The 2009 Ageing Report:

Underlying Assumptions and Projection Methodologies

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The 2009 Ageing Report:
Underlying Assumptions and Projection Methodologies for the EU-27 Member States (2007-2060)

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

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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 February 2006; to update and further deepen its common projection exercise of age-related expenditure projections on the basis of a new population projection provided by Eurostat.

The forthcoming projections of the budgetary impact of the ageing population in the 27 EU Member States over the period 2007–2060 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 2009.

In accordance with its normal practice, the EPC mandated a working group, the Ageing Working Group (AWG) under the chairmanship of Henri Bogaert, 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 (EUROPOP2008) were carried out by Eurostat. Valuable contributions were also made by staff of the OECD, the IMF and the ECB.

The report was prepared under the supervision of Gert-Jan Koopman (Director of DG ECFIN), Christian Kastrop (Chair of the EPC), Henri Bogaert (Chairman of the AWG), Giuseppe Carone (Head of Unit-DG ECFIN). The main contributors were Per Eckefeldt, Kamil Dybczak, Bartosz Przywara, Etienne Sail 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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EXECUTIVE SUMMARY

Overview of the 2009 projection of age-related expenditure

The mandate and broad principles

In 2006, the ECOFIN Council gave the Economic Policy Committee (EPC) a mandate to update and further deepen its common exercise of age-related expenditure projections by the autumn of 2009 on the basis of a new population projection to be provided by Eurostat (the EUROPOP2008 demographic projection was released in April 2008).

The new projection exercise follows those carried out in 2001 and 2006.[1] The age-related expenditure projections feed into a variety of policy debates at EU level. In particular, they are used in the annual assessment of the sustainability of public finances carried out as part of the Stability and Growth Pact; in the context of the open method of co-ordination on pensions; and in the analysis on the impact of ageing populations on the labour market and potential growth which is of great relevance for the Lisbon strategy and the Integrated Guidelines.

This report provides a description of 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 transfers will be calculated and presented to the ECOFIN Council in May 2009.

In light of this mandate, the EPC developed a work programme establishing the broad arrangements for organising the budgetary projection exercise and for reaching agreement on the assumptions and methodologies. To this end, it was agreed that the projections should be made on the basis of a demographic projection by Eurostat and common macroeconomic assumptions to be agreed in the EPC, which would be used for the projection of all age-related expenditure items. It was also agreed that the projections should be made on the basis of a 'no policy change' assumption, i.e. reflecting only enacted legislation but not possible future policy changes.

The work has been carried out by the EPC Working Group on Ageing Populations (AWG) and the Commission (Directorate-General for Economic and Financial Affairs - DG ECFIN) with a view to update and further improve the previous projection exercises so as to enhance comparability across countries, consistency across expenditure items and the economic basis for the underlying assumptions. The work has been guided by the agreed principles of simplicity, comparability, consistency, prudence and transparency. The EPC endorsed the progress report by the AWG, outlining the progress and agreements reached.[2]

---

1 The 2001 projections on pension, health care and long-term were published in DG ECFIN (2001), *'Budgetary challenges posed by ageing populations'*, Note for the attention of the EPC, EPC/ECFIN/655/01-EN of 24 October 2001. The projections on education and unemployment transfers were included in DG ECFIN (2003) *'The impact of ageing populations on public finances: overview of analysis carried out at EU level and proposals for a future work programme'*, Note for the attention of the AWG, EPC/ECFIN/407/04-rev.3-EN of 22 October 2003. The 2006 projections were published in Economic Policy Committee and European Commission (2006), *'The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)'*, European Economy, Special report, No.1/2006.

2 See *'The 2009 budgetary projection exercise of the Ageing Working Group: Second progress report to the EPC'*, ECFIN/CEFCPE(2008)REP/ 52951 rev, Brussels, 23/06/2008.

Participation in the budgetary projection exercise and working method

The work has been prepared by experts from 27 Member States, Norway, and the Commission (represented by DG ECFIN, the Directorate-General for Economic and Financial Affairs). DG ECFIN has provided analysis and calculations. The European Central Bank, the OECD and IMF have also contributed. Eurostat has played a central role by preparing a population projection. Other Commission services have also been associated with the work, especially the Directorate-General for Employment, Social Affairs and Equal Opportunities and the Health and Consumer Protection Directorate-General. The EPC and its AWG have coordinated the work with other Council formations, in particular the Social Protection Committee and the EFC.

In the preparation of the population projection, Eurostat actively consulted national statistical institutes in the Member States.[3]

Approach to agreeing on the underlying assumptions and specific adjustments

The EPC adopted the following approach to reach agreement on the underlying exogenous assumptions and on the projection methodologies to use:

- a survey of the economic literature was carried out to identify best practices in international organisations and national authorities in making long-run budgetary projections. This has mostly been done on the basis of contributions from DG ECFIN and AWG members;

- on issues where specific expertise was required, a series of workshops was organised to which external academics and experts were invited;[4]

- the EPC has reached agreement on underlying assumptions, projection methodologies and coverage by consensus on the basis of proposals prepared by DG ECFIN. The underlying assumptions have been made by applying common methodologies uniformly to all Member States. The projections were made sequentially. The approaches and assumptions used were the following:
  - a convergence approach for the demographic projection
  - a cohort approach for participation rates used in the labour force projection
  - an assumption of unchanged structural unemployment rates combined with an assumed reduction to the EU15 average for those with high structural unemployment rates initially
  - a production function approach for the potential GDP projection
  - an assumption of a constant real interest rate;

- 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,

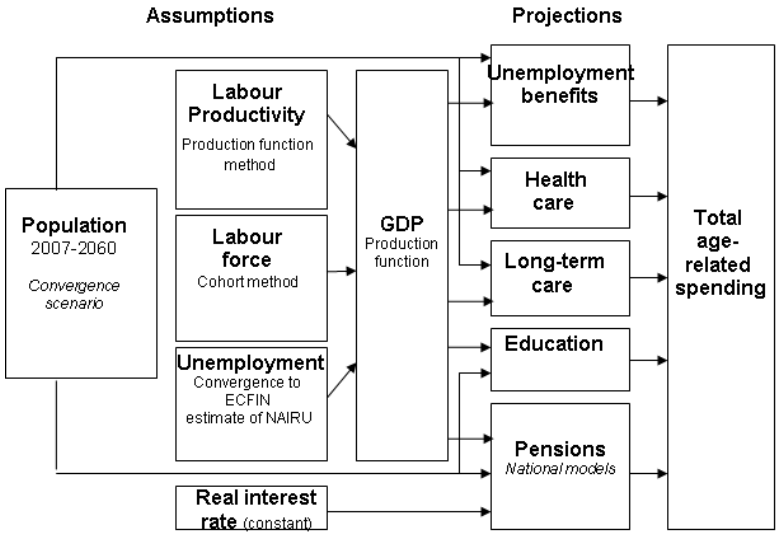
[3] Through meetings of Eurostat's Working Group on Population Projection and by using the "Population Projection" Interest Group on CIRCA.

[4] Workshops on *'Data issues in health care and long-term care expenditure projection's* and *'Methodology to project health care and long-term care expenditure'* were held on 18 April and 4 October 2007, respectively.

so as to quantify the responsiveness of projection results to changes in key underlying assumptions;

- before being finalised, the budgetary 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 pension projection, an analysis of the projection results and other relevant information on data sources and institutional factors which could be driving the budgetary projections.

Graph 0.1 - Overview of the 2009 projection of age-related expenditure



Source: Commission services, EPC.

Coverage and general overview

Graph 0.1 above presents an overview of the entire age-related projection exercise. The starting point is the EUROPOP2008 population projection for the period 2008 to 2060. Next, the EPC agreed a common set of assumptions and methodologies in order to make projections on a set of exogenous macroeconomic assumptions covering the labour force (participation, employment and unemployment rates), labour productivity and the real interest rate. These combined assumptions enable 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). The projections for health care, long-term care, education and unemployment are run by the European Commission, 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.

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

Main results

The long-term projections provide an indication of the timing and scale of changes in economic developments that could result from an ageing population in a 'no-policy change' scenario. The projections 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. Hence, the projections are helpful in highlighting the immediate and future policy challenges for governments posed by demographic trends. 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, given the current juncture characterized by the financial and economic crisis, there is also considerable additional uncertainty concerning the medium-term economic developments.

Demographic projections

Changes in the size and age profile of the population depend upon assumptions regarding fertility rates, life expectancy and migration.

Fertility rates rise slightly and life expectancy continues to increase

The convergence scenario approach employed in the EUROPOP2008 projection entails a process of convergence of fertility rates across Member States to that of the forerunners over the very long-term projection period. For the EU, the total fertility rate (TFR) is projected to rise from 1.52 in 2008 to 1.57 by 2030 and 1.64 by 2060. In the euro area, a similar increase is projected, from 1.55 in 2008 to 1.66 in 2060.

The fertility rate is projected to increase over the projection period in all Member States except Ireland and France (where it will nevertheless remain above 1.85), while in Denmark, Finland, Sweden and the UK it is projected to remain stable. In all countries the fertility rate will remain below the natural replacement rate of 2.1. The largest increases in fertility rates are projected to take place in Slovakia, Poland and Lithuania which have the lowest rates in the EU in 2008. The increase is projected to occur gradually, approaching the current EU average rates only in 2060.

Further life expectancy gains projected

In the EU, life expectancy at birth for males is projected to increase by 8.5 years over the projection period, from 76 in 2008 to 84.5 in 2060. For females, life expectancy at birth is projected to increase by 6.9 years for females, from 82.1 in 2008 to 89 in 2060, implying a narrowing gap between males and females life expectancy.

