9953	17412	8740
Latvia	3413	3473	3451	3445
Lithuania	2351	2935	4740	3173
Luxembourg	11599	15256	na	13054
Hungary	3775	3485	5583	4093
Malta	3543	5829	8689	6371
Netherlands	5434	7650	13134	7418
Austria	na	na	na	na
Poland	3378	3000	4635	3481
Portugal	4166	5673	8645	5279
Romania	2195	1807	5436	2566
Slovenia	6505	4885	6027	6077
Slovakia	2850	2675	4769	3133
Finland	5179	6581	11635	6722
Sweden	6886	7434	15466	7904
United Kingdom	6138	6856	na	6526
EU27	5114	5849	9032	6024
Norway	8368	9801	15270	9941

Source: Commission services, based on UOE data.
(a) Based on full-time equivalents.

As in the 2009 Ageing Report, the direct costs of education per student are modelled as:[144]

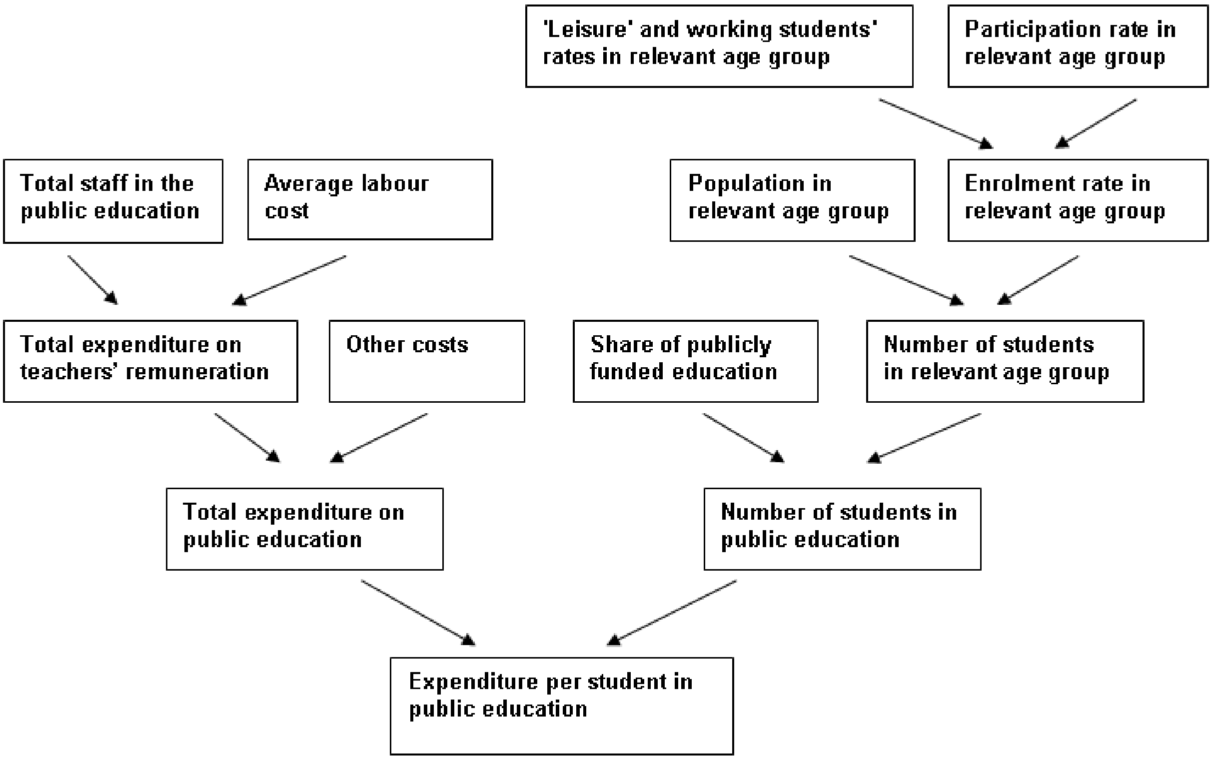
$$UC_j = \frac{T_j}{ST_j} * W_j + \frac{O_j}{ST_j}$$

where T_j is the total number of teachers and non-teaching staff; ST_j is the total number of students; W_j are average gross wages (i.e. including social contributions); O_j are other current and capital costs; and *j* refers to an ISCED grouping.

See Graph 9. 1 for a schematic breakdown of expenditure per student.

[144] These modelling assumptions involve a considerable simplification of the determinants of unity costs. A key variable missing is class size. Research suggests that costs change discontinuously with the creation/destruction of classes. Given the difficulty in obtaining comprehensive data on class sizes, a reasonable approximation may be obtained using the student-to-staff ratio.

Graph 9. 1 - Implicit decomposition of expenditure per student



Source: Commission services, EPC.

As in the 2009 Ageing Report, the following assumptions are made in the baseline scenario:

- the staff-to-student ratio will remain constant over the projection period (i.e. staff adjusts instantaneously and fully to demographic changes);
- average wages of workers in the education sector are assumed to grow in line with GDP per worker in the whole economy (i.e. labour productivity);
- the "other-costs" per student ratio remains a constant share of total expenditure per student, implying that "other-costs" grow also in line with labour productivity.[145]

9.2.3. Transfers to households

Public expenditure on education is carried out directly mainly by government institutions. However, part of the total expenditure on education results from transfers to households. The share of transfers over total public expenditure on education is calculated using OECD data (*Education at a Glance*). This share is assumed to remain constant over the projection horizon. The sum of direct expenditure and transfers to households gives total public expenditure on education.

[145] Assuming that per student costs grow in line with labour productivity secures stationarity of the education expenditure-to-GDP ratio in the long-term.

9.3. Data

Eurostat will be the main provider of data, using the UOE data collection.[146] The average of years 2007-2008 is used as the base period for the projections. In most Member States, enrolment, personnel and financial data are all available for the period 2007-2008. For those countries where data are missing, data from earlier years or from national sources will be used. In the latter case, Members of the EPC/AWG will provide the relevant data to Commission Services.

Specifically, by country, year, and ISCED groupings (1, 2, 3-4, 5-6), the following information from the UOE dataset will be used:

- total number of students by single age;
- number of working students by single age;
- number of teachers and non-teaching staff;
- total expenditure in public wages;
- other current (excluding wages) and capital expenditure;
- share of transfers over total public education expenditure;[147] and
- share of public funded education.

Furthermore, and to secure full consistency of the long-term budgetary exercise, the common AWG macroeconomic assumptions for the following variables will be used:

- total population per single age;
- labour force per single age;
- GDP per worker, and;
- GDP.

[146] The objective of the UNESCO-UIS/OECD/EUROSTAT (UOE) data collection on education statistics is to provide internationally comparable data on key aspects of education systems, specifically on the participation and completion of education programmes, as well as the cost and type of resources dedicated to education (http://www.oecd.org/dataoecd/32/53/33712760.pdf)

[147] From the OECD, *Education at a Glance*.

9.4. Sensitivity analysis

In addition to the baseline scenario described above, the following two sensitivity tests will be run:

- *High enrolment rates* – given the importance in the EU2020 strategy of reducing drop-out rates in education (to less than 10%) and increasing the share of 30-34 years old having completed tertiary education (to at least 40%), these objectives will be attained in a number of years and thereafter remain constant;

- *Small class sizes* – evaluate the budgetary impact of a lagged response of staff levels to a reduction in youth/student cohorts. These lagged effects will be temporary and symmetric (i.e. to any future increase in youth cohorts).

Derivation of the enrolment rate formula

Starting with the labour market identity:

$$\mathrm{E}_{i,t} + U_{i,t} + \mathrm{I}_{i.t} \equiv \mathrm{P}_{i,t} \qquad \textbf{[1]}$$

where $E_{i,t}$, $U_{i,t}$, $I_{i,t}$ and $P_{i,t}$ are respectively employment, unemployment, inactive and the population for age cohort *i* in period *t*.

After adding and subtracting the number of full-time students ($SF_{i,t}$), and of part-time students ($SP_{i,t}$):

$$SF_{i,t} + SP_{i,t} - SP_{i,t} + \mathrm{E}_{i,t} + U_{i,t} + \mathrm{I}_{i.t} - SF_{i,t} \equiv \mathrm{P}_{i,t} \qquad \textbf{[2]}$$

Let us use the definitions of total students ($ST_{i,t} = SF_{i,t} + SP_{i,t}$), labour force ($LF_{i,t} \equiv E_{i,t} + U_{i,t}$), and inactive minus full-time students ($I^*_{i,t} = I_{i,t} - SF_{i,t}$):

$$ST_{i,t} - SP_{i,t} + LF_{i,t} + I^*_{i,t} \equiv \mathrm{P}_{i,t} \qquad \textbf{[3]}$$

Dividing equation [3] by the population ($P_{i,t}$), and defining $\alpha_{i,t} \equiv \dfrac{SP_{i,t}}{SF_{i,t} + SP_{i,t}}$ as the fraction of part-time students in the total number of students, the following identity is obtained:

$$\frac{ST_{i,t}}{\mathrm{P}_{i,t}} - \frac{SP_{i,t}}{ST_{i,t}} * \frac{ST_{i,t}}{\mathrm{P}_{i,t}} + \frac{LF_{i,t}}{\mathrm{P}_{i,t}} + \frac{I^*_{i,t}}{\mathrm{P}_{i,t}} \equiv 1 \qquad \textbf{[4]}$$

Equation [4] can be rearranged as:

$$e_{i,t} = \frac{1 - p_{i,t} - i^*_{i,t}}{1 - \alpha_{i,t}} \qquad \textbf{[5]}$$

where $e_{i,t} = \frac{ST_{i,t}}{\mathrm{P}_{i,t}}$ is the enrolment rate for total students; $p_{i,t} = \frac{LF_{i,t}}{\mathrm{P}_{i,t}}$ is the participation rate; and $i^*_{i,t} = \frac{\mathrm{I}^*_{i,t}}{\mathrm{P}_{i,t}}$ is the fraction of inactive minus full-time students over the population.

In most EU Member States, the LFS MAINSTAT variable can be used to assess the distribution of inactivity by age, distinguishing between schooling and other forms of inactivity.[148]

Assume that the ratio between full-time students and the total inactive ($\overline{\kappa}_{i,b}$) is constant at the value in the base period (b):

$$\frac{SF_{i,t}}{I_{i,t}} = \frac{SF_{i,b}}{I_{i,b}} = \overline{\kappa}_{i,b} \Rightarrow i^*_{i,t} - i^*_{i,b} = \left(1 - \overline{\kappa}_{i,b}\right) * \left(i_{i,t} - i_{i,b}\right)$$

where **[6]**

$$\overline{\kappa}_{i,b} \leq 1$$

where $i_{i,t} \equiv \frac{I_{i,t}}{P_{i,t}}$ is the inactivity rate.

A bar over a variable indicates that it is constant (i.e. time invariant).

Let us plug back into equation [5], the value observed for the fraction of part-time students ($\overline{\alpha}_{i,b}$) in the base period/year. Throughout the projection period, enrolment rates become a function of the participation and the (adjusted) inactivity rates:

$$e_{i,t} = \frac{1 - p_{i,t} - i^*_{i,t}}{1 - \overline{\alpha}_{i,b}} \qquad \textbf{[7]}$$

In equation [7], enrolment rates are inversely related to the participation and the (adjusted) inactivity rates.

How equation [7] is used to project enrolment rates

Expressing equation [7] in terms of differences to the base period, substituting equation [6], and using the identity $\left(p_{i,t} - p_{i,b}\right) + \left(i_{i,t} - i_{i,b}\right) \equiv 0$:

[148] However, given that the MAINSTAT variable, which describes the main labour status, is an optional LFS variable, there are no data for DE and the UK.

$$e_{i,t} - e_{i,b} = -\frac{\bar{\kappa}_{i,b}}{1-\bar{\alpha}_{i,b}} * \left(p_{i,t} - p_{i,b}\right)$$

where

$$\bar{\kappa}_{i,b} = \frac{SF_{i,b}}{I_{i,b}} \qquad \textbf{[8]}$$

$$\bar{\alpha}_{i,b} = \frac{SP_{i,b}}{SF_{i,b} + SP_{i,b}}$$

$$0 \le \bar{\kappa}_{i,b}, \bar{\alpha}_{i,b} \le 1$$

In the 2009 Ageing Report, $\bar{\kappa}_{i,b}$ values were set uniformly to one, thereby any change in the participation rate was fully offset by an opposite change in the enrolment rate. In the 2012 Ageing Report, $\bar{\kappa}_{i,b}$ values will be estimated using LFS data.

A value for $\bar{\kappa}_{i,b}$ lower than one means that changes in the labour force do not imply a one to one change in enrolment rates, because some people coming from inactivity were not involved in education activities.

Annex 9.1: Organisational structure of secondary education

The end of lower secondary education often coincides with that of full-time compulsory education[149]

Three different organisational models can be distinguished: i) a single structure; ii) a compulsory integrated secondary education corresponding to a 'common core'; and iii) distinct types of education. In some new Member States (the Czech Republic, Latvia, Lithuania, Hungary and Slovakia), combinations of these three models coexist.

In all countries where the **single structure** is the only type of structure (Denmark, Estonia, Portugal, Slovenia, Finland, Sweden, Iceland, Norway and Bulgaria), the end of secondary education coincides with the end of compulsory education, except in Bulgaria where compulsory education ends one year later.

In almost half of all European countries, all pupils follow the same general curriculum "**common core"** during lower secondary education. In seven of these countries, the end of lower secondary education coincides with the end of full-time compulsory education.

In Belgium, France, Ireland, Italy, Hungary, Austria, Slovakia, the United Kingdom (England, Wales and Northern Ireland) and Bulgaria, the end of full-time compulsory education does not coincide with the end of lower secondary education. Instead, one or more final years of compulsory education are part of upper secondary education. Thus, pupils in these countries - with the exception of Ireland and the United Kingdom (England, Wales and Northern Ireland) - have to choose between general, technical or vocational education one or two years (or four in Hungary) before the end of full-time compulsory education.

In the French and German-speaking Belgian Communities, Germany, Latvia, Lithuania, Luxembourg, the Netherlands, Austria and Liechtenstein, pupils may select or be streamed into **different types of provision or school** from the beginning or before the end of lower secondary education. Even though pupils in Germany attend different schools, they follow entirely compatible curricula for the first two years so that selection of an appropriate study branch can be deferred. In the Netherlands, pupils follow a common core curriculum usually for the first two years at VMBO and three years at HAVO and VWO. While its level varies depending on the type of school concerned, it specifies minimum skills that should be acquired by all pupils. The three types of lower secondary school in Liechtenstein offer the same basic common curriculum, which is supplemented by certain kinds of provision in the Realschule or Gymnasium.

[149] *Source:* Key data on education in Europe 2005, European Commission, Eurydice, Eurostat, 2005.

10. Unemployment benefits

10.1. Applying the methodology used in previous rounds

In order to preserve the comprehensive nature of the budgetary exercise, the AWG decided also to project expenditure on unemployment benefits (henceforth UB), although the latter is more affected by (short- and medium-term) cyclical fluctuations than by (long-term) demographic waves. Besides being consistent with past practice, projection of UB expenditure could highlight the direct budgetary costs of persistently high structural unemployment.

In order to project expenditure on UB, the 2012 Ageing Report applies the same simple methodology used in the previous three projection rounds (2003, 2006, and 2009). The main assumption is one of unchanged policies, namely of constant replacement and coverage rates of unemployment benefit systems throughout the projection period. The number of individuals receiving UB is derived from the commonly agreed AWG's labour market assumptions, while the wage share in income is endogenously determined. UB expenditure is calculated for the sum of full and partial unemployment benefits using ESSPROS data.[150]

10.2. Methodology used to project expenditure on unemployment benefits

The methodology is derived from the following identity:

$$UB \equiv UB_{pb} * B \qquad \textbf{[1]}$$

where total expenditure in unemployment benefits (UB) is broken down in expenditure per beneficiary (UB_{pb}) and the number of beneficiaries (B).

Unemployment expenditure per beneficiary is a fraction of average wages in the economy:

$$UB_{pb} = RR * \frac{W}{E} \qquad \textbf{[2]}$$

where RR is the replacement rate; W is the wage bill; and E is employment.

Substituting equation [2] into equation [1]:

$$UB = RR * \frac{W}{E} * \frac{B}{U} * U \qquad \textbf{[3]}$$

where U is unemployment.

Dividing equation [3] by GDP and rearranging:

$$\frac{UB}{GDP} = RR * CR * WS * \frac{u}{1-u} \qquad \textbf{[4]}$$

150 The **E**uropean **S**ystem of integrated **S**ocial **PRO**tection **S**tatistics (ESSPROS).

where $CR \equiv \frac{B}{U}$ is the coverage rate or the take-up rate of unemployment benefits; $WS \equiv \frac{W}{GDP}$ is the wage share in income; and *u* is the unemployment rate.[151]

Equation [4] shows that the ratio between UB expenditure and GDP is determined by four parameters/variables: i) the replacement rate of UB (*RR*); ii) the coverage/take-up rate of UB (*CR*); iii) the wage share in income (*WS*); and iv) the unemployment rate (*u*).

The methodology used assumes that the replacement rate (RR) and the coverage rate (CR) are constant throughout the projection horizon at the level observed in a base period/year (*b*).

$$\begin{aligned} RR_t &= RR_b \\ CR_t &= CR_b \end{aligned} \qquad \textbf{[5]}$$

Using equation [4] and the assumption of unchanged policies (equation [5]). The UB-to-GDP ratio ($\frac{UB_t}{GDP_t}$) is calculated as:

$$\frac{UB_t}{GDP_t} = \left[\frac{UB_b}{GDP_b} * \frac{1}{WS_b} * \frac{1-u_b}{u_b} \right] * WS_t * \frac{u_t}{1-u_t} \qquad \textbf{[6]}$$

"Historical" values (i.e. base period/year) are taken from the ESSPROS dataset for the UB-to-GDP ratio ($\frac{UB_b}{GDP_b}$), from AMECO for the wage share (WS_b) and from the Labour Force Survey for the unemployment rate (u_b). Unemployment rates (u_t) in the projection period are derived from NAWRU values following the methodology agreed in the AWG. The wage share in income (WS_t) during the projection period is endogenously calculated in the model.

The last year for which ESSPROS data are available is 2008. In order to avoid imposing an excessive weight on a particular year, and given that the last recession started in 2008, average expenditure (in total and part-time) UB in the period 2007 and 2008 is used as the base period for the projection.[152]

Recall that the projection of UB expenditure (as a share of GDP) is done under the assumption of unchanged policies, namely replacement and coverage rates are kept constant throughout the projection period.

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[151] Given that $E = LF * (1-u)$ and $U = LF * u$ then $\frac{U}{E} = \frac{u}{1-u}$; where uppercase variables *E, U, LF* are respectively, employment, unemployment and the labour force; and lowercase *u* the unemployment rate.

[152] In the 2009 Ageing Report, average expenditure in 2005 and 2006 was used as the base period. The labour market policy database could also be used for more recent data (i.e. 2009).

STATISTICAL ANNEX

1. Belgium

Belgium	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	0.0
Life expectancy at birth											
males	77.3	79.0	79.7	80.5	81.2	82.0	82.7	83.3	84.0	84.6	7.3
females	82.6	84.0	84.7	85.4	86.0	86.7	87.3	87.9	88.4	89.0	6.4
Life expectancy at 65											
males	17.4	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.8	22.3	4.9
females	20.9	21.9	22.4	22.9	23.4	23.9	24.3	24.8	25.2	25.7	4.8
Net migration (thousand)	61.3	46.2	44.4	42.6	40.9	39.1	37.3	35.5	33.8	32.0	-29.3
Net migration as % of population	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	-0.3
Population (million)	10.9	11.6	11.9	12.2	12.5	12.7	13.0	13.1	13.3	13.5	2.6
Children population (0-14) as % of total population	16.9	17.3	17.2	16.8	16.5	16.4	16.4	16.5	16.5	16.3	-0.6
Prime age population (25-54) as % of total population	41.5	38.9	37.6	36.8	36.5	36.2	36.1	35.8	35.8	35.9	-5.6
Working age population (15-64) as % of total population	65.9	63.3	62.0	60.7	59.8	59.3	59.0	58.6	58.4	58.2	-7.7
Elderly population (65 and over) as % of total population	17.2	19.3	20.8	22.5	23.7	24.3	24.6	24.9	25.2	25.5	8.3
Very elderly population (80 and over) as % of total population	5.0	5.6	5.6	6.4	7.3	8.2	9.1	9.6	9.8	9.9	4.9
Very elderly population (80 and over) as % of elderly population	29.0	28.8	26.9	28.6	30.8	33.9	37.1	38.7	39.0	38.9	9.9
Very elderly population (80 and over) as % of working age population	7.6	8.8	9.0	10.6	12.2	13.9	15.5	16.4	16.8	17.1	9.5
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.4	1.4	1.5	1.6	1.8	1.8	1.8	1.7	1.7	1.8	1.6
Employment (growth rate)	0.7	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Labour input : hours worked (growth rate)	0.7	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Labour productivity per hour (growth rate)	0.7	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
TFP (growth rate)	0.5	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	2.8	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.2
GDP per worker (growth rate)	0.7	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
GDP in 2010 prices (in millions euros)	352.3	419.2	449.9	486.2	528.9	577.1	629.4	685.2	744.8	812.3	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	7169	7361	7404	7425	7479	7559	7638	7703	7766	7830	661
Population growth (working age:15-64)	0.6	0.1	0.1	0.0	0.2	0.3	0.1	0.2	0.1	0.2	-0.4
Population (20-64) (in thousands)	6522	6729	6721	6718	6762	6841	6926	6984	7029	7078	557
Population growth (20-64)	0.8	0.1	0.0	0.0	0.2	0.3	0.2	0.2	0.1	0.2	-0.5
Labour force 15-64 (thousands)	4853	5105	5081	5076	5115	5173	5227	5270	5308	5362	509
Labour force 20-64 (thousands)	4794	5049	5021	5014	5051	5109	5164	5207	5243	5295	501
Participation rate (20-64)	73.5	75.0	74.7	74.6	74.7	74.7	74.6	74.6	74.6	74.8	1.3
Participation rate (15-64)	67.7	69.4	68.6	68.4	68.4	68.4	68.4	68.4	68.3	68.5	0.8
young (15-24)	32.7	33.7	32.7	33.2	33.5	33.7	33.8	33.6	33.3	33.3	0.6
prime-age (25-54)	86.3	86.4	86.2	85.9	85.6	85.5	85.6	85.6	85.6	85.6	-0.7
older (55-64)	39.1	49.2	49.0	49.4	49.6	49.6	49.0	48.8	48.3	48.7	9.6
Participation rate (20-64) - FEMALES	67.2	70.1	70.1	70.2	70.2	70.0	69.8	69.7	69.8	70.0	2.8
Participation rate (15-64) - FEMALES	61.9	64.8	64.4	64.4	64.3	64.2	64.1	64.0	63.9	64.0	2.1
young (15-24)	30.3	31.3	30.3	30.7	30.9	31.1	31.2	31.0	30.7	30.7	0.5
prime-age (25-54)	80.4	81.5	81.4	80.9	80.5	80.2	80.2	80.3	80.3	80.2	-0.1
older (55-64)	30.9	44.1	44.9	46.4	46.9	46.9	45.8	45.6	45.1	45.5	14.5
Participation rate (20-64) - MALES	79.8	79.9	79.2	79.0	79.1	79.2	79.3	79.3	79.3	79.5	-0.3
Participation rate (15-64) - MALES	73.4	73.8	72.7	72.3	72.4	72.6	72.7	72.7	72.6	72.8	-0.7
young (15-24)	35.2	36.1	35.0	35.5	35.9	36.1	36.2	36.0	35.7	35.8	0.6
prime-age (25-54)	92.2	91.3	90.9	90.8	90.7	90.7	90.8	90.8	90.8	90.7	-1.4
older (55-64)	47.5	54.4	53.2	52.3	52.2	52.3	52.2	52.1	51.5	52.0	4.5
Employment rate (15-64)	62.0	64.1	63.5	63.3	63.4	63.4	63.4	63.4	63.4	63.5	1.5
Employment rate (20-64)	67.6	69.5	69.4	69.4	69.5	69.4	69.3	69.3	69.4	69.6	2.0
Employment rate (15-74)	55.3	55.6	54.7	54.0	54.0	54.3	54.6	54.5	54.3	54.4	-0.9
Unemployment rate (15-64)	8.4	7.6	7.4	7.4	7.3	7.3	7.3	7.3	7.3	7.3	-1.1
Unemployment rate (20-64)	8.0	7.3	7.2	7.1	7.0	7.0	7.0	7.0	7.0	7.0	-1.0
Unemployment rate (15-74)	8.3	7.6	7.4	7.3	7.2	7.2	7.2	7.2	7.2	7.2	-1.1
Employment (20-64) (in millions)	4.4	4.7	4.7	4.7	4.7	4.8	4.8	4.8	4.9	4.9	0.5
Employment (15-64) (in millions)	4.4	4.7	4.7	4.7	4.7	4.8	4.8	4.9	4.9	5.0	0.5
share of young (15-24)	8%	7%	7%	8%	8%	8%	8%	8%	8%	8%	1%
share of prime-age (25-54)	81%	77%	77%	77%	77%	77%	77%	77%	78%	78%	-3%
share of older (55-64)	11%	15%	16%	15%	15%	15%	15%	15%	14%	14%	3%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.6	21.0	21.1	20.3	19.6	19.5	19.7	19.8	19.4	18.9	0.3
Old-age dependency ratio (2)	26	31	34	37	40	41	42	43	43	44	18
Total dependency ratio (3)	52	58	61	65	67	69	70	71	71	72	20
Total economic dependency ratio (4)	143	144	150	156	160	162	164	165	167	167	24
Economic old-age dependency ratio (15-64) (5)	41	47	51	57	61	63	64	66	67	68	26
Economic old-age dependency ratio (15-74) (6)	41	46	51	56	60	62	64	65	66	67	25

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

2. Bulgaria

Bulgaria — EC-EPC (AWG) 2012 projections

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.56	1.58	1.59	1.60	1.61	1.63	1.64	1.65	1.66	1.67	0.1
Life expectancy at birth											
males	70.3	72.9	74.2	75.4	76.5	77.6	78.7	79.7	80.7	81.7	11.4
females	77.5	79.6	80.5	81.5	82.4	83.3	84.2	85.0	85.8	86.6	9.1
Life expectancy at 65											
males	13.8	15.3	15.9	16.6	17.3	18.0	18.7	19.3	19.9	20.6	6.7
females	17.0	18.4	19.1	19.7	20.4	21.1	21.7	22.4	23.0	23.6	6.6
Net migration (thousand)	-9.9	-14.6	-9.5	-3.3	4.8	5.5	4.6	3.8	3.0	0.7	10.7
Net migration as % of population	-0.1	-0.2	-0.1	-0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Population (million)	7.5	7.1	6.8	6.6	6.4	6.2	6.1	5.9	5.7	5.5	-2.0
Children population (0-14) as % of total population	13.7	14.9	14.2	13.2	12.8	13.0	13.4	13.5	13.3	13.1	-0.6
Prime age population (25-54) as % of total population	42.8	41.6	39.3	37.1	35.4	34.4	33.1	32.9	33.6	33.8	-8.9
Working age population (15-64) as % of total population	68.7	64.1	63.1	62.5	61.4	59.4	57.0	55.3	54.0	54.3	-14.4
Elderly population (65 and over) as % of total population	17.6	21.0	22.8	24.3	25.8	27.6	29.6	31.2	32.6	32.6	15.0
Very elderly population (80 and over) as % of total population	3.9	4.8	5.4	6.7	7.7	8.5	9.2	10.1	11.4	12.9	9.0
Very elderly population (80 and over) as % of elderly population	22.0	23.0	23.6	27.4	29.8	30.8	31.0	32.3	35.0	39.6	17.6
Very elderly population (80 and over) as % of working age population	5.6	7.6	8.5	10.7	12.5	14.3	16.1	18.2	21.1	23.8	18.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.8	1.2	1.3	1.5	1.4	1.3	0.9	0.8	1.0	1.0	1.3
Employment (growth rate)	-0.8	-1.1	-1.0	-0.9	-0.9	-1.1	-1.2	-1.1	-0.8	-0.5	-0.9
Labour input : hours worked (growth rate)	-0.8	-1.1	-1.0	-0.8	-0.9	-1.1	-1.2	-1.1	-0.8	-0.5	-1.0
Labour productivity per hour (growth rate)	2.7	2.3	2.3	2.3	2.3	2.3	2.1	1.9	1.7	1.5	2.3
TFP (growth rate)	0.9	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.1	1.0	1.4
Capital deepening (contribution to labour productivity growth)	1.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.9
GDP per capita (growth rate)	1.9	2.0	2.1	2.2	2.0	1.8	1.5	1.4	1.6	1.7	1.9
GDP per worker (growth rate)	2.6	2.3	2.3	2.3	2.3	2.3	2.1	2.0	1.7	1.6	2.3
GDP in 2010 prices (in millions euros)	36.0	46.0	48.9	52.6	56.5	60.4	63.6	66.2	69.2	72.7	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	5183	4546	4308	4119	3924	3693	3449	3251	3081	2994	-2189
Population growth (working age:15-64)	1.2	-1.2	-0.9	-0.8	-1.1	-1.4	-1.3	-1.1	-1.0	-0.3	-1.5
Population (20-64) (in thousands)	4781	4215	3947	3760	3605	3410	3181	2980	2806	2725	-2056
Population growth (20-64)	3.5	-1.4	-1.2	-0.8	-1.0	-1.3	-1.4	-1.3	-1.1	-0.3	-3.8
Labour force 15-64 (thousands)	3476	3126	2943	2814	2677	2528	2372	2232	2129	2079	-1397
Labour force 20-64 (thousands)	3448	3105	2921	2791	2657	2509	2355	2215	2112	2062	-1386
Participation rate (20-64)	72.1	73.7	74.0	74.2	73.7	73.6	74.0	74.3	75.3	75.7	3.6
Participation rate (15-64)	67.1	68.8	68.3	68.3	68.2	68.4	68.8	68.7	69.1	69.4	2.4
young (15-24)	32.0	28.8	28.2	29.5	31.2	31.3	30.5	29.6	29.4	29.9	-2.0
prime-age (25-54)	82.7	83.5	84.0	84.0	83.7	83.6	83.9	84.2	84.2	84.0	1.3
older (55-64)	49.3	50.1	53.0	57.5	58.3	58.0	58.5	57.1	57.4	59.8	10.5
Participation rate (20-64) - FEMALES	67.2	68.4	68.4	68.3	67.5	67.3	67.8	68.2	69.5	70.0	2.8
Participation rate (15-64) - FEMALES	62.6	63.9	63.1	62.9	62.5	62.6	63.0	63.0	63.8	64.3	1.7
young (15-24)	27.1	24.2	23.7	24.8	26.3	26.4	25.7	24.9	24.7	25.1	-2.0
prime-age (25-54)	79.4	79.6	80.1	79.9	79.6	79.3	79.6	80.0	80.2	80.0	0.6
older (55-64)	42.7	43.6	44.7	49.0	49.2	48.5	49.1	47.3	47.8	50.6	7.9
Participation rate (20-64) - MALES	77.1	78.9	79.6	80.1	79.8	79.8	80.1	80.3	80.9	81.2	4.1
Participation rate (15-64) - MALES	71.6	73.6	73.5	73.7	73.9	74.2	74.4	74.1	74.2	74.5	2.9
young (15-24)	36.6	33.2	32.7	34.1	36.0	36.1	35.1	34.1	34.0	34.5	-2.0
prime-age (25-54)	86.1	87.3	87.7	87.9	87.7	87.7	88.1	88.3	88.2	88.0	2.0
older (55-64)	56.8	57.4	62.0	66.7	67.8	67.8	68.0	66.8	67.0	68.9	12.1
Employment rate (15-64)	60.0	63.1	63.0	63.2	63.2	63.4	63.7	63.7	64.1	64.4	4.4
Employment rate (20-64)	64.8	67.8	68.5	68.8	68.4	68.3	68.8	69.1	69.9	70.3	5.6
Employment rate (15-74)	53.2	55.0	54.7	54.6	54.5	54.1	53.5	53.1	53.5	54.5	1.3
Unemployment rate (15-64)	10.5	8.2	7.7	7.5	7.4	7.3	7.3	7.3	7.3	7.3	-3.2
Unemployment rate (20-64)	10.2	8.0	7.5	7.3	7.2	7.1	7.1	7.1	7.1	7.1	-3.1
Unemployment rate (15-74)	10.4	8.1	7.6	7.4	7.3	7.2	7.1	7.1	7.1	7.1	-3.3
Employment (20-64) (in millions)	3.1	2.9	2.7	2.6	2.5	2.3	2.2	2.1	2.0	1.9	-1.2
Employment (15-64) (in millions)	3.1	2.9	2.7	2.6	2.5	2.3	2.2	2.1	2.0	1.9	-1.2
share of young (15-24)	7%	5%	6%	7%	7%	7%	6%	6%	7%	7%	0%
share of prime-age (25-54)	78%	79%	77%	74%	71%	71%	71%	74%	76%	76%	-2%
share of older (55-64)	15%	15%	17%	20%	22%	22%	22%	20%	17%	17%	2%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	20.1	21.0	21.6	23.2	25.1	25.7	25.8	23.8	20.0	19.5	-0.6
Old-age dependency ratio (2)	26	33	36	39	42	47	52	56	60	60	34
Total dependency ratio (3)	46	56	59	60	63	68	76	81	85	84	39
Total economic dependency ratio (4)	140	138	142	144	147	153	161	169	174	173	33
Economic old-age dependency ratio (15-64) (5)	42	48	53	58	62	68	76	83	88	88	47
Economic old-age dependency ratio (15-74) (6)	41	46	51	56	60	65	72	78	84	84	43