The largest increases in life expectancy at birth, for both males and females, are projected to take place in the new Member States. Life expectancy for males in 2008 is lowest in Estonia, Latvia, Lithuania, Hungary, Slovakia, Poland, Bulgaria and Romania, at between 66 and 71 years. Some catching-up will take place over the projection period, as life expectancy in these countries increases by more than 10 years – a bigger increase than in the rest of the EU. Overall however, life expectancy at birth is projected to remain below the EU average in all new Member States except Cyprus throughout the projection period, especially for males. This reflects a convergence of life expectancy. Still, by 2060 the life expectancy for many of these countries remains below the average in the EU.

The projection compresses the spread across the Member States of life expectancy at birth for males, from 13.1 years in 2008 (from a high of 79 in Sweden to a low of 65.9 in Lithuania) to 5 years in 2060 (85.5 in Italy compared with 80.4 in Lithuania). For females, there is less of a reduction in the differential in life expectancy at birth, from 7.7 years in 2008 (84.3 in France to 76.6 in Romania) to 4.1 years in 2060 (90.1 in France to 86.5 in Bulgaria).

In the EU, life expectancy at age 65 is projected to increase by 5.4 years for males and by 5.2 years for females over the projection period. In 2060, life expectancy at age 65 will reach 21.8 years for males and 25.1 for females. The projected difference between males and females in 2060 is 3.3 years, less than the 4.5 year difference in life expectancy at birth.

Continued but decelerating inward net migration to the EU

For the EU as a whole, annual net inflows are projected to fall from about 1,680,000 people in 2008 (equivalent to 0.33% of the EU population) to 980,000 by 2020 and thereafter to some 800,000 people by 2060 (0.16% of the EU population).

Over the entire projection period, the cumulated net migration to the EU is 59 million, of which the bulk is concentrated in the euro area (46.2 million). Net migration flows are projected to be concentrated in a few destination countries: Italy (12 million cumulated up to 2060), Spain (11.6 million), Germany (8.2 million), and the UK (7.8 million). According to the assumptions, the change of Spain and Italy from origin to destination countries will be confirmed in coming decades. Countries that are currently experiencing a net outflow (EE, LT, LV, PL, BG and RO) are projected to see it taper off or reverse in the coming decades.

The size and age structure of the population

The age structure of the EU population is projected to dramatically change in coming decades due to the dynamics of fertility, life expectancy and migration rates. The population is projected to be slightly larger, and much older, in 50 years' time than it is now. It will increase (from 495.4 million in 2008) by almost 5% by 2035, when it will peak (at 520.1 million). It will then decline steadily, shrinking by nearly 3%, to 505.7 million by 2060, slightly higher than in 2008.

The most numerous cohorts in 2008 are those around the age of 40 for men and women. The median age is projected to rise from 40.4 years in 2008 to 47.9 years in 2060. Elderly people are projected to account for an increasing share of the population due to continued gains in life expectancy over the projection period. At the same time, the base of the age pyramid will become 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.

While the EU population is projected to be slightly larger in 2060 than in 2008, there are wide differences in population trends until 2060 across Member States. The total population is projected to decrease in about half of the EU Member States (BG, CZ, DE, EE, EL, IT, LV, LT, HU, MT, PL, RO, SI and SK). For the other Member States an increase is projected.

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

The young population (aged 0-14) is projected to decline gradually from 2020 onwards. According to the projections, the working-age population (aged 15-64) will start to decline as of 2010 and, over the whole projection period, it will drop by 15 per cent in the EU. However, 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 elderly population (aged 65 and above) will increase very markedly throughout the projection period. The number of the elderly will almost double, rising from 85 million in 2008 to 151 million in 2060 in the EU. The number of very old people (aged 80 years and above) is projected to increase by even more, almost tripling from 22 million in 2008 to 61 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 old-age dependency ratio (people aged 65 or above relative to the working-age population aged 15-64) is projected to increase from 25.4% to 53.5% in the EU over the projection period. The largest increase will occur during the period 2015-35, when year-on-year increases of over 2 p.p. are projected. Hence, the dependency ratio is projected to more than double by 2060. This means that the EU would move from having 4 working-age people for every person aged over 65 to a ratio of 2 to 1. The increase in the total dependency ratio (people aged 14 and below and aged 65 and above relative to the population aged 15-64) is projected to be even larger, rising by nearly 30 percentage points.

Labour force projections

Projected increases in overall participation rates…

The overall participation rate (for the age group 15 to 64) in the EU27 is projected to increase by 3.5 percentage points over the period 2007-2060 (from 70.6% in 2007 to 74.1% in 2060). For the euro area, a similar increase is projected, (from 70.8% in 2007 to 74.5% in 2060). For the age-group 15-71, the current and projected participation rates as well as the increase are smaller. Almost all of the increase is projected to materialise in the period to 2020.

The biggest increase in participation rates is projected for older workers[5] (around 20 percentage points for females and 10 p.p. for males) in the EU27, and a slightly higher increase in the euro area (22 p.p. for females and 13 p.p. for males). As a result of these dynamics, the gap between male and female participation rates is projected to gradually narrow, especially in countries with a large gap in 2007.

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

The overall labour force (aged 15 to 71) in the EU27 is projected to increase by 3.7% from 2007 to 2020. In terms of numbers, this means an increase in the labour force of roughly 8.6 million. In the euro area, an increase of almost 5% is projected.

[5] Age group 55-64.

The increase in labour supply over the period 2007 to 2020 is mainly due to the increase in female labour supply, while the male labour force is projected to remain substantially unchanged. However, the positive trend in female labour supply is projected to reverse during the period 2020-2060 and, as male labour supply drops too, the overall labour force is expected to decrease by as much as 13.6%, equivalent to around 33 million people (24.4 million if compared with the level in 2007) in the EU. In the euro area, the projected fall in labour supply between 2020 and 2060 is 12.6%, which translates into 20.4 million people (13 million if compared with the level in 2007).

In the first part of the projection (2007 to 2020), a majority of EU countries (excluding DK, NL, FI, CZ, EE, LT, LV, PL, SI, BG, RO), are projected to record an increase in labour supply. This trend is projected to reverse in the second part of the projection period (2020 to 2060), when most countries are projected to record a decrease, except for CY (+19.8%), LU (+19.5%), IE (+11%), FR (+3.1%) SE (+2.2%) and the UK (+9.2%). As already mentioned, the projected negative labour force growth over the period 2020-2060 in the EU can be ascribed almost exclusively to negative demographic developments, given that the participation rates over the period 2020-2060 are projected to continue to increase, albeit at a slower pace than during 2007-2020.

Assumptions on unemployment

The general assumption on unemployment was the projection that the NAIRU (structural unemployment rate) should remain unchanged over the projection period. To avoid extrapolating forward high levels of NAIRU for countries which are still above the estimated medium-term EU15 average of the NAIRU (6.2%)[6] (Belgium, Germany, Greece, Spain, France, Portugal, Hungary, Malta and Slovakia), the EPC agreed that these countries should converge to this average in the period up to 2020. Overall, a reduction in the EU unemployment rate of around 1 ½ percentage points is projected (from 7.2% in 2007 to 5.7% in 2020). A fall of a similar magnitude is projected for the euro area (from 7.5% in 2007 5.9% in 2020).

Employment projections

Given the population projection, the unemployment rate assumptions and the labour force projection, the overall employment rates (of people aged 15 to 64) in the EU are projected to increase from 65.5% in 2007 to 66.6% in 2010, 69% in 2020, and almost 70% in 2060. In the euro area, a similar development is projected and employment will surpass 70% at the end of the projection period.

The employment rate of females is projected to rise from 58.4% in 2007 to 63.4% in 2020 and to 65.1% in 2060. The employment rate for older workers (55-64) will increase even more, from 44.9% in 2007 to 54.5% in 2020 and further to 59.8% in 2060. For the euro area, the increase in the employment rate of older workers (55-64) is higher than in the EU, rising by 17.7 p.p. compared with 14.9 p.p. in the EU. The older workers employment rate in 2060 is projected to be 60.3% in the euro area.

The number of people employed (according to the European Labour Force Survey definition) is projected to record an annual growth rate of only 0.4% over the period 2007 to 2020, which will reverse to a negative annual growth rate of a similar magnitude in the subsequent

[6] Based on the spring 2008 economic forecast by DG ECFIN.

period 2020 to 2060. As a result of these opposite trends, the overall employment in the EU is projected to shrink by about 19.4 million people over the period 2007 to 2060. Rises in immigration levels in some countries and increases in labour force participation rates moderate the fall in employment owed to the ageing of the population and the negative population growth projected for the period 2020 to 2060.

Projection of labour input (total hours worked)

Compared with the projections in the 2006 Ageing Report, the definition of labour input has been changed from number of employees to number of hours worked so as to ensure consistency with the commonly agreed production function used to calculate potential GDP growth and output gaps for the purpose, inter alia, of estimating cyclically adjusted budget balances (CABs) in the context of the European Commission's multilateral budgetary surveillance.

The population projection, unemployment rate assumptions, labour force projection, projected employment rates (of people age 15 to 71) and assumptions on changes in hours worked per person, result in a projection of total hours worked in the EU Member States.

Total hours worked are projected to increase by 5.4% in the period to 2020 in the EU. However, from 2020 onwards the situation is projected to reverse and they will fall by 12.9% between 2020 and 2060. Over the entire projection period, total hours worked are projected to fall by 8.2% in the EU. For the euro area, the projected fall is less marked (-5.7% between 2007 and 2060). In terms of annual average growth rates, hours worked are projected to fall by 0.2% over 2007-2060 in the EU and by 0.1% in the euro area. These trends in hours worked reflect the projected employment trends and also a composition effect, namely the increasing number of employed persons working part-time, which will cause average hours worked per person to change over time.

There are major differences between the Member States. A reduction in the labour input (hours worked) of 20% or more between 2007 and 2060 is projected for BG, CZ, DE, EE, LV, LT, HU, PL, RO, SI and SK. In contrast, for some other Member States (BE, IE, ES, FR, CY, LU, SE and the UK) an increase is projected over the same period.