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

3. Czech Republic

Czech Republik — EC-EPC (AWG) 2012 projections

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.49	1.52	1.53	1.55	1.56	1.57	1.58	1.60	1.61	1.62	0.1
Life expectancy at birth											
males	74.3	76.3	77.3	78.2	79.1	79.9	80.8	81.6	82.4	83.2	8.8
females	80.4	82.1	82.9	83.6	84.4	85.1	85.8	86.5	87.2	87.8	7.4
Life expectancy at 65											
males	15.3	16.5	17.1	17.7	18.4	18.9	19.5	20.1	20.7	21.2	5.9
females	18.7	19.9	20.5	21.1	21.7	22.3	22.8	23.4	23.9	24.5	5.8
Net migration (thousand)	30.5	29.0	25.1	25.6	26.0	29.9	26.5	24.1	22.1	18.3	-12.2
Net migration as % of population	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	-0.1
Population (million)	10.5	10.8	10.9	10.8	10.8	10.7	10.7	10.7	10.6	10.5	-0.1
Children population (0-14) as % of total population	14.3	15.7	14.9	13.9	13.2	13.3	13.7	14.1	13.9	13.6	-0.8
Prime age population (25-54) as % of total population	43.8	43.2	41.7	39.1	37.0	36.3	35.5	34.8	35.0	35.1	-8.7
Working age population (15-64) as % of total population	70.3	64.5	64.0	64.0	63.7	61.6	58.7	57.1	56.1	55.8	-14.5
Elderly population (65 and over) as % of total population	15.4	19.8	21.0	22.1	23.0	25.1	27.5	28.8	30.0	30.6	15.3
Very elderly population (80 and over) as % of total population	3.6	4.0	5.0	6.5	7.6	7.9	8.2	8.7	10.4	12.3	8.7
Very elderly population (80 and over) as % of elderly population	23.5	20.4	23.6	29.4	33.0	31.5	29.7	30.1	34.6	40.0	16.6
Very elderly population (80 and over) as % of working age population	5.1	6.3	7.7	10.1	11.9	12.8	13.9	15.2	18.5	22.0	16.8
Macroeconomic assumptions*	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**AVG 10-60**
Potential GDP (growth rate)	2.1	1.8	1.7	1.7	1.6	1.5	1.3	1.1	1.1	1.2	1.5
Employment (growth rate)	-0.1	-0.2	-0.2	-0.1	-0.3	-0.3	-0.5	-0.6	-0.5	-0.3	-0.3
Labour input : hours worked (growth rate)	-0.1	-0.2	-0.2	-0.1	-0.3	-0.3	-0.5	-0.6	-0.5	-0.3	-0.3
Labour productivity per hour (growth rate)	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.9
TFP (growth rate)	1.4	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.2
Capital deepening (contribution to labour productivity growth)	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7
GDP per capita (growth rate)	1.9	1.6	1.7	1.8	1.7	1.5	1.4	1.2	1.3	1.5	1.6
GDP per worker (growth rate)	2.2	2.0	1.9	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.9
GDP in 2010 prices (in millions euros)	145.1	180.0	195.8	213.7	231.8	249.9	267.6	283.2	299.0	317.2	
Labour force assumptions	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch 10-60**
Working age population (15-64) (in thousands)	7403	6978	6958	6939	6868	6617	6292	6088	5930	5835	-1568
Population growth (working age:15-64)	-0.4	-0.4	0.2	-0.2	-0.3	-1.1	-0.9	-0.6	-0.5	-0.1	0.3
Population (20-64) (in thousands)	6803	6484	6362	6344	6312	6103	5812	5605	5418	5312	-1491
Population growth (20-64)	0.0	-0.6	-0.1	-0.1	-0.2	-1.0	-0.9	-0.7	-0.6	-0.1	-0.1
Labour force 15-64 (thousands)	5204	5083	5008	4959	4884	4738	4593	4456	4329	4264	-940
Labour force 20-64 (thousands)	5164	5053	4972	4921	4848	4704	4562	4426	4298	4231	-933
Participation rate (20-64)	75.9	77.9	78.2	77.6	76.8	77.1	78.5	79.0	79.3	79.7	3.7
Participation rate (15-64)	70.3	72.9	72.0	71.5	71.1	71.6	73.0	73.2	73.0	73.1	2.8
young (15-24)	31.1	29.6	27.7	29.9	31.0	31.2	31.2	30.1	29.4	29.7	-1.4
prime-age (25-54)	87.9	87.0	86.8	86.4	85.8	85.1	85.1	85.3	85.7	85.7	-2.1
older (55-64)	50.1	55.1	58.7	63.2	64.6	66.6	71.0	71.7	71.2	72.6	22.5
Participation rate (20-64) - FEMALES	66.5	68.7	69.2	68.8	68.0	68.4	70.1	70.9	71.3	71.7	5.2
Participation rate (15-64) - FEMALES	61.7	64.2	63.7	63.4	62.9	63.5	65.2	65.7	65.7	65.8	4.2
young (15-24)	25.6	24.3	22.7	24.5	25.4	25.6	25.6	24.7	24.0	24.3	-1.2
prime-age (25-54)	79.8	78.4	78.4	77.9	77.0	75.8	75.6	75.9	76.6	76.9	-2.9
older (55-64)	38.3	44.6	48.6	54.2	56.1	59.7	66.1	67.7	67.3	68.6	30.3
Participation rate (20-64) - MALES	85.1	86.9	86.9	86.1	85.4	85.5	86.6	86.8	87.1	87.3	2.3
Participation rate (15-64) - MALES	78.7	81.2	80.0	79.3	79.0	79.4	80.5	80.5	80.1	80.1	1.4
young (15-24)	36.4	34.7	32.5	35.1	36.3	36.7	36.6	35.3	34.4	34.9	-1.6
prime-age (25-54)	95.5	95.1	94.9	94.5	94.1	94.1	94.3	94.4	94.4	94.3	-1.3
older (55-64)	62.8	66.1	68.8	72.2	73.1	73.3	75.8	75.7	75.1	76.6	13.8
Employment rate (15-64)	65.1	68.2	67.5	67.1	66.7	67.2	68.5	68.7	68.6	68.6	3.5
Employment rate (20-64)	70.5	73.1	73.4	73.0	72.2	72.5	73.8	74.3	74.6	75.0	4.4
Employment rate (15-74)	58.7	59.1	59.0	59.3	59.1	58.8	58.5	58.8	59.5	59.6	0.9
Unemployment rate (15-64)	7.3	6.4	6.3	6.2	6.1	6.1	6.1	6.1	6.1	6.1	-1.2
Unemployment rate (20-64)	7.1	6.2	6.0	6.0	5.9	5.9	5.9	5.9	5.9	5.9	-1.2
Unemployment rate (15-74)	7.3	6.3	6.1	6.0	6.0	5.9	5.8	5.8	5.8	5.8	-1.4
Employment (20-64) (in millions)	4.8	4.7	4.7	4.6	4.6	4.4	4.3	4.2	4.0	4.0	-0.8
Employment (15-64) (in millions)	4.8	4.8	4.7	4.7	4.6	4.4	4.3	4.2	4.1	4.0	-0.8
share of young (15-24)	7%	5%	6%	7%	7%	7%	6%	6%	6%	7%	0%
share of prime-age (25-54)	79%	81%	79%	74%	71%	70%	71%	71%	74%	74%	-4%
share of older (55-64)	14%	14%	15%	19%	23%	23%	23%	23%	20%	19%	5%
Dependency ratios:	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch 10-60**
Share of older population (55-64) (1)	20.1	18.6	18.8	21.4	24.6	24.4	23.3	22.8	20.3	18.9	-1.3
Old-age dependency ratio (2)	22	31	33	35	36	41	47	50	54	55	33
Total dependency ratio (3)	42	55	56	56	57	62	70	75	78	79	37
Total economic dependency ratio (4)	115	122	125	126	127	129	134	139	144	146	30
Economic old-age dependency ratio (15-64) (5)	32	42	46	48	50	55	62	67	71	74	41
Economic old-age dependency ratio (15-74) (6)	32	41	45	47	49	53	58	63	67	69	38

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

4. Denmark

Denmark	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	0.0
Life expectancy at birth											
males	77.0	78.6	79.4	80.2	80.9	81.7	82.4	83.1	83.8	84.4	7.4
females	81.1	82.8	83.6	84.3	85.1	85.8	86.5	87.2	87.8	88.4	7.3
Life expectancy at 65											
males	16.8	17.9	18.5	19.0	19.5	20.0	20.6	21.1	21.5	22.0	5.2
females	19.5	20.8	21.4	21.9	22.5	23.1	23.6	24.1	24.6	25.1	5.6
Net migration (thousand)	12.3	11.4	11.4	12.0	10.3	9.9	9.2	8.7	8.6	8.7	-3.6
Net migration as % of population	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	-0.1
Population (million)	5.5	5.7	5.8	5.9	6.0	6.0	6.0	6.0	6.1	6.1	0.5
Children population (0-14) as % of total population	18.0	16.9	16.8	16.9	16.9	16.7	16.3	16.1	16.0	16.1	-1.9
Prime age population (25-54) as % of total population	40.2	38.2	37.1	36.3	36.2	36.4	36.3	35.9	35.6	35.5	-4.7
Working age population (15-64) as % of total population	65.4	63.1	62.1	60.5	59.2	58.7	58.7	59.2	59.1	58.4	-7.1
Elderly population (65 and over) as % of total population	16.6	20.0	21.2	22.6	23.9	24.7	24.9	24.7	24.9	25.5	9.0
Very elderly population (80 and over) as % of total population	4.1	4.7	5.8	7.0	7.5	8.0	8.8	9.6	10.1	10.1	6.0
Very elderly population (80 and over) as % of elderly population	24.8	23.4	27.3	30.9	31.6	32.5	35.5	39.0	40.6	39.7	14.9
Very elderly population (80 and over) as % of working age population	6.3	7.4	9.3	11.6	12.7	13.7	15.1	16.3	17.1	17.3	11.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	0.5	1.3	1.6	1.4	1.4	1.6	1.7	1.7	1.6	1.5	1.4
Employment (growth rate)	0.0	0.1	0.1	-0.1	-0.1	0.0	0.2	0.2	0.0	0.0	0.0
Labour input : hours worked (growth rate)	0.0	0.0	0.1	-0.1	-0.1	0.0	0.2	0.2	0.0	0.0	0.0
Labour productivity per hour (growth rate)	0.5	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
TFP (growth rate)	0.4	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	-0.1	1.0	1.3	1.2	1.3	1.5	1.6	1.6	1.5	1.4	1.2
GDP per worker (growth rate)	0.6	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
GDP in 2010 prices (in millions euros)	234.4	271.3	293.3	315.8	339.2	365.3	396.6	431.9	468.4	505.2	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	3629	3614	3612	3570	3530	3516	3535	3574	3580	3552	-77
Population growth (working age:15-64)	1.0	0.0	-0.1	-0.4	-0.1	-0.1	0.2	0.2	-0.1	-0.2	-1.2
Population (20-64) (in thousands)	3275	3279	3275	3245	3200	3174	3191	3234	3245	3222	-53
Population growth (20-64)	0.6	0.1	0.0	-0.4	-0.1	-0.1	0.2	0.2	0.0	-0.2	-0.8
Labour force 15-64 (thousands)	2884	2887	2902	2861	2831	2823	2845	2877	2881	2863	-22
Labour force 20-64 (thousands)	2674	2687	2700	2667	2634	2619	2639	2673	2681	2665	-9
Participation rate (20-64)	81.6	81.9	82.4	82.2	82.3	82.5	82.7	82.7	82.6	82.7	1.1
Participation rate (15-64)	79.5	79.9	80.3	80.2	80.2	80.3	80.5	80.5	80.5	80.6	1.1
young (15-24)	67.8	69.4	69.3	69.4	69.1	69.0	69.2	69.3	69.3	69.3	1.5
prime-age (25-54)	89.0	87.4	86.9	86.7	86.5	86.5	86.6	86.6	86.6	86.6	-2.4
older (55-64)	61.1	67.4	71.7	71.2	71.5	71.1	72.0	72.9	73.0	73.2	12.1
Participation rate (20-64) - FEMALES	77.7	78.5	79.8	79.9	80.1	80.4	80.7	80.7	80.7	80.8	3.1
Participation rate (15-64) - FEMALES	76.1	77.0	78.2	78.3	78.4	78.6	78.8	78.9	78.9	79.0	2.9
young (15-24)	67.6	69.4	69.4	69.5	69.2	69.1	69.3	69.4	69.4	69.4	1.8
prime-age (25-54)	85.6	84.7	84.4	84.5	84.4	84.5	84.6	84.6	84.6	84.6	-1.0
older (55-64)	54.9	60.8	68.1	68.2	68.9	69.0	69.9	70.9	71.2	71.4	16.5
Participation rate (20-64) - MALES	85.6	85.3	85.0	84.5	84.5	84.5	84.7	84.6	84.5	84.6	-1.0
Participation rate (15-64) - MALES	82.8	82.8	82.5	82.0	82.0	81.9	82.0	82.0	82.0	82.1	-0.7
young (15-24)	68.0	69.4	69.1	69.4	69.0	68.9	69.1	69.2	69.3	69.3	1.3
prime-age (25-54)	92.4	90.0	89.3	88.8	88.5	88.5	88.5	88.4	88.5	88.5	-3.9
older (55-64)	67.4	73.9	75.3	74.2	74.2	73.3	74.3	74.9	74.8	75.0	7.5
Employment rate (15-64)	73.5	76.0	76.5	76.3	76.4	76.5	76.6	76.7	76.7	76.8	3.3
Employment rate (20-64)	76.0	78.3	78.8	78.6	78.7	78.9	79.1	79.1	79.0	79.1	3.1
Employment rate (15-74)	65.5	66.1	66.8	66.7	66.4	66.5	67.3	68.0	68.1	67.6	2.1
Unemployment rate (15-64)	7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	-2.8
Unemployment rate (20-64)	6.9	4.4	4.4	4.4	4.4	4.3	4.4	4.4	4.4	4.4	-2.5
Unemployment rate (15-74)	7.4	4.7	4.7	4.6	4.6	4.6	4.6	4.6	4.6	4.6	-2.8
Employment (20-64) (in millions)	2.5	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.5	0.1
Employment (15-64) (in millions)	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	0.1
share of young (15-24)	15%	16%	16%	16%	16%	16%	16%	16%	16%	16%	1%
share of prime-age (25-54)	70%	67%	65%	65%	66%	67%	67%	66%	65%	66%	-4%
share of older (55-64)	16%	17%	19%	19%	18%	17%	17%	18%	19%	19%	3%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	19.8	20.3	21.3	21.2	20.1	18.5	18.5	19.9	20.6	20.2	0.4
Old-age dependency ratio (2)	25	32	34	37	40	42	42	42	42	44	18
Total dependency ratio (3)	53	59	61	65	69	70	70	69	69	71	18
Total economic dependency ratio (4)	104	104	106	109	112	114	114	112	112	113	9
Economic old-age dependency ratio (15-64) (5)	32	40	42	45	49	51	51	51	51	52	20
Economic old-age dependency ratio (15-74) (6)	32	39	41	44	47	49	49	49	49	50	18

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

5. Germany

Germany — EC-EPC (AWG) 2012 projections

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.36	1.40	1.41	1.43	1.45	1.47	1.48	1.50	1.52	1.54	0.2
Life expectancy at birth											
males	77.6	79.3	80.0	80.8	81.5	82.2	82.9	83.6	84.2	84.8	7.2
females	82.7	84.1	84.7	85.4	86.0	86.6	87.2	87.8	88.3	88.9	6.2
Life expectancy at 65											
males	17.4	18.5	19.0	19.5	20.0	20.5	21.0	21.5	21.9	22.4	5.0
females	20.6	21.6	22.1	22.6	23.1	23.6	24.1	24.5	25.0	25.4	4.8
Net migration (thousand)	41.0	114.6	129.8	133.0	108.5	82.4	92.0	87.7	90.1	72.3	31.2
Net migration as % of population	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Population (million)	81.7	80.0	79.0	77.7	76.3	74.6	72.7	70.6	68.3	66.2	-15.5
Children population (0-14) as % of total population	13.4	12.6	12.6	12.5	12.3	12.1	12.0	12.1	12.3	12.5	-0.9
Prime age population (25-54) as % of total population	42.6	38.6	36.3	35.7	35.3	34.6	33.7	33.4	33.2	33.2	-9.3
Working age population (15-64) as % of total population	66.0	64.2	62.1	59.2	56.7	56.2	56.0	55.6	54.9	54.8	-11.2
Elderly population (65 and over) as % of total population	20.6	23.2	25.3	28.4	31.0	31.7	32.0	32.3	32.8	32.8	12.2
Very elderly population (80 and over) as % of total population	5.1	7.3	8.0	8.2	9.2	10.7	12.9	14.5	14.1	13.5	8.4
Very elderly population (80 and over) as % of elderly population	24.9	31.6	31.5	28.9	29.5	33.8	40.4	44.7	42.9	41.3	16.4
Very elderly population (80 and over) as % of working age population	7.8	11.4	12.9	13.8	16.1	19.1	23.1	26.0	25.6	24.7	16.9
Macroeconomic assumptions*	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**AVG 10-60**
Potential GDP (growth rate)	1.2	1.0	0.7	0.5	0.6	0.8	0.9	0.8	0.7	0.8	0.8
Employment (growth rate)	0.5	-0.4	-0.8	-1.1	-1.0	-0.7	-0.7	-0.8	-0.8	-0.7	-0.6
Labour input : hours worked (growth rate)	0.3	-0.4	-0.8	-1.1	-1.0	-0.7	-0.7	-0.8	-0.8	-0.7	-0.6
Labour productivity per hour (growth rate)	0.9	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.5	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	1.2	1.2	1.0	0.8	1.0	1.3	1.4	1.4	1.4	1.5	1.3
GDP per worker (growth rate)	0.7	1.4	1.5	1.5	1.6	1.5	1.5	1.6	1.6	1.6	1.5
GDP in 2010 prices (in millions euros)	2498.8	2886.2	3002.9	3088.0	3166.9	3281.2	3426.8	3570.2	3709.1	3854.2	
Labour force assumptions	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch 10-60**
Working age population (15-64) (in thousands)	53879	51350	49031	45993	43299	41942	40726	39218	37522	36218	-17661
Population growth (working age:15-64)	0.2	-0.7	-1.1	-1.3	-1.0	-0.5	-0.7	-0.7	-0.9	-0.6	-0.8
Population (20-64) (in thousands)	49655	47678	45528	42552	39874	38614	37530	36136	34534	33295	-16361
Population growth (20-64)	0.6	-0.7	-1.1	-1.4	-1.1	-0.4	-0.7	-0.8	-0.9	-0.6	-1.3
Labour force 15-64 (thousands)	41306	40259	38451	36154	34226	33218	32191	30935	29614	28572	-12733
Labour force 20-64 (thousands)	40032	39170	37423	35147	33222	32239	31251	30028	28737	27715	-12316
Participation rate (20-64)	80.6	82.2	82.2	82.6	83.3	83.5	83.3	83.1	83.2	83.2	2.6
Participation rate (15-64)	76.7	78.4	78.4	78.6	79.0	79.2	79.0	78.9	78.9	78.9	2.2
young (15-24)	51.6	51.3	50.9	50.6	50.5	50.7	50.9	50.8	50.8	50.6	-1.0
prime-age (25-54)	87.3	87.9	88.0	88.2	88.3	88.3	88.2	88.2	88.2	88.2	0.9
older (55-64)	62.5	72.0	73.0	72.8	73.9	75.3	75.3	74.7	74.9	74.8	12.3
Participation rate (20-64) - FEMALES	74.5	77.0	77.6	78.4	79.4	79.7	79.6	79.5	79.6	79.6	5.1
Participation rate (15-64) - FEMALES	70.8	73.5	73.9	74.6	75.2	75.5	75.5	75.3	75.4	75.3	4.5
young (15-24)	48.8	48.4	48.1	47.8	47.6	47.8	47.9	47.9	47.8	47.7	-1.2
prime-age (25-54)	81.3	82.8	83.2	83.7	84.0	84.0	83.9	83.9	83.9	83.9	2.5
older (55-64)	54.5	66.1	68.3	69.2	70.8	72.7	73.1	72.5	72.7	72.7	18.2
Participation rate (20-64) - MALES	86.6	87.2	86.7	86.7	87.2	87.2	86.8	86.6	86.8	86.8	0.2
Participation rate (15-64) - MALES	82.4	83.2	82.8	82.5	82.8	82.8	82.5	82.3	82.4	82.4	0.0
young (15-24)	54.3	54.2	53.7	53.4	53.3	53.5	53.7	53.6	53.6	53.4	-0.9
prime-age (25-54)	93.1	92.8	92.6	92.6	92.5	92.4	92.4	92.4	92.4	92.4	-0.7
older (55-64)	70.8	77.9	77.7	76.3	77.1	77.9	77.6	76.8	77.0	76.9	6.1
Employment rate (15-64)	71.2	73.6	73.6	73.8	74.2	74.3	74.2	74.0	74.1	74.0	2.9
Employment rate (20-64)	74.9	77.2	77.2	77.6	78.3	78.4	78.2	78.1	78.2	78.2	3.3
Employment rate (15-74)	61.4	64.9	63.9	62.7	62.0	63.0	64.4	64.1	63.4	63.2	1.7
Unemployment rate (15-64)	7.2	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	-1.0
Unemployment rate (20-64)	7.1	6.1	6.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-1.0
Unemployment rate (15-74)	7.1	6.0	5.9	5.8	5.8	5.9	5.9	5.9	5.8	5.9	-1.2
Employment (20-64) (in millions)	37.2	36.8	35.2	33.0	31.2	30.3	29.4	28.2	27.0	26.0	-11.2
Employment (15-64) (in millions)	38.3	37.8	36.1	33.9	32.1	31.2	30.2	29.0	27.8	26.8	-11.5
share of young (15-24)	11%	10%	10%	10%	10%	10%	10%	10%	10%	11%	-1%
share of prime-age (25-54)	74%	68%	66%	68%	70%	69%	67%	68%	68%	68%	-6%
share of older (55-64)	15%	22%	25%	22%	20%	21%	22%	22%	22%	21%	6%
Dependency ratios:	**2010**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**Ch 10-60**
Share of older population (55-64) (1)	18.4	24.5	26.5	24.1	21.4	22.0	23.5	23.4	22.8	22.5	4.1
Old-age dependency ratio (2)	31	36	41	48	55	56	57	58	60	60	29
Total dependency ratio (3)	52	56	61	69	76	78	79	80	82	83	31
Total economic dependency ratio (4)	110	104	109	116	123	127	129	130	132	133	23
Economic old-age dependency ratio (15-64) (5)	42	46	51	59	67	71	72	73	75	75	33
Economic old-age dependency ratio (15-74) (6)	42	44	48	55	63	67	68	69	70	71	29

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

6. Estonia

Estonia	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.62	1.64	1.65	1.66	1.66	1.67	1.68	1.69	1.70	1.70	0.1
Life expectancy at birth											
males	69.8	72.5	73.8	75.0	76.2	77.4	78.5	79.6	80.6	81.6	11.8
females	80.1	81.9	82.7	83.6	84.4	85.1	85.9	86.6	87.3	88.0	7.9
Life expectancy at 65											
males	14.1	15.5	16.2	16.9	17.6	18.3	19.0	19.6	20.3	20.9	6.8
females	19.1	20.4	21.0	21.6	22.2	22.7	23.3	23.8	24.4	24.9	5.8
Net migration (thousand)	-0.5	-1.0	-0.7	-0.3	0.5	0.6	0.7	0.8	0.6	0.0	0.6
Net migration as % of population	0.0	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Population (million)	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	-0.2
Children population (0-14) as % of total population	15.2	17.2	16.4	15.2	14.2	14.1	14.6	15.0	14.9	14.4	-0.8
Prime age population (25-54) as % of total population	41.9	41.2	39.5	37.9	37.3	36.2	34.4	34.0	34.6	34.8	-7.1
Working age population (15-64) as % of total population	67.7	63.5	62.6	62.4	62.2	61.0	59.3	57.1	55.0	55.1	-12.6
Elderly population (65 and over) as % of total population	17.0	19.3	20.9	22.5	23.6	24.9	26.1	27.9	30.1	30.5	13.4
Very elderly population (80 and over) as % of total population	4.2	5.5	5.7	6.4	7.3	8.4	9.1	9.6	10.3	11.2	7.0
Very elderly population (80 and over) as % of elderly population	24.5	28.7	27.1	28.3	31.1	33.7	35.1	34.4	34.3	36.7	12.3
Very elderly population (80 and over) as % of working age population	6.2	8.7	9.1	10.2	11.8	13.8	15.4	16.8	18.8	20.3	14.2
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-0.8	1.9	2.3	2.0	1.8	1.6	1.2	0.9	0.9	1.2	1.5
Employment (growth rate)	-2.0	-0.2	0.2	-0.1	-0.3	-0.5	-0.8	-1.0	-0.8	-0.4	-0.6
Labour input : hours worked (growth rate)	-2.4	-0.2	0.2	-0.1	-0.3	-0.5	-0.8	-1.0	-0.8	-0.4	-0.6
Labour productivity per hour (growth rate)	1.7	2.1	2.1	2.1	2.1	2.1	2.0	1.8	1.7	1.5	2.1
TFP (growth rate)	0.1	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.0	1.2
Capital deepening (contribution to labour productivity growth)	1.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.8
GDP per capita (growth rate)	-0.8	2.1	2.7	2.4	2.1	1.8	1.4	1.1	1.2	1.6	1.8
GDP per worker (growth rate)	1.3	2.1	2.1	2.1	2.1	2.1	2.0	1.8	1.7	1.5	2.1
GDP in 2010 prices (in millions euros)	14.5	18.6	20.6	23.1	25.3	27.5	29.4	30.9	32.2	33.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	907	840	815	797	782	757	728	692	656	645	-262
Population growth (working age:15-64)	0.1	-0.8	-0.6	-0.3	-0.5	-0.7	-0.9	-1.0	-1.0	0.0	-0.1
Population (20-64) (in thousands)	829	775	739	720	710	694	671	635	596	583	-246
Population growth (20-64)	1.5	-1.0	-0.9	-0.3	-0.4	-0.5	-0.8	-1.2	-1.2	0.0	-1.5
Labour force 15-64 (thousands)	672	639	615	601	589	574	552	522	495	487	-185
Labour force 20-64 (thousands)	665	633	609	594	583	568	547	517	490	482	-183
Participation rate (20-64)	80.2	81.7	82.3	82.5	82.1	81.8	81.5	81.5	82.3	82.7	2.5
Participation rate (15-64)	74.1	76.0	75.5	75.4	75.4	75.7	75.8	75.5	75.5	75.6	1.5
young (15-24)	39.6	35.0	33.3	35.6	37.0	38.2	37.7	36.2	35.3	35.7	-4.0
prime-age (25-54)	88.3	88.3	88.5	88.5	88.2	87.8	87.7	87.9	88.1	88.2	-0.1
older (55-64)	64.4	67.1	70.6	73.7	73.6	74.0	73.6	71.8	71.8	73.6	9.2
Participation rate (20-64) - FEMALES	76.8	79.0	79.7	79.8	79.3	78.9	78.6	78.7	79.5	80.0	3.2
Participation rate (15-64) - FEMALES	71.4	73.8	73.3	73.1	72.9	73.1	73.2	72.9	73.0	73.2	1.9
young (15-24)	35.2	30.8	29.3	31.1	32.6	33.5	33.2	31.9	31.1	31.4	-3.8
prime-age (25-54)	84.9	85.1	85.7	86.1	85.8	85.0	84.6	85.0	85.5	85.7	0.8
older (55-64)	64.4	69.0	71.5	73.3	72.7	73.2	73.2	71.5	71.4	73.4	8.9
Participation rate (20-64) - MALES	83.8	84.5	85.1	85.3	85.0	84.8	84.5	84.3	85.0	85.3	1.5
Participation rate (15-64) - MALES	77.1	78.4	77.7	77.7	77.8	78.4	78.4	78.0	77.9	77.9	0.9
young (15-24)	43.9	39.1	37.1	39.9	41.4	42.7	42.2	40.4	39.4	39.9	-4.0
prime-age (25-54)	91.8	91.5	91.3	90.9	90.6	90.5	90.8	90.9	90.7	90.6	-1.2
older (55-64)	64.3	64.6	69.6	74.2	74.5	74.8	74.1	72.0	72.2	73.9	9.6
Employment rate (15-64)	61.3	65.4	67.2	69.2	69.5	70.1	70.2	69.9	70.0	70.1	8.7
Employment rate (20-64)	66.8	70.5	73.6	75.9	75.9	75.8	75.6	75.7	76.4	76.8	10.1
Employment rate (15-74)	55.8	58.7	59.5	61.1	61.7	62.0	61.5	60.6	59.5	60.0	4.3
Unemployment rate (15-64)	17.2	14.0	10.9	8.2	7.7	7.5	7.4	7.3	7.3	7.3	-10.0
Unemployment rate (20-64)	16.7	13.7	10.6	8.0	7.5	7.3	7.2	7.2	7.1	7.1	-9.7
Unemployment rate (15-74)	16.8	13.6	10.6	7.9	7.5	7.2	7.1	7.0	6.9	7.0	-9.8
Employment (20-64) (in millions)	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	-0.1
Employment (15-64) (in millions)	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	-0.1
share of young (15-24)	9%	6%	7%	8%	9%	8%	8%	7%	8%	8%	-1%
share of prime-age (25-54)	75%	76%	75%	72%	71%	69%	68%	70%	74%	74%	-1%
share of older (55-64)	16%	18%	19%	20%	21%	22%	25%	23%	18%	17%	2%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	17.8	20.2	19.7	20.0	21.0	22.8	25.4	23.7	19.0	17.8	0.0
Old-age dependency ratio (2)	25	30	33	36	38	41	44	49	55	55	30
Total dependency ratio (3)	48	57	60	60	61	64	69	75	82	82	34
Total economic dependency ratio (4)	133	131	128	122	121	123	128	136	143	145	12
Economic old-age dependency ratio (15-64) (5)	38	42	45	47	50	53	57	63	71	73	36
Economic old-age dependency ratio (15-74) (6)	36	40	43	45	47	50	54	60	66	69	33

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

7. Ireland

Ireland	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	2.07	2.05	2.04	2.04	2.03	2.02	2.01	2.00	2.00	1.99	-0.1
Life expectancy at birth											
males	77.0	78.7	79.5	80.3	81.0	81.8	82.5	83.2	83.9	84.5	7.5
females	82.0	83.5	84.3	85.0	85.7	86.4	87.0	87.7	88.3	88.9	6.9
Life expectancy at 65											
males	16.8	18.0	18.5	19.1	19.6	20.1	20.7	21.2	21.7	22.2	5.3
females	20.0	21.2	21.8	22.4	22.9	23.5	24.0	24.5	25.0	25.5	5.5
Net migration (thousand)	-21.5	22.5	21.6	20.8	19.9	19.0	18.3	17.3	16.4	15.6	37.1
Net migration as % of population	-0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.7
Population (million)	4.5	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.4	6.6	2.1
Children population (0-14) as % of total population	21.5	22.2	20.3	18.7	18.3	18.9	19.5	19.4	18.8	18.0	-3.5
Prime age population (25-54) as % of total population	44.7	39.5	38.3	37.5	37.0	36.4	37.0	37.3	37.0	36.8	-7.9
Working age population (15-64) as % of total population	67.0	63.2	63.6	63.6	62.7	60.8	58.9	57.7	58.7	60.1	-6.9
Elderly population (65 and over) as % of total population	11.5	14.6	16.1	17.7	19.0	20.3	21.6	22.9	22.5	21.9	10.5
Very elderly population (80 and over) as % of total population	2.8	3.3	3.8	4.7	5.4	6.1	6.8	7.5	8.2	9.1	6.3
Very elderly population (80 and over) as % of elderly population	24.4	22.6	23.7	26.3	28.4	30.0	31.5	32.6	36.4	41.4	17.0
Very elderly population (80 and over) as % of working age population	4.2	5.2	6.0	7.3	8.6	10.0	11.6	12.9	14.0	15.1	11.0
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-1.5	3.3	3.4	2.7	2.2	1.8	1.6	2.0	2.2	2.3	2.1
Employment (growth rate)	-2.7	1.5	1.8	1.2	0.6	0.3	0.1	0.4	0.7	0.8	0.5
Labour input : hours worked (growth rate)	-3.2	1.5	1.8	1.2	0.6	0.3	0.1	0.4	0.7	0.8	0.5
Labour productivity per hour (growth rate)	1.8	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
TFP (growth rate)	0.4	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	1.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
GDP per capita (growth rate)	-2.0	2.2	2.4	1.8	1.3	1.0	0.9	1.3	1.7	1.9	1.3
GDP per worker (growth rate)	1.2	1.7	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.6
GDP in 2010 prices (in millions euros)	153.9	188.5	221.6	257.9	289.9	319.3	347.3	379.6	422.1	473.3	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	3000	3059	3225	3370	3469	3517	3544	3592	3758	3939	939
Population growth (working age:15-64)	-1.0	0.8	1.1	0.8	0.4	0.2	0.0	0.6	1.0	0.8	1.8
Population (20-64) (in thousands)	2727	2735	2847	2984	3112	3183	3199	3212	3348	3516	789
Population growth (20-64)	-0.8	0.7	0.8	1.0	0.7	0.3	-0.1	0.4	1.0	0.9	1.7
Labour force 15-64 (thousands)	2088	2117	2201	2293	2371	2403	2403	2427	2533	2650	563
Labour force 20-64 (thousands)	2040	2060	2136	2223	2306	2343	2343	2361	2461	2575	535
Participation rate (20-64)	74.8	75.3	75.0	74.5	74.1	73.6	73.2	73.5	73.5	73.2	-1.6
Participation rate (15-64)	69.6	69.2	68.2	68.0	68.3	68.3	67.8	67.6	67.4	67.3	-2.3
young (15-24)	42.3	40.2	40.1	42.1	43.6	43.4	41.9	40.9	41.2	42.0	-0.4
prime-age (25-54)	80.4	79.7	79.2	78.5	77.5	76.9	76.9	76.9	76.9	76.9	-3.5
older (55-64)	54.7	64.4	65.5	66.5	67.6	67.0	63.6	63.2	64.2	63.9	9.3
Participation rate (20-64) - FEMALES	66.4	69.2	69.7	69.7	69.5	68.9	68.3	68.4	68.6	68.5	2.1
Participation rate (15-64) - FEMALES	62.0	63.9	63.7	63.9	64.3	64.2	63.4	63.0	63.0	63.1	1.1
young (15-24)	41.5	39.1	38.9	40.9	42.3	42.0	40.5	39.5	39.9	40.6	-0.9
prime-age (25-54)	71.6	72.6	72.9	72.6	71.3	70.3	70.2	70.3	70.5	70.6	-1.0
older (55-64)	44.3	59.7	61.8	63.8	66.6	67.0	63.7	62.8	63.9	63.6	19.3
Participation rate (20-64) - MALES	83.3	81.5	80.4	79.3	78.7	78.3	78.1	78.5	78.2	77.7	-5.5
Participation rate (15-64) - MALES	77.2	74.6	72.8	72.1	72.3	72.4	72.1	72.0	71.6	71.3	-5.9
young (15-24)	43.2	41.4	41.1	43.3	44.9	44.7	43.1	42.1	42.5	43.3	0.1
prime-age (25-54)	89.3	86.8	85.6	84.4	83.7	83.4	83.4	83.2	83.1	83.0	-6.3
older (55-64)	65.0	69.3	69.2	69.3	68.6	66.9	63.5	63.6	64.6	64.3	-0.7
Employment rate (15-64)	60.0	59.9	61.4	63.2	63.9	64.1	63.7	63.5	63.3	63.2	3.2
Employment rate (20-64)	64.9	65.7	67.9	69.5	69.5	69.2	68.9	69.3	69.3	69.0	4.1
Employment rate (15-74)	55.8	54.9	56.2	57.6	58.0	57.9	57.2	56.6	57.1	58.1	2.2
Unemployment rate (15-64)	13.7	13.4	10.0	7.1	6.5	6.3	6.1	6.1	6.0	6.0	-7.7
Unemployment rate (20-64)	13.2	12.8	9.5	6.7	6.2	6.0	5.9	5.8	5.7	5.7	-7.5
Unemployment rate (15-74)	13.5	13.0	9.7	6.8	6.3	6.0	5.8	5.8	5.8	5.8	-7.7
Employment (20-64) (in millions)	1.8	1.8	1.9	2.1	2.2	2.2	2.2	2.2	2.3	2.4	0.7
Employment (15-64) (in millions)	1.8	1.8	2.0	2.1	2.2	2.3	2.3	2.3	2.4	2.5	0.7
share of young (15-24)	9%	9%	11%	13%	13%	12%	11%	11%	12%	12%	3%
share of prime-age (25-54)	78%	73%	71%	69%	67%	68%	72%	74%	72%	70%	-8%
share of older (55-64)	13%	17%	18%	19%	20%	21%	17%	15%	16%	17%	5%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	15.1	17.7	18.1	18.5	19.6	20.5	18.1	15.2	15.9	17.7	2.6
Old-age dependency ratio (2)	17	23	25	28	30	33	37	40	38	37	19
Total dependency ratio (3)	49	58	57	57	60	64	70	73	70	67	17
Total economic dependency ratio (4)	144	154	145	137	138	143	151	157	157	153	9
Economic old-age dependency ratio (15-64) (5)	26	34	37	39	42	47	52	56	56	54	27
Economic old-age dependency ratio (15-74) (6)	26	33	35	37	40	44	49	53	53	52	26

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

8. Greece

Greece	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.52	1.55	1.56	1.57	1.58	1.59	1.61	1.62	1.63	1.64	0.1
Life expectancy at birth											
males	77.8	79.4	80.2	80.9	81.6	82.3	83.0	83.7	84.3	84.9	7.1
females	82.8	84.0	84.5	85.1	85.7	86.2	86.7	87.3	87.8	88.3	5.5
Life expectancy at 65											
males	17.9	18.9	19.4	19.9	20.4	20.8	21.3	21.7	22.2	22.6	4.7
females	20.2	21.1	21.6	22.0	22.5	22.9	23.3	23.8	24.2	24.6	4.4
Net migration (thousand)	26.2	37.0	36.4	35.8	37.0	35.9	34.8	29.8	27.0	25.3	-0.9
Net migration as % of population	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.0
Population (million)	11.3	11.5	11.6	11.6	11.6	11.6	11.6	11.6	11.4	11.3	0.0
Children population (0-14) as % of total population	14.4	14.8	14.1	13.4	13.1	13.2	13.5	13.7	13.6	13.5	-0.9
Prime age population (25-54) as % of total population	44.0	41.3	39.1	36.9	35.1	34.0	33.8	33.7	33.7	33.8	-10.1
Working age population (15-64) as % of total population	66.5	64.2	63.5	62.7	60.8	58.5	56.2	54.8	54.8	55.2	-11.3
Elderly population (65 and over) as % of total population	19.1	21.1	22.4	23.9	26.1	28.3	30.3	31.5	31.6	31.2	12.2
Very elderly population (80 and over) as % of total population	4.8	6.5	6.4	7.0	7.7	8.7	9.7	11.0	12.3	13.4	8.6
Very elderly population (80 and over) as % of elderly population	25.2	31.0	28.7	29.3	29.5	30.8	31.8	35.0	39.0	43.0	17.8
Very elderly population (80 and over) as % of working age population	7.2	10.2	10.1	11.2	12.7	14.9	17.2	20.1	22.5	24.3	17.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-0.3	1.2	1.2	1.4	1.2	1.0	1.0	1.3	1.3	1.4	1.0
Employment (growth rate)	-0.2	0.5	0.0	-0.2	-0.4	-0.6	-0.6	-0.3	-0.2	-0.1	-0.2
Labour input : hours worked (growth rate)	0.3	0.5	0.0	-0.2	-0.4	-0.6	-0.6	-0.3	-0.2	-0.1	-0.1
Labour productivity per hour (growth rate)	-0.6	0.7	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.1
TFP (growth rate)	-0.3	0.5	0.8	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.8
Capital deepening (contribution to labour productivity growth)	-0.3	0.2	0.4	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.3
GDP per capita (growth rate)	-4.0	1.1	1.1	1.4	1.2	1.0	1.1	1.4	1.6	1.7	0.9
GDP per worker (growth rate)	-0.2	0.7	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.2
GDP in 2010 prices (in millions euros)	230.2	248.6	263.4	280.9	299.7	316.6	333.1	352.6	376.4	403.1	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	7534	7398	7344	7262	7053	6801	6533	6336	6270	6230	-1303
Population growth (working age:15-64)	4.3	-0.2	-0.2	-0.3	-0.7	-0.8	-0.8	-0.4	-0.1	-0.1	-4.4
Population (20-64) (in thousands)	6965	6847	6735	6657	6490	6267	6006	5802	5720	5676	-1289
Population growth (20-64)	4.3	-0.3	-0.4	-0.3	-0.6	-0.8	-0.9	-0.5	-0.2	-0.1	-4.5
Labour force 15-64 (thousands)	5151	5274	5219	5129	5016	4870	4716	4611	4560	4521	-630
Labour force 20-64 (thousands)	5102	5228	5169	5077	4967	4824	4671	4566	4514	4474	-628
Participation rate (20-64)	73.2	76.4	76.7	76.3	76.5	77.0	77.8	78.7	78.9	78.8	5.6
Participation rate (15-64)	68.4	71.3	71.1	70.6	71.1	71.6	72.2	72.8	72.7	72.6	4.2
young (15-24)	31.4	30.5	29.4	30.6	31.7	31.5	31.0	30.6	30.4	30.6	-0.8
prime-age (25-54)	83.5	85.8	86.0	86.0	85.9	85.8	85.9	86.0	86.0	85.9	2.4
older (55-64)	45.5	55.6	59.7	61.2	63.4	64.9	65.9	68.4	69.2	69.6	24.1
Participation rate (20-64) - FEMALES	61.8	67.4	68.5	68.5	69.1	69.8	70.5	71.2	71.4	71.4	9.6
Participation rate (15-64) - FEMALES	57.7	62.9	63.4	63.5	64.3	64.9	65.5	66.0	65.9	65.8	8.1
young (15-24)	28.0	27.6	26.4	27.5	28.5	28.4	27.9	27.5	27.3	27.5	-0.5
prime-age (25-54)	72.3	76.9	77.7	78.0	78.1	77.9	78.0	78.1	78.1	78.0	5.7
older (55-64)	31.4	45.5	50.5	52.8	55.4	57.7	58.9	60.9	61.6	61.9	30.5
Participation rate (20-64) - MALES	84.5	85.1	84.8	83.8	83.8	84.1	85.1	86.3	86.5	86.4	1.9
Participation rate (15-64) - MALES	78.8	79.4	78.5	77.6	77.8	78.2	78.9	79.6	79.6	79.4	0.6
young (15-24)	34.5	33.3	32.2	33.7	34.7	34.5	34.0	33.5	33.3	33.6	-0.9
prime-age (25-54)	94.2	94.3	94.1	93.9	93.8	93.9	94.1	94.1	94.1	94.0	-0.3
older (55-64)	60.4	66.0	68.7	69.2	70.8	71.5	72.6	75.9	76.9	77.3	16.9
Employment rate (15-64)	59.6	63.7	64.7	64.9	65.6	66.2	66.9	67.4	67.4	67.3	7.7
Employment rate (20-64)	64.1	68.4	70.0	70.2	70.8	71.3	72.2	73.1	73.3	73.2	9.2
Employment rate (15-74)	52.8	55.2	55.6	55.2	54.8	54.3	54.2	54.7	55.8	56.6	3.8
Unemployment rate (15-64)	12.8	10.6	8.9	8.1	7.7	7.5	7.4	7.3	7.3	7.3	-5.5
Unemployment rate (20-64)	12.5	10.4	8.7	7.9	7.5	7.3	7.2	7.2	7.1	7.1	-5.4
Unemployment rate (15-74)	12.6	10.5	8.8	8.0	7.6	7.4	7.3	7.2	7.2	7.2	-5.5
Employment (20-64) (in millions)	4.5	4.7	4.7	4.7	4.6	4.5	4.3	4.2	4.2	4.2	-0.3
Employment (15-64) (in millions)	4.5	4.7	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.2	-0.3
share of young (15-24)	6%	5%	5%	6%	6%	6%	6%	6%	6%	7%	1%
share of prime-age (25-54)	81%	78%	75%	72%	70%	70%	72%	73%	73%	73%	-9%
share of older (55-64)	13%	17%	20%	22%	24%	24%	22%	21%	21%	21%	8%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.2	20.7	22.5	24.2	25.4	25.4	23.3	21.6	20.9	20.8	2.6
Old-age dependency ratio (2)	29	33	35	38	43	48	54	58	58	57	28
Total dependency ratio (3)	50	56	57	59	65	71	78	83	82	81	31
Total economic dependency ratio (4)	148	142	140	142	147	154	161	166	166	165	17
Economic old-age dependency ratio (15-64) (5)	46	50	53	57	64	71	79	84	84	82	36
Economic old-age dependency ratio (15-74) (6)	46	50	52	56	63	70	77	82	82	81	35

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

9. Spain

Spain	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.40	1.43	1.45	1.46	1.48	1.50	1.51	1.53	1.54	1.56	0.2
Life expectancy at birth											
males	78.6	80.2	80.9	81.6	82.3	83.0	83.6	84.2	84.8	85.4	6.8
females	84.7	85.8	86.4	86.9	87.5	88.0	88.5	89.0	89.5	89.9	5.3
Life expectancy at 65											
males	18.2	19.2	19.7	20.2	20.7	21.1	21.6	22.0	22.5	22.9	4.7
females	22.1	23.0	23.4	23.9	24.3	24.7	25.1	25.5	25.9	26.3	4.1
Net migration (thousand)	79.1	267.4	257.2	254.0	252.4	249.6	234.1	209.7	195.4	185.2	106.1
Net migration as % of population	0.2	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.2
Population (million)	46.1	48.1	49.1	50.1	51.0	51.8	52.4	52.7	52.6	52.2	6.2
Children population (0-14) as % of total population	15.0	14.8	13.7	12.8	12.6	12.8	13.0	13.1	12.9	12.7	-2.3
Prime age population (25-54) as % of total population	46.6	42.8	40.5	38.3	36.4	35.4	35.1	34.8	34.6	34.4	-12.3
Working age population (15-64) as % of total population	68.0	65.9	65.4	64.1	61.9	59.2	56.5	55.3	55.4	55.9	-12.2
Elderly population (65 and over) as % of total population	17.0	19.2	20.9	23.1	25.5	28.0	30.4	31.6	31.7	31.4	14.4
Very elderly population (80 and over) as % of total population	5.0	5.9	6.2	6.9	7.6	8.7	10.1	11.5	13.0	14.3	9.4
Very elderly population (80 and over) as % of elderly population	29.2	30.6	29.8	29.9	30.0	31.1	33.1	36.4	41.0	45.6	16.4
Very elderly population (80 and over) as % of working age population	7.3	8.9	9.5	10.8	12.3	14.7	17.8	20.8	23.4	25.6	18.3
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	0.7	2.4	2.8	2.2	1.5	1.1	1.0	1.2	1.5	1.6	1.6
Employment (growth rate)	-1.1	1.7	1.7	0.6	-0.1	-0.5	-0.6	-0.4	-0.1	0.0	0.2
Labour input : hours worked (growth rate)	-0.9	1.7	1.7	0.6	-0.1	-0.5	-0.6	-0.4	-0.1	0.0	0.2
Labour productivity per hour (growth rate)	1.6	0.7	1.1	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4
TFP (growth rate)	0.3	0.4	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8
Capital deepening (contribution to labour productivity growth)	1.3	0.2	0.4	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6
GDP per capita (growth rate)	0.0	1.9	2.4	1.8	1.2	0.8	0.8	1.2	1.5	1.7	1.3
GDP per worker (growth rate)	1.8	0.6	1.1	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4
GDP in 2010 prices (in millions euros)	1062.6	1284.4	1460.7	1656.9	1803.6	1920.8	2023.3	2140.4	2291.3	2470.7	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	31347	31699	32144	32095	31567	30658	29645	29159	29128	29175	-2172
Population growth (working age:15-64)	0.0	0.4	0.2	-0.2	-0.4	-0.7	-0.6	-0.2	0.0	0.0	0.0
Population (20-64) (in thousands)	29119	29252	29480	29522	29201	28408	27382	26806	26681	26707	-2412
Population growth (20-64)	0.1	0.2	0.1	0.0	-0.3	-0.7	-0.7	-0.2	0.0	0.0	-0.1
Labour force 15-64 (thousands)	23014	24212	24662	24822	24574	23891	23101	22694	22599	22599	-415
Labour force 20-64 (thousands)	22624	23801	24214	24371	24159	23501	22714	22294	22182	22174	-450
Participation rate (20-64)	77.7	81.4	82.1	82.6	82.7	82.7	83.0	83.2	83.1	83.0	5.3
Participation rate (15-64)	73.4	76.4	76.7	77.3	77.8	77.9	77.9	77.8	77.6	77.5	4.0
young (15-24)	43.0	40.5	40.7	42.4	43.2	42.8	42.0	41.4	41.3	41.8	-1.2
prime-age (25-54)	85.5	87.8	88.2	88.2	88.0	87.9	88.0	88.0	88.0	87.9	2.4
older (55-64)	50.8	66.5	71.3	74.9	76.6	76.0	75.6	75.9	76.1	76.4	25.6
Participation rate (20-64) - FEMALES	69.7	77.4	79.2	80.3	81.0	81.2	81.4	81.5	81.5	81.5	11.7
Participation rate (15-64) - FEMALES	65.9	72.5	73.9	75.1	76.1	76.4	76.3	76.1	75.9	75.8	9.9
young (15-24)	40.2	37.7	37.8	39.5	40.3	39.9	39.1	38.6	38.5	38.9	-1.3
prime-age (25-54)	78.3	84.0	85.4	85.8	85.6	85.3	85.4	85.5	85.5	85.5	7.2
older (55-64)	38.5	62.5	68.5	73.4	77.0	77.7	77.4	77.4	77.6	78.0	39.5
Participation rate (20-64) - MALES	85.5	85.2	85.0	84.7	84.4	84.2	84.5	84.8	84.7	84.6	-1.0
Participation rate (15-64) - MALES	80.8	80.1	79.5	79.5	79.5	79.5	79.5	79.5	79.2	79.1	-1.7
young (15-24)	45.6	43.3	43.4	45.2	46.0	45.6	44.8	44.2	44.1	44.5	-1.0
prime-age (25-54)	92.5	91.5	90.9	90.5	90.3	90.4	90.5	90.4	90.3	90.2	-2.3
older (55-64)	63.9	70.6	74.2	76.5	76.2	74.4	73.7	74.4	74.5	74.9	11.0
Employment rate (15-64)	58.6	63.3	67.1	70.5	71.6	71.9	72.1	72.1	71.9	71.8	13.2
Employment rate (20-64)	62.6	67.9	72.2	75.5	76.3	76.6	77.0	77.3	77.3	77.2	14.7
Employment rate (15-74)	52.6	56.3	59.6	61.9	62.1	61.7	61.0	61.0	62.0	62.7	10.0
Unemployment rate (15-64)	20.2	17.2	12.6	8.9	8.1	7.7	7.5	7.4	7.3	7.3	-12.9
Unemployment rate (20-64)	19.5	16.5	12.1	8.5	7.8	7.4	7.2	7.1	7.0	7.0	-12.5
Unemployment rate (15-74)	20.1	16.9	12.3	8.6	7.8	7.3	7.1	7.1	7.1	7.0	-13.1
Employment (20-64) (in millions)	18.2	19.9	21.3	22.3	22.3	21.8	21.1	20.7	20.6	20.6	2.4
Employment (15-64) (in millions)	18.4	20.1	21.6	22.6	22.6	22.1	21.4	21.0	20.9	21.0	2.6
share of young (15-24)	7%	6%	7%	8%	8%	8%	8%	8%	8%	9%	2%
share of prime-age (25-54)	81%	76%	72%	68%	67%	68%	70%	71%	71%	70%	-11%
share of older (55-64)	12%	18%	21%	23%	25%	25%	22%	21%	20%	21%	9%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	16.1	19.9	21.7	23.5	25.1	24.5	22.2	20.7	20.4	21.1	5.0
Old-age dependency ratio (2)	25	29	32	36	41	47	54	57	57	56	31
Total dependency ratio (3)	47	52	53	56	61	69	77	81	81	79	32
Total economic dependency ratio (4)	149	135	121	112	115	122	131	138	140	138	-11
Economic old-age dependency ratio (15-64) (5)	42	44	44	47	53	60	68	74	75	74	32
Economic old-age dependency ratio (15-74) (6)	41	43	43	45	50	57	65	70	71	70	29

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

10. France

France	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	2.00	1.99	1.98	1.98	1.97	1.97	1.96	1.96	1.95	1.95	-0.1
Life expectancy at birth											
males	77.9	79.6	80.3	81.1	81.8	82.5	83.2	83.9	84.5	85.1	7.2
females	84.6	85.8	86.4	87.0	87.6	88.1	88.6	89.1	89.6	90.0	5.5
Life expectancy at 65											
males	18.5	19.5	19.9	20.4	20.8	21.3	21.7	22.1	22.6	23.0	4.5
females	22.7	23.6	24.0	24.4	24.8	25.2	25.5	25.9	26.3	26.6	3.9
Net migration (thousand)	71.9	92.7	89.1	87.0	83.4	76.8	75.5	70.7	66.9	62.9	-9.0
Net migration as % of population	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Population (million)	64.9	68.0	69.2	70.4	71.4	72.3	72.8	73.2	73.5	73.7	8.9
Children population (0-14) as % of total population	18.5	18.1	17.7	17.3	17.0	16.8	16.8	16.7	16.6	16.4	-2.1
Prime age population (25-54) as % of total population	39.7	37.3	36.2	35.3	35.2	35.0	34.8	34.8	34.7	34.7	-5.0
Working age population (15-64) as % of total population	64.8	61.5	60.4	59.3	58.4	57.6	57.4	57.2	57.0	57.0	-7.7
Elderly population (65 and over) as % of total population	16.7	20.3	21.8	23.4	24.6	25.6	25.8	26.1	26.5	26.6	9.9
Very elderly population (80 and over) as % of total population	5.3	6.0	6.1	7.5	8.6	9.4	10.1	10.7	11.1	11.0	5.7
Very elderly population (80 and over) as % of elderly population	31.9	29.7	28.1	32.0	34.9	36.9	39.4	40.9	41.8	41.5	9.6
Very elderly population (80 and over) as % of working age population	8.2	9.8	10.2	12.6	14.7	16.4	17.7	18.6	19.4	19.4	11.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.6	1.9	1.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7
Employment (growth rate)	0.4	0.6	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2
Labour input : hours worked (growth rate)	0.4	0.6	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2
Labour productivity per hour (growth rate)	1.1	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	-0.7	1.5	1.5	1.3	1.3	1.4	1.5	1.5	1.5	1.6	1.4
GDP per worker (growth rate)	1.1	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
GDP in 2010 prices (in millions euros)	1947.6	2391.1	2631.0	2859.3	3092.0	3351.4	3629.5	3923.4	4243.3	4597.0	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	42041	41827	41852	41781	41704	41600	41817	41893	41893	42071	31
Population growth (working age:15-64)	2.5	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	-2.4
Population (20-64) (in thousands)	38084	37790	37701	37589	37541	37490	37731	37782	37749	37923	-161
Population growth (20-64)	2.5	0.0	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	-2.3
Labour force 15-64 (thousands)	29616	30563	31019	30996	30976	31091	31214	31238	31277	31413	1797
Labour force 20-64 (thousands)	28977	29916	30365	30328	30311	30435	30563	30584	30618	30752	1775
Participation rate (20-64)	76.1	79.2	80.5	80.7	80.7	81.2	81.0	81.0	81.1	81.1	5.0
Participation rate (15-64)	70.4	73.1	74.1	74.2	74.3	74.7	74.6	74.6	74.7	74.7	4.2
young (15-24)	39.8	39.4	39.2	39.4	39.7	39.8	39.7	39.5	39.5	39.6	-0.2
prime-age (25-54)	88.9	89.6	89.7	89.7	89.6	89.6	89.6	89.7	89.7	89.7	0.7
older (55-64)	42.5	55.4	61.9	63.0	62.3	63.8	63.4	62.8	63.2	63.3	20.8
Participation rate (20-64) - FEMALES	71.6	75.4	77.1	77.5	77.7	78.1	77.9	77.9	78.1	78.1	6.6
Participation rate (15-64) - FEMALES	66.2	69.5	70.9	71.2	71.3	71.8	71.7	71.6	71.7	71.7	5.5
young (15-24)	36.1	35.4	35.3	35.6	35.7	35.8	35.7	35.5	35.5	35.6	-0.5
prime-age (25-54)	83.8	85.7	86.1	86.2	86.2	86.1	86.1	86.2	86.2	86.2	2.4
older (55-64)	40.1	52.9	59.9	61.7	61.3	63.0	62.6	62.1	62.5	62.8	22.7
Participation rate (20-64) - MALES	80.7	83.0	84.0	83.9	83.8	84.2	84.0	83.9	84.0	84.0	3.2
Participation rate (15-64) - MALES	74.8	76.7	77.4	77.2	77.2	77.7	77.6	77.5	77.5	77.5	2.7
young (15-24)	43.5	43.3	43.0	43.1	43.5	43.6	43.5	43.3	43.3	43.4	-0.1
prime-age (25-54)	94.2	93.5	93.3	93.2	93.1	93.0	93.0	93.0	93.0	93.0	-1.2
older (55-64)	45.1	58.1	64.1	64.5	63.4	64.6	64.2	63.4	63.9	63.9	18.8
Employment rate (15-64)	63.8	67.2	68.4	68.6	68.8	69.3	69.2	69.1	69.2	69.2	5.4
Employment rate (20-64)	69.3	73.1	74.7	74.9	75.1	75.5	75.4	75.3	75.5	75.5	6.2
Employment rate (15-74)	57.2	57.5	58.7	58.9	58.9	59.2	59.5	59.7	59.4	59.5	2.2
Unemployment rate (15-64)	9.4	8.0	7.7	7.5	7.4	7.3	7.3	7.3	7.3	7.3	-2.1
Unemployment rate (20-64)	9.0	7.7	7.3	7.1	7.0	7.0	7.0	7.0	7.0	6.9	-2.0
Unemployment rate (15-74)	9.4	8.0	7.6	7.4	7.3	7.3	7.2	7.2	7.2	7.2	-2.2
Employment (20-64) (in millions)	26.4	27.6	28.1	28.2	28.2	28.3	28.4	28.5	28.5	28.6	2.2
Employment (15-64) (in millions)	26.8	28.1	28.6	28.7	28.7	28.8	28.9	29.0	29.0	29.1	2.3
share of young (15-24)	9%	9%	9%	9%	10%	9%	9%	9%	9%	9%	0%
share of prime-age (25-54)	79%	75%	73%	73%	74%	74%	73%	74%	74%	74%	-5%
share of older (55-64)	12%	16%	18%	18%	17%	17%	17%	17%	17%	17%	5%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	19.5	20.2	20.6	20.5	19.7	19.3	19.9	19.7	19.4	19.5	0.1
Old-age dependency ratio (2)	26	33	36	39	42	44	45	46	46	47	21
Total dependency ratio (3)	54	62	65	69	71	74	74	75	75	75	21
Total economic dependency ratio (4)	141	140	139	141	144	146	147	148	149	148	8
Economic old-age dependency ratio (15-64) (5)	40	48	51	55	59	62	63	64	65	65	25
Economic old-age dependency ratio (15-74) (6)	40	48	51	54	58	61	62	63	64	64	24