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 agreed on the following prudent assumption for TFP growth: country-specific TFP growth rates will converge to a long-term historical average TFP growth rate recorded in the EU, of 1.1%; this rate is close to that experienced in the US, the world's leading economy.

However, the speed of convergence to this growth rate was assumed 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, which is assumed to materialise via a period of higher TFP growth.

Markedly lower potential growth rates projected for the EU

The annual average potential GDP growth rate in the EU is projected to decline sharply, from 2.4% in the period 2007 to 2020, to 1.7% in the period 2021-30 and to 1.3% in the period 2041-2060. Over the whole period 2007-2060, 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 at the beginning of the projection period (up to the 2020s) is lower than for the EU27 and the decline is therefore less sharp.

While 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.

The sources of economic growth are also projected to change

For the EU27, productivity growth is projected to remain fairly stable throughout the projection period at close to 1.7%. The small increase in the growth rate up to the 2030s is due to the assumed higher productivity growth rate in the catching up Member States, which is eventually assumed to converge to the 1.7% growth rate by 2050. Since the starting point of productivity growth in the euro area is below the assumed long-term EU average of 1.7% annual growth, this leads to a higher assumed increase in productivity growth up to the 2030s. Over time, labour productivity will become the key driver of growth in the EU.

Labour input in the EU and in the euro area is projected to increase up to the 2020s. Thereafter, the demographic changes, with a reduction in the working-age population, are projected to act as a drag on growth in both the EU and the euro area.

In the first half of the projection period, productivity growth is the main source of the discrepancy across countries, reflecting different productivity growth rates at the outset of the projection and the differentiation of assumed productivity growth rates according to the catching-up potential. In the latter part of the projection period, developments in labour input have a dominant role in the divergent pattern, due to different demographic developments and the mechanical effect of productivity growth convergence.

Comparison with the previous 2006 long-term budgetary projection exercise

The EU's population in 2008 is larger than was projected in the 2006 Ageing Report. By 2050, the population is projected to have grown again, by about 37 million. The higher population in 2050 is concentrated in the working-age population (15-64), although all age brackets will increase in number.

As regards fertility rates, they were slightly higher in 2008 than in 2004 in the EU25, and are now projected to increase again by 2050 – by 0.1, a marginally lower increase than projected in the 2006 exercise. The gain in life expectancy is now projected to be slightly higher than in the previous 2006 exercise, rising by 6.8 years for males and 5.6 years for females in the EU25 by 2050, compared with 5.6 and 4.7 years, respectively, in the previous exercise. Life expectancy in the EU25 in 2050 is now projected to be 1.5 years higher for males at 83.3 and 1.2 years higher for females at 88.1. As a result of recent observed increases in net migration inflows to the EU, especially in some Member States (ES, IT, UK), net migration flows are

projected to be significantly higher in EUROPOP2008 in the EU, although for some Member States (DE, NL, EE, LT, LV, MT, PL, and SI) net migration flows are projected to be lower than projected in 2006. Overall, net migration inflow into the EU is projected to be about 785 000 higher in 2010 than in the previous projection, and to gradually be reduced to about 90 000 higher in 2050. Overall, EU net inward migration is projected to be 12.6 million higher and therefore constitutes about one third of the higher total population projected in EUROPOP2008 by 2050.

As a result, the increase in the old-age dependency ratio in the EU25 (65+ year olds relative to over 15-64 year olds) is lower in the EUROPOP2008 projection and rising less; by 24.6 percentage points between 2008 and 2050 according to EUROPOP2008 (by 25.8 percentage points in the previous projection over the same period). Due to the diverging assumptions, the projected increase in the old-age dependency ratio is significantly lower in UK, ES, PT, CY, IE, AT, EL, BE and IT and significantly higher in MT, LV, LT, SK, PL, NL, DE, SI, EE (in descending order).

In the EU25, the participation rate (15-64) is now projected to increase at virtually the same pace as in the 2006 projection up to 2050, by 4 p.p. The structural unemployment rate in was estimated to be lower in 2007 (7.3%) than in the 2006 projection, but the decrease in the unemployment rate up to 2050 is projected to be smaller in the current projection. Accordingly, the employment rate is higher in 2007 in the current projection exercise, but is projected to increase less over the projection period, but still surpassing 70% in 2050.

The updated projection reveals that annual average potential GDP growth over the period 2004-2050 in the EU25 is projected to be 1.8%, compared with 1.7% in the 2006 projection. The higher average growth rate in the EU25 can be attributed to a more favourable demographic outlook in the current exercise (higher growth in the total population and a less adverse population composition effect), which is partly offset by a worse employment outlook. The projected average annual productivity growth is 1.8%, similar to the previous (2006) projection.

There are however marked differences at the Member State level. Greece, Spain and Portugal are projected to have higher average GDP growth (by 0.4-0.6 p.p.). In the case of Greece this is due to higher labour productivity growth, following from the assumption of a higher degree of real convergence over the long term. For Spain and Portugal, the more favourable growth outlook is due to a more benign demographic outlook. In GDP per capita growth terms, the difference in growth rates between the two projection exercises is smaller, especially for Spain and Portugal.

By contrast, some other countries (Latvia, Lithuania and Malta) are projected to have lower annual average GDP growth, by 0.4-0.6 p.p. For Latvia and Lithuania, this is due to a downward revision of productivity growth over the medium term, while in the case of Malta it is due to lower labour input growth following from less favourable demographic prospects (which is true also for Lithuania and Latvia, albeit to a lesser degree).