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

11. Italy

Italy	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.42	1.45	1.47	1.48	1.50	1.51	1.53	1.54	1.56	1.57	0.2
Life expectancy at birth											
males	78.9	80.4	81.1	81.8	82.4	83.1	83.7	84.3	84.9	85.5	6.6
females	84.2	85.4	86.0	86.6	87.2	87.7	88.2	88.8	89.3	89.7	5.6
Life expectancy at 65											
males	18.1	19.1	19.6	20.1	20.6	21.0	21.5	22.0	22.4	22.8	4.7
females	21.7	22.7	23.1	23.6	24.0	24.5	24.9	25.3	25.7	26.1	4.4
Net migration (thousand)	360.7	344.1	334.8	338.7	326.3	312.3	286.4	269.8	259.1	244.3	-116.4
Net migration as % of population	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	-0.2
Population (million)	60.5	63.0	63.8	64.6	65.2	65.7	66.0	65.9	65.5	64.9	4.4
Children population (0-14) as % of total population	14.1	13.5	12.9	12.6	12.5	12.5	12.6	12.6	12.5	12.5	-1.6
Prime age population (25-54) as % of total population	43.3	40.5	38.3	36.5	35.7	35.4	35.0	34.6	34.5	34.3	-9.0
Working age population (15-64) as % of total population	65.7	64.1	63.4	61.7	59.5	57.5	56.3	55.9	55.9	55.9	-9.8
Elderly population (65 and over) as % of total population	20.3	22.4	23.7	25.7	28.0	30.0	31.1	31.5	31.6	31.6	11.4
Very elderly population (80 and over) as % of total population	5.9	7.2	7.5	8.3	8.8	9.7	11.1	12.6	13.8	14.1	8.2
Very elderly population (80 and over) as % of elderly population	28.9	32.2	31.6	32.1	31.5	32.2	35.6	39.9	43.5	44.6	15.6
Very elderly population (80 and over) as % of working age population	8.9	11.2	11.8	13.4	14.8	16.8	19.7	22.5	24.6	25.2	16.3
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	0.3	1.3	1.6	1.3	1.2	1.2	1.3	1.4	1.4	1.4	1.2
Employment (growth rate)	0.2	0.4	0.0	-0.2	-0.4	-0.3	-0.2	-0.1	-0.1	-0.2	-0.1
Labour input : hours worked (growth rate)	0.1	0.4	0.0	-0.2	-0.4	-0.3	-0.2	-0.1	-0.1	-0.2	-0.1
Labour productivity per hour (growth rate)	0.2	0.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.3
TFP (growth rate)	0.0	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8
Capital deepening (contribution to labour productivity growth)	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	-0.8	1.0	1.3	1.1	1.0	1.1	1.3	1.5	1.6	1.6	1.1
GDP per worker (growth rate)	0.1	0.9	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.3
GDP in 2010 prices (in millions euros)	1548.8	1738.4	1867.2	2002.6	2128.4	2256.4	2404.4	2576.2	2766.3	2965.2	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	39747	40367	40458	39847	38834	37786	37143	36845	36603	36286	-3461
Population growth (working age:15-64)	0.9	0.1	-0.1	-0.5	-0.5	-0.5	-0.2	-0.1	-0.2	-0.2	-1.0
Population (20-64) (in thousands)	36792	37344	37347	36822	35930	34918	34268	33939	33670	33366	-3426
Population growth (20-64)	1.0	0.1	-0.1	-0.4	-0.5	-0.6	-0.3	-0.2	-0.2	-0.1	-1.1
Labour force 15-64 (thousands)	24718	25916	25963	25555	25009	24502	24215	24063	23906	23704	-1013
Labour force 20-64 (thousands)	24453	25651	25689	25283	24750	24248	23962	23808	23647	23446	-1007
Participation rate (20-64)	66.5	68.7	68.8	68.7	68.9	69.4	69.9	70.1	70.2	70.3	3.8
Participation rate (15-64)	62.2	64.2	64.2	64.1	64.4	64.8	65.2	65.3	65.3	65.3	3.1
young (15-24)	28.7	28.9	28.9	29.6	29.8	29.4	29.2	29.1	29.1	29.2	0.5
prime-age (25-54)	76.9	76.8	76.6	76.3	76.1	76.1	76.2	76.2	76.2	76.1	-0.8
older (55-64)	37.8	52.3	55.9	57.4	58.2	59.0	60.3	61.3	62.0	62.6	24.8
Participation rate (20-64) - FEMALES	54.5	58.2	58.5	58.5	58.8	59.3	59.7	59.9	60.0	60.1	5.6
Participation rate (15-64) - FEMALES	51.1	54.5	54.6	54.7	55.0	55.3	55.6	55.7	55.8	55.8	4.7
young (15-24)	23.5	23.5	23.5	24.0	24.2	23.9	23.7	23.6	23.6	23.7	0.2
prime-age (25-54)	64.4	66.2	66.2	65.7	65.3	65.1	65.2	65.2	65.2	65.1	0.7
older (55-64)	26.8	42.0	45.5	47.8	49.5	50.6	51.7	52.7	53.4	54.1	27.3
Participation rate (20-64) - MALES	78.5	79.1	79.0	78.6	78.7	79.2	79.7	79.9	79.9	79.8	1.3
Participation rate (15-64) - MALES	73.3	73.8	73.6	73.3	73.5	74.0	74.3	74.4	74.3	74.3	0.9
young (15-24)	33.6	33.9	33.9	34.6	34.9	34.5	34.3	34.1	34.1	34.3	0.7
prime-age (25-54)	89.4	87.3	86.7	86.4	86.3	86.5	86.5	86.5	86.4	86.4	-3.0
older (55-64)	49.5	63.2	66.9	67.4	67.2	67.7	69.0	69.9	70.4	70.8	21.4
Employment rate (15-64)	56.9	59.5	59.5	59.5	59.7	60.1	60.5	60.6	60.6	60.6	3.7
Employment rate (20-64)	61.1	63.9	64.0	63.9	64.1	64.6	65.1	65.3	65.4	65.4	4.4
Employment rate (15-74)	49.9	51.8	51.8	51.0	50.4	50.2	50.7	51.5	52.0	52.0	2.1
Unemployment rate (15-64)	8.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	-1.3
Unemployment rate (20-64)	8.1	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	-1.2
Unemployment rate (15-74)	8.4	7.2	7.1	7.1	7.0	7.0	7.0	7.1	7.0	7.0	-1.4
Employment (20-64) (in millions)	22.5	23.9	23.9	23.5	23.0	22.6	22.3	22.2	22.0	21.8	-0.6
Employment (15-64) (in millions)	22.6	24.0	24.1	23.7	23.2	22.7	22.5	22.3	22.2	22.0	-0.6
share of young (15-24)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	0%
share of prime-age (25-54)	82%	76%	73%	71%	71%	73%	73%	73%	72%	72%	-11%
share of older (55-64)	12%	18%	22%	23%	23%	22%	21%	21%	22%	22%	10%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.8	21.6	23.8	24.8	24.2	22.6	21.8	21.8	21.9	22.1	3.3
Old-age dependency ratio (2)	31	35	37	42	47	52	55	56	57	57	26
Total dependency ratio (3)	52	56	58	62	68	74	78	79	79	79	27
Total economic dependency ratio (4)	164	157	158	163	170	177	182	184	184	183	20
Economic old-age dependency ratio (15-64) (5)	53	57	60	66	75	82	87	89	89	89	36
Economic old-age dependency ratio (15-74) (6)	52	56	59	64	72	79	84	86	86	86	34

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**
(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64
(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64
(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64
(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74
(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64
(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74
NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

12. Cyprus

Cyprus — EC-EPC (AWG) 2012 projections

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.50	1.52	1.54	1.55	1.56	1.57	1.59	1.60	1.61	1.62	0.1
Life expectancy at birth											
males	78.3	79.9	80.6	81.3	82.0	82.7	83.3	83.9	84.5	85.1	6.8
females	82.8	84.2	84.8	85.4	86.1	86.7	87.3	87.9	88.4	89.0	6.2
Life expectancy at 65											
males	17.8	18.8	19.3	19.8	20.2	20.7	21.2	21.6	22.1	22.5	4.8
females	20.0	21.1	21.7	22.2	22.7	23.3	23.8	24.3	24.8	25.3	5.3
Net migration (thousand)	2.2	6.0	5.7	5.5	5.3	5.0	4.9	4.7	4.5	4.1	1.9
Net migration as % of population	0.3	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.1
Population (million)	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	0.3
Children population (0-14) as % of total population	16.8	17.3	17.2	16.5	15.5	14.8	14.6	14.8	14.9	14.8	-2.0
Prime age population (25-54) as % of total population	43.9	43.1	42.7	41.7	40.6	39.2	38.1	37.0	36.4	36.2	-7.7
Working age population (15-64) as % of total population	70.0	66.1	64.4	63.8	64.0	63.9	62.8	60.7	59.0	57.6	-12.4
Elderly population (65 and over) as % of total population	13.2	16.6	18.4	19.7	20.5	21.3	22.6	24.4	26.0	27.6	14.4
Very elderly population (80 and over) as % of total population	3.0	3.8	4.5	5.4	6.2	7.1	7.7	8.0	8.4	9.3	6.4
Very elderly population (80 and over) as % of elderly population	22.4	22.9	24.3	27.2	30.3	33.4	34.3	32.6	32.2	33.8	11.4
Very elderly population (80 and over) as % of working age population	4.2	5.8	6.9	8.4	9.7	11.2	12.3	13.1	14.2	16.2	11.9
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.7	1.8	1.9	2.4	2.3	2.2	1.8	1.6	1.4	1.5	1.8
Employment (growth rate)	0.6	1.0	0.7	0.7	0.6	0.5	0.1	-0.1	-0.2	-0.1	0.4
Labour input : hours worked (growth rate)	0.8	1.0	0.7	0.7	0.6	0.5	0.1	-0.1	-0.2	0.0	0.4
Labour productivity per hour (growth rate)	0.9	0.8	1.2	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.4
TFP (growth rate)	0.0	0.5	0.8	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.8
Capital deepening (contribution to labour productivity growth)	0.9	0.3	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
GDP per capita (growth rate)	-3.6	0.6	1.0	1.6	1.7	1.6	1.3	1.1	1.0	1.2	1.0
GDP per worker (growth rate)	1.1	0.8	1.2	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.4
GDP in 2010 prices (in millions euros)	17.5	20.8	22.8	25.4	28.5	31.8	35.1	38.1	40.9	44.0	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	564	588	604	623	646	663	670	664	659	655	90
Population growth (working age:15-64)	6.9	0.5	0.5	0.7	0.7	0.5	0.0	-0.2	-0.1	0.0	-6.9
Population (20-64) (in thousands)	508	544	555	568	589	607	615	611	605	598	90
Population growth (20-64)	5.0	0.6	0.3	0.6	0.7	0.6	0.0	-0.2	-0.2	-0.1	-5.1
Labour force 15-64 (thousands)	413	459	474	489	505	518	521	518	514	511	97
Labour force 20-64 (thousands)	406	453	468	482	498	510	514	511	507	503	98
Participation rate (20-64)	79.9	83.2	84.4	84.8	84.6	84.1	83.6	83.7	83.8	84.2	4.3
Participation rate (15-64)	73.2	77.9	78.6	78.4	78.2	78.0	77.9	78.1	78.0	78.0	4.8
young (15-24)	42.0	44.7	41.5	41.0	42.0	42.9	43.5	43.3	42.4	41.9	-0.1
prime-age (25-54)	87.3	90.2	90.8	90.9	90.9	90.9	90.8	90.9	91.0	91.0	3.7
older (55-64)	59.6	64.3	66.6	68.8	70.0	70.3	69.1	69.2	68.7	68.8	9.2
Participation rate (20-64) - FEMALES	72.7	79.1	81.2	82.2	82.4	81.9	81.2	81.2	81.5	82.0	9.2
Participation rate (15-64) - FEMALES	66.6	74.1	75.6	76.1	76.2	76.0	75.7	75.7	75.8	75.9	9.3
young (15-24)	41.3	43.5	40.4	39.6	40.7	41.6	42.2	42.0	41.1	40.6	-0.8
prime-age (25-54)	81.0	87.5	88.8	89.3	89.5	89.4	89.4	89.4	89.5	89.5	8.6
older (55-64)	44.8	52.9	56.7	60.5	63.1	64.6	63.7	63.4	63.0	63.1	18.3
Participation rate (20-64) - MALES	87.2	87.3	87.5	87.3	86.7	86.3	86.0	86.1	86.1	86.4	-0.8
Participation rate (15-64) - MALES	79.8	81.8	81.5	80.7	80.2	80.0	80.1	80.3	80.2	80.1	0.3
young (15-24)	42.6	45.8	42.6	42.3	43.3	44.1	44.7	44.5	43.6	43.2	0.6
prime-age (25-54)	93.5	93.0	92.7	92.6	92.4	92.3	92.3	92.4	92.4	92.4	-1.1
older (55-64)	75.1	75.5	76.1	76.5	76.3	75.8	74.8	75.2	74.4	74.4	-0.7
Employment rate (15-64)	68.3	73.8	74.7	74.7	74.6	74.4	74.3	74.5	74.5	74.5	6.2
Employment rate (20-64)	74.8	79.0	80.4	80.9	80.8	80.4	79.9	80.0	80.2	80.5	5.8
Employment rate (15-74)	63.1	66.7	66.9	66.8	67.0	67.1	66.4	65.5	64.6	64.5	1.4
Unemployment rate (15-64)	6.8	5.3	4.9	4.7	4.6	4.6	4.5	4.5	4.5	4.5	-2.3
Unemployment rate (20-64)	6.4	5.1	4.7	4.5	4.4	4.4	4.3	4.3	4.3	4.3	-2.1
Unemployment rate (15-74)	6.6	5.1	4.7	4.6	4.5	4.4	4.4	4.3	4.3	4.3	-2.3
Employment (20-64) (in millions)	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1
Employment (15-64) (in millions)	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1
share of young (15-24)	11%	9%	8%	8%	9%	9%	9%	9%	8%	9%	-2%
share of prime-age (25-54)	76%	76%	77%	76%	74%	72%	71%	72%	73%	74%	-2%
share of older (55-64)	13%	15%	15%	15%	17%	19%	20%	20%	19%	17%	4%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	16.2	18.2	17.4	17.2	18.4	20.7	22.0	22.2	21.3	19.6	3.3
Old-age dependency ratio (2)	19	25	29	31	32	33	36	40	44	48	29
Total dependency ratio (3)	43	51	55	57	56	57	59	65	69	74	31
Total economic dependency ratio (4)	104	98	100	102	102	102	105	110	116	121	17
Economic old-age dependency ratio (15-64) (5)	25	31	34	38	39	41	44	49	54	59	34
Economic old-age dependency ratio (15-74) (6)	24	30	33	36	38	39	42	46	51	56	31

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

13. Latvia

Latvia	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.31	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49	1.51	0.2
Life expectancy at birth											
males	68.3	71.2	72.6	74.0	75.3	76.6	77.8	78.9	80.0	81.1	12.8
females	78.0	80.1	81.1	82.1	83.1	83.9	84.8	85.6	86.4	87.2	9.2
Life expectancy at 65											
males	13.5	15.0	15.7	16.5	17.2	17.9	18.6	19.3	20.0	20.6	7.2
females	18.1	19.5	20.1	20.8	21.4	22.1	22.7	23.3	23.9	24.4	6.3
Net migration (thousand)	-3.4	-0.5	0.3	0.4	1.3	1.5	1.6	1.9	1.7	0.6	4.0
Net migration as % of population	-0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2
Population (million)	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.8	1.7	1.7	-0.6
Children population (0-14) as % of total population	13.8	14.9	14.0	13.0	12.1	11.9	12.1	12.3	12.2	11.9	-1.9
Prime age population (25-54) as % of total population	43.1	43.1	41.2	39.4	38.6	36.6	33.8	32.5	33.0	33.0	-10.1
Working age population (15-64) as % of total population	68.9	65.9	64.8	63.8	63.0	61.3	59.3	56.6	53.5	52.5	-16.4
Elderly population (65 and over) as % of total population	17.3	19.2	21.2	23.2	24.9	26.8	28.5	31.2	34.3	35.6	18.3
Very elderly population (80 and over) as % of total population	4.0	5.5	5.8	6.3	7.2	8.6	9.8	10.7	11.7	12.8	8.8
Very elderly population (80 and over) as % of elderly population	23.1	28.5	27.6	27.1	28.7	32.0	34.4	34.2	34.1	35.9	12.8
Very elderly population (80 and over) as % of working age population	5.8	8.3	9.0	9.9	11.4	14.0	16.6	18.8	21.9	24.4	18.5
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-1.9	1.9	2.5	1.9	1.5	1.3	0.6	0.3	0.5	0.6	1.1
Employment (growth rate)	-3.0	0.1	0.5	-0.4	-0.8	-1.0	-1.4	-1.6	-1.2	-1.0	-0.9
Labour input : hours worked (growth rate)	-4.4	0.1	0.5	-0.4	-0.8	-1.0	-1.4	-1.6	-1.2	-1.0	-1.0
Labour productivity per hour (growth rate)	2.6	1.9	2.1	2.3	2.3	2.3	2.1	1.9	1.7	1.5	2.1
TFP (growth rate)	0.6	1.2	1.3	1.5	1.5	1.5	1.3	1.2	1.1	1.0	1.2
Capital deepening (contribution to labour productivity growth)	2.0	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.9
GDP per capita (growth rate)	-0.7	2.5	3.1	2.5	2.1	1.8	1.3	1.0	1.2	1.4	1.8
GDP per worker (growth rate)	1.2	1.9	2.1	2.3	2.3	2.3	2.1	1.9	1.7	1.6	2.1
GDP in 2010 prices (in millions euros)	18.0	22.1	24.7	27.7	30.0	32.1	33.6	34.3	35.0	36.0	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	1544	1407	1346	1286	1232	1166	1097	1013	926	874	-670
Population growth (working age:15-64)	-1.0	-0.9	-1.0	-0.8	-0.9	-1.2	-1.3	-1.7	-1.7	-0.7	0.3
Population (20-64) (in thousands)	1407	1308	1234	1180	1135	1081	1021	939	851	800	-607
Population growth (20-64)	0.2	-1.1	-1.2	-0.8	-0.8	-1.0	-1.3	-1.9	-1.8	-0.7	-0.9
Labour force 15-64 (thousands)	1138	1087	1027	982	941	894	834	762	702	672	-466
Labour force 20-64 (thousands)	1124	1078	1017	972	932	886	827	755	695	665	-459
Participation rate (20-64)	79.9	82.4	82.4	82.4	82.1	81.9	81.0	80.5	81.7	83.1	3.3
Participation rate (15-64)	73.7	77.2	76.3	76.4	76.4	76.6	76.0	75.2	75.8	76.9	3.2
young (15-24)	42.2	37.1	36.0	38.9	39.5	40.6	40.1	38.8	38.1	38.5	-3.7
prime-age (25-54)	88.5	90.3	91.0	91.2	91.1	91.0	91.1	91.4	91.4	91.3	2.8
older (55-64)	57.1	62.3	61.8	63.2	63.3	64.8	64.4	61.4	60.3	64.7	7.5
Participation rate (20-64) - FEMALES	76.7	79.4	79.5	79.6	79.4	79.2	78.4	78.1	79.5	80.9	4.2
Participation rate (15-64) - FEMALES	70.9	74.6	73.7	73.9	73.9	74.1	73.6	73.0	73.7	74.8	3.8
young (15-24)	38.5	33.3	32.3	35.2	35.6	36.6	36.2	35.0	34.4	34.6	-3.8
prime-age (25-54)	85.8	88.3	89.2	89.6	89.7	89.6	89.7	90.1	90.2	90.0	4.2
older (55-64)	55.7	59.5	58.8	59.8	59.6	61.0	61.2	58.6	57.6	61.7	6.0
Participation rate (20-64) - MALES	83.2	85.5	85.3	85.2	84.9	84.6	83.6	82.8	83.9	85.3	2.1
Participation rate (15-64) - MALES	76.6	80.0	78.9	78.9	78.9	79.1	78.4	77.4	77.9	78.9	2.3
young (15-24)	45.7	40.6	39.5	42.5	43.3	44.5	44.0	42.5	41.8	42.2	-3.6
prime-age (25-54)	91.3	92.4	92.7	92.7	92.5	92.4	92.5	92.5	92.5	92.5	1.2
older (55-64)	59.0	65.9	65.3	67.0	67.4	68.8	67.8	64.4	63.0	67.6	8.6
Employment rate (15-64)	59.7	63.1	66.2	69.6	70.2	70.8	70.3	69.7	70.3	71.3	11.6
Employment rate (20-64)	65.1	67.6	71.7	75.3	75.7	75.8	75.1	74.6	75.9	77.2	12.1
Employment rate (15-74)	53.5	57.1	59.0	61.3	61.6	61.8	60.9	59.4	58.2	59.1	5.6
Unemployment rate (15-64)	19.0	18.3	13.3	8.8	8.0	7.7	7.5	7.4	7.3	7.3	-11.7
Unemployment rate (20-64)	18.4	18.0	12.9	8.6	7.9	7.5	7.3	7.2	7.2	7.1	-11.3
Unemployment rate (15-74)	18.7	17.9	12.9	8.5	7.8	7.4	7.2	7.1	6.9	6.9	-11.7
Employment (20-64) (in millions)	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.6	-0.3
Employment (15-64) (in millions)	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.6	-0.3
share of young (15-24)	10%	5%	6%	8%	8%	8%	7%	7%	8%	8%	-2%
share of prime-age (25-54)	77%	77%	76%	74%	73%	71%	68%	70%	75%	75%	-2%
share of older (55-64)	14%	17%	17%	18%	19%	21%	24%	23%	18%	17%	4%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	16.8	20.9	20.8	21.2	22.2	24.6	28.3	27.6	22.1	20.1	3.3
Old-age dependency ratio (2)	25	29	33	36	40	44	48	55	64	68	43
Total dependency ratio (3)	45	52	54	57	59	63	69	77	87	91	45
Total economic dependency ratio (4)	138	131	122	114	115	119	126	137	146	149	12
Economic old-age dependency ratio (15-64) (5)	40	42	44	47	51	56	62	72	83	88	48
Economic old-age dependency ratio (15-74) (6)	39	40	42	45	49	53	59	67	76	82	43

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

14. Lithuania

Lithuania	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.55	1.57	1.58	1.59	1.60	1.61	1.62	1.63	1.65	1.66	0.1
Life expectancy at birth											
males	67.7	70.7	72.1	73.5	74.8	76.1	77.3	78.5	79.6	80.7	12.9
females	78.7	80.6	81.5	82.4	83.2	84.0	84.8	85.6	86.3	87.1	8.4
Life expectancy at 65											
males	13.5	15.0	15.7	16.4	17.1	17.8	18.5	19.1	19.8	20.4	6.9
females	18.4	19.6	20.2	20.8	21.4	22.0	22.6	23.1	23.7	24.2	5.8
Net migration (thousand)	-13.0	-5.1	-2.8	-1.0	1.4	1.2	1.5	2.2	1.9	0.8	13.8
Net migration as % of population	-0.4	-0.2	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.4
Population (million)	3.3	3.2	3.1	3.0	3.0	2.9	2.9	2.8	2.7	2.7	-0.7
Children population (0-14) as % of total population	15.0	16.3	16.2	15.1	13.8	13.3	13.5	14.0	14.1	13.7	-1.2
Prime age population (25-54) as % of total population	43.1	42.0	40.2	38.3	37.7	36.9	35.3	34.2	34.1	34.5	-8.6
Working age population (15-64) as % of total population	68.9	66.0	64.0	62.7	62.0	61.1	60.0	58.2	56.0	55.0	-13.8
Elderly population (65 and over) as % of total population	16.1	17.7	19.8	22.3	24.2	25.6	26.4	27.8	29.9	31.2	15.1
Very elderly population (80 and over) as % of total population	3.7	4.9	5.3	5.6	6.4	7.8	9.3	10.2	10.6	10.8	7.1
Very elderly population (80 and over) as % of elderly population	23.0	27.8	26.6	25.2	26.3	30.6	35.3	36.5	35.5	34.7	11.6
Very elderly population (80 and over) as % of working age population	5.4	7.5	8.2	9.0	10.3	12.8	15.5	17.5	18.9	19.7	14.3
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-0.3	1.5	2.0	1.7	1.7	1.7	1.3	0.7	0.6	0.8	1.3
Employment (growth rate)	-3.3	0.0	0.1	-0.5	-0.5	-0.5	-0.7	-1.1	-1.1	-0.7	-0.8
Labour input : hours worked (growth rate)	-2.3	0.0	0.1	-0.5	-0.5	-0.5	-0.7	-1.1	-1.1	-0.7	-0.7
Labour productivity per hour (growth rate)	2.1	1.5	1.9	2.2	2.2	2.2	2.0	1.9	1.7	1.5	1.9
TFP (growth rate)	0.4	1.0	1.2	1.4	1.4	1.4	1.3	1.2	1.1	1.0	1.1
Capital deepening (contribution to labour productivity growth)	1.7	0.5	0.6	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.8
GDP per capita (growth rate)	0.8	1.9	2.4	2.1	2.1	2.1	1.7	1.2	1.1	1.4	1.7
GDP per worker (growth rate)	3.2	1.6	1.9	2.2	2.2	2.2	2.0	1.9	1.7	1.6	2.1
GDP in 2010 prices (in millions euros)	27.4	33.7	36.7	40.2	43.5	47.4	51.0	53.4	55.1	57.0	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	2287	2095	1989	1903	1841	1782	1719	1632	1536	1469	-818
Population growth (working age:15-64)	-0.9	-1.0	-1.0	-0.7	-0.7	-0.6	-0.8	-1.2	-1.1	-0.5	0.4
Population (20-64) (in thousands)	2054	1948	1827	1725	1669	1629	1586	1506	1405	1334	-719
Population growth (20-64)	-0.1	-0.9	-1.4	-0.8	-0.6	-0.4	-0.7	-1.3	-1.3	-0.6	-0.5
Labour force 15-64 (thousands)	1624	1549	1463	1384	1334	1301	1262	1194	1120	1072	-552
Labour force 20-64 (thousands)	1613	1542	1456	1376	1327	1294	1256	1189	1115	1066	-547
Participation rate (20-64)	78.5	79.2	79.7	79.8	79.5	79.5	79.2	78.9	79.3	79.9	1.4
Participation rate (15-64)	71.0	73.9	73.5	72.7	72.5	73.0	73.4	73.2	73.0	73.0	2.0
young (15-24)	31.3	32.2	28.2	27.9	30.3	31.6	32.1	30.9	29.5	29.4	-2.0
prime-age (25-54)	88.5	87.9	87.9	87.9	87.5	87.3	87.4	87.7	87.8	87.6	-0.8
older (55-64)	56.5	62.1	64.3	66.5	66.7	68.1	67.8	66.1	65.3	66.1	9.7
Participation rate (20-64) - FEMALES	76.1	76.6	77.7	78.2	77.9	77.8	77.5	77.2	77.7	78.3	2.2
Participation rate (15-64) - FEMALES	69.1	71.7	71.8	71.5	71.2	71.6	71.9	71.6	71.5	71.5	2.4
young (15-24)	27.7	28.6	24.9	24.6	26.7	28.0	28.4	27.4	26.0	25.9	-1.7
prime-age (25-54)	87.8	86.9	87.0	87.1	86.7	86.1	86.2	86.5	86.7	86.6	-1.2
older (55-64)	51.9	57.6	61.5	65.4	65.6	67.3	67.0	65.1	64.2	65.1	13.3
Participation rate (20-64) - MALES	81.1	81.9	81.9	81.4	81.1	81.1	80.8	80.6	80.9	81.4	0.3
Participation rate (15-64) - MALES	73.0	76.3	75.3	74.0	73.8	74.5	74.8	74.7	74.4	74.3	1.4
young (15-24)	34.9	35.7	31.3	31.0	33.6	35.1	35.5	34.3	32.7	32.6	-2.2
prime-age (25-54)	89.2	88.8	88.8	88.7	88.3	88.4	88.6	88.8	88.8	88.6	-0.5
older (55-64)	62.6	67.8	67.7	67.8	68.0	69.0	68.7	67.3	66.4	67.2	4.6
Employment rate (15-64)	58.2	61.6	64.4	66.5	66.7	67.5	67.9	67.8	67.6	67.7	9.5
Employment rate (20-64)	64.6	66.1	70.0	73.0	73.3	73.5	73.4	73.2	73.6	74.2	9.6
Employment rate (15-74)	52.3	55.1	56.4	57.0	57.0	57.9	58.5	57.8	56.1	55.7	3.4
Unemployment rate (15-64)	18.1	16.7	12.4	8.6	7.9	7.6	7.4	7.4	7.3	7.3	-10.8
Unemployment rate (20-64)	17.8	16.5	12.2	8.4	7.8	7.5	7.3	7.3	7.2	7.2	-10.6
Unemployment rate (15-74)	17.9	16.4	12.1	8.4	7.7	7.4	7.3	7.2	7.1	7.1	-10.8
Employment (20-64) (in millions)	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.0	1.0	-0.3
Employment (15-64) (in millions)	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.0	1.0	-0.3
share of young (15-24)	8%	5%	5%	6%	7%	7%	7%	6%	6%	7%	-1%
share of prime-age (25-54)	79%	76%	75%	74%	74%	72%	70%	70%	73%	75%	-4%
share of older (55-64)	13%	19%	20%	20%	19%	20%	23%	23%	21%	18%	5%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	15.6	21.2	21.8	21.1	20.2	21.4	24.5	25.3	22.5	19.2	3.6
Old-age dependency ratio (2)	23	27	31	36	39	42	44	48	53	57	33
Total dependency ratio (3)	45	52	56	60	61	64	67	72	78	82	37
Total economic dependency ratio (4)	146	141	137	133	135	136	139	146	154	159	14
Economic old-age dependency ratio (15-64) (5)	39	42	46	51	56	59	62	67	75	80	42
Economic old-age dependency ratio (15-74) (6)	38	41	44	49	54	58	60	65	72	77	39

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

15. Luxembourg

Luxembourg	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.59	1.61	1.62	1.63	1.64	1.65	1.65	1.66	1.67	1.68	0.1
Life expectancy at birth											
males	77.8	79.4	80.1	80.9	81.6	82.3	83.0	83.6	84.3	84.9	7.1
females	82.9	84.4	85.1	85.8	86.5	87.1	87.7	88.3	88.9	89.5	6.6
Life expectancy at 65											
males	17.3	18.4	18.9	19.5	20.0	20.5	21.0	21.4	21.9	22.4	5.0
females	21.1	22.2	22.8	23.3	23.8	24.3	24.7	25.2	25.6	26.1	4.9
Net migration (thousand)	6.3	3.7	3.6	3.4	3.3	3.1	3.0	2.8	2.7	2.6	-3.8
Net migration as % of population	1.2	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	-0.9
Population (million)	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.2
Children population (0-14) as % of total population	17.7	16.7	16.5	16.1	15.7	15.4	15.2	15.1	15.1	15.1	-2.5
Prime age population (25-54) as % of total population	45.5	43.3	41.7	40.4	39.3	38.3	37.6	37.0	36.6	36.4	-9.2
Working age population (15-64) as % of total population	68.4	67.6	66.1	64.3	62.7	61.6	60.7	59.7	59.0	58.5	-9.9
Elderly population (65 and over) as % of total population	14.0	15.8	17.4	19.6	21.6	23.0	24.2	25.2	25.8	26.4	12.5
Very elderly population (80 and over) as % of total population	3.7	4.3	4.5	5.0	5.9	6.9	8.1	9.2	9.8	10.2	6.5
Very elderly population (80 and over) as % of elderly population	26.6	27.3	25.5	25.7	27.1	30.0	33.7	36.5	37.8	38.7	12.1
Very elderly population (80 and over) as % of working age population	5.4	6.4	6.7	7.8	9.3	11.2	13.4	15.4	16.5	17.5	12.0
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	2.2	2.0	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.7	1.9
Employment (growth rate)	2.4	0.7	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.5
Labour input : hours worked (growth rate)	1.5	0.7	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.4
Labour productivity per hour (growth rate)	0.7	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.4	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
GDP per capita (growth rate)	-0.4	1.0	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.2
GDP per worker (growth rate)	-0.1	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
GDP in 2010 prices (in millions euros)	41.6	56.2	61.7	67.4	73.6	80.2	87.3	95.0	103.1	111.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	346	389	399	404	408	414	419	421	424	426	80
Population growth (working age:15-64)	5.0	0.7	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.1	-5.0
Population (20-64) (in thousands)	316	357	366	371	374	378	383	385	388	389	73
Population growth (20-64)	5.0	0.8	0.4	0.1	0.2	0.3	0.2	0.2	0.1	0.1	-5.0
Labour force 15-64 (thousands)	235	266	271	274	277	280	282	284	286	288	53
Labour force 20-64 (thousands)	232	263	268	271	274	277	279	281	283	284	52
Participation rate (20-64)	73.5	73.6	73.2	73.1	73.3	73.1	72.9	72.9	72.9	73.0	-0.5
Participation rate (15-64)	67.9	68.4	68.0	67.8	67.8	67.6	67.4	67.5	67.5	67.5	-0.4
young (15-24)	25.3	28.9	28.6	28.3	28.3	28.5	28.6	28.6	28.6	28.4	3.2
prime-age (25-54)	85.7	86.6	87.0	87.0	86.9	86.8	86.9	86.9	86.9	86.9	1.2
older (55-64)	40.1	42.1	41.5	41.1	42.2	42.4	41.8	42.0	41.8	41.6	1.5
Participation rate (20-64) - FEMALES	65.0	68.4	68.6	68.7	68.9	68.8	68.5	68.5	68.5	68.6	3.6
Participation rate (15-64) - FEMALES	60.0	63.5	63.7	63.6	63.7	63.6	63.4	63.4	63.3	63.3	3.3
young (15-24)	23.1	28.9	28.5	28.1	28.2	28.3	28.4	28.5	28.4	28.3	5.2
prime-age (25-54)	76.4	79.4	80.1	80.2	80.1	80.0	80.0	80.0	80.1	80.1	3.6
older (55-64)	31.4	40.2	40.7	41.3	42.8	43.0	42.4	42.6	42.3	42.0	10.7
Participation rate (20-64) - MALES	81.8	78.7	77.7	77.6	77.7	77.4	77.2	77.3	77.3	77.4	-4.4
Participation rate (15-64) - MALES	75.6	73.1	72.3	71.9	71.9	71.6	71.4	71.6	71.6	71.6	-4.0
young (15-24)	27.4	28.9	28.8	28.4	28.5	28.6	28.7	28.8	28.7	28.6	1.2
prime-age (25-54)	94.8	93.8	93.8	93.8	93.8	93.7	93.7	93.7	93.7	93.7	-1.1
older (55-64)	48.5	43.9	42.2	40.8	41.6	41.7	41.2	41.5	41.2	41.1	-7.4
Employment rate (15-64)	64.9	65.3	65.1	64.9	65.0	64.7	64.6	64.7	64.6	64.6	-0.2
Employment rate (20-64)	70.4	70.4	70.1	70.1	70.3	70.1	69.9	70.0	70.0	70.1	-0.3
Employment rate (15-74)	59.0	58.1	57.0	55.9	55.2	55.0	55.0	54.8	54.6	54.6	-4.4
Unemployment rate (15-64)	4.4	4.5	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2	-0.2
Unemployment rate (20-64)	4.3	4.3	4.2	4.1	4.1	4.1	4.0	4.0	4.0	4.0	-0.2
Unemployment rate (15-74)	4.4	4.5	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2	-0.2
Employment (20-64) (in millions)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
Employment (15-64) (in millions)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
share of young (15-24)	6%	6%	6%	6%	7%	7%	7%	7%	7%	7%	1%
share of prime-age (25-54)	85%	82%	81%	81%	81%	80%	80%	80%	80%	81%	-4%
share of older (55-64)	10%	12%	13%	13%	13%	13%	13%	13%	13%	13%	3%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	16.0	19.1	20.4	20.3	20.0	20.3	20.4	20.4	20.4	20.1	4.1
Old-age dependency ratio (2)	20	23	26	30	34	37	40	42	44	45	25
Total dependency ratio (3)	46	48	51	55	60	62	65	67	69	71	25
Total economic dependency ratio (4)	124	126	131	138	144	149	154	157	161	163	39
Economic old-age dependency ratio (15-64) (5)	31	35	40	46	52	57	61	65	67	69	39
Economic old-age dependency ratio (15-74) (6)	30	35	40	46	52	57	61	64	67	69	38

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

16. Hungary

Hungary	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.32	1.36	1.38	1.40	1.42	1.44	1.46	1.47	1.49	1.51	0.2
Life expectancy at birth											
males	70.4	73.0	74.3	75.5	76.7	77.8	78.9	80.0	81.0	81.9	11.5
females	78.4	80.5	81.5	82.4	83.3	84.2	85.0	85.9	86.6	87.4	9.0
Life expectancy at 65											
males	14.0	15.5	16.2	16.9	17.7	18.3	19.0	19.7	20.3	20.9	6.9
females	18.1	19.5	20.2	20.9	21.5	22.2	22.8	23.4	24.0	24.6	6.4
Net migration (thousand)	22.5	27.3	23.0	22.1	23.8	26.7	23.8	22.0	20.9	18.9	-3.7
Net migration as % of population	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.0
Population (million)	10.0	9.9	9.8	9.7	9.6	9.4	9.3	9.2	9.0	8.8	-1.2
Children population (0-14) as % of total population	14.7	14.4	13.9	13.3	12.8	12.6	12.5	12.5	12.5	12.3	-2.4
Prime age population (25-54) as % of total population	42.8	43.5	42.6	40.8	38.5	37.4	36.2	35.1	34.6	34.2	-8.6
Working age population (15-64) as % of total population	68.6	65.6	64.8	64.9	64.1	62.4	59.7	58.1	56.6	55.5	-13.2
Elderly population (65 and over) as % of total population	16.7	20.0	21.3	21.8	23.1	25.1	27.8	29.4	30.9	32.2	15.5
Very elderly population (80 and over) as % of total population	4.0	4.8	5.4	6.3	7.6	8.3	8.4	9.1	10.7	12.7	8.7
Very elderly population (80 and over) as % of elderly population	24.0	23.9	25.4	28.8	33.1	33.2	30.1	31.1	34.6	39.4	15.4
Very elderly population (80 and over) as % of working age population	5.8	7.3	8.4	9.7	11.9	13.3	14.0	15.8	18.9	22.9	17.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	0.2	1.4	1.9	1.9	1.4	1.2	1.0	0.9	0.9	0.9	1.2
Employment (growth rate)	-0.7	0.5	0.3	-0.3	-0.7	-1.0	-1.0	-0.9	-0.8	-0.7	-0.5
Labour input : hours worked (growth rate)	-0.9	0.5	0.3	-0.3	-0.7	-1.0	-1.0	-0.9	-0.8	-0.7	-0.5
Labour productivity per hour (growth rate)	1.1	0.9	1.5	2.1	2.1	2.1	2.0	1.8	1.7	1.5	1.7
TFP (growth rate)	-0.2	0.6	1.0	1.4	1.4	1.4	1.3	1.2	1.1	1.0	1.0
Capital deepening (contribution to labour productivity growth)	1.3	0.3	0.5	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.7
GDP per capita (growth rate)	-1.5	1.5	2.1	2.1	1.7	1.4	1.3	1.2	1.2	1.3	1.4
GDP per worker (growth rate)	0.9	0.9	1.5	2.1	2.1	2.1	2.0	1.9	1.7	1.6	1.7
GDP in 2010 prices (in millions euros)	98.4	112.2	122.0	134.0	144.8	154.2	162.6	170.6	178.3	185.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	6870	6493	6354	6287	6129	5880	5554	5320	5103	4904	-1966
Population growth (working age:15-64)	1.5	-0.8	-0.3	-0.3	-0.6	-1.2	-1.0	-0.8	-0.8	-0.7	-2.2
Population (20-64) (in thousands)	6273	6005	5857	5802	5668	5443	5141	4921	4707	4511	-1762
Population growth (20-64)	1.5	-0.9	-0.3	-0.2	-0.6	-1.2	-1.0	-0.9	-0.9	-0.7	-2.3
Labour force 15-64 (thousands)	4285	4402	4374	4289	4139	3938	3733	3570	3417	3288	-997
Labour force 20-64 (thousands)	4264	4385	4357	4273	4122	3922	3719	3556	3404	3275	-989
Participation rate (20-64)	68.0	73.0	74.4	73.6	72.7	72.1	72.3	72.3	72.3	72.6	4.6
Participation rate (15-64)	62.4	67.8	68.8	68.2	67.5	67.0	67.2	67.1	67.0	67.1	4.7
young (15-24)	25.7	25.9	25.1	25.6	25.9	26.0	26.1	25.8	25.4	25.3	-0.4
prime-age (25-54)	81.0	81.8	81.6	81.4	81.2	80.9	80.9	81.0	81.0	81.0	0.0
older (55-64)	37.1	52.8	60.8	61.3	60.7	59.0	59.5	59.2	58.5	59.1	22.0
Participation rate (20-64) - FEMALES	61.4	67.5	69.2	68.7	67.8	67.2	67.5	67.3	67.4	67.7	6.3
Participation rate (15-64) - FEMALES	56.5	62.8	64.1	63.7	63.0	62.5	62.7	62.6	62.4	62.6	6.0
young (15-24)	22.6	22.7	22.0	22.4	22.7	22.7	22.9	22.6	22.2	22.2	-0.4
prime-age (25-54)	74.6	75.6	75.6	75.6	75.5	75.0	74.9	74.9	75.0	75.1	0.5
older (55-64)	32.2	51.1	59.5	59.4	58.3	57.3	58.1	57.6	56.8	57.5	25.3
Participation rate (20-64) - MALES	74.7	78.6	79.6	78.6	77.6	76.9	77.1	77.1	77.2	77.4	2.7
Participation rate (15-64) - MALES	68.4	72.8	73.5	72.7	72.0	71.4	71.6	71.6	71.4	71.5	3.1
young (15-24)	28.7	29.0	28.1	28.6	29.0	29.0	29.2	28.8	28.4	28.4	-0.4
prime-age (25-54)	87.4	87.8	87.5	87.0	86.7	86.7	86.8	86.9	86.9	86.8	-0.6
older (55-64)	43.0	54.7	62.3	63.4	63.2	60.8	60.9	60.8	60.1	60.8	17.7
Employment rate (15-64)	55.4	60.1	62.3	62.9	62.4	62.0	62.3	62.2	62.1	62.2	6.8
Employment rate (20-64)	60.4	64.8	67.4	67.9	67.3	66.8	67.1	67.1	67.1	67.4	7.0
Employment rate (15-74)	49.2	51.8	53.6	55.2	54.7	53.1	51.8	51.4	51.7	51.6	2.4
Unemployment rate (15-64)	11.3	11.4	9.5	7.8	7.6	7.4	7.3	7.3	7.3	7.3	-4.0
Unemployment rate (20-64)	11.1	11.2	9.4	7.7	7.5	7.3	7.3	7.2	7.2	7.2	-3.9
Unemployment rate (15-74)	11.2	11.3	9.4	7.7	7.4	7.2	7.1	7.1	7.1	7.1	-4.1
Employment (20-64) (in millions)	3.8	3.9	3.9	3.9	3.8	3.6	3.4	3.3	3.2	3.0	-0.8
Employment (15-64) (in millions)	3.8	3.9	4.0	4.0	3.8	3.6	3.5	3.3	3.2	3.0	-0.8
share of young (15-24)	6%	5%	5%	5%	5%	5%	5%	5%	5%	5%	-1%
share of prime-age (25-54)	82%	80%	78%	75%	72%	72%	73%	73%	74%	75%	-7%
share of older (55-64)	12%	15%	17%	20%	22%	22%	22%	22%	21%	20%	8%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	19.6	18.1	18.3	21.1	24.2	24.5	23.6	24.0	23.0	21.9	2.3
Old-age dependency ratio (2)	24	30	33	34	36	40	47	51	55	58	34
Total dependency ratio (3)	46	52	54	54	56	60	67	72	77	80	35
Total economic dependency ratio (4)	161	151	144	141	144	152	161	169	176	182	21
Economic old-age dependency ratio (15-64) (5)	43	50	51	52	55	62	72	78	85	90	47
Economic old-age dependency ratio (15-74) (6)	43	49	50	51	54	60	69	76	83	88	45

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

17. Malta

Malta — **EC-EPC (AWG) 2012 projections**

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.44	1.47	1.48	1.50	1.51	1.53	1.54	1.56	1.57	1.59	0.1
Life expectancy at birth											
males	77.6	79.3	80.1	80.8	81.6	82.3	83.0	83.6	84.3	84.9	7.3
females	82.3	83.8	84.6	85.3	85.9	86.6	87.2	87.8	88.4	88.9	6.6
Life expectancy at 65											
males	17.0	18.1	18.7	19.2	19.7	20.3	20.8	21.3	21.8	22.2	5.2
females	20.2	21.3	21.8	22.4	22.9	23.4	23.9	24.4	24.9	25.4	5.2
Net migration (thousand)	-1.2	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	1.6
Net migration as % of population	-0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Population (million)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0
Children population (0-14) as % of total population	15.5	15.0	14.7	14.1	13.4	12.9	12.8	13.0	13.1	13.1	-2.5
Prime age population (25-54) as % of total population	41.4	40.5	40.8	40.1	39.0	37.9	36.6	35.4	34.7	34.6	-6.8
Working age population (15-64) as % of total population	69.4	64.3	62.4	61.7	62.1	62.0	60.9	59.3	57.3	55.8	-13.6
Elderly population (65 and over) as % of total population	15.1	20.7	22.9	24.2	24.5	25.1	26.3	27.8	29.6	31.2	16.1
Very elderly population (80 and over) as % of total population	3.4	4.7	5.5	7.4	8.6	9.6	10.0	9.7	10.1	11.3	7.9
Very elderly population (80 and over) as % of elderly population	22.3	22.8	24.0	30.7	35.1	38.3	37.8	34.8	34.1	36.3	14.0
Very elderly population (80 and over) as % of working age population	4.8	7.3	8.8	12.1	13.8	15.5	16.4	16.3	17.6	20.3	15.4
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.4	1.9	2.0	1.9	1.7	1.4	1.1	0.8	0.7	0.9	1.4
Employment (growth rate)	1.2	0.2	0.2	0.1	-0.1	-0.4	-0.7	-0.8	-0.9	-0.7	-0.2
Labour input : hours worked (growth rate)	0.4	0.2	0.2	0.1	-0.1	-0.4	-0.7	-0.8	-0.9	-0.7	-0.2
Labour productivity per hour (growth rate)	1.0	1.7	1.7	1.8	1.8	1.8	1.7	1.7	1.6	1.5	1.7
TFP (growth rate)	0.9	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.1
Capital deepening (contribution to labour productivity growth)	0.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6
GDP per capita (growth rate)	2.1	1.7	1.9	2.0	2.0	1.6	1.3	1.1	0.9	1.2	1.6
GDP per worker (growth rate)	0.2	1.6	1.7	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.6
GDP in 2010 prices (in millions euros)	6.2	7.5	8.3	9.1	10.0	10.7	11.4	11.9	12.4	12.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	286	267	261	257	256	252	244	235	225	216	-71
Population growth (working age:15-64)	-1.9	-0.5	-0.5	-0.1	-0.1	-0.5	-0.7	-0.8	-1.0	-0.7	1.3
Population (20-64) (in thousands)	259	247	240	236	235	232	226	217	207	198	-61
Population growth (20-64)	-1.6	-0.4	-0.6	-0.2	0.0	-0.4	-0.7	-0.8	-1.1	-0.8	0.8
Labour force 15-64 (thousands)	174	177	179	180	180	177	172	165	158	152	-22
Labour force 20-64 (thousands)	167	172	174	175	175	172	167	161	153	147	-20
Participation rate (20-64)	64.3	69.7	72.5	74.3	74.4	74.1	74.0	73.9	73.9	74.3	10.0
Participation rate (15-64)	60.7	66.3	68.7	70.2	70.4	70.3	70.3	70.3	70.2	70.3	9.6
young (15-24)	51.9	53.4	51.0	51.0	51.5	52.1	52.6	52.5	51.8	51.5	-0.3
prime-age (25-54)	73.2	77.9	78.7	79.0	79.2	79.4	79.5	79.5	79.5	79.5	6.3
older (55-64)	32.6	41.1	48.6	56.5	59.2	58.8	59.3	59.3	58.6	58.5	26.0
Participation rate (20-64) - FEMALES	44.9	53.3	56.7	59.3	60.0	59.9	59.8	59.7	59.8	60.2	15.3
Participation rate (15-64) - FEMALES	43.0	51.0	54.1	56.3	57.0	57.0	57.0	57.0	56.9	57.2	14.2
young (15-24)	48.8	49.7	48.0	47.7	48.4	48.9	49.4	49.2	48.6	48.2	-0.6
prime-age (25-54)	51.1	61.2	63.0	63.5	63.9	64.2	64.3	64.3	64.3	64.2	13.1
older (55-64)	14.3	21.3	28.9	39.2	43.8	44.0	44.3	44.4	43.7	44.0	29.6
Participation rate (20-64) - MALES	83.0	85.4	87.5	88.5	88.0	87.5	87.3	87.0	87.0	87.3	4.3
Participation rate (15-64) - MALES	77.7	81.0	82.6	83.4	83.0	82.7	82.7	82.6	82.4	82.4	4.7
young (15-24)	54.7	56.7	53.8	54.0	54.4	55.1	55.6	55.4	54.8	54.5	-0.2
prime-age (25-54)	94.4	93.8	93.5	93.4	93.3	93.2	93.3	93.4	93.5	93.4	-1.0
older (55-64)	51.2	61.2	69.0	74.5	74.8	74.0	74.2	73.6	72.7	72.5	21.3
Employment rate (15-64)	56.5	61.8	64.1	65.5	65.7	65.6	65.7	65.6	65.5	65.6	9.2
Employment rate (20-64)	60.4	65.4	68.1	69.8	70.0	69.7	69.6	69.5	69.5	69.9	9.5
Employment rate (15-74)	50.7	52.4	54.3	55.6	56.8	56.9	55.7	54.6	53.9	53.6	2.9
Unemployment rate (15-64)	6.9	6.8	6.7	6.7	6.7	6.6	6.6	6.6	6.6	6.6	-0.3
Unemployment rate (20-64)	6.0	6.1	6.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-0.1
Unemployment rate (15-74)	6.9	6.8	6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	-0.3
Employment (20-64) (in millions)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0
Employment (15-64) (in millions)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0
share of young (15-24)	16%	13%	11%	11%	12%	12%	11%	11%	11%	12%	-4%
share of prime-age (25-54)	73%	74%	75%	74%	71%	69%	68%	68%	69%	70%	-2%
share of older (55-64)	11%	13%	13%	15%	18%	19%	20%	21%	20%	18%	7%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	20.3	20.2	18.2	18.0	20.3	22.0	23.4	24.1	23.1	21.0	0.7
Old-age dependency ratio (2)	22	32	37	39	39	40	43	47	52	56	34
Total dependency ratio (3)	44	55	60	62	61	61	64	69	74	79	35
Total economic dependency ratio (4)	152	149	148	145	142	143	147	153	162	168	16
Economic old-age dependency ratio (15-64) (5)	37	51	56	59	59	60	64	70	77	83	46
Economic old-age dependency ratio (15-74) (6)	37	51	56	58	58	60	63	69	76	82	45

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

18. Netherlands

Netherlands	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.79	1.79	1.80	1.80	1.80	1.80	1.81	1.81	1.81	1.81	0.0
Life expectancy at birth											
males	78.7	80.1	80.8	81.5	82.1	82.8	83.4	84.0	84.6	85.2	6.5
females	82.8	84.2	84.9	85.5	86.2	86.8	87.4	88.0	88.5	89.1	6.3
Life expectancy at 65											
males	17.5	18.5	19.0	19.5	20.0	20.5	21.0	21.4	21.9	22.3	4.9
females	20.9	21.9	22.4	22.9	23.4	23.8	24.3	24.8	25.2	25.6	4.8
Net migration (thousand)	35.5	9.3	11.1	11.8	11.0	5.2	5.7	5.9	7.6	6.2	-29.4
Net migration as % of population	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.2
Population (million)	16.6	17.2	17.4	17.6	17.7	17.6	17.5	17.3	17.2	17.1	0.4
Children population (0-14) as % of total population	17.5	16.2	16.1	16.1	16.0	15.8	15.5	15.4	15.4	15.5	-2.0
Prime age population (25-54) as % of total population	41.7	38.2	36.4	35.6	35.5	35.4	35.1	34.9	34.9	34.7	-7.0
Working age population (15-64) as % of total population	67.0	63.9	61.9	59.6	57.8	57.2	57.5	57.8	57.6	57.3	-9.8
Elderly population (65 and over) as % of total population	15.4	19.9	22.0	24.3	26.2	27.0	27.0	26.9	27.0	27.2	11.8
Very elderly population (80 and over) as % of total population	4.0	4.9	5.6	7.1	8.2	9.2	10.4	11.3	11.5	11.1	7.1
Very elderly population (80 and over) as % of elderly population	25.6	24.3	25.4	29.4	31.2	34.0	38.5	42.2	42.7	40.8	15.1
Very elderly population (80 and over) as % of working age population	5.9	7.6	9.1	12.0	14.1	16.1	18.0	19.6	20.0	19.4	13.5
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.1	1.2	1.1	1.1	1.2	1.4	1.4	1.4	1.3	1.3	1.3
Employment (growth rate)	0.3	-0.2	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2
Labour input : hours worked (growth rate)	0.1	-0.2	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2
Labour productivity per hour (growth rate)	1.0	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	-0.4	1.0	0.9	0.9	1.2	1.4	1.6	1.6	1.5	1.4	1.2
GDP per worker (growth rate)	0.8	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.5	1.5
GDP in 2010 prices (in millions euros)	591.5	700.4	740.6	781.0	826.1	881.5	944.0	1012.2	1082.2	1155.0	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	11140	11013	10789	10486	10206	10070	10056	10018	9910	9770	-1370
Population growth (working age:15-64)	1.6	-0.3	-0.5	-0.6	-0.6	-0.1	-0.1	-0.1	-0.3	-0.2	-1.8
Population (20-64) (in thousands)	10129	10005	9848	9552	9260	9112	9102	9079	8997	8876	-1254
Population growth (20-64)	1.6	-0.2	-0.5	-0.6	-0.7	-0.1	0.0	-0.1	-0.3	-0.2	-1.9
Labour force 15-64 (thousands)	8714	8768	8578	8344	8159	8091	8058	8004	7911	7806	-908
Labour force 20-64 (thousands)	8109	8144	7997	7767	7575	7500	7469	7424	7346	7254	-855
Participation rate (20-64)	80.0	81.4	81.2	81.3	81.8	82.3	82.1	81.8	81.7	81.7	1.7
Participation rate (15-64)	78.2	79.6	79.5	79.6	79.9	80.3	80.1	79.9	79.8	79.9	1.7
young (15-24)	69.1	71.0	71.2	70.9	70.8	70.8	70.9	71.0	71.1	71.0	2.0
prime-age (25-54)	87.9	88.8	88.9	88.9	88.7	88.6	88.6	88.6	88.6	88.6	0.7
older (55-64)	56.0	61.6	61.9	61.4	61.6	63.2	62.9	62.4	62.1	62.4	6.5
Participation rate (20-64) - FEMALES	73.8	77.0	77.3	77.9	78.7	79.4	79.2	78.8	78.7	78.7	5.0
Participation rate (15-64) - FEMALES	72.6	75.6	76.0	76.5	77.2	77.8	77.6	77.3	77.2	77.2	4.6
young (15-24)	69.5	70.5	70.8	70.5	70.4	70.4	70.5	70.5	70.6	70.6	1.1
prime-age (25-54)	82.4	85.5	86.2	86.5	86.3	86.2	86.2	86.2	86.1	86.1	3.8
older (55-64)	44.5	52.7	54.1	54.8	56.0	58.1	57.9	57.4	57.1	57.4	12.9
Participation rate (20-64) - MALES	86.3	85.7	85.0	84.6	84.8	85.1	84.8	84.6	84.5	84.6	-1.7
Participation rate (15-64) - MALES	83.7	83.5	82.9	82.6	82.6	82.8	82.6	82.4	82.4	82.5	-1.3
young (15-24)	68.7	71.4	71.7	71.4	71.3	71.3	71.4	71.4	71.5	71.5	2.8
prime-age (25-54)	93.3	92.0	91.5	91.3	91.0	90.8	90.9	90.9	90.9	91.0	-2.4
older (55-64)	67.4	70.6	69.7	68.0	67.2	68.3	67.7	67.3	67.1	67.4	0.0
Employment rate (15-64)	74.7	76.8	76.7	76.8	77.2	77.6	77.4	77.1	77.1	77.1	2.4
Employment rate (20-64)	76.8	78.8	78.7	78.8	79.3	79.8	79.6	79.3	79.2	79.2	2.4
Employment rate (15-74)	67.4	67.3	67.0	66.2	65.8	66.5	67.4	67.7	67.3	66.9	-0.5
Unemployment rate (15-64)	4.5	3.5	3.5	3.5	3.5	3.4	3.4	3.4	3.4	3.4	-1.1
Unemployment rate (20-64)	4.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	-0.9
Unemployment rate (15-74)	4.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	-1.1
Employment (20-64) (in millions)	7.8	7.9	7.7	7.5	7.3	7.3	7.2	7.2	7.1	7.0	-0.8
Employment (15-64) (in millions)	8.3	8.5	8.3	8.1	7.9	7.8	7.8	7.7	7.6	7.5	-0.8
share of young (15-24)	15%	16%	16%	16%	16%	16%	17%	17%	16%	16%	1%
share of prime-age (25-54)	71%	67%	66%	67%	69%	69%	68%	68%	68%	68%	-3%
share of older (55-64)	14%	17%	18%	17%	15%	15%	15%	16%	16%	16%	2%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	19.5	21.6	22.8	22.0	19.9	18.9	19.6	20.3	20.5	20.6	1.1
Old-age dependency ratio (2)	23	31	36	41	45	47	47	46	47	48	24
Total dependency ratio (3)	49	57	62	68	73	75	74	73	73	75	25
Total economic dependency ratio (4)	97	97	103	110	115	117	117	117	117	118	22
Economic old-age dependency ratio (15-64) (5)	29	37	43	49	54	57	57	57	57	58	29
Economic old-age dependency ratio (15-74) (6)	29	36	41	47	52	55	55	55	55	56	27