Table 0.1 - 2009 and 2006 projections compared, Demographic assumptions

	Projection exercise 2009 (EUROPOP2008)												Projection exercise 2009 - Projection exercise 2006											
	Fertility rate			Life expectancy at birth						Net migration (1000's)			Fertility rate			Life expectancy at birth						Net migration (1000's)		
				Males			Females									Males			Females					
	2008	2050	change	2008	2050	change	2008	2050	change	2008	2050	cumulated 2008-2050 as % of total pop. in 2008	2008	2050	change	2008	2050	change	2008	2050	change	2008	2050	cumulated 2008-2050 as % of total pop. in 2008
BE	1.75	1.78	0.03	76.7	83.1	6.5	82.3	87.8	5.5	51	25	13.5%	0.10	0.08	-0.02	0.3	0.8	0.6	-0.2	-0.5	-0.3	30	7	5.8%
BG	1.38	1.52	0.14	69.7	79.6	9.9	76.7	84.9	8.2	-1	2	0.5%	0.15	0.02	-0.13	-0.5	1.4	1.9	-0.1	2.3	2.4	10	-1	3.1%
CZ	1.33	1.49	0.16	73.9	81.6	7.7	80.2	86.5	6.4	24	22	10.2%	0.13	-0.01	-0.14	0.7	1.9	1.2	0.7	2.4	1.8	20	2	4.0%
DK	1.85	1.85	0.00	76.4	82.9	6.5	81.0	87.2	6.2	10	6	6.0%	0.08	0.05	-0.03	0.5	2.0	1.5	0.9	3.5	2.6	2	-1	0.7%
DE	1.34	1.49	0.15	77.3	83.6	6.3	82.6	88.0	5.4	160	136	8.4%	-0.06	0.04	0.10	0.5	1.6	1.1	0.2	1.1	0.9	-47	-43	-1.5%
EE	1.55	1.64	0.09	68.0	78.8	10.8	78.7	86.1	7.4	-1	0	-0.1%	0.12	0.04	-0.08	1.8	3.9	2.1	1.2	3.0	1.8	1	-1	-1.7%
IE	1.90	1.88	-0.02	77.5	83.9	6.4	81.9	88.0	6.1	63	7	17.9%	-0.01	0.08	0.09	1.1	1.5	0.4	0.5	1.0	0.5	47	-5	4.1%
GR	1.41	1.54	0.13	77.4	83.6	6.1	82.6	87.6	5.1	40	31	14.2%	0.04	0.04	0.00	0.5	3.3	2.7	0.7	2.5	1.9	0	-4	0.1%
ES	1.39	1.52	0.13	77.4	83.7	6.3	83.9	88.6	4.8	623	135	22.8%	0.05	0.12	0.07	0.1	2.3	2.2	-0.2	0.7	1.0	472	34	12.3%
FR	1.98	1.94	-0.04	77.5	83.9	6.4	84.3	89.1	4.8	99	70	6.0%	0.10	0.09	-0.01	0.4	1.2	0.8	0.2	0.0	-0.2	37	11	1.8%
IT	1.38	1.52	0.14	78.5	84.3	5.8	84.2	89.0	4.8	260	193	17.1%	0.02	0.12	0.10	0.4	0.7	0.3	0.4	0.2	-0.2	141	80	8.6%
CY	1.45	1.57	0.12	78.2	84.0	5.8	81.7	87.5	5.8	9	7	42.8%	0.02	0.07	0.05	1.1	2.1	1.0	0.3	2.4	2.1	3	2	14.9%
LV	1.36	1.50	0.14	66.0	78.1	12.2	76.7	85.2	8.5	-1	1	-0.3%	-0.02	-0.10	-0.08	0.6	3.8	3.3	0.0	2.7	2.7	1	-2	-2.0%
LT	1.35	1.51	0.16	65.9	78.1	12.2	77.4	85.3	7.9	-2	1	-0.3%	0.06	-0.09	-0.15	-1.2	2.6	3.8	-0.8	1.6	2.4	4	-3	-1.9%
LU	1.65	1.71	0.06	76.3	83.2	6.8	81.2	87.3	6.1	4	3	33.1%	-0.06	-0.09	-0.03	0.4	1.6	1.1	-0.9	0.6	1.5	2	0	7.5%
HU	1.35	1.50	0.15	69.7	79.9	10.2	78.1	85.8	7.7	20	18	8.4%	0.04	-0.10	-0.14	0.1	1.8	1.7	0.5	2.4	1.9	5	-2	1.1%
MT	1.38	1.52	0.14	76.0	83.0	7.0	81.1	87.4	6.3	1	1	10.2%	-0.15	-0.08	0.07	-1.1	1.2	2.3	-0.3	2.4	2.7	-2	-2	-14.7%
NL	1.72	1.76	0.04	77.9	83.7	5.8	82.2	87.8	5.6	8	7	2.6%	-0.03	0.01	0.04	1.1	3.5	2.4	1.0	4.2	3.2	-25	-24	-5.7%
AT	1.41	1.54	0.13	77.4	83.6	6.2	82.9	88.1	5.2	33	25	15.2%	0.00	0.09	0.09	0.4	0.0	-0.4	0.1	0.4	0.3	9	4	4.4%
PL	1.27	1.44	0.17	71.4	80.7	9.3	79.9	86.7	6.8	-16	26	1.0%	0.09	-0.16	-0.25	-0.1	1.6	1.7	0.6	2.3	1.7	14	-7	-0.1%
PT	1.36	1.51	0.15	75.8	82.7	6.9	82.4	87.7	5.3	52	39	18.7%	-0.14	-0.09	0.05	0.8	2.3	1.5	0.6	1.1	0.5	31	24	12.4%
RO	1.32	1.48	0.16	69.8	79.9	10.2	76.6	85.0	8.4	-6	13	1.2%	0.00	-0.02	-0.02	0.5	2.3	1.9	0.5	3.0	2.5	8	4	3.2%
SI	1.32	1.48	0.16	74.7	82.2	7.5	81.9	87.6	5.7	6	3	8.3%	0.10	-0.02	-0.12	1.3	2.4	1.1	1.0	2.4	1.4	0	-4	-4.8%
SK	1.25	1.43	0.18	70.9	80.2	9.3	78.7	85.9	7.2	4	6	3.9%	0.08	-0.17	-0.25	0.4	2.5	2.1	0.3	2.5	2.2	6	1	1.6%
FI	1.84	1.84	0.00	76.1	83.0	6.8	83.0	88.2	5.2	10	5	5.4%	0.06	0.04	-0.02	-0.1	1.1	1.1	0.5	1.7	1.2	3	-1	0.4%
SE	1.85	1.85	0.00	79.0	84.3	5.4	83.1	88.3	5.1	47	17	11.3%	0.03	0.00	-0.03	0.2	1.0	0.9	0.2	1.8	1.5	22	-5	0.8%
UK	1.84	1.84	0.00	77.4	83.8	6.4	81.5	87.7	6.1	188	126	10.8%	0.11	0.09	-0.02	0.2	0.9	0.7	-0.2	1.1	1.2	66	28	3.5%
NO	1.90	1.89	-0.01	78.4	84.1	5.7	82.9	88.1	5.3	22	10	12.6%	:	:	:	:	:	:	:	:	:	:	:	:
EU27	1.54	1.65	0.11	76.1	83.2	7.0	82.1	87.9	5.8	1684	924	10.2%	0.04	0.05	0.01	0.3	1.6	1.2	0.3	1.3	1.0	863	91	3.2%
EA	1.53	1.64	0.10	77.5	83.7	6.2	83.4	88.5	5.1	1418	687	12.4%	0.01	0.07	0.06	0.4	1.6	1.1	0.3	0.9	0.6	702	79	3.8%
EA12	1.54	1.64	0.10	77.5	83.8	6.2	83.4	88.5	5.1	1402	676	12.3%	0.01	0.07	0.06	0.4	1.6	1.1	0.3	0.8	0.6	701	82	3.8%
EU15	1.59	1.68	0.09	77.5	83.8	6.2	83.1	88.3	5.3	1647	825	12.0%	0.03	0.07	0.04	0.4	1.4	1.1	0.2	0.9	0.7	792	104	3.7%
EU10	1.30	1.47	0.16	71.2	80.6	9.4	79.4	86.4	7.0	44	85	4.1%	0.08	-0.11	-0.20	0.1	1.9	1.8	0.5	2.3	1.8	53	-16	0.5%
EU25	1.55	1.65	0.10	76.5	83.3	6.8	82.5	88.1	5.6	1691	910	10.7%	0.04	0.05	0.01	0.4	1.5	1.2	0.2	1.2	0.9	845	88	3.2%

Source: EUROSTAT (EUROPOP2008), Commission services (DG ECFIN), EPC (AWG).

Table 0.2 - 2009 and 2006 projections compared, Population projections

	Projection exercise 2009 (EUROPOP2008)									Projection exercise 2009 - Projection exercise 2006					
	Total population			Old-age dependency ratio			Total dependency ratio			Total population			Old-age dependency ratio		
	2008	2050	% change	2008	2050	p.p change	2008	2050	p.p change	2008	2050	% change	2008	2050	p.p change
BE	10.7	12.2	14.4%	25.8	43.9	18.1	51.4	70.7	19.3	0.2	1.3	10.6%	-0.2	-3.3	-3.1
BG	7.6	5.9	-22.5%	25.0	55.4	30.4	44.3	77.3	33.0	0.1	0.8	10.1%	:	:	:
CZ	10.3	9.9	-4.4%	20.6	54.8	34.2	40.7	77.1	36.5	0.2	1.0	8.0%	-0.1	0.0	0.0
DK	5.5	5.9	7.7%	23.6	41.3	17.7	51.6	68.8	17.2	0.0	0.5	8.0%	0.1	-0.6	-0.7
DE	82.2	74.5	-9.4%	30.3	56.4	26.1	51.0	78.0	26.9	-0.6	-0.2	0.4%	0.3	4.7	4.3
EE	1.3	1.2	-11.7%	25.2	47.2	22.0	47.0	72.1	25.1	0.0	0.1	3.5%	0.3	4.1	3.7
IE	4.4	6.5	47.9%	16.3	40.4	24.1	46.1	70.2	24.1	0.2	1.1	18.3%	-0.6	-4.8	-4.2
GR	11.2	11.4	2.0%	27.8	57.0	29.2	49.1	80.7	31.6	0.0	0.8	7.1%	0.2	-3.4	-3.6
ES	45.3	53.2	17.5%	24.1	58.7	34.5	45.4	82.8	37.4	1.1	10.4	20.6%	-0.5	-6.9	-6.4
FR	61.9	71.0	14.8%	25.3	44.7	19.4	53.4	74.4	20.9	0.9	5.3	7.1%	0.0	-1.7	-1.6
IT	59.5	61.2	2.9%	30.5	59.2	28.8	51.7	81.6	29.8	1.0	8.5	12.8%	-0.3	-3.0	-2.6
CY	0.8	1.3	57.5%	17.7	37.7	20.0	42.7	62.1	19.4	0.0	0.3	30.2%	-0.8	-5.5	-4.7
LV	2.3	1.8	-20.5%	25.0	51.2	26.2	44.9	73.0	28.2	0.0	-0.1	-3.2%	-0.1	7.1	7.2
LT	3.4	2.7	-18.7%	23.0	51.1	28.1	45.3	72.2	26.9	0.0	-0.1	-3.9%	-0.3	6.3	6.5
LU	0.5	0.7	44.6%	20.9	37.8	16.9	47.8	64.5	16.7	0.0	0.1	7.6%	-0.5	1.7	2.2
HU	10.0	9.1	-9.8%	23.5	50.8	27.3	45.3	73.2	27.9	0.0	0.1	1.3%	-0.1	2.5	2.6
MT	0.4	0.4	1.0%	19.8	49.8	30.0	43.1	71.3	28.2	0.0	-0.1	-21.3%	0.8	9.1	8.3
NL	16.4	16.9	3.1%	21.8	45.6	23.8	48.4	71.2	22.8	-0.1	-0.5	-2.1%	0.5	5.0	4.5
AT	8.3	9.1	9.5%	25.4	48.3	22.9	48.1	71.5	23.4	0.1	0.9	9.5%	-0.1	-4.1	-4.0
PL	38.1	33.3	-12.7%	18.9	55.7	36.7	40.7	76.1	35.3	0.2	-0.4	-1.4%	0.2	4.7	4.6
PT	10.6	11.4	7.8%	25.9	53.0	27.0	48.7	75.8	27.1	0.0	1.4	13.7%	0.1	-5.6	-5.7
RO	21.4	18.1	-15.3%	21.3	54.0	32.7	43.1	74.6	31.5	-0.1	1.0	5.0%	:	:	:
SI	2.0	1.9	-7.2%	23.0	59.4	36.4	42.8	82.7	39.9	0.0	0.0	-1.8%	0.0	3.8	3.8
SK	5.4	4.9	-10.0%	16.6	55.5	38.9	38.4	75.3	37.0	0.0	0.1	1.6%	0.0	4.8	4.8
FI	5.3	5.4	2.8%	24.8	46.6	21.8	50.1	73.9	23.8	0.0	0.2	3.8%	0.2	-0.1	-0.3
SE	9.2	10.7	16.2%	26.7	41.9	15.2	52.2	69.5	17.3	0.1	0.5	4.3%	0.0	1.0	1.1
UK	61.3	74.5	21.6%	24.3	38.0	13.7	50.7	65.4	14.7	0.8	10.2	15.3%	-0.2	-7.1	-6.9
NO	4.7	5.9	24.5%	22.1	41.4	19.3	51.0	69.8	18.8	:	:	:	:	:	:
EU27	495.4	515.3	4.0%	25.4	50.4	25.0	48.7	75.0	26.4	4.1	43.3	7.9%	:	:	:
EA	319.5	337.3	5.6%	27.1	52.8	25.7	50.3	77.5	27.2	2.8	29.6	8.4%	:	:	:
EA12	316.3	333.8	5.5%	27.2	52.8	25.6	50.3	77.5	27.2	2.8	29.4	8.5%	-0.1	-0.8	-0.7
EU15	392.2	424.9	8.3%	26.7	49.6	22.9	50.5	74.9	24.5	3.6	40.5	9.4%	-0.1	-2.0	-1.9
EU10	74.1	66.4	-10.5%	20.2	54.1	33.9	41.7	75.3	33.6	0.4	0.9	0.7%	0.1	3.7	3.6
EU25	466.3	491.2	5.3%	25.6	50.2	24.6	49.0	75.0	26.0	4.1	41.4	8.0%	-0.1	-1.2	-1.2

Source: EUROSTAT 5EUROPOP2008), Commission services (DG ECFIN), EPC (AWG).

Table 0.3 - 2009 and 2006 projections compared, Labour force projections

	Projection exercise 2009															Projection exercise 2009 - Projection exercise 2006													
	Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)			Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)		
	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change
BE	62.3	65.4	3.1	34.6	47.6	13.0	67.3	69.7	2.3	36.2	49.4	13.2	7.5	6.2	-1.3	1.4	-0.1	-1.5	4.3	3.3	-1.0	1.6	-0.3	-1.9	5.1	4.5	-0.6	0.1	-0.3	-0.4
BG	62.1	64.7	2.5	43.4	45.4	2.0	66.8	67.9	1.0	46.6	47.6	1.0	7.0	4.7	-2.3	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
CZ	66.2	70.2	4.0	46.6	64.5	17.8	70.0	73.5	3.5	48.9	66.8	17.9	5.4	4.5	-0.9	0.7	0.5	-0.2	0.9	5.6	4.6	-1.1	-1.1	0.0	1.5	6.7	5.2	-2.5	-2.0	0.5
DK	77.2	78.3	1.2	59.1	68.4	9.3	80.3	81.0	0.7	61.3	70.3	9.0	3.9	3.2	-0.6	0.9	0.5	-0.4	-2.6	1.6	4.2	0.6	-0.4	-1.0	-2.6	1.3	3.9	-0.4	-1.0	-0.6
DE	69.6	74.8	5.2	51.4	68.7	17.3	76.2	79.7	3.5	57.3	73.9	16.5	8.7	6.2	-2.5	1.6	1.3	-0.3	6.4	3.0	-3.4	1.5	0.7	-0.7	6.6	4.7	-1.9	-0.4	-0.8	-0.4
EE	69.4	71.2	1.8	60.2	60.1	-0.1	72.9	73.7	0.8	62.4	61.9	-0.5	4.8	3.5	-1.3	3.1	0.4	-2.7	6.1	-1.6	-7.7	0.7	-2.4	-3.1	5.0	-1.8	-6.7	-3.4	-3.5	-0.2
IE	69.1	72.5	3.4	53.8	66.5	12.7	72.5	76.3	3.9	55.1	68.3	13.1	4.7	5.1	0.4	-0.3	-2.1	-1.8	1.0	-2.4	-3.4	0.6	-0.9	-1.5	1.5	-1.3	-2.7	1.3	1.6	0.4
GR	61.4	64.8	3.4	42.8	50.0	7.2	67.1	69.1	1.9	44.3	51.3	7.0	8.5	6.2	-2.3	0.0	-0.3	-0.3	-1.1	-3.0	-1.9	-0.5	-0.9	-0.3	-0.8	-2.4	-1.6	-0.8	-0.8	0.0
ES	65.6	72.8	7.2	44.7	69.7	24.9	71.6	77.6	6.0	47.5	73.1	25.6	8.3	6.2	-2.1	1.4	1.4	0.0	1.0	7.2	6.2	0.7	0.8	0.1	1.3	9.2	7.9	-1.1	-0.8	0.3
FR	64.7	67.1	2.4	38.9	46.5	7.7	70.3	71.5	1.2	41.0	48.4	7.5	8.0	6.2	-1.8	0.9	-0.9	-1.8	-3.0	-6.3	-3.3	0.3	-1.6	-1.9	-2.6	-5.7	-3.1	-0.9	-0.8	0.1
IT	58.7	64.0	5.3	33.8	61.3	27.5	62.6	67.9	5.3	34.7	62.8	28.2	6.2	5.8	-0.4	-0.2	-1.6	-1.5	1.1	6.7	5.6	-1.3	-2.3	-1.0	0.9	7.5	6.5	-1.6	-0.7	0.8
CY	69.7	75.3	5.6	55.9	63.7	7.9	72.9	78.0	5.1	57.6	65.4	7.8	4.4	3.4	-0.9	-2.7	-2.0	0.6	-1.6	-5.3	-3.7	-2.2	-2.7	-0.5	-1.7	-5.2	-3.5	0.7	-0.8	-1.5
LV	68.5	68.5	0.1	57.7	52.4	-5.3	72.9	72.0	-0.9	60.4	54.4	-6.0	6.1	4.8	-1.2	1.4	-2.8	-4.2	8.3	-6.3	-14.6	0.1	-4.7	-4.8	8.0	-6.1	-14.1	-1.7	-2.2	-0.5
LT	65.1	65.2	0.1	53.4	53.2	-0.2	68.1	67.6	-0.5	55.5	54.8	-0.7	4.4	3.5	-0.9	-0.1	-6.5	-6.4	3.0	-13.0	-16.0	-4.1	-9.5	-5.5	0.3	-13.6	-13.9	-5.2	-3.5	1.7
LU	63.6	64.0	0.4	32.3	41.4	9.1	66.4	67.1	0.6	33.0	42.3	9.3	4.2	4.6	0.4	-0.2	-1.5	-1.3	-1.5	-0.4	1.1	-0.2	-1.3	-1.1	-1.2	0.1	1.3	0.0	0.4	0.4
HU	57.2	60.9	3.7	32.7	47.8	15.1	61.7	64.9	3.2	34.1	49.4	15.2	7.4	6.2	-1.2	-2.5	-2.4	0.1	-2.7	-1.7	1.0	-0.9	-1.5	-0.6	-1.9	-0.7	1.2	2.7	1.4	-1.2
MT	55.8	60.4	4.6	30.5	48.8	18.3	59.5	64.4	4.9	31.6	51.1	19.5	6.2	6.2	0.0	0.4	-1.0	-1.4	-0.5	15.7	16.2	-1.2	-1.6	-0.4	-0.3	17.3	17.6	-2.6	-0.8	1.8
NL	76.1	78.0	1.8	51.4	55.9	4.5	78.7	80.4	1.7	53.3	57.8	4.5	3.2	3.0	-0.2	1.2	0.1	-1.1	4.3	0.8	-3.5	1.2	-0.1	-1.3	5.3	1.8	-3.5	0.0	-0.2	-0.2
AT	71.5	74.2	2.7	38.8	54.6	15.7	74.8	77.5	2.7	40.0	56.0	16.0	4.5	4.3	-0.2	-0.5	-2.2	-1.6	4.2	-3.5	-7.7	0.3	-1.5	-1.8	3.9	-3.2	-7.1	1.1	0.9	-0.2
PL	57.1	61.7	4.6	29.9	44.3	14.3	63.3	65.5	2.2	32.1	46.2	14.1	9.8	5.9	-3.9	2.5	-4.4	-6.8	-1.5	-4.4	-2.9	-2.9	-5.5	-2.6	-1.7	-3.1	-1.4	-7.7	-1.1	6.6
PT	67.8	71.8	4.0	51.0	64.3	13.3	74.1	76.6	2.5	54.5	67.5	13.0	8.5	6.2	-2.3	-3.1	-1.5	1.6	-3.8	-0.4	3.4	-1.0	-1.1	-0.1	-2.2	1.3	3.4	2.9	0.6	-2.3
RO	58.7	56.9	-1.9	41.4	43.4	2.0	63.0	60.5	-2.5	42.4	44.2	1.8	6.8	6.0	-0.8	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
SI	67.8	68.3	0.4	33.4	47.0	13.6	71.4	71.6	0.3	34.5	48.3	13.8	4.9	4.7	-0.3	1.6	-1.1	-2.7	-0.9	-5.6	-4.7	1.3	-1.8	-3.1	-0.3	-4.8	-4.4	-0.6	-0.9	-0.3
SK	61.2	66.0	4.9	36.2	50.2	14.0	68.8	70.4	1.6	39.4	52.6	13.1	11.1	6.2	-4.9	0.7	-2.7	-3.4	2.2	-1.0	-3.2	-3.4	-3.5	-0.1	2.1	0.6	-1.6	-5.2	-0.8	4.4
FI	70.5	74.5	4.0	55.6	65.1	9.4	75.8	79.1	3.3	59.4	68.5	9.1	7.0	5.8	-1.2	0.4	0.1	-0.2	0.9	0.2	-0.7	0.4	-0.5	-0.9	2.0	1.0	-1.0	0.0	-0.7	-0.7
SE	74.3	77.5	3.2	70.3	74.1	3.8	79.2	82.4	3.2	73.2	77.1	3.9	6.2	5.9	-0.3	-0.2	-0.1	0.0	-0.4	-2.5	-2.1	1.4	1.3	-0.1	0.1	-2.0	-2.1	1.9	1.6	-0.3
UK	71.5	74.3	2.8	57.8	69.0	11.2	75.6	78.6	3.0	59.7	71.3	11.6	5.4	5.4	0.0	-0.7	-0.4	0.3	2.2	5.1	2.9	-0.1	0.2	0.3	2.6	6.0	3.4	0.8	0.8	0.0
NO	76.8	74.8	-2.1	69.2	65.5	-3.7	78.8	78.0	-0.8	69.9	66.5	-3.4	2.5	4.1	1.6	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU27	65.5	69.7	4.2	44.9	59.4	14.5	70.6	73.9	3.3	47.5	62.0	14.5	7.2	5.7	-1.5	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EA	65.5	70.4	4.8	42.6	60.8	18.2	70.8	74.7	3.9	45.4	63.7	18.3	7.5	5.8	-1.6	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EA12	65.5	70.4	4.8	42.6	60.9	18.2	70.9	74.7	3.9	45.5	63.8	18.3	7.5	5.9	-1.7	0.4	-0.1	-0.5	0.9	2.1	1.2	0.0	-0.6	-0.6	1.1	3.3	2.1	-0.6	-0.6	0.0
EU15	66.7	71.4	4.7	45.9	62.8	16.9	71.8	75.7	3.9	48.6	65.6	17.0	7.1	5.7	-1.4	0.1	-0.1	-0.3	0.8	2.5	1.7	-0.1	-0.4	-0.3	1.1	3.6	2.5	-0.3	-0.3	0.0
EU10	59.9	65.0	5.2	34.8	50.9	16.1	65.2	68.8	3.6	36.9	52.9	16.0	8.3	5.5	-2.8	1.1	-2.0	-3.1	-1.7	-1.0	0.7	-2.4	-3.0	-0.6	-1.8	0.1	2.0	-4.8	-1.1	3.7
EU25	65.6	70.5	5.0	44.1	60.9	16.8	70.7	74.8	4.1	46.7	63.6	16.9	7.3	5.7	-1.6	0.3	-0.3	-0.6	0.4	2.1	1.6	-0.4	-0.7	-0.2	0.6	3.2	2.5	-1.0	-0.4	0.6