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

19. Austria

Austria	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.39	1.43	1.44	1.46	1.48	1.49	1.51	1.52	1.54	1.56	0.2
Life expectancy at birth											
males	77.6	79.2	80.0	80.7	81.5	82.2	82.9	83.5	84.2	84.8	7.2
females	83.0	84.4	85.0	85.6	86.3	86.9	87.4	88.0	88.5	89.1	6.1
Life expectancy at 65											
males	17.6	18.6	19.1	19.6	20.1	20.6	21.1	21.5	22.0	22.4	4.8
females	20.9	21.9	22.4	22.9	23.3	23.8	24.3	24.7	25.1	25.6	4.7
Net migration (thousand)	19.1	35.2	36.1	35.6	32.9	29.9	29.1	27.9	27.2	25.8	6.7
Net migration as % of population	0.2	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.1
Population (million)	8.4	8.6	8.7	8.9	8.9	9.0	9.0	9.0	8.9	8.9	0.5
Children population (0-14) as % of total population	14.8	13.9	13.8	13.8	13.6	13.4	13.2	13.2	13.4	13.5	-1.3
Prime age population (25-54) as % of total population	44.0	40.9	38.8	37.8	37.5	36.9	36.4	35.7	35.4	35.3	-8.7
Working age population (15-64) as % of total population	67.6	66.2	64.4	61.8	59.7	58.9	58.8	58.4	58.0	57.3	-10.3
Elderly population (65 and over) as % of total population	17.6	19.9	21.8	24.4	26.6	27.7	27.9	28.4	28.6	29.2	11.5
Very elderly population (80 and over) as % of total population	4.8	5.6	6.4	7.0	7.6	8.8	10.5	11.8	12.0	11.6	6.7
Very elderly population (80 and over) as % of elderly population	27.4	28.2	29.5	28.8	28.5	31.8	37.6	41.6	41.7	39.7	12.3
Very elderly population (80 and over) as % of working age population	7.1	8.5	10.0	11.4	12.7	14.9	17.9	20.2	20.6	20.2	13.0
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.3	1.5	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.3	1.4
Employment (growth rate)	0.7	0.0	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.1
Labour input : hours worked (growth rate)	0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.1
Labour productivity per hour (growth rate)	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	0.3	1.2	1.0	1.1	1.3	1.4	1.4	1.4	1.4	1.4	1.3
GDP per worker (growth rate)	0.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
GDP in 2010 prices (in millions euros)	284.0	339.0	362.7	386.8	414.1	444.2	476.0	509.3	543.0	578.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	5668	5697	5629	5479	5341	5293	5285	5233	5172	5082	-586
Population growth (working age:15-64)	1.4	0.0	-0.4	-0.6	-0.4	-0.1	-0.1	-0.2	-0.3	-0.3	-1.8
Population (20-64) (in thousands)	5169	5270	5207	5057	4911	4858	4855	4810	4754	4665	-504
Population growth (20-64)	1.3	0.0	-0.4	-0.7	-0.5	-0.1	-0.1	-0.2	-0.3	-0.4	-1.7
Labour force 15-64 (thousands)	4254	4323	4260	4179	4136	4124	4104	4060	4001	3942	-312
Labour force 20-64 (thousands)	4034	4136	4074	3994	3948	3933	3915	3874	3818	3759	-276
Participation rate (20-64)	78.0	78.5	78.3	79.0	80.4	81.0	80.6	80.5	80.3	80.6	2.5
Participation rate (15-64)	75.0	75.9	75.7	76.3	77.4	77.9	77.7	77.6	77.4	77.6	2.5
young (15-24)	59.5	61.9	61.6	61.5	61.3	61.3	61.4	61.5	61.4	61.3	1.8
prime-age (25-54)	87.7	88.4	88.8	89.1	89.3	89.5	89.5	89.5	89.5	89.5	1.9
older (55-64)	43.1	51.2	51.9	52.1	54.2	56.4	56.2	56.9	56.0	56.1	12.9
Participation rate (20-64) - FEMALES	72.3	74.4	75.0	76.3	78.2	79.0	78.7	78.6	78.4	78.6	6.4
Participation rate (15-64) - FEMALES	69.3	71.7	72.2	73.4	75.0	75.7	75.5	75.4	75.1	75.3	6.0
young (15-24)	54.7	57.6	57.2	57.1	56.8	56.8	57.0	57.0	56.9	56.8	2.1
prime-age (25-54)	82.8	85.6	86.4	86.9	87.2	87.4	87.5	87.4	87.4	87.4	4.7
older (55-64)	33.9	43.3	46.5	48.8	52.5	55.4	55.3	56.0	55.2	55.3	21.4
Participation rate (20-64) - MALES	83.8	82.6	81.5	81.7	82.6	82.9	82.5	82.4	82.2	82.5	-1.4
Participation rate (15-64) - MALES	80.8	80.1	79.1	79.1	79.9	80.1	79.8	79.8	79.6	79.7	-1.0
young (15-24)	64.1	66.1	65.8	65.6	65.5	65.5	65.6	65.7	65.6	65.5	1.5
prime-age (25-54)	92.5	91.2	91.2	91.3	91.3	91.4	91.4	91.5	91.5	91.5	-1.0
older (55-64)	52.9	59.2	57.4	55.5	56.0	57.3	57.1	57.7	56.8	56.9	4.0
Employment rate (15-64)	71.7	72.8	72.6	73.1	74.3	74.7	74.5	74.4	74.2	74.4	2.7
Employment rate (20-64)	74.8	75.4	75.2	75.9	77.3	77.8	77.5	77.4	77.2	77.5	2.7
Employment rate (15-74)	63.7	64.6	63.7	62.8	62.9	63.8	64.8	64.8	64.2	63.9	0.2
Unemployment rate (15-64)	4.5	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	-0.4
Unemployment rate (20-64)	4.2	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	-0.3
Unemployment rate (15-74)	4.4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	-0.5
Employment (20-64) (in millions)	3.9	4.0	3.9	3.8	3.8	3.8	3.8	3.7	3.7	3.6	-0.3
Employment (15-64) (in millions)	4.1	4.1	4.1	4.0	4.0	4.0	3.9	3.9	3.8	3.8	-0.3
share of young (15-24)	14%	13%	12%	13%	13%	13%	13%	13%	13%	13%	-1%
share of prime-age (25-54)	76%	72%	71%	72%	73%	72%	71%	71%	71%	71%	-5%
share of older (55-64)	10%	15%	17%	16%	15%	15%	16%	16%	16%	16%	6%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	16.9	22.0	23.7	22.5	20.3	20.2	21.0	21.7	21.9	21.2	4.3
Old-age dependency ratio (2)	26	30	34	39	45	47	48	49	49	51	25
Total dependency ratio (3)	48	51	55	62	67	70	70	71	72	74	26
Total economic dependency ratio (4)	103	103	108	113	116	119	120	122	124	125	22
Economic old-age dependency ratio (15-64) (5)	35	39	44	50	56	59	60	62	63	64	29
Economic old-age dependency ratio (15-74) (6)	34	38	42	48	54	57	58	59	60	62	27

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

20. Poland

Poland	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.40	1.43	1.45	1.46	1.48	1.50	1.51	1.53	1.54	1.56	0.2
Life expectancy at birth											
males	71.7	74.2	75.3	76.4	77.5	78.6	79.6	80.6	81.5	82.4	10.7
females	80.1	81.9	82.7	83.5	84.3	85.1	85.8	86.6	87.2	87.9	7.8
Life expectancy at 65											
males	14.8	16.2	16.9	17.5	18.2	18.8	19.4	20.0	20.6	21.2	6.4
females	19.1	20.3	20.9	21.5	22.1	22.7	23.2	23.8	24.3	24.8	5.7
Net migration (thousand)	11.7	13.0	4.4	3.2	14.0	26.4	33.0	34.2	23.9	14.1	2.4
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Population (million)	38.2	38.4	38.1	37.5	36.8	36.0	35.3	34.5	33.6	32.6	-5.6
Children population (0-14) as % of total population	15.1	15.6	14.9	13.6	12.5	12.1	12.2	12.5	12.4	12.0	-3.1
Prime age population (25-54) as % of total population	44.0	43.3	42.7	40.9	38.9	36.6	34.9	33.7	33.4	33.4	-10.6
Working age population (15-64) as % of total population	71.3	66.2	64.0	63.8	63.8	62.7	60.1	56.9	54.5	53.4	-18.0
Elderly population (65 and over) as % of total population	13.5	18.2	21.0	22.6	23.7	25.3	27.6	30.6	33.0	34.6	21.0
Very elderly population (80 and over) as % of total population	3.4	4.3	4.4	5.7	7.6	9.2	9.5	9.6	10.6	12.6	9.2
Very elderly population (80 and over) as % of elderly population	24.9	23.5	20.7	25.2	32.1	36.2	34.5	31.3	32.0	36.3	11.4
Very elderly population (80 and over) as % of working age population	4.7	6.5	6.8	8.9	11.9	14.6	15.8	16.9	19.4	23.5	18.8
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	4.3	2.0	1.6	1.5	1.4	1.2	0.8	0.5	0.5	0.6	1.5
Employment (growth rate)	1.8	-0.3	-0.6	-0.6	-0.7	-1.0	-1.2	-1.3	-1.2	-0.9	-0.6
Labour input : hours worked (growth rate)	1.8	-0.4	-0.6	-0.6	-0.7	-1.0	-1.2	-1.3	-1.2	-0.9	-0.6
Labour productivity per hour (growth rate)	2.5	2.3	2.2	2.1	2.1	2.1	2.0	1.8	1.7	1.5	2.2
TFP (growth rate)	1.4	1.5	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.0	1.3
Capital deepening (contribution to labour productivity growth)	1.1	0.8	0.8	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.8
GDP per capita (growth rate)	1.9	2.0	1.8	1.9	1.8	1.6	1.2	1.0	1.1	1.3	1.8
GDP per worker (growth rate)	2.4	2.3	2.2	2.1	2.2	2.2	2.0	1.9	1.7	1.6	2.2
GDP in 2010 prices (in millions euros)	354.4	482.1	526.2	567.8	610.5	650.3	680.3	701.7	720.0	741.4	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	27246	25410	24385	23921	23484	22580	21209	19594	18306	17405	-9841
Population growth (working age:15-64)	3.4	-1.0	-0.6	-0.3	-0.5	-1.0	-1.4	-1.6	-1.2	-0.8	-4.3
Population (20-64) (in thousands)	24772	23636	22416	21857	21568	20898	19722	18179	16861	15942	-8830
Population growth (20-64)	3.9	-1.0	-0.9	-0.3	-0.3	-0.9	-1.3	-1.7	-1.4	-0.9	-4.7
Labour force 15-64 (thousands)	17923	17376	16821	16282	15717	14957	14006	13032	12247	11694	-6229
Labour force 20-64 (thousands)	17720	17237	16676	16122	15565	14822	13888	12923	12136	11581	-6140
Participation rate (20-64)	71.5	72.9	74.4	73.8	72.2	70.9	70.4	71.1	72.0	72.6	1.1
Participation rate (15-64)	65.8	68.4	69.0	68.1	66.9	66.2	66.0	66.5	66.9	67.2	1.4
young (15-24)	35.5	35.4	32.0	32.7	34.6	35.5	35.5	34.5	33.4	33.4	-2.1
prime-age (25-54)	84.2	84.0	83.6	82.9	82.3	82.2	82.6	83.1	83.2	82.8	-1.4
older (55-64)	36.8	41.7	46.6	49.5	49.5	49.0	47.4	46.9	46.6	47.4	10.5
Participation rate (20-64) - FEMALES	64.1	65.4	67.2	66.6	64.7	63.0	62.3	63.1	64.3	65.3	1.1
Participation rate (15-64) - FEMALES	59.1	61.4	62.3	61.5	60.0	58.9	58.4	59.0	59.7	60.3	1.2
young (15-24)	30.6	30.3	27.3	27.8	29.6	30.4	30.3	29.4	28.4	28.5	-2.1
prime-age (25-54)	78.6	78.4	78.4	77.9	77.3	77.0	77.2	77.7	78.0	77.7	-0.9
older (55-64)	26.1	29.8	33.8	37.1	36.9	36.6	34.7	34.1	33.7	34.6	8.5
Participation rate (20-64) - MALES	79.1	80.5	81.6	80.9	79.6	78.7	78.4	78.8	79.4	79.7	0.6
Participation rate (15-64) - MALES	72.6	75.4	75.6	74.6	73.7	73.5	73.5	73.8	73.8	73.8	1.2
young (15-24)	40.1	40.2	36.5	37.2	39.4	40.4	40.5	39.3	38.1	38.1	-2.1
prime-age (25-54)	89.8	89.4	88.6	87.8	87.1	87.2	87.7	88.1	88.0	87.6	-2.2
older (55-64)	49.1	54.9	60.5	63.0	63.0	62.2	60.8	60.1	59.8	60.3	11.1
Employment rate (15-64)	59.3	63.2	63.8	63.1	62.0	61.4	61.2	61.7	62.0	62.3	3.0
Employment rate (20-64)	64.7	67.5	69.0	68.5	67.0	65.9	65.4	66.0	66.8	67.5	2.8
Employment rate (15-74)	54.6	55.3	55.0	54.9	54.9	53.9	52.4	51.2	50.8	51.5	-3.1
Unemployment rate (15-64)	9.8	7.6	7.5	7.4	7.3	7.3	7.3	7.3	7.3	7.3	-2.5
Unemployment rate (20-64)	9.6	7.5	7.3	7.2	7.2	7.1	7.1	7.1	7.1	7.1	-2.5
Unemployment rate (15-74)	9.7	7.5	7.3	7.2	7.2	7.1	7.1	7.0	7.0	7.0	-2.7
Employment (20-64) (in millions)	16.0	15.9	15.5	15.0	14.5	13.8	12.9	12.0	11.3	10.8	-5.3
Employment (15-64) (in millions)	16.2	16.1	15.6	15.1	14.6	13.9	13.0	12.1	11.4	10.8	-5.3
share of young (15-24)	9%	7%	6%	7%	8%	8%	7%	7%	7%	7%	-2%
share of prime-age (25-54)	80%	81%	81%	79%	76%	73%	73%	75%	77%	78%	-2%
share of older (55-64)	11%	12%	12%	14%	17%	19%	20%	18%	16%	15%	4%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.6	19.7	18.0	19.0	22.2	25.6	27.0	25.7	23.1	20.6	2.1
Old-age dependency ratio (2)	19	28	33	35	37	40	46	54	61	65	46
Total dependency ratio (3)	40	51	56	57	57	60	66	76	83	87	47
Total economic dependency ratio (4)	133	133	137	141	145	151	160	170	180	187	53
Economic old-age dependency ratio (15-64) (5)	31	41	48	53	57	62	70	82	92	99	68
Economic old-age dependency ratio (15-74) (6)	30	40	47	52	55	60	67	78	87	94	64

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

21. Portugal

Portugal — EC-EPC (AWG) 2012 projections

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.32	1.36	1.38	1.40	1.42	1.44	1.45	1.47	1.49	1.51	0.2
Life expectancy at birth											
males	76.5	78.3	79.1	79.9	80.7	81.5	82.2	82.9	83.6	84.2	7.7
females	82.5	83.9	84.5	85.1	85.7	86.3	86.9	87.5	88.0	88.6	6.1
Life expectancy at 65											
males	17.1	18.1	18.7	19.2	19.7	20.2	20.7	21.1	21.6	22.1	5.0
females	20.4	21.4	21.9	22.4	22.8	23.3	23.8	24.2	24.7	25.1	4.7
Net migration (thousand)	18.5	36.8	37.6	37.2	36.7	37.0	34.2	30.7	29.2	27.8	9.3
Net migration as % of population	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
Population (million)	10.6	10.7	10.8	10.8	10.8	10.8	10.7	10.6	10.4	10.2	-0.4
Children population (0-14) as % of total population	15.1	13.5	12.8	12.4	12.3	12.3	12.3	12.2	12.0	12.0	-3.1
Prime age population (25-54) as % of total population	43.8	41.5	40.3	38.9	37.1	35.9	35.4	34.9	34.5	33.8	-10.0
Working age population (15-64) as % of total population	66.8	65.7	64.9	63.4	61.7	59.5	57.5	56.4	56.1	56.0	-10.9
Elderly population (65 and over) as % of total population	18.0	20.7	22.3	24.2	26.0	28.2	30.2	31.4	31.8	32.0	14.0
Very elderly population (80 and over) as % of total population	4.6	5.9	6.3	7.1	7.9	8.9	10.1	11.1	12.4	13.6	9.0
Very elderly population (80 and over) as % of elderly population	25.3	28.6	28.4	29.1	30.4	31.6	33.3	35.2	38.8	42.4	17.1
Very elderly population (80 and over) as % of working age population	6.8	9.0	9.8	11.1	12.8	14.9	17.5	19.6	22.0	24.3	17.4
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	-0.2	1.5	2.0	1.9	1.5	1.3	1.2	1.1	1.1	1.1	1.2
Employment (growth rate)	-1.1	0.6	0.6	0.0	-0.4	-0.6	-0.7	-0.6	-0.5	-0.4	-0.3
Labour input : hours worked (growth rate)	-0.5	0.6	0.5	0.0	-0.4	-0.6	-0.7	-0.6	-0.5	-0.4	-0.2
Labour productivity per hour (growth rate)	0.3	0.9	1.4	2.0	2.0	2.0	1.9	1.8	1.6	1.5	1.4
TFP (growth rate)	0.0	0.6	0.9	1.3	1.3	1.3	1.2	1.1	1.1	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.3	0.3	0.5	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5
GDP per capita (growth rate)	-0.5	1.4	1.9	1.9	1.5	1.4	1.4	1.4	1.4	1.5	1.3
GDP per worker (growth rate)	0.9	0.9	1.4	1.9	2.0	2.0	1.9	1.8	1.7	1.5	1.5
GDP in 2010 prices (in millions euros)	172.5	181.8	198.6	219.1	237.9	255.2	271.7	287.5	304.1	321.4	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	7114	7052	6983	6831	6649	6404	6152	5967	5852	5734	-1380
Population growth (working age:15-64)	-0.4	-0.1	-0.3	-0.5	-0.6	-0.9	-0.7	-0.5	-0.4	-0.4	0.0
Population (20-64) (in thousands)	6551	6476	6438	6321	6167	5936	5684	5497	5387	5283	-1268
Population growth (20-64)	-0.2	-0.1	-0.2	-0.5	-0.6	-0.9	-0.8	-0.5	-0.4	-0.4	-0.1
Labour force 15-64 (thousands)	5270	5338	5334	5257	5127	4932	4737	4593	4495	4397	-874
Labour force 20-64 (thousands)	5199	5266	5265	5192	5066	4873	4679	4534	4437	4340	-859
Participation rate (20-64)	79.4	81.3	81.8	82.1	82.1	82.1	82.3	82.5	82.4	82.1	2.8
Participation rate (15-64)	74.1	75.7	76.4	77.0	77.1	77.0	77.0	77.0	76.8	76.7	2.6
young (15-24)	37.3	36.7	38.1	38.3	38.2	37.8	37.4	37.2	37.4	37.7	0.3
prime-age (25-54)	88.7	89.9	90.2	90.1	90.1	90.1	90.1	90.1	90.0	90.0	1.3
older (55-64)	54.2	63.2	65.8	68.5	69.6	69.1	68.8	69.2	69.3	69.4	15.2
Participation rate (20-64) - FEMALES	74.9	78.5	79.5	80.3	80.5	80.5	80.8	81.0	80.9	80.7	5.8
Participation rate (15-64) - FEMALES	70.0	73.1	74.2	75.1	75.5	75.4	75.5	75.5	75.3	75.2	5.2
young (15-24)	35.4	34.8	36.1	36.4	36.3	36.0	35.6	35.4	35.6	35.8	0.4
prime-age (25-54)	84.9	87.8	88.6	88.7	88.6	88.7	88.7	88.7	88.6	88.6	3.7
older (55-64)	47.3	58.6	62.3	66.2	68.0	67.7	67.4	67.9	68.0	68.1	20.9
Participation rate (20-64) - MALES	83.9	84.2	84.0	84.0	83.8	83.6	83.8	83.9	83.8	83.6	-0.4
Participation rate (15-64) - MALES	78.3	78.3	78.5	78.8	78.7	78.6	78.5	78.4	78.2	78.1	-0.2
young (15-24)	39.2	38.4	40.0	40.1	40.0	39.7	39.2	39.0	39.2	39.5	0.3
prime-age (25-54)	92.6	91.9	91.8	91.5	91.5	91.5	91.5	91.5	91.4	91.4	-1.2
older (55-64)	62.0	68.2	69.6	70.9	71.3	70.6	70.2	70.4	70.6	70.7	8.7
Employment rate (15-64)	65.6	66.9	69.1	70.8	71.2	71.3	71.3	71.3	71.2	71.1	5.5
Employment rate (20-64)	70.5	72.1	74.1	75.8	76.0	76.1	76.4	76.6	76.5	76.3	5.8
Employment rate (15-74)	60.1	60.4	62.1	63.4	63.4	63.1	62.6	62.5	62.9	63.2	3.1
Unemployment rate (15-64)	11.4	11.6	9.6	8.0	7.6	7.5	7.4	7.3	7.3	7.3	-4.2
Unemployment rate (20-64)	11.1	11.3	9.3	7.8	7.4	7.3	7.2	7.1	7.1	7.1	-4.0
Unemployment rate (15-74)	11.0	11.2	9.2	7.5	7.2	6.9	6.8	6.8	6.8	6.8	-4.2
Employment (20-64) (in millions)	4.6	4.7	4.8	4.8	4.7	4.5	4.3	4.2	4.1	4.0	-0.6
Employment (15-64) (in millions)	4.7	4.7	4.8	4.8	4.7	4.6	4.4	4.3	4.2	4.1	-0.6
share of young (15-24)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	0%
share of prime-age (25-54)	79%	76%	74%	72%	71%	71%	72%	73%	72%	71%	-8%
share of older (55-64)	13%	18%	19%	21%	22%	22%	21%	20%	20%	21%	8%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	17.9	20.4	21.4	22.8	24.3	24.3	22.8	21.8	22.2	23.1	5.2
Old-age dependency ratio (2)	27	32	34	38	42	47	52	56	57	57	30
Total dependency ratio (3)	50	52	54	58	62	68	74	77	78	79	29
Total economic dependency ratio (4)	118	116	111	108	112	117	123	128	131	132	14
Economic old-age dependency ratio (15-64) (5)	36	42	44	47	52	58	64	69	71	72	36
Economic old-age dependency ratio (15-74) (6)	35	40	41	44	48	53	58	63	66	67	32

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

22. Romania

Romania	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.38	1.41	1.43	1.45	1.46	1.48	1.50	1.51	1.53	1.55	0.2
Life expectancy at birth											
males	70.0	72.8	74.1	75.3	76.5	77.6	78.8	79.8	80.8	81.8	11.8
females	77.5	79.6	80.6	81.6	82.5	83.4	84.3	85.1	86.0	86.7	9.3
Life expectancy at 65											
males	14.1	15.5	16.2	16.9	17.6	18.3	18.9	19.6	20.2	20.8	6.7
females	17.2	18.6	19.3	20.0	20.6	21.3	22.0	22.6	23.2	23.8	6.6
Net migration (thousand)	-0.2	8.4	4.6	3.2	16.5	17.6	18.6	16.8	13.2	7.6	7.9
Net migration as % of population	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Population (million)	21.4	21.0	20.6	20.2	19.8	19.4	18.9	18.4	17.9	17.2	-4.2
Children population (0-14) as % of total population	15.2	14.8	14.0	13.0	12.3	12.0	12.0	11.9	11.8	11.6	-3.6
Prime age population (25-54) as % of total population	44.2	45.5	43.2	41.0	38.7	36.9	34.3	33.6	33.1	32.8	-11.4
Working age population (15-64) as % of total population	69.9	67.6	66.6	66.8	64.5	62.2	59.3	57.0	54.2	53.7	-16.3
Elderly population (65 and over) as % of total population	14.9	17.6	19.5	20.2	23.2	25.7	28.7	31.1	34.1	34.8	19.9
Very elderly population (80 and over) as % of total population	3.2	4.3	4.4	5.1	6.4	7.5	7.7	9.6	11.3	13.3	10.1
Very elderly population (80 and over) as % of elderly population	21.2	24.6	22.6	25.4	27.8	29.3	26.8	31.0	33.2	38.2	17.1
Very elderly population (80 and over) as % of working age population	4.5	6.4	6.6	7.7	10.0	12.1	13.0	16.9	20.9	24.8	20.3
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	2.0	1.3	1.3	1.3	1.2	1.1	0.7	0.5	0.6	0.5	1.1
Employment (growth rate)	-0.6	-0.6	-0.8	-1.0	-1.1	-1.2	-1.4	-1.4	-1.2	-1.1	-1.0
Labour input : hours worked (growth rate)	-0.5	-0.6	-0.8	-1.0	-1.1	-1.2	-1.4	-1.4	-1.2	-1.1	-1.0
Labour productivity per hour (growth rate)	2.5	1.9	2.1	2.3	2.3	2.3	2.1	1.9	1.7	1.5	2.1
TFP (growth rate)	1.0	1.2	1.4	1.5	1.5	1.5	1.4	1.3	1.1	1.0	1.3
Capital deepening (contribution to labour productivity growth)	1.5	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.8
GDP per capita (growth rate)	2.2	1.6	1.6	1.7	1.6	1.5	1.2	1.1	1.2	1.2	1.5
GDP per worker (growth rate)	2.6	1.9	2.1	2.3	2.3	2.3	2.2	2.0	1.8	1.6	2.1
GDP in 2010 prices (in millions euros)	121.9	150.6	160.4	171.1	182.1	192.8	200.5	206.7	212.4	218.1	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	14996	14178	13730	13495	12790	12072	11231	10502	9693	9252	-5744
Population growth (working age:15-64)	-0.2	-0.8	-0.5	-0.3	-1.2	-1.3	-1.5	-1.4	-1.4	-0.8	-0.6
Population (20-64) (in thousands)	13768	13119	12643	12444	11823	11202	10423	9720	8923	8507	-5261
Population growth (20-64)	0.6	-0.8	-0.6	-0.2	-1.2	-1.3	-1.5	-1.5	-1.5	-0.8	-1.5
Labour force 15-64 (thousands)	9563	9145	8774	8392	7857	7331	6789	6318	5903	5632	-3931
Labour force 20-64 (thousands)	9417	9024	8651	8271	7745	7230	6696	6229	5815	5546	-3870
Participation rate (20-64)	68.4	68.8	68.4	66.5	65.5	64.5	64.2	64.1	65.2	65.2	-3.2
Participation rate (15-64)	63.8	64.5	63.9	62.2	61.4	60.7	60.4	60.2	60.9	60.9	-2.9
young (15-24)	31.9	29.1	28.5	29.1	29.7	30.0	29.7	29.2	29.0	29.2	-2.7
prime-age (25-54)	79.5	77.8	76.7	75.7	74.8	74.4	74.8	75.0	74.9	74.8	-4.7
older (55-64)	42.3	44.0	49.5	48.8	49.1	47.4	46.8	44.7	45.8	46.3	4.0
Participation rate (20-64) - FEMALES	59.9	59.4	59.1	57.3	56.5	55.6	55.3	55.2	56.3	56.4	-3.5
Participation rate (15-64) - FEMALES	55.9	55.8	55.2	53.6	53.0	52.3	52.0	51.8	52.6	52.6	-3.3
young (15-24)	26.7	24.3	23.8	24.3	24.8	25.1	24.8	24.4	24.3	24.4	-2.3
prime-age (25-54)	71.4	69.3	68.3	67.2	66.4	65.8	66.4	66.5	66.5	66.2	-5.1
older (55-64)	33.3	32.1	37.6	37.7	38.6	37.4	36.9	34.7	35.7	36.2	2.9
Participation rate (20-64) - MALES	77.0	78.1	77.7	75.6	74.4	73.4	73.0	72.9	73.8	73.8	-3.2
Participation rate (15-64) - MALES	71.7	73.2	72.6	70.7	69.8	69.0	68.7	68.4	69.0	68.9	-2.8
young (15-24)	36.8	33.7	33.0	33.6	34.4	34.6	34.3	33.8	33.6	33.7	-3.1
prime-age (25-54)	87.5	86.1	85.0	83.9	83.0	82.7	83.0	83.1	83.1	83.0	-4.5
older (55-64)	52.6	57.4	62.6	60.7	60.1	57.7	57.1	54.9	56.0	56.4	3.8
Employment rate (15-64)	58.9	60.1	59.6	58.0	57.3	56.7	56.4	56.2	56.8	56.8	-2.1
Employment rate (20-64)	63.4	64.2	64.0	62.2	61.3	60.4	60.1	60.0	61.0	61.1	-2.4
Employment rate (15-74)	55.1	54.0	53.0	52.0	50.9	49.1	48.2	47.5	47.4	47.6	-7.5
Unemployment rate (15-64)	7.6	6.9	6.8	6.7	6.7	6.7	6.7	6.7	6.7	6.7	-0.9
Unemployment rate (20-64)	7.3	6.6	6.5	6.4	6.4	6.4	6.4	6.4	6.4	6.4	-0.9
Unemployment rate (15-74)	7.3	6.6	6.5	6.5	6.4	6.3	6.3	6.3	6.2	6.3	-1.0
Employment (20-64) (in millions)	8.7	8.4	8.1	7.7	7.2	6.8	6.3	5.8	5.4	5.2	-3.5
Employment (15-64) (in millions)	8.8	8.5	8.2	7.8	7.3	6.8	6.3	5.9	5.5	5.3	-3.6
share of young (15-24)	8%	6%	6%	6%	6%	6%	6%	6%	6%	7%	-2%
share of prime-age (25-54)	80%	82%	78%	75%	73%	73%	72%	74%	76%	76%	-4%
share of older (55-64)	12%	12%	16%	19%	20%	21%	22%	20%	18%	18%	6%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	17.2	17.4	19.5	22.7	24.3	25.4	27.1	25.9	22.8	22.4	5.2
Old-age dependency ratio (2)	21	26	29	30	36	41	48	55	63	65	43
Total dependency ratio (3)	43	48	50	50	55	61	69	76	85	86	43
Total economic dependency ratio (4)	132	138	142	149	157	167	180	192	202	208	76
Economic old-age dependency ratio (15-64) (5)	31	40	45	48	58	67	79	90	103	108	76
Economic old-age dependency ratio (15-74) (6)	30	38	43	47	55	63	74	84	96	101	71