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

Table 0.4 - 2009 and 2006 projections compared, Economic growth projections

	2009 projection										Projection exercise 2009 - Projection exercise 2006									
		Due to growth in:										Due to growth in:								
	GDP growth in 2004-2050	***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 2004-2050		GDP growth in 2004-2050	***Productivity*** *(GDP per worker)*	*TFP*	*Capital deepening*	***Labour input***	*Total pop.*	*Empl. rate*	*Share of Working age pop.*	*change in average hours worked*	GDP per capita growth in 2004-2050
	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6		1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	**1.9**	**1.6**	1.1	0.6	**0.3**	0.3	0.1	-0.2	0.0	**1.5**	**BE**	**0.2**	**-0.1**	-0.1	0.0	**0.2**	0.2	-0.1	0.1		**-0.1**
BG	**2.4**	**3.0**	1.5	1.4	**-0.6**	-0.6	0.3	-0.3	0.0	**3.0**	**BG**	**2.4**	**3.0**	1.5	1.4	**-0.6**	-0.6	0.3	-0.3		**3.0**
CZ	**2.1**	**2.5**	1.6	0.9	**-0.3**	-0.1	0.0	-0.3	0.0	**2.2**	**CZ**	**0.2**	**-0.2**	0.2	-0.3	**0.4**	0.2	0.0	0.2		**-0.1**
DK	**1.8**	**1.7**	1.1	0.6	**0.0**	0.2	0.1	-0.2	0.0	**1.6**	**DK**	**0.1**	**-0.1**	-0.1	0.0	**0.1**	0.2	0.0	0.0		**0.0**
DE	**1.3**	**1.7**	1.1	0.6	**-0.4**	-0.2	0.2	-0.3	-0.1	**1.5**	**DE**	**-0.1**	**0.1**	0.0	0.1	**-0.2**	-0.1	-0.1	0.0		**0.0**
EE	**2.7**	**3.1**	1.7	1.4	**-0.4**	-0.3	0.1	-0.2	0.0	**3.0**	**EE**	**0.0**	**-0.1**	-0.1	0.0	**0.1**	0.1	-0.1	0.1		**-0.1**
IE	**2.8**	**1.8**	1.2	0.7	**0.9**	1.1	0.1	-0.1	-0.1	**1.7**	**IE**	**-0.1**	**-0.5**	-0.4	-0.1	**0.3**	0.4	-0.2	0.2		**-0.5**
EL	**2.0**	**2.1**	1.2	0.9	**-0.1**	0.1	0.1	-0.3	0.0	**1.9**	**EL**	**0.5**	**0.3**	0.3	0.0	**0.0**	0.1	-0.2	0.1		**0.4**
ES	**2.1**	**1.8**	1.1	0.7	**0.4**	0.5	0.3	-0.3	-0.1	**1.6**	**ES**	**0.6**	**0.0**	0.1	0.0	**0.4**	0.5	-0.2	0.2		**0.1**
FR	**1.8**	**1.7**	1.1	0.6	**0.2**	0.4	0.1	-0.2	-0.1	**1.5**	**FR**	**0.1**	**0.0**	0.0	0.1	**0.1**	0.2	-0.1	0.1		**-0.1**
IT	**1.4**	**1.4**	0.9	0.5	**0.0**	0.1	0.2	-0.3	0.0	**1.3**	**IT**	**0.1**	**-0.1**	-0.1	0.0	**0.2**	0.3	-0.1	0.1		**-0.2**
CY	**3.1**	**1.9**	1.2	0.7	**1.2**	1.2	0.1	-0.1	0.0	**1.9**	**CY**	**0.1**	**-0.5**	-0.2	-0.2	**0.4**	0.5	-0.2	0.2		**-0.4**
LV	**2.5**	**3.2**	1.7	1.4	**-0.7**	-0.5	0.1	-0.2	0.0	**3.0**	**LV**	**-0.6**	**-0.4**	-0.2	-0.2	**-0.2**	-0.1	-0.2	0.1		**-0.5**
LT	**2.5**	**3.0**	1.7	1.3	**-0.5**	-0.5	0.1	-0.2	0.1	**3.0**	**LT**	**-0.4**	**-0.3**	-0.1	-0.1	**-0.2**	-0.1	-0.3	0.1		**-0.3**
LU	**2.9**	**1.7**	1.1	0.7	**1.2**	0.9	0.4	-0.2	0.0	**2.0**	**LU**	**-0.2**	**-0.1**	0.0	-0.1	**-0.1**	0.2	-0.3	0.0		**-0.4**
HU	**2.0**	**2.5**	1.4	1.0	**-0.5**	-0.2	0.0	-0.2	0.0	**2.3**	**HU**	**-0.1**	**0.0**	0.1	-0.1	**-0.1**	0.0	-0.2	0.1		**-0.1**
MT	**1.9**	**2.0**	1.2	0.7	**-0.1**	0.1	0.1	-0.2	-0.1	**1.8**	**MT**	**-0.5**	**0.0**	0.1	-0.1	**-0.6**	-0.4	-0.2	0.1		**-0.1**
NL	**1.6**	**1.7**	1.1	0.6	**-0.1**	0.1	0.1	-0.2	-0.1	**1.5**	**NL**	**-0.1**	**0.1**	0.0	0.0	**-0.1**	-0.1	0.0	0.0		**0.0**
AT	**1.7**	**1.7**	1.1	0.6	**0.1**	0.3	0.0	-0.2	0.0	**1.5**	**AT**	**0.2**	**0.0**	0.0	0.0	**0.2**	0.2	-0.2	0.1		**0.0**
PL	**2.2**	**2.6**	1.5	1.1	**-0.4**	-0.3	0.1	-0.2	0.0	**2.5**	**PL**	**-0.2**	**-0.2**	-0.2	0.1	**-0.2**	0.0	-0.4	0.2		**-0.2**
PT	**1.9**	**1.9**	1.2	0.7	**0.0**	0.2	0.1	-0.3	0.0	**1.7**	**PT**	**0.4**	**-0.1**	0.0	0.0	**0.5**	0.3	0.1	0.2		**0.1**
RO	**2.5**	**3.2**	1.8	1.4	**-0.7**	-0.4	-0.2	-0.2	0.1	**2.9**	**RO**	**2.5**	**3.2**	1.8	1.4	**-0.7**	-0.4	-0.2	-0.2		**2.9**
SI	**1.9**	**2.4**	1.3	1.1	**-0.5**	-0.1	0.0	-0.4	0.0	**2.0**	**SI**	**-0.2**	**-0.1**	-0.1	-0.1	**-0.1**	0.0	-0.2	0.1		**-0.2**
SK	**2.6**	**2.9**	1.8	1.1	**-0.3**	-0.2	0.1	-0.2	0.0	**2.8**	**SK**	**0.2**	**0.1**	0.1	0.0	**0.0**	0.1	-0.3	0.2		**0.1**
FI	**1.9**	**1.9**	1.3	0.6	**0.0**	0.1	0.2	-0.2	0.0	**1.8**	**FI**	**0.1**	**0.0**	-0.1	0.1	**0.1**	0.1	0.0	0.1		**0.0**
SE	**2.1**	**1.8**	1.2	0.6	**0.3**	0.4	0.0	-0.1	0.0	**1.7**	**SE**	**-0.1**	**-0.2**	-0.2	0.0	**0.1**	0.1	-0.1	0.0		**-0.2**
UK	**2.2**	**1.8**	1.1	0.7	**0.4**	0.5	0.1	-0.1	-0.1	**1.7**	**UK**	**0.3**	**-0.1**	-0.1	0.0	**0.4**	0.3	0.0	0.1		**-0.1**
NO	**2.1**	**1.7**	1.2	0.5	**0.5**	0.6	0.0	-0.1	0.0	**1.6**	**NO**										
EU27	**1.8**	**1.8**	1.1	0.7	**0.0**	0.1	0.1	-0.2	0.0	**1.7**	**EU27**										
EA	**1.7**	**1.7**	1.1	0.6	**0.0**	0.2	0.2	-0.3	0.0	**1.5**	**EA**										
EA12	**1.7**	**1.7**	1.1	0.6	**0.0**	0.2	0.2	-0.3	0.0	**1.5**	**EA12**	**0.2**	**0.0**	0.0	0.0	**0.1**	0.2	-0.1	0.1		**0.0**
EU15	**1.8**	**1.7**	1.1	0.6	**0.1**	0.2	0.1	-0.2	0.0	**1.5**	**EU15**	**0.2**	**0.0**	0.0	0.0	**0.2**	0.2	-0.1	0.1		**0.0**
EU10	**2.2**	**2.6**	1.5	1.1	**-0.4**	-0.2	0.1	-0.2	0.0	**2.4**	**EU10**	**-0.1**	**-0.1**	-0.1	0.0	**-0.1**	0.0	-0.3	0.2		**-0.2**
EU25	**1.8**	**1.8**	1.1	0.7	**0.0**	0.2	0.1	-0.2	-0.1	**1.6**	**EU25**	**0.1**	**0.0**	0.0	0.0	**0.1**	0.2	-0.1	0.1		**0.0**

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

PART I
Underlying assumptions and projection methodologies

1. POPULATION

1.1. Background and general approach

Eurostat's EUROPOP2008 population projection used by the EPC

The 2009 age-related expenditure projection is based on the new population projection for 27 EU countries prepared by Eurostat, the EUROPOP2008 population projection released by Eurostat in April 2008 (see Eurostat (2008)). A description of the methodologies used to project fertility rates, life expectancy and net migration in EUROPOP2008 can be found in Eurostat (2008). [7]

In preparing the EUROPOP2008 population projection, Eurostat actively involved national statistical institutes via the "Population Projection" Interest Group and through meetings of its Working Group on Population Projection. Moreover, a joint meeting of the Working Group on Population Projections and the EPC Working Group on Ageing populations (AWG) was held on 29-30 November 2007 in Luxembourg so that the views of the EPC-AWG could be taken into account before the finalisation of the projection.