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

23. Slovenia

Slovenia	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.54	1.56	1.57	1.58	1.59	1.60	1.61	1.63	1.64	1.65	0.1
Life expectancy at birth											
males	75.8	77.7	78.5	79.4	80.2	81.0	81.8	82.5	83.3	84.0	8.1
females	82.3	83.7	84.4	85.1	85.8	86.4	87.0	87.6	88.2	88.8	6.5
Life expectancy at 65											
males	16.4	17.6	18.1	18.7	19.2	19.8	20.3	20.8	21.4	21.9	5.5
females	20.2	21.3	21.9	22.4	22.9	23.4	23.9	24.4	24.8	25.3	5.1
Net migration (thousand)	11.0	6.3	5.6	5.7	5.3	5.6	5.6	5.0	4.4	3.8	-7.1
Net migration as % of population	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	-0.3
Population (million)	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	0.0
Children population (0-14) as % of total population	14.1	15.2	14.6	13.6	12.9	12.9	13.5	13.9	13.9	13.6	-0.4
Prime age population (25-54) as % of total population	44.9	41.7	39.6	37.7	36.0	34.8	33.9	33.7	33.8	34.1	-10.8
Working age population (15-64) as % of total population	69.4	64.8	63.2	62.0	60.9	59.4	57.2	55.4	54.5	54.8	-14.6
Elderly population (65 and over) as % of total population	16.5	20.0	22.2	24.4	26.2	27.7	29.3	30.7	31.6	31.5	15.0
Very elderly population (80 and over) as % of total population	4.0	5.2	5.6	6.5	8.0	9.3	10.3	11.0	11.7	12.8	8.8
Very elderly population (80 and over) as % of elderly population	24.4	26.2	25.3	26.6	30.6	33.5	35.0	35.8	37.0	40.7	16.3
Very elderly population (80 and over) as % of working age population	5.8	8.1	8.9	10.4	13.2	15.6	17.9	19.8	21.4	23.4	17.6
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.8	1.5	1.6	1.4	1.2	1.0	0.9	0.9	1.1	1.3	1.3
Employment (growth rate)	-0.1	0.1	0.0	-0.2	-0.4	-0.6	-0.7	-0.7	-0.5	-0.2	-0.3
Labour input : hours worked (growth rate)	0.2	0.1	0.0	-0.3	-0.4	-0.6	-0.7	-0.7	-0.5	-0.2	-0.3
Labour productivity per hour (growth rate)	1.7	1.4	1.5	1.6	1.6	1.7	1.6	1.6	1.6	1.5	1.6
TFP (growth rate)	0.7	0.9	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	1.0	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7
GDP per capita (growth rate)	1.2	1.3	1.5	1.4	1.3	1.1	1.0	1.1	1.4	1.6	1.3
GDP per worker (growth rate)	1.9	1.4	1.5	1.6	1.7	1.7	1.6	1.6	1.6	1.5	1.7
GDP in 2010 prices (in millions euros)	36.1	45.2	48.7	52.4	55.9	59.1	62.0	64.8	68.1	72.4	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	1426	1389	1361	1337	1308	1271	1219	1171	1138	1127	-299
Population growth (working age:15-64)	0.9	-0.6	-0.3	-0.4	-0.4	-0.7	-0.9	-0.7	-0.4	-0.1	-1.0
Population (20-64) (in thousands)	1322	1295	1251	1222	1200	1172	1125	1077	1038	1024	-298
Population growth (20-64)	1.2	-0.7	-0.6	-0.4	-0.3	-0.6	-0.9	-0.8	-0.6	-0.1	-1.3
Labour force 15-64 (thousands)	1022	1038	1022	998	974	945	909	876	852	842	-180
Labour force 20-64 (thousands)	1005	1022	1004	979	956	928	894	860	836	825	-180
Participation rate (20-64)	76.0	78.9	80.3	80.1	79.7	79.2	79.4	79.9	80.5	80.6	4.5
Participation rate (15-64)	71.7	74.7	75.1	74.7	74.5	74.3	74.6	74.8	74.9	74.7	3.0
young (15-24)	39.6	39.1	36.8	37.9	39.4	39.8	39.6	38.7	38.0	38.2	-1.4
prime-age (25-54)	90.2	90.2	90.0	89.6	89.3	89.4	89.7	89.8	89.8	89.6	-0.6
older (55-64)	36.3	51.6	59.1	62.2	63.1	61.9	61.3	60.6	61.0	61.6	25.3
Participation rate (20-64) - FEMALES	71.6	75.2	77.6	78.1	77.7	77.3	77.6	78.0	78.6	78.6	7.0
Participation rate (15-64) - FEMALES	67.5	71.1	72.4	72.6	72.5	72.5	72.8	73.0	73.0	72.9	5.4
young (15-24)	35.2	36.1	34.0	35.2	36.6	36.9	36.7	35.9	35.3	35.5	0.2
prime-age (25-54)	88.3	88.5	88.2	87.7	87.4	87.5	87.8	87.9	87.9	87.7	-0.6
older (55-64)	25.6	43.7	55.6	61.3	62.3	60.9	60.2	59.8	60.0	60.7	35.1
Participation rate (20-64) - MALES	80.2	82.4	82.8	82.1	81.5	81.0	81.1	81.7	82.4	82.5	2.3
Participation rate (15-64) - MALES	75.7	78.1	77.6	76.7	76.3	76.1	76.4	76.6	76.7	76.6	0.9
young (15-24)	43.7	42.0	39.6	40.7	42.2	42.7	42.5	41.5	40.7	41.0	-2.8
prime-age (25-54)	91.8	91.9	91.7	91.4	91.2	91.2	91.5	91.7	91.7	91.5	-0.4
older (55-64)	47.0	59.4	62.4	63.1	63.8	62.9	62.3	61.5	62.0	62.5	15.5
Employment rate (15-64)	66.4	68.5	69.8	70.2	70.1	70.0	70.3	70.6	70.6	70.5	4.1
Employment rate (20-64)	70.5	72.5	74.7	75.4	75.1	74.7	75.0	75.4	76.0	76.1	5.6
Employment rate (15-74)	60.0	59.7	59.9	60.3	60.3	60.1	59.7	59.2	59.4	60.1	0.1
Unemployment rate (15-64)	7.4	8.3	7.1	6.0	5.9	5.8	5.7	5.7	5.7	5.7	-1.7
Unemployment rate (20-64)	7.2	8.1	6.9	5.9	5.7	5.6	5.6	5.6	5.6	5.5	-1.7
Unemployment rate (15-74)	7.2	8.1	6.9	5.8	5.6	5.5	5.5	5.4	5.4	5.5	-1.8
Employment (20-64) (in millions)	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	-0.2
Employment (15-64) (in millions)	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	-0.2
share of young (15-24)	8%	7%	7%	8%	9%	8%	8%	8%	8%	9%	0%
share of prime-age (25-54)	82%	78%	75%	73%	71%	70%	71%	73%	74%	75%	-7%
share of older (55-64)	10%	16%	18%	19%	21%	21%	21%	19%	17%	17%	7%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.8	21.6	21.9	22.1	23.5	24.7	24.6	22.9	20.6	19.6	0.8
Old-age dependency ratio (2)	24	31	35	39	43	47	51	55	58	57	34
Total dependency ratio (3)	44	54	58	61	64	68	75	80	83	82	38
Total economic dependency ratio (4)	113	120	121	122	125	130	137	144	148	148	35
Economic old-age dependency ratio (15-64) (5)	34	43	48	53	57	62	68	74	77	77	43
Economic old-age dependency ratio (15-74) (6)	33	42	46	51	55	60	65	70	74	74	41

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

24. Slovak Republic

Slovak Republic	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.41	1.44	1.46	1.48	1.49	1.51	1.52	1.54	1.55	1.57	0.2
Life expectancy at birth											
males	71.6	74.0	75.1	76.2	77.3	78.4	79.4	80.3	81.3	82.2	10.6
females	79.1	81.0	81.9	82.7	83.6	84.4	85.2	86.0	86.7	87.4	8.3
Life expectancy at 65											
males	14.1	15.5	16.2	16.9	17.6	18.2	18.9	19.5	20.2	20.8	6.6
females	18.0	19.3	19.9	20.6	21.2	21.9	22.5	23.1	23.7	24.3	6.3
Net migration (thousand)	10.6	9.9	8.3	8.2	8.4	10.3	10.4	9.9	8.7	6.8	-3.7
Net migration as % of population	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	-0.1
Population (million)	5.4	5.6	5.6	5.6	5.5	5.5	5.4	5.3	5.2	5.1	-0.3
Children population (0-14) as % of total population	15.3	15.6	15.0	13.8	12.8	12.4	12.5	12.7	12.6	12.4	-3.0
Prime age population (25-54) as % of total population	45.7	45.1	43.9	41.6	38.9	36.9	35.3	34.0	33.7	33.7	-12.0
Working age population (15-64) as % of total population	72.4	68.0	66.2	65.5	65.0	63.2	60.2	57.4	55.3	54.1	-18.2
Elderly population (65 and over) as % of total population	12.3	16.4	18.8	20.7	22.2	24.4	27.3	29.9	32.1	33.5	21.2
Very elderly population (80 and over) as % of total population	2.7	3.2	3.7	4.7	6.3	7.5	8.2	8.8	10.2	12.3	9.5
Very elderly population (80 and over) as % of elderly population	22.3	19.6	19.8	22.9	28.3	30.6	30.2	29.4	31.7	36.6	14.3
Very elderly population (80 and over) as % of working age population	3.8	4.7	5.6	7.3	9.7	11.8	13.7	15.3	18.4	22.7	18.9
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	3.5	3.0	2.5	1.7	1.2	0.9	0.7	0.6	0.7	1.0	1.6
Employment (growth rate)	0.1	0.2	0.1	-0.3	-0.8	-1.1	-1.2	-1.2	-1.0	-0.6	-0.6
Labour input : hours worked (growth rate)	0.2	0.2	0.1	-0.3	-0.8	-1.1	-1.2	-1.2	-1.0	-0.6	-0.6
Labour productivity per hour (growth rate)	3.2	2.8	2.4	2.0	2.0	2.0	1.9	1.8	1.7	1.5	2.3
TFP (growth rate)	2.2	1.8	1.5	1.3	1.3	1.3	1.2	1.1	1.1	1.0	1.4
Capital deepening (contribution to labour productivity growth)	1.1	1.0	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.8
GDP per capita (growth rate)	3.0	2.8	2.5	1.8	1.4	1.1	0.9	0.9	1.1	1.5	1.8
GDP per worker (growth rate)	3.4	2.7	2.4	2.0	2.0	2.0	1.9	1.8	1.7	1.6	2.3
GDP in 2010 prices (in millions euros)	65.9	90.6	103.1	114.2	122.2	128.5	133.4	137.5	142.0	148.2	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	3933	3796	3708	3650	3590	3454	3251	3054	2885	2763	-1170
Population growth (working age:15-64)	0.4	-0.6	-0.3	-0.4	-0.4	-1.0	-1.3	-1.3	-1.0	-0.6	-1.1
Population (20-64) (in thousands)	3574	3533	3420	3346	3304	3195	3017	2829	2657	2532	-1042
Population growth (20-64)	1.2	-0.6	-0.5	-0.3	-0.3	-0.9	-1.2	-1.3	-1.2	-0.7	-1.9
Labour force 15-64 (thousands)	2710	2696	2624	2544	2452	2321	2179	2046	1939	1872	-838
Labour force 20-64 (thousands)	2685	2679	2607	2525	2434	2304	2163	2032	1925	1858	-828
Participation rate (20-64)	75.1	75.8	76.2	75.5	73.7	72.1	71.7	71.8	72.4	73.4	-1.8
Participation rate (15-64)	68.9	71.0	70.8	69.7	68.3	67.2	67.0	67.0	67.2	67.8	-1.1
young (15-24)	31.8	31.5	29.0	29.4	31.0	31.6	31.7	30.9	30.1	30.1	-1.7
prime-age (25-54)	86.9	85.5	85.0	84.4	84.0	83.3	83.3	83.5	83.7	83.7	-3.2
older (55-64)	45.1	51.1	53.7	56.0	54.8	52.6	51.4	50.2	49.2	50.7	5.5
Participation rate (20-64) - FEMALES	66.9	69.0	70.2	69.6	67.7	66.0	65.4	65.4	66.1	67.1	0.3
Participation rate (15-64) - FEMALES	61.4	64.7	65.2	64.4	62.9	61.6	61.2	61.1	61.4	62.0	0.6
young (15-24)	26.1	25.7	23.7	24.0	25.4	25.9	25.9	25.3	24.6	24.6	-1.6
prime-age (25-54)	80.8	78.9	78.6	78.1	77.6	76.5	76.1	76.3	76.7	76.9	-3.9
older (55-64)	32.2	46.2	51.4	53.9	52.0	49.8	48.7	47.4	46.4	47.9	15.7
Participation rate (20-64) - MALES	83.5	82.6	82.2	81.3	79.5	78.2	77.9	78.1	78.7	79.5	-4.0
Participation rate (15-64) - MALES	76.4	77.2	76.3	75.0	73.7	72.8	72.8	72.8	72.9	73.4	-3.0
young (15-24)	37.2	37.0	34.1	34.5	36.5	37.2	37.2	36.3	35.4	35.4	-1.9
prime-age (25-54)	93.0	91.9	91.3	90.6	90.2	90.1	90.3	90.6	90.6	90.4	-2.6
older (55-64)	59.8	56.3	56.1	58.2	57.7	55.4	54.1	53.0	52.0	53.5	-6.3
Employment rate (15-64)	59.0	61.7	63.4	64.0	63.1	62.2	62.1	62.1	62.3	62.8	3.8
Employment rate (20-64)	64.7	66.1	68.5	69.5	68.1	66.8	66.6	66.7	67.3	68.2	3.5
Employment rate (15-74)	54.0	54.1	54.6	55.2	54.5	53.0	51.1	50.0	49.9	50.6	-3.4
Unemployment rate (15-64)	14.4	13.1	10.4	8.1	7.7	7.5	7.4	7.3	7.3	7.3	-7.1
Unemployment rate (20-64)	13.9	12.8	10.2	7.9	7.5	7.3	7.2	7.1	7.1	7.1	-6.9
Unemployment rate (15-74)	14.3	13.0	10.3	8.1	7.6	7.4	7.3	7.2	7.2	7.2	-7.1
Employment (20-64) (in millions)	2.3	2.3	2.3	2.3	2.3	2.1	2.0	1.9	1.8	1.7	-0.6
Employment (15-64) (in millions)	2.3	2.3	2.4	2.3	2.3	2.1	2.0	1.9	1.8	1.7	-0.6
share of young (15-24)	7%	5%	5%	6%	7%	7%	6%	6%	6%	7%	-1%
share of prime-age (25-54)	81%	80%	80%	77%	74%	73%	73%	74%	76%	77%	-4%
share of older (55-64)	12%	14%	15%	17%	19%	21%	21%	20%	17%	16%	4%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	17.2	19.1	18.7	20.1	23.6	25.7	26.1	25.5	23.2	21.0	3.9
Old-age dependency ratio (2)	17	24	28	32	34	39	45	52	58	62	45
Total dependency ratio (3)	38	47	51	53	54	58	66	74	81	85	47
Total economic dependency ratio (4)	133	136	136	136	141	151	163	175	185	189	56
Economic old-age dependency ratio (15-64) (5)	28	38	44	48	53	61	71	82	91	97	68
Economic old-age dependency ratio (15-74) (6)	28	38	43	48	52	60	70	80	90	95	67

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

25. Finland

Finland	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	0.0
Life expectancy at birth											
males	76.6	78.4	79.2	80.0	80.8	81.6	82.3	83.0	83.7	84.4	7.7
females	83.2	84.6	85.2	85.9	86.5	87.0	87.6	88.2	88.7	89.2	6.0
Life expectancy at 65											
males	17.3	18.3	18.9	19.4	19.9	20.4	20.9	21.4	21.8	22.3	5.0
females	21.3	22.2	22.7	23.2	23.6	24.1	24.5	25.0	25.4	25.8	4.5
Net migration (thousand)	14.8	11.4	10.3	9.7	8.9	8.6	8.5	8.2	8.0	7.3	-7.5
Net migration as % of population	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-0.1
Population (million)	5.4	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	0.4
Children population (0-14) as % of total population	16.6	16.9	16.8	16.5	16.1	15.9	15.9	16.1	16.1	16.0	-0.6
Prime age population (25-54) as % of total population	39.2	37.0	36.1	35.9	35.6	35.3	35.2	34.9	35.0	35.0	-4.2
Working age population (15-64) as % of total population	66.2	60.9	59.3	58.4	58.1	58.6	58.4	57.9	57.5	56.9	-9.3
Elderly population (65 and over) as % of total population	17.3	22.3	23.8	25.1	25.7	25.5	25.6	26.0	26.4	27.1	9.8
Very elderly population (80 and over) as % of total population	4.7	5.6	6.3	8.1	9.3	9.8	10.2	10.3	10.1	10.4	5.7
Very elderly population (80 and over) as % of elderly population	27.2	25.1	26.4	32.5	36.1	38.6	39.9	39.6	38.1	38.3	11.2
Very elderly population (80 and over) as % of working age population	7.1	9.2	10.6	14.0	16.0	16.8	17.5	17.8	17.5	18.2	11.1
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.8	1.7	1.3	1.4	1.6	1.6	1.5	1.4	1.4	1.5	1.5
Employment (growth rate)	0.4	-0.2	-0.2	-0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1
Labour input : hours worked (growth rate)	0.3	-0.2	-0.2	-0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1
Labour productivity per hour (growth rate)	1.5	2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.7
TFP (growth rate)	1.2	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Capital deepening (contribution to labour productivity growth)	0.2	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
GDP per capita (growth rate)	0.9	1.4	1.1	1.3	1.6	1.6	1.5	1.4	1.4	1.5	1.4
GDP per worker (growth rate)	1.4	2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.7
GDP in 2010 prices (in millions euros)	180.3	226.2	243.0	259.9	280.4	303.4	327.2	351.6	376.9	404.9	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	3550	3399	3359	3332	3329	3356	3345	3316	3296	3271	-279
Population growth (working age:15-64)	0.6	-0.3	-0.2	-0.1	0.1	0.0	-0.1	-0.2	-0.2	-0.1	-0.7
Population (20-64) (in thousands)	3216	3103	3047	3009	3003	3034	3033	3009	2987	2957	-259
Population growth (20-64)	0.4	-0.4	-0.3	-0.2	0.1	0.1	0.0	-0.2	-0.2	-0.1	-0.6
Labour force 15-64 (thousands)	2648	2597	2558	2532	2535	2549	2544	2527	2507	2493	-154
Labour force 20-64 (thousands)	2545	2507	2463	2433	2435	2450	2448	2433	2413	2398	-147
Participation rate (20-64)	79.1	80.8	80.8	80.9	81.1	80.8	80.7	80.9	80.8	81.1	2.0
Participation rate (15-64)	74.6	76.4	76.1	76.0	76.1	75.9	76.0	76.2	76.1	76.2	1.7
young (15-24)	50.0	51.3	50.4	50.6	50.9	51.2	51.4	51.2	50.9	50.8	0.8
prime-age (25-54)	87.5	87.2	87.2	87.2	87.3	87.4	87.3	87.4	87.4	87.4	-0.1
older (55-64)	60.5	66.6	66.6	65.6	66.6	65.9	65.8	66.4	65.4	65.8	5.3
Participation rate (20-64) - FEMALES	76.8	78.6	78.7	78.8	79.2	78.9	78.9	79.0	78.9	79.2	2.4
Participation rate (15-64) - FEMALES	72.8	74.7	74.5	74.5	74.8	74.6	74.7	74.8	74.7	74.9	2.1
young (15-24)	50.1	51.6	50.8	51.0	51.3	51.5	51.7	51.5	51.3	51.2	1.1
prime-age (25-54)	84.4	84.1	84.2	84.4	84.7	84.8	84.7	84.7	84.8	84.8	0.4
older (55-64)	60.9	67.1	67.3	66.3	66.9	66.5	66.7	67.3	66.3	66.7	5.8
Participation rate (20-64) - MALES	81.4	82.9	82.9	82.8	83.0	82.6	82.5	82.7	82.6	82.9	1.5
Participation rate (15-64) - MALES	76.3	78.1	77.7	77.4	77.5	77.3	77.3	77.6	77.4	77.6	1.2
young (15-24)	49.9	51.0	50.0	50.1	50.5	50.8	51.1	50.9	50.5	50.4	0.6
prime-age (25-54)	90.5	90.1	90.0	89.8	89.7	89.8	89.9	90.0	90.0	89.9	-0.6
older (55-64)	60.2	66.1	66.0	64.9	66.2	65.4	65.0	65.5	64.6	65.0	4.8
Employment rate (15-64)	68.2	71.4	71.1	71.0	71.1	70.9	71.0	71.2	71.1	71.2	3.0
Employment rate (20-64)	73.1	76.0	76.1	76.1	76.3	76.0	76.0	76.1	76.0	76.3	3.2
Employment rate (15-74)	60.8	61.0	61.3	61.3	61.6	62.1	62.2	61.7	61.4	61.4	0.6
Unemployment rate (15-64)	8.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	-2.0
Unemployment rate (20-64)	7.7	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	-1.8
Unemployment rate (15-74)	8.5	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	-2.1
Employment (20-64) (in millions)	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	-0.1
Employment (15-64) (in millions)	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	-0.1
share of young (15-24)	11%	11%	11%	11%	12%	12%	12%	11%	11%	11%	1%
share of prime-age (25-54)	71%	70%	71%	72%	71%	70%	70%	70%	71%	72%	1%
share of older (55-64)	18%	19%	19%	17%	17%	18%	18%	18%	18%	17%	-1%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	22.1	21.3	20.9	19.3	19.2	20.3	20.5	20.8	20.3	19.3	-2.8
Old-age dependency ratio (2)	26	37	40	43	44	43	44	45	46	48	21
Total dependency ratio (3)	51	64	69	71	72	71	71	73	74	76	25
Total economic dependency ratio (4)	118	123	129	133	134	133	133	135	137	138	20
Economic old-age dependency ratio (15-64) (5)	37	48	53	57	59	58	58	60	61	63	27
Economic old-age dependency ratio (15-74) (6)	36	46	51	55	57	56	57	58	59	61	25

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

26. Sweden

Sweden	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.94	1.93	1.93	1.92	1.92	1.92	1.91	1.91	1.91	1.90	0.0
Life expectancy at birth											
males	79.4	80.8	81.4	82.1	82.7	83.3	83.8	84.4	85.0	85.5	6.1
females	83.4	84.8	85.4	86.0	86.6	87.2	87.7	88.3	88.8	89.3	5.9
Life expectancy at 65											
males	18.2	19.2	19.6	20.1	20.5	21.0	21.4	21.8	22.3	22.7	4.4
females	21.1	22.1	22.6	23.1	23.5	24.0	24.5	24.9	25.3	25.7	4.7
Net migration (thousand)	59.9	28.2	27.1	26.0	24.9	23.8	22.7	21.7	22.0	19.5	-40.4
Net migration as % of population	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-0.5
Population (million)	9.4	10.1	10.4	10.6	10.8	10.9	11.1	11.2	11.4	11.5	2.2
Children population (0-14) as % of total population	16.6	17.9	18.0	17.6	17.0	16.5	16.5	16.8	16.9	16.8	0.2
Prime age population (25-54) as % of total population	39.1	39.0	37.2	36.2	36.1	36.2	35.7	35.1	35.4	35.5	-3.6
Working age population (15-64) as % of total population	65.1	61.4	60.5	59.9	59.6	59.4	59.2	58.6	57.7	56.9	-8.2
Elderly population (65 and over) as % of total population	18.3	20.7	21.5	22.5	23.5	24.1	24.2	24.5	25.4	26.3	8.0
Very elderly population (80 and over) as % of total population	5.3	5.4	6.4	7.6	8.1	8.3	8.8	9.4	9.9	10.0	4.7
Very elderly population (80 and over) as % of elderly population	28.9	26.1	30.0	33.9	34.3	34.5	36.3	38.4	38.8	37.8	8.9
Very elderly population (80 and over) as % of working age population	8.1	8.8	10.6	12.7	13.5	14.0	14.9	16.1	17.1	17.5	9.4
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	2.1	1.8	1.8	1.7	1.8	1.8	1.8	1.6	1.5	1.7	1.8
Employment (growth rate)	0.9	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.0	0.1	0.2
Labour input : hours worked (growth rate)	1.2	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.0	0.1	0.2
Labour productivity per hour (growth rate)	0.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
TFP (growth rate)	0.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	0.8	1.2	1.3	1.4	1.5	1.5	1.5	1.3	1.2	1.5	1.3
GDP per worker (growth rate)	1.1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
GDP in 2010 prices (in millions euros)	346.1	427.0	466.8	509.2	555.8	608.0	665.0	722.7	779.9	843.6	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	6109	6201	6285	6350	6411	6484	6559	6597	6579	6566	457
Population growth (working age:15-64)	0.5	0.2	0.3	0.1	0.3	0.2	0.2	0.1	-0.2	0.1	-0.3
Population (20-64) (in thousands)	5481	5661	5689	5725	5761	5833	5937	5988	5952	5915	434
Population growth (20-64)	0.8	0.0	0.2	0.0	0.3	0.3	0.3	0.1	-0.3	0.1	-0.7
Labour force 15-64 (thousands)	4832	5057	5116	5156	5206	5281	5361	5396	5371	5375	543
Labour force 20-64 (thousands)	4630	4891	4931	4961	5003	5076	5165	5205	5175	5172	542
Participation rate (20-64)	84.5	86.4	86.7	86.7	86.8	87.0	87.0	86.9	87.0	87.4	3.0
Participation rate (15-64)	79.1	81.5	81.4	81.2	81.2	81.4	81.7	81.8	81.6	81.9	2.8
young (15-24)	51.9	52.7	52.2	52.9	53.0	53.5	54.1	53.7	53.0	52.9	1.0
prime-age (25-54)	90.0	91.2	91.7	91.9	91.9	92.0	92.0	92.0	92.1	92.2	2.1
older (55-64)	73.9	75.7	76.6	76.4	76.9	77.6	78.1	78.0	76.6	77.9	3.9
Participation rate (20-64) - FEMALES	81.2	83.0	83.2	83.2	83.4	83.6	83.6	83.6	83.6	84.2	3.0
Participation rate (15-64) - FEMALES	76.5	78.8	78.7	78.5	78.5	78.8	79.1	79.1	79.0	79.3	2.7
young (15-24)	51.8	52.9	52.5	53.0	53.0	53.5	54.0	53.7	53.1	53.0	1.2
prime-age (25-54)	87.1	88.1	88.7	89.0	89.1	89.2	89.2	89.3	89.4	89.4	2.3
older (55-64)	69.8	71.1	71.7	71.4	71.7	72.3	72.9	73.0	71.4	72.9	3.1
Participation rate (20-64) - MALES	87.7	89.7	90.0	90.0	90.1	90.3	90.2	90.1	90.2	90.6	2.9
Participation rate (15-64) - MALES	81.6	84.2	84.1	83.8	83.8	84.0	84.3	84.4	84.2	84.3	2.7
young (15-24)	52.1	52.6	52.0	52.8	52.9	53.5	54.2	53.7	53.0	52.9	0.8
prime-age (25-54)	92.8	94.1	94.5	94.7	94.7	94.6	94.6	94.6	94.7	94.7	1.9
older (55-64)	78.0	80.2	81.4	81.5	82.0	82.8	83.1	82.8	81.6	82.8	4.7
Employment rate (15-64)	72.4	76.2	76.1	75.9	75.9	76.1	76.4	76.5	76.3	76.5	4.2
Employment rate (20-64)	78.3	81.4	81.7	81.7	81.9	82.1	82.0	81.9	82.0	82.5	4.2
Employment rate (15-74)	64.6	66.9	67.4	67.1	66.6	66.7	67.3	67.5	66.9	66.3	1.8
Unemployment rate (15-64)	8.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	-2.0
Unemployment rate (20-64)	7.3	5.8	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	-1.6
Unemployment rate (15-74)	8.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.3	6.3	-2.0
Employment (20-64) (in millions)	4.3	4.6	4.6	4.7	4.7	4.8	4.9	4.9	4.9	4.9	0.6
Employment (15-64) (in millions)	4.4	4.7	4.8	4.8	4.9	4.9	5.0	5.0	5.0	5.0	0.6
share of young (15-24)	11%	10%	10%	11%	11%	12%	11%	11%	11%	11%	0%
share of prime-age (25-54)	70%	72%	70%	70%	70%	70%	69%	68%	70%	71%	1%
share of older (55-64)	19%	18%	19%	19%	19%	18%	20%	21%	19%	18%	-1%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	19.5	19.2	20.1	20.1	19.2	18.8	20.0	21.3	19.6	18.0	-1.6
Old-age dependency ratio (2)	28	34	35	37	39	41	41	42	44	46	18
Total dependency ratio (3)	54	63	65	67	68	68	69	71	73	76	22
Total economic dependency ratio (4)	107	107	110	112	113	113	113	115	118	120	13
Economic old-age dependency ratio (15-64) (5)	36	41	43	46	48	49	50	51	53	56	20
Economic old-age dependency ratio (15-74) (6)	35	39	42	44	46	47	48	49	51	54	18