A convergence approach was adopted for the EUROPOP2008 projection

In contrast with the EUROPOP2004 demographic projection[8] which was a 'trend' scenario, the approach used by EUROSTAT in EUROPOP2008 was a 'convergence' scenario. This means that the key demographic determinants are assumed to converge over the very long-term (by the year 2150). Setting the year of convergence very far into the future has the advantage of taking due account of recent trends and developments in the beginning of the period, while at the same time assuming a degree of convergence over the very long-term in terms of demographic drivers. 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, in the convergence year 2150, *fertility rates* are assumed to converge to levels achieved by Member States that are considered to be 'forerunners' in the demographic transition. Forerunners concerning fertility are: DK (2006:1.83), FI (2006: 1.84), SE (2006: 1.85) as well as UK (2006: 1.84), France, Ireland and Norway above 1.9. The theoretical convergence Total fertility Rate (TFR) was set to 1.85 to be achieved by 2150.

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. For *mortality rates*, the forerunners are France, Italy, Spain and Sweden, where life expectancy is assumed to continue to increase. The theoretical convergence life expectancy was set to 92.9 and 96.3 for males and females respectively, for the convergence year 2150.

Migration is assumed to converge to zero *net migration* in the same convergence year as for fertility and mortality (in 2150).

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[7] See Eurostat (2008) and Annex 1.1 for more details. A comprehensive account of the EUROPOP2008 population projection will be provided in the forthcoming: *"Methodology and main results of the Eurostat Population Projections 2008-based (EUROPOP2008)",* Eurostat, Methodologies and Working Papers series, Luxembourg.

[8] See Eurostat (2005a) for a detailed methodological description.

1.2. Projection of fertility rates

1.2.1. Past trends

Fertility rates have been declining to well below the natural replacement level

Fertility rates 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 replacement level of 2.1 (see Table 1.1). This decline was relatively fast and unexpected (just as the surge in fertility rates in post-war years was unexpected).

Table 1.1 - Past trends in fertility rates, 1950-2006

	1950	1960	1970	1980	1990	2000	2006	*1960-2006*	*1960-2000*
BE	2.34	2.54	2.25	1.68	1.62	1.66	:	*:*	*-0.9*
BG	:	2.31	2.17	2.05	1.81	1.26	1.37	*-0.9*	*-1.1*
CZ	:	2.11	1.9	2.1	1.9	1.14	1.33	*-0.8*	*-1.0*
DK	2.57	2.57	1.95	1.55	1.67	1.78	1.83	*-0.7*	*-0.8*
DE	:	2.37	2.03	1.56	1.45	1.38	1.32	*-1.1*	*-1.0*
EE	:	:	2.16	:	2.05	1.39	1.55	*:*	*:*
IE	:	3.76	3.93	3.25	2.11	1.88	1.9	*-1.9*	*-1.9*
EL	:	2.28	2.4	2.23	1.4	1.26	1.39	*-0.9*	*-1.0*
ES	:	2.86	2.9	2.2	1.36	1.23	1.38	*-1.5*	*-1.6*
FR	2.93	2.73	2.47	1.95	1.78	1.87	1.98	*-0.8*	*-0.9*
IT	2.5	2.41	2.43	1.64	1.33	1.26	:	*:*	*-1.2*
CY	:	3.51	2.54	:	2.42	1.64	1.47	*-2.0*	*-1.9*
LV	:	:	2	1.88	2.01	1.24	1.35	*:*	*:*
LT	:	2.6	2.4	1.99	2.03	1.39	1.31	*-1.3*	*-1.2*
LU	:	2.28	1.97	1.49	1.61	1.76	1.65	*-0.6*	*-0.5*
HU	:	2.02	1.98	1.91	1.87	1.32	1.34	*-0.7*	*-0.7*
MT	:	3.62	2.02	1.99	2.05	1.72	1.41	*-2.2*	*-1.9*
NL	3.1	3.12	2.57	1.6	1.62	1.72	1.7	*-1.4*	*-1.4*
AT	:	2.69	2.29	1.65	1.46	1.36	1.4	*-1.3*	*-1.3*
PL	:	2.98	2.2	2.28	2.04	1.35	1.27	*-1.7*	*-1.6*
PT	:	3.15	3.01	2.25	1.56	1.55	1.35	*-1.8*	*-1.6*
RO	:	:	:	2.44	1.84	1.39	1.31	*:*	*:*
SI	:	2.18	2.1	2.11	1.46	1.26	1.31	*-0.9*	*-0.9*
SK	:	3.03	2.41	2.31	2.09	1.29	1.24	*-1.8*	*-1.7*
FI	3.15	2.72	1.82	1.63	1.78	1.73	1.84	*-0.9*	*-1.0*
SE	2.28	2.2	1.92	1.68	2.13	1.54	1.85	*-0.4*	*-0.7*
UK	:	2.72	2.43	1.9	1.83	1.64	1.84	*-0.9*	*-1.1*
NO	2.51	2.9	2.5	1.72	1.93	1.85	1.9	*-1.0*	*-1.1*
EU27					1.79	1.48			
EA		2.75	2.38		1.62	1.51			*-1.2*
EA12		2.77	2.34		1.82	1.41			*-1.4*
EU15		2.69	2.42	1.88	1.65	1.57			*-1.1*
EU10			2.13	2.07	1.94	1.34	1.35		
EU25			2.32		1.79	1.49			

Source: Eurostat, European Economy (2005), Central Statistical Office (Ireland) for IE in 1970 and 1980.

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). Declines in fertility rates occurred much later in Greece, Spain, Portugal (1981-82) and Ireland (2000) Malta (1980), Poland 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.

Recent trends since 2000 also differ across Member States, with fertility rates continuing to fall in Germany, Cyprus, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, and Slovakia.

By contrast, recent increases are noted in a large number of countries (Bulgaria, Czech Republic, Denmark, Estonia, Greece, Spain, France, Latvia, Finland, Sweden, UK), with fertility rates going above 1.8 in Denmark, France, Finland, Sweden, UK.

1.2.2. The EUROPOP2008 projection

The projected fertility rates in EUROPOP2008

The convergence scenario approach employed in the EUROPOP2008 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, the total fertility rate (TFR) is projected to rise from 1.52 in 2008 to 1.57 by 2030 and further to 1.64 by 2060. In the euro area, a similar increase is projected, from 1.55 in 2008 to 1.66 in 2060. The fertility rate is projected to increase over the projection period in all Member States, except Ireland and France (though remaining above 1.85), and in Denmark, Finland, Sweden and the UK it is projected to remain stable. Hence, in all countries the fertility rates will remain below the natural replacement rate of 2.1 in the period to 2060. The largest increases in fertility rates are projected to take place in Slovakia, Poland and Lithuania which have the lowest fertility rates in the EU in 2008. The increase is projected to occur gradually, with fertility rates in these countries approaching the current EU average rates only in 2060.