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

27. United-Kingdom

United-Kingdom	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.94	1.93	1.93	1.93	1.92	1.92	1.92	1.91	1.91	1.91	0.0
Life expectancy at birth											
males	78.3	79.9	80.6	81.4	82.1	82.7	83.4	84.0	84.6	85.2	7.0
females	82.4	83.9	84.7	85.4	86.0	86.7	87.3	87.9	88.5	89.1	6.7
Life expectancy at 65											
males	18.0	19.0	19.5	20.0	20.5	21.0	21.4	21.9	22.3	22.8	4.8
females	20.7	21.8	22.3	22.8	23.3	23.8	24.3	24.8	25.3	25.7	5.0
Net migration (thousand)	197.9	193.0	185.6	178.1	170.7	163.3	155.9	148.5	141.0	133.6	-64.2
Net migration as % of population	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	-0.1
Population (million)	62.2	66.5	68.5	70.4	72.0	73.6	75.1	76.5	77.8	79.0	16.8
Children population (0-14) as % of total population	17.4	18.2	18.1	17.8	17.4	17.2	17.2	17.3	17.3	17.1	-0.3
Prime age population (25-54) as % of total population	41.0	39.3	37.7	36.8	37.0	36.8	36.4	36.0	36.0	36.2	-4.9
Working age population (15-64) as % of total population	66.0	63.0	62.0	60.8	59.9	59.6	59.7	59.3	58.6	58.3	-7.7
Elderly population (65 and over) as % of total population	16.5	18.8	19.8	21.4	22.7	23.2	23.1	23.4	24.1	24.6	8.0
Very elderly population (80 and over) as % of total population	4.7	5.2	5.7	6.7	7.1	7.7	8.7	9.4	9.5	9.3	4.6
Very elderly population (80 and over) as % of elderly population	28.2	27.8	28.7	31.3	31.5	33.5	37.5	40.0	39.5	37.8	9.7
Very elderly population (80 and over) as % of working age population	7.1	8.3	9.2	11.0	11.9	13.0	14.5	15.8	16.2	15.9	8.9
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.2	2.1	1.9	1.9	1.9	2.0	1.9	1.8	1.7	1.8	1.9
Employment (growth rate)	0.2	0.4	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.2	0.3
Labour input : hours worked (growth rate)	-0.3	0.4	0.4	0.3	0.4	0.5	0.4	0.2	0.2	0.2	0.3
Labour productivity per hour (growth rate)	1.5	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
TFP (growth rate)	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
GDP per capita (growth rate)	-0.6	1.4	1.3	1.4	1.5	1.6	1.5	1.4	1.4	1.5	1.4
GDP per worker (growth rate)	1.0	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
GDP in 2010 prices (in millions euros)	1694.5	2151.5	2370.1	2599.7	2856.8	3152.5	3477.3	3807.8	4148.7	4523.3	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	41078	41908	42507	42790	43126	43895	44861	45364	45653	46088	5010
Population growth (working age:15-64)	1.9	0.3	0.2	0.1	0.2	0.5	0.3	0.1	0.1	0.3	-1.6
Population (20-64) (in thousands)	37178	38340	38515	38612	38834	39574	40575	41062	41238	41547	4369
Population growth (20-64)	1.6	0.2	0.1	0.0	0.2	0.5	0.4	0.1	0.1	0.2	-1.4
Labour force 15-64 (thousands)	30976	32050	32375	32597	32980	33713	34436	34774	34983	35359	4383
Labour force 20-64 (thousands)	29358	30616	30764	30899	31233	31949	32685	33024	33193	33515	4156
Participation rate (20-64)	79.0	79.9	79.9	80.0	80.4	80.7	80.6	80.4	80.5	80.7	1.7
Participation rate (15-64)	75.4	76.5	76.2	76.2	76.5	76.8	76.8	76.7	76.6	76.7	1.3
young (15-24)	59.4	59.1	57.8	58.4	58.6	58.8	59.0	58.8	58.5	58.4	-0.9
prime-age (25-54)	85.0	84.8	84.7	84.8	84.6	84.5	84.5	84.5	84.5	84.5	-0.5
older (55-64)	59.9	66.0	67.4	67.6	68.7	70.7	70.7	70.2	69.9	70.1	10.2
Participation rate (20-64) - FEMALES	72.1	74.1	74.7	75.2	75.8	76.1	75.9	75.8	75.8	76.0	3.9
Participation rate (15-64) - FEMALES	69.3	71.3	71.5	71.9	72.4	72.7	72.6	72.5	72.5	72.6	3.2
young (15-24)	56.7	56.3	55.3	55.8	56.0	56.1	56.2	56.1	55.8	55.8	-0.9
prime-age (25-54)	78.6	79.0	79.1	79.4	79.5	79.4	79.3	79.3	79.3	79.4	0.8
older (55-64)	51.1	60.8	63.9	65.2	66.5	68.5	68.3	67.8	67.5	67.7	16.6
Participation rate (20-64) - MALES	85.8	85.5	85.0	84.8	85.0	85.2	85.1	84.9	85.0	85.2	-0.7
Participation rate (15-64) - MALES	81.5	81.6	80.7	80.3	80.5	80.7	80.8	80.7	80.6	80.7	-0.8
young (15-24)	61.9	61.8	60.3	60.9	61.2	61.4	61.6	61.3	61.0	61.0	-1.0
prime-age (25-54)	91.4	90.5	90.2	90.0	89.6	89.4	89.5	89.6	89.5	89.5	-1.9
older (55-64)	69.2	71.5	71.0	70.0	70.9	72.8	73.0	72.5	72.2	72.5	3.3
Employment rate (15-64)	69.4	71.2	71.4	71.6	72.0	72.4	72.4	72.3	72.3	72.4	3.0
Employment rate (20-64)	73.5	75.1	75.6	76.0	76.4	76.8	76.6	76.5	76.6	76.8	3.3
Employment rate (15-74)	62.9	63.3	63.6	63.3	63.4	64.3	65.2	65.2	64.6	64.4	1.5
Unemployment rate (15-64)	8.0	6.9	6.3	5.9	5.8	5.7	5.7	5.7	5.6	5.6	-2.4
Unemployment rate (20-64)	6.9	6.0	5.4	5.1	4.9	4.9	4.9	4.9	4.8	4.8	-2.1
Unemployment rate (15-74)	7.9	6.8	6.1	5.8	5.6	5.6	5.5	5.5	5.5	5.5	-2.4
Employment (20-64) (in millions)	27.3	28.8	29.1	29.3	29.7	30.4	31.1	31.4	31.6	31.9	4.6
Employment (15-64) (in millions)	28.5	29.8	30.3	30.7	31.1	31.8	32.5	32.8	33.0	33.4	4.9
share of young (15-24)	14%	12%	13%	14%	14%	14%	14%	14%	14%	14%	0%
share of prime-age (25-54)	72%	70%	69%	68%	69%	69%	68%	68%	69%	69%	-2%
share of older (55-64)	15%	17%	19%	18%	16%	17%	18%	18%	18%	17%	2%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	17.8	19.5	20.5	19.5	17.7	17.9	19.2	19.6	18.8	17.9	0.1
Old-age dependency ratio (2)	25	30	32	35	38	39	39	40	41	42	17
Total dependency ratio (3)	51	59	61	64	67	68	67	69	71	72	20
Total economic dependency ratio (4)	113	117	119	121	122	122	121	122	124	125	12
Economic old-age dependency ratio (15-64) (5)	33	39	42	45	48	49	49	50	51	53	19
Economic old-age dependency ratio (15-74) (6)	33	38	40	43	46	47	47	47	49	50	18

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

28. Norway

Norway **EC-EPC (AWG) 2012 projections**

Main demographic and macroeconomic assumptions

Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.90	1.90	1.90	1.89	1.89	1.89	1.89	1.89	1.89	1.88	0.0
Life expectancy at birth											
males	78.7	80.2	80.9	81.5	82.2	82.8	83.4	84.1	84.6	85.2	6.5
females	83.1	84.5	85.2	85.8	86.4	87.0	87.6	88.1	88.7	89.2	6.1
Life expectancy at 65											
males	17.9	18.9	19.4	19.9	20.3	20.8	21.2	21.7	22.1	22.5	4.6
females	21.0	22.0	22.5	23.0	23.5	23.9	24.4	24.8	25.3	25.7	4.7
Net migration (thousand)	36.9	17.4	16.7	16.0	15.4	14.7	14.0	13.4	12.7	12.0	-24.9
Net migration as % of population	0.8	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	-0.6
Population (million)	4.9	5.4	5.6	5.8	6.0	6.1	6.3	6.4	6.5	6.6	1.7
Children population (0-14) as % of total population	18.8	18.6	18.6	18.3	17.8	17.4	17.2	17.2	17.2	17.1	-1.7
Prime age population (25-54) as % of total population	41.2	39.9	38.5	37.1	36.7	36.5	36.2	35.8	35.6	35.6	-5.5
Working age population (15-64) as % of total population	66.2	63.7	62.3	61.3	60.3	59.6	59.4	59.0	58.4	57.9	-8.2
Elderly population (65 and over) as % of total population	15.0	17.6	19.0	20.4	21.9	23.0	23.4	23.8	24.4	25.0	10.0
Very elderly population (80 and over) as % of total population	4.5	4.3	4.9	6.1	6.8	7.5	8.1	8.9	9.5	9.6	5.1
Very elderly population (80 and over) as % of elderly population	30.1	24.1	25.7	29.7	31.2	32.6	34.7	37.5	39.0	38.5	8.4
Very elderly population (80 and over) as % of working age population	6.8	6.7	7.9	9.9	11.4	12.6	13.7	15.1	16.3	16.6	9.8
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	2.7	2.0	1.8	1.8	1.8	1.9	1.9	1.8	1.7	1.7	1.9
Employment (growth rate)	-0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4
Labour input : hours worked (growth rate)	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4
Labour productivity per hour (growth rate)	1.7	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
TFP (growth rate)	1.3	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Capital deepening (contribution to labour productivity growth)	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	1.3	1.2	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.3
GDP per worker (growth rate)	3.0	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
GDP in 2010 prices (in millions euros)	243.0	307.0	337.4	369.1	403.4	441.6	484.2	529.9	577.7	629.3	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	3234	3442	3500	3558	3599	3645	3710	3760	3793	3822	588
Population growth (working age:15-64)	1.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.1	0.2	-1.2
Population (20-64) (in thousands)	2912	3129	3173	3212	3238	3280	3348	3400	3427	3447	535
Population growth (20-64)	1.3	0.4	0.3	0.2	0.2	0.3	0.4	0.3	0.1	0.2	-1.2
Labour force 15-64 (thousands)	2529	2696	2733	2767	2795	2836	2889	2932	2955	2980	451
Labour force 20-64 (thousands)	2394	2565	2597	2622	2644	2683	2737	2781	2802	2823	429
Participation rate (20-64)	82.2	82.0	81.8	81.6	81.7	81.8	81.8	81.8	81.8	81.9	-0.3
Participation rate (15-64)	78.2	78.3	78.1	77.8	77.7	77.8	77.9	78.0	77.9	78.0	-0.2
young (15-24)	57.1	58.4	57.5	57.4	57.6	57.9	58.1	58.0	57.8	57.7	0.6
prime-age (25-54)	87.3	87.1	87.2	87.2	87.2	87.3	87.3	87.4	87.4	87.4	0.1
older (55-64)	69.8	69.1	68.8	68.7	68.4	68.0	68.3	68.7	68.2	68.2	-1.7
Participation rate (20-64) - FEMALES	79.1	79.5	79.6	79.6	79.8	80.0	80.0	80.0	80.0	80.1	1.1
Participation rate (15-64) - FEMALES	75.7	76.4	76.4	76.2	76.3	76.5	76.6	76.7	76.6	76.7	1.0
young (15-24)	57.6	58.9	58.2	58.2	58.3	58.5	58.7	58.6	58.4	58.4	0.7
prime-age (25-54)	84.3	84.7	85.1	85.3	85.4	85.6	85.6	85.6	85.7	85.7	1.4
older (55-64)	65.8	66.1	65.8	65.9	65.8	65.8	66.6	66.9	66.4	66.4	0.7
Participation rate (20-64) - MALES	85.2	84.3	84.0	83.6	83.5	83.5	83.5	83.5	83.5	83.6	-1.6
Participation rate (15-64) - MALES	80.6	80.2	79.8	79.2	79.0	79.0	79.1	79.2	79.2	79.2	-1.4
young (15-24)	56.7	57.8	56.8	56.8	57.0	57.3	57.5	57.5	57.2	57.1	0.5
prime-age (25-54)	90.2	89.4	89.3	89.1	88.9	89.0	89.0	89.1	89.1	89.1	-1.1
older (55-64)	73.8	71.9	71.7	71.4	70.8	70.1	70.1	70.5	69.9	69.9	-3.9
Employment rate (15-64)	75.4	75.7	75.5	75.2	75.1	75.2	75.3	75.4	75.3	75.4	0.0
Employment rate (20-64)	79.6	79.5	79.4	79.3	79.3	79.4	79.4	79.4	79.4	79.5	-0.1
Employment rate (15-74)	69.4	67.7	67.4	66.8	66.3	66.1	66.5	66.8	66.5	66.2	-3.2
Unemployment rate (15-64)	3.6	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	-0.3
Unemployment rate (20-64)	3.1	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	-0.2
Unemployment rate (15-74)	3.5	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	-0.3
Employment (20-64) (in millions)	2.3	2.5	2.5	2.5	2.6	2.6	2.7	2.7	2.7	2.7	0.4
Employment (15-64) (in millions)	2.4	2.6	2.6	2.7	2.7	2.7	2.8	2.8	2.9	2.9	0.4
share of young (15-24)	13%	13%	13%	13%	14%	14%	14%	14%	14%	14%	0%
share of prime-age (25-54)	70%	70%	69%	68%	69%	69%	69%	68%	69%	69%	-1%
share of older (55-64)	17%	17%	18%	18%	17%	17%	17%	18%	18%	17%	0%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.2	18.7	19.8	20.2	19.2	18.6	19.2	19.8	19.7	18.9	0.7
Old-age dependency ratio (2)	23	28	31	33	36	39	39	40	42	43	20
Total dependency ratio (3)	51	57	60	63	66	68	68	70	71	73	21
Total economic dependency ratio (4)	95	100	105	109	112	114	116	117	119	120	25
Economic old-age dependency ratio (15-64) (5)	27	33	37	41	44	47	49	50	51	53	26
Economic old-age dependency ratio (15-74) (6)	26	32	36	39	43	45	47	48	49	51	25

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

29. European Union

European Union	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.59	1.60	1.61	1.62	1.63	1.64	1.65	1.66	1.67	1.68	0.1
Life expectancy at birth											
males	76.2	78.0	78.8	79.7	80.4	81.2	82.0	82.7	83.4	84.0	7.8
females	82.2	83.6	84.3	85.0	85.6	86.2	86.9	87.4	88.0	88.5	6.4
Life expectancy at 65											
males	16.7	17.8	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.8	5.1
females	20.2	21.2	21.8	22.3	22.8	23.3	23.8	24.3	24.7	25.1	4.9
Net migration (thousand)	1043.0	1332.5	1300.7	1295.2	1274.4	1226.7	1178.3	1100.9	1040.3	945.0	-98.0
Net migration as % of population	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Population (million)	501.8	514.9	519.5	522.6	524.7	525.7	525.5	523.8	520.7	516.5	14.7
Children population (0-14) as % of total population	15.6	15.5	15.1	14.6	14.3	14.2	14.3	14.3	14.3	14.2	-1.4
Prime age population (25-54) as % of total population	42.7	40.3	38.6	37.2	36.4	35.7	35.1	34.7	34.6	34.5	-8.1
Working age population (15-64) as % of total population	67.0	64.2	62.9	61.5	60.1	58.9	57.8	57.0	56.4	56.2	-10.7
Elderly population (65 and over) as % of total population	17.4	20.3	22.0	23.8	25.6	27.0	27.9	28.7	29.3	29.5	12.1
Very elderly population (80 and over) as % of total population	4.7	5.8	6.2	7.1	8.0	9.0	10.1	11.1	11.7	12.1	7.4
Very elderly population (80 and over) as % of elderly population	27.1	28.6	28.3	29.8	31.3	33.4	36.1	38.5	39.8	40.9	13.8
Very elderly population (80 and over) as % of working age population	7.1	9.1	9.9	11.5	13.3	15.3	17.4	19.4	20.7	21.5	14.4
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.2	1.6	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.4	1.4
Employment (growth rate)	0.5	0.2	0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.1
Labour input : hours worked (growth rate)	0.1	0.2	0.1	-0.2	-0.3	-0.3	-0.4	-0.3	-0.3	-0.2	-0.2
Labour productivity per hour (growth rate)	1.1	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5
TFP (growth rate)	0.6	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0
Capital deepening (contribution to labour productivity growth)	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	0.1	1.4	1.5	1.4	1.3	1.4	1.4	1.4	1.5	1.6	1.4
GDP per worker (growth rate)	0.7	1.4	1.6	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.5
GDP in 2010 prices (in millions euros)	12280.6	14719.1	15951.6	17201.8	18434.4	19757.9	21169.4	22644.8	24224.1	25959.8	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	335997	330322	326839	321627	315257	309485	303920	298448	293540	290376	-45621
Population growth (working age:15-64)	1.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.1	-1.3
Population (20-64) (in thousands)	307530	303976	299237	293939	288236	283288	278343	272941	267753	264482	-43048
Population growth (20-64)	1.4	-0.2	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.2	-1.5
Labour force 15-64 (thousands)	238763	241509	239314	235140	230788	227161	223356	219445	216039	213909	-24853
Labour force 20-64 (thousands)	232480	235769	233393	229110	224776	221225	217533	213671	210231	208060	-24420
Participation rate (20-64)	75.6	77.6	78.0	77.9	78.0	78.1	78.2	78.3	78.5	78.7	3.1
Participation rate (15-64)	71.1	73.1	73.2	73.1	73.2	73.4	73.5	73.5	73.6	73.7	2.6
young (15-24)	43.5	43.4	42.6	43.1	43.8	44.2	44.3	44.0	43.7	43.8	0.3
prime-age (25-54)	85.0	85.3	85.3	85.2	85.0	85.0	85.1	85.1	85.2	85.2	0.2
older (55-64)	49.7	59.7	63.0	63.9	64.3	64.8	64.8	64.7	65.1	65.7	16.0
Participation rate (20-64) - FEMALES	68.4	71.6	72.5	72.8	73.0	73.1	73.2	73.4	73.7	73.9	5.4
Participation rate (15-64) - FEMALES	64.5	67.6	68.1	68.3	68.5	68.8	68.9	68.9	69.1	69.2	4.7
young (15-24)	40.1	40.0	39.3	39.8	40.4	40.8	40.9	40.6	40.4	40.5	0.3
prime-age (25-54)	78.1	79.6	80.0	80.0	80.0	79.8	79.9	80.0	80.0	80.0	1.9
older (55-64)	41.1	53.0	57.2	58.8	59.6	60.6	60.6	60.7	61.2	62.0	20.9
Participation rate (20-64) - MALES	82.8	83.5	83.4	83.1	82.9	83.0	83.0	83.1	83.2	83.3	0.5
Participation rate (15-64) - MALES	77.7	78.6	78.3	77.8	77.8	77.9	78.0	78.0	78.0	78.0	0.3
young (15-24)	46.8	46.6	45.7	46.3	47.0	47.4	47.5	47.1	46.9	46.9	0.2
prime-age (25-54)	91.7	90.9	90.5	90.2	90.0	90.0	90.1	90.1	90.1	90.1	-1.7
older (55-64)	58.8	66.7	69.1	69.1	69.0	69.0	68.9	68.8	68.9	69.3	10.5
Employment rate (15-64)	64.1	67.0	67.7	68.1	68.3	68.5	68.7	68.7	68.8	68.9	4.7
Employment rate (20-64)	68.6	71.3	72.4	72.8	73.0	73.2	73.3	73.4	73.7	73.8	5.2
Employment rate (15-74)	57.4	58.8	59.2	59.1	58.9	59.0	59.2	59.2	59.2	59.4	2.0
Unemployment rate (15-64)	9.7	8.4	7.5	6.9	6.7	6.6	6.6	6.5	6.5	6.5	-3.2
Unemployment rate (20-64)	9.3	8.0	7.2	6.5	6.4	6.3	6.2	6.2	6.2	6.2	-3.1
Unemployment rate (15-74)	9.6	8.2	7.4	6.7	6.5	6.4	6.4	6.3	6.3	6.3	-3.3
Employment (20-64) (in millions)	210.9	216.9	216.6	214.1	210.4	207.3	204.0	200.4	197.2	195.2	-15.7
Employment (15-64) (in millions)	215.5	221.3	221.3	219.0	215.3	212.1	208.7	205.1	201.9	200.0	-15.6
share of young (15-24)	10%	9%	9%	9%	10%	10%	10%	10%	10%	10%	0%
share of prime-age (25-54)	77%	74%	72%	71%	71%	71%	71%	71%	72%	72%	-6%
share of older (55-64)	13%	17%	19%	20%	19%	20%	20%	19%	19%	19%	5%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.3	20.8	21.8	22.0	21.7	21.8	22.0	21.6	20.8	20.4	2.1
Old-age dependency ratio (2)	26	32	35	39	43	46	48	50	52	53	27
Total dependency ratio (3)	49	56	59	62	66	70	73	76	77	78	29
Total economic dependency ratio (4)	129	127	128	130	134	138	141	145	147	148	18
Economic old-age dependency ratio (15-64) (5)	39	45	48	53	58	63	66	69	71	72	33
Economic old-age dependency ratio (15-74) (6)	38	44	47	51	56	60	63	66	68	69	31

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

30. Euro Area

Euro-Area	EC-EPC (AWG) 2012 projections										
Main demographic and macroeconomic assumptions											
Demographic projections - EUROPOP2010 (EUROSTAT)	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Fertility rate	1.59	1.61	1.62	1.63	1.64	1.65	1.66	1.67	1.68	1.68	0.1
Life expectancy at birth											
males	76.8	78.5	79.4	80.2	80.9	81.7	82.4	83.1	83.8	84.5	7.7
females	82.6	84.0	84.7	85.4	86.0	86.7	87.3	87.8	88.4	89.0	6.3
Life expectancy at 65											
males	17.1	18.2	18.7	19.2	19.8	20.3	20.8	21.3	21.8	22.2	5.1
females	20.6	21.7	22.2	22.7	23.2	23.7	24.1	24.6	25.1	25.5	4.9
Net migration (thousand)	745.4	1052.4	1039.9	1037.0	989.1	931.1	891.2	826.9	790.8	729.1	-16.4
Net migration as % of population	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.0
Population (million)	331.4	340.1	343.4	345.8	347.7	348.6	348.3	346.8	344.1	340.8	9.5
Children population (0-14) as % of total population	15.4	15.0	14.5	14.1	13.9	13.9	13.9	14.0	13.9	13.9	-1.5
Prime age population (25-54) as % of total population	42.8	39.7	37.8	36.5	35.8	35.2	34.8	34.6	34.4	34.3	-8.5
Working age population (15-64) as % of total population	66.3	63.9	62.7	61.0	59.2	57.9	57.0	56.4	56.1	56.2	-10.1
Elderly population (65 and over) as % of total population	18.3	21.1	22.7	24.9	26.9	28.2	29.1	29.6	29.9	29.9	11.6
Very elderly population (80 and over) as % of total population	5.1	6.4	6.7	7.5	8.4	9.4	10.8	11.9	12.5	12.7	7.6
Very elderly population (80 and over) as % of elderly population	27.7	30.2	29.5	30.2	31.2	33.4	37.0	40.0	41.6	42.5	14.7
Very elderly population (80 and over) as % of working age population	7.7	9.9	10.7	12.3	14.1	16.3	18.9	21.0	22.2	22.6	15.0
Macroeconomic assumptions*	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	AVG 10-60
Potential GDP (growth rate)	1.0	1.5	1.6	1.3	1.2	1.3	1.3	1.3	1.3	1.4	1.3
Employment (growth rate)	0.1	0.4	0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1
Labour input : hours worked (growth rate)	0.0	0.4	0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1
Labour productivity per hour (growth rate)	0.9	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4
TFP (growth rate)	0.4	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Capital deepening (contribution to labour productivity growth)	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5
GDP per capita (growth rate)	0.0	1.3	1.4	1.2	1.2	1.2	1.3	1.4	1.5	1.6	1.2
GDP per worker (growth rate)	0.9	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4
GDP in 2010 prices (in millions euros)	9204.3	10842.6	11706.8	12570.1	13383.5	14245.2	15171.4	16166.3	17258.1	18459.2	
Labour force assumptions	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Working age population (15-64) (in thousands)	219652	217491	215365	210969	205921	201798	198413	195514	193156	191437	-28214
Population growth (working age:15-64)	1.0	-0.1	-0.3	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2	-0.1	-1.1
Population (20-64) (in thousands)	201738	199980	197472	193246	188661	184940	181753	178809	176346	174666	-27071
Population growth (20-64)	1.1	-0.1	-0.3	-0.5	-0.5	-0.4	-0.4	-0.3	-0.3	-0.1	-1.3
Labour force 15-64 (thousands)	156856	159747	158511	155424	152222	149658	147126	144834	142956	141611	-15245
Labour force 20-64 (thousands)	153068	156151	154947	151856	148710	146214	143743	141476	139608	138281	-14788
Participation rate (20-64)	75.9	78.1	78.5	78.6	78.8	79.1	79.1	79.1	79.2	79.2	3.3
Participation rate (15-64)	71.4	73.4	73.6	73.7	73.9	74.2	74.2	74.1	74.0	74.0	2.6
young (15-24)	42.9	42.3	41.7	42.0	42.4	42.5	42.3	42.0	41.8	41.8	-1.1
prime-age (25-54)	85.2	86.0	86.0	86.0	85.9	85.8	85.8	85.8	85.8	85.8	0.6
older (55-64)	49.3	61.2	64.3	65.3	66.0	66.8	66.7	66.5	66.7	67.0	17.7
Participation rate (20-64) - FEMALES	68.6	72.4	73.3	73.8	74.3	74.6	74.6	74.6	74.7	74.7	6.2
Participation rate (15-64) - FEMALES	64.6	68.1	68.7	69.2	69.6	69.9	69.9	69.8	69.8	69.7	5.2
young (15-24)	39.7	38.9	38.4	38.7	39.0	39.1	38.9	38.6	38.4	38.4	-1.3
prime-age (25-54)	78.0	80.4	80.8	81.0	81.0	80.8	80.8	80.8	80.8	80.8	2.8
older (55-64)	40.9	55.2	59.0	61.0	62.5	63.9	63.9	63.7	63.9	64.2	23.3
Participation rate (20-64) - MALES	83.2	83.7	83.6	83.3	83.3	83.4	83.4	83.5	83.5	83.5	0.3
Participation rate (15-64) - MALES	78.2	78.7	78.4	78.1	78.1	78.3	78.3	78.2	78.1	78.0	-0.2
young (15-24)	46.0	45.5	44.9	45.2	45.6	45.7	45.5	45.2	45.0	45.0	-1.0
prime-age (25-54)	92.4	91.4	91.1	90.8	90.7	90.7	90.7	90.7	90.7	90.6	-1.8
older (55-64)	58.1	67.5	69.8	69.7	69.5	69.7	69.5	69.4	69.5	69.7	11.6
Employment rate (15-64)	64.2	67.0	67.8	68.5	68.8	69.1	69.2	69.1	69.1	69.0	4.9
Employment rate (20-64)	68.4	71.4	72.6	73.3	73.6	73.9	74.0	74.0	74.1	74.1	5.6
Employment rate (15-74)	56.9	58.7	59.1	59.0	58.7	58.9	59.2	59.3	59.3	59.4	2.6
Unemployment rate (15-64)	10.1	8.8	7.8	7.0	6.9	6.8	6.7	6.7	6.7	6.7	-3.4
Unemployment rate (20-64)	9.8	8.5	7.5	6.8	6.6	6.5	6.5	6.4	6.4	6.4	-3.4
Unemployment rate (15-74)	10.0	8.6	7.6	6.8	6.6	6.6	6.5	6.5	6.5	6.5	-3.5
Employment (20-64) (in millions)	138.1	142.9	143.3	141.6	138.9	136.7	134.4	132.4	130.6	129.4	-8.7
Employment (15-64) (in millions)	141.0	145.7	146.1	144.5	141.8	139.5	137.2	135.1	133.4	132.1	-8.8
share of young (15-24)	9%	8%	9%	9%	9%	9%	9%	9%	9%	9%	0%
share of prime-age (25-54)	78%	73%	71%	70%	71%	71%	71%	71%	72%	71%	-7%
share of older (55-64)	13%	18%	21%	21%	20%	20%	20%	20%	19%	19%	6%
Dependency ratios:	2010	2020	2025	2030	2035	2040	2045	2050	2055	2060	Ch 10-60
Share of older population (55-64) (1)	18.3	21.6	22.9	22.8	22.2	21.8	21.7	21.3	21.0	21.0	2.7
Old-age dependency ratio (2)	28	33	36	41	45	49	51	53	53	53	26
Total dependency ratio (3)	51	56	59	64	69	73	76	77	78	78	27
Total economic dependency ratio (4)	132	128	128	130	135	140	144	147	148	148	16
Economic old-age dependency ratio (15-64) (5)	42	47	50	56	62	66	70	72	73	73	32
Economic old-age dependency ratio (15-74) (6)	41	46	49	53	59	64	67	69	70	70	29

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net of normal cyclical variations**

(1) Share of older population = Population aged 55 to 64 as % of population aged 15-64

(2) Old-age dependency ratio = Population aged 65 and over as a percentage of the population aged 15-64

(3) Total dependency ratio = Population under 15 and over 64 as a percentage of the population aged 15-64

(4) Total economic dependency ratio = Total population less employed as % of employed population 15-74

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(5) Economic old-age dependency ratio (15-74) = Inactive population aged 65+ as % of employed population 15-74

NB: : = data not provided

Source : Commission Services (DG ECFIN), Eurostat (EUROPOP2010), EPC (AWG).

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