Table 1.2 - Projection of fertility rates in EUROPOP2008

	Fertility rate							
	2008	2010	2020	2030	2040	2050	2060	change 2008-2060
BE	1.75	1.76	1.76	1.77	1.78	1.78	1.79	0.04
BG	1.38	1.39	1.42	1.46	1.49	1.52	1.55	0.17
CZ	1.33	1.34	1.38	1.41	1.45	1.49	1.52	0.19
DK	1.85	1.85	1.85	1.85	1.85	1.85	1.85	0.00
DE	1.34	1.35	1.38	1.42	1.45	1.49	1.53	0.19
EE	1.55	1.55	1.57	1.60	1.62	1.64	1.66	0.11
IE	1.90	1.90	1.90	1.89	1.89	1.88	1.88	-0.02
GR	1.41	1.41	1.45	1.48	1.51	1.54	1.57	0.16
ES	1.39	1.39	1.43	1.46	1.49	1.52	1.56	0.17
FR	1.98	1.98	1.97	1.96	1.95	1.94	1.93	-0.05
IT	1.38	1.39	1.42	1.46	1.49	1.52	1.55	0.17
CY	1.45	1.46	1.49	1.52	1.54	1.57	1.60	0.15
LV	1.36	1.36	1.40	1.43	1.47	1.50	1.54	0.18
LT	1.35	1.35	1.39	1.43	1.47	1.51	1.54	0.19
LU	1.65	1.65	1.67	1.68	1.70	1.71	1.72	0.07
HU	1.35	1.35	1.39	1.42	1.46	1.50	1.53	0.18
MT	1.38	1.39	1.42	1.46	1.49	1.52	1.55	0.17
NL	1.72	1.72	1.73	1.74	1.75	1.76	1.77	0.05
AT	1.41	1.42	1.45	1.48	1.51	1.54	1.57	0.16
PL	1.27	1.28	1.32	1.36	1.40	1.44	1.49	0.22
PT	1.36	1.37	1.40	1.44	1.47	1.51	1.54	0.18
RO	1.32	1.33	1.37	1.41	1.44	1.48	1.52	0.20
SI	1.32	1.33	1.37	1.40	1.44	1.48	1.52	0.20
SK	1.25	1.26	1.30	1.34	1.38	1.43	1.47	0.22
FI	1.84	1.84	1.84	1.84	1.84	1.84	1.84	0.00
SE	1.85	1.85	1.85	1.85	1.85	1.85	1.85	0.00
UK	1.84	1.84	1.84	1.84	1.84	1.84	1.84	0.00
NO	1.90	1.90	1.90	1.89	1.89	1.89	1.88	-0.02
EU27	1.54	1.54	1.57	1.60	1.62	1.65	1.67	0.14
EA	1.53	1.54	1.56	1.59	1.61	1.64	1.66	0.13
EA12	1.54	1.54	1.56	1.59	1.61	1.64	1.66	0.13
EU15	1.59	1.60	1.62	1.64	1.66	1.68	1.70	0.11
EU10	1.30	1.31	1.35	1.39	1.43	1.47	1.51	0.21
EU25	1.55	1.55	1.58	1.61	1.63	1.65	1.68	0.13

Source: Eurostat, EUROPOP2008.

1.3. Projection of life expectancy

1.3.1. Past trends

Large and continuous increases in life expectancy have been observed

Over very long time periods, life expectancy has been increasing in most developed countries worldwide. [9] In the EU, there have been significant increases in life expectancy at birth since 1960 in all Member States (see Table 1.3). Between 1960 and 2000, life expectancy at birth has increased significantly, especially for women. In euro area Member States, the increase is even more pronounced.

In the EU, the difference 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.

The gains in life expectancy at birth have differed across countries between 1980 and 2000. Women have gained 5 years or more in Germany, Italy, Luxembourg, Malta, Austria and Portugal. Smaller increases of 2.5 years or less were observed in Bulgaria, Denmark, Estonia, Latvia, Lithuania and the Netherlands.
Gains in the life expectancy over the same period for men have been five years or more in Germany, France, Italy, Luxembourg, Malta, Austria, Portugal, Finland and the UK, while increases of 2.5 years or less have occurred in Bulgaria, Estonia, Greece, Latvia, Lithuania, Hungary, Romania 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, underestimated the gains in life expectancy at birth, and some commentators have argued that governments may be underestimating the potential budgetary impact of ageing populations because of that.

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 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 2006, life expectancy at birth for females ranges from 76.2 in Romania to 84.4 years in Spain and France, and for males ranging from 65.3 in Lithuania to over 78.8 in Cyprus and Sweden.

[9] 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.

Table 1.3 - Past trends in life expectancy at birth, 1950-2006

Males	1950	1960	1970	1980	1990	2000	2006	*1960-2006*	*1960-2000*
BE	62.0	67.7	67.8	69.9	72.7	74.6	76.6	*8.9*	*6.9*
BG	:	67.5	69.1	68.4	68.0	68.4	69.2	*1.7*	*0.9*
CZ	:	67.8	66.1	66.9	67.6	71.7	73.5	*5.7*	*3.9*
DK	:	70.4	70.7	71.2	72.0	74.5	76.1	*5.7*	*4.1*
DE	64.6	66.5	67.5	69.6	72.0	75.1	77.2	*10.7*	*8.6*
EE	:	64.3	65.5	64.1	64.7	65.5	67.4	*3.1*	*1.2*
IE	64.5	68.1	68.8	70.1	72.1	74.0	77.3	*9.2*	*5.9*
EL	63.4	67.3	71.6	73.0	74.7	75.5	77.2	*9.9*	*8.2*
ES	59.8	67.4	69.2	72.3	73.4	75.8	77.7	*10.3*	*8.4*
FR	62.9	66.9	68.4	70.2	72.8	75.4	77.4	*10.5*	*8.5*
IT	63.7	67.2	69.0	70.6	73.9	77.0	:	*:*	*9.8*
CY	:	:	:	72.3	74.1	:	78.8	*:*	*:*
LV	:	65.2	66.0	63.6	64.3	65.0	65.4	*0.2*	*-0.2*
LT	:	64.9	66.8	65.4	66.5	66.8	65.3	*0.4*	*1.9*
LU	:	66.5	67.1	69.1	72.4	74.6	76.8	*10.3*	*8.1*
HU	:	65.9	66.3	65.5	65.2	67.6	69.2	*3.3*	*1.7*
MT	:	66.5	68.4	68.0	73.7	76.2	77	*10.5*	*9.7*
NL	:	71.5	70.7	72.7	73.8	75.5	77.7	*6.2*	*4.0*
AT	:	66.2	66.5	69.0	72.3	75.2	77.2	*11.0*	*9.0*
PL	:	64.9	66.6	66.9	66.3	69.6	70.9	*6.0*	*4.7*
PT	56.4	61.0	63.6	67.9	70.6	73.2	75.5	*14.5*	*12.2*
RO	:	:	65.8	66.6	66.7	67.7	69.2	*:*	*:*
SI	:	66.1	65.0	67.4	69.8	72.2	74.5	*8.4*	*6.1*
SK	:	67.9	66.8	66.7	66.7	69.2	70.4	*2.5*	*1.3*
FI	:	65.5	66.5	69.2	71.0	74.2	75.9	*10.4*	*8.7*
SE	:	71.2	72.3	72.8	74.8	77.4	78.8	*7.6*	*6.2*
UK	66.2	67.9	68.7	70.2	72.9	75.5	:	*:*	*7.6*
NO	:	71.6	71.2	72.4	73.4	76.0	78.2	*6.6*	*4.4*
EU27				68.9	70.6				
EA				70.1	72.6				
EA12				70.1	72.6				
EU15		67.4	68.6	70.5	72.8	75.2			*7.7*
EU10				66.7	67.9		71.2		
EU25				69.0	70.8				
Females	**1950**	**1960**	**1970**	**1980**	**1990**	**2000**	**2006**	*1960-2006*	*1960-2000*
BE	67.3	73.5	74.2	76.7	79.5	81.0	82.3	*8.8*	*7.5*
BG	:	71.1	73.5	73.9	74.7	75.0	76.3	*5.2*	*3.9*
CZ	:	73.5	73.1	74.0	75.5	78.5	79.9	*6.4*	*5.0*
DK	:	74.4	75.9	77.3	77.8	79.2	80.7	*6.3*	*4.8*
DE	68.5	71.7	73.6	76.2	78.5	81.2	82.4	*10.7*	*9.5*
EE	:	71.6	74.1	74.1	75.0	76.2	78.6	*7.0*	*4.6*
IE	67.1	71.9	73.5	75.6	77.7	79.2	82.1	*10.2*	*7.3*
EL	68.5	72.4	76.0	77.5	79.5	80.6	81.9	*9.5*	*8.2*
ES	64.3	72.2	74.8	78.4	80.6	82.9	84.4	*12.2*	*10.7*
FR	68.5	73.6	75.9	78.4	81.2	83.0	84.4	*10.8*	*9.4*
IT	67.2	72.3	74.9	77.4	80.4	82.9	:	*:*	*10.6*
CY	:	:	:	77.0	78.6	:	82.4	*:*	*:*
LV	:	72.4	74.4	74.2	74.6	76.1	76.3	*3.9*	*3.7*
LT	:	71.4	75.0	75.4	76.3	77.5	77	*5.6*	*6.1*
LU	:	72.2	73.4	75.9	78.7	81.3	81.9	*9.7*	*9.1*
HU	:	70.2	72.1	72.8	73.8	76.2	77.8	*7.6*	*6.0*
MT	:	70.5	72.6	72.8	78.1	80.3	81.9	*11.4*	*9.8*
NL	:	75.5	76.3	79.3	80.2	80.5	82	*6.5*	*5.0*
AT	:	72.7	73.5	76.1	79.0	81.2	82.8	*10.1*	*8.5*
PL	:	70.6	73.3	75.4	75.3	78.0	79.7	*9.1*	*7.4*
PT	61.6	66.6	69.6	74.9	77.5	80.2	82.3	*15.7*	*13.6*
RO	:	:	70.4	71.9	73.1	74.8	76.2	*:*	*:*
SI	:	72.0	72.4	75.2	77.8	79.9	82	*10.0*	*7.9*
SK	:	72.7	73.0	74.4	75.7	77.5	78.4	*5.7*	*4.8*
FI	:	72.5	75.0	77.6	79.0	81.2	83.1	*10.6*	*8.7*
SE	:	74.9	77.3	79.0	80.5	82.0	83.1	*8.2*	*7.1*
UK	71.2	73.7	75.0	76.2	78.5	80.3	:	*:*	*6.6*
NO	:	76.0	77.5	79.3	79.9	81.5	82.9	*6.9*	*5.5*
EU27				75.8	77.7				
EA				76.6	79.1				
EA12				76.6	79.1				
EU15		72.7	74.6	77.1	79.2	81.1			*8.4*
EU10				74.5	76.1		79.4		
EU25				76.1	78.0				

Source: Eurostat.

Note: EU averages are simple averages.

1.3.2. The projection used in EUROPOP2008: methodology and results

A detailed overview of the projection methodology is provided by Eurostat (2008).

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 EUROPOP2008. 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 8.5 years over the projection period, from 76 in 2008 to 84.5 in 2060. For females, life expectancy at birth is projected to increase by 6.9 years for females, from 82.1 in 2008 to 89 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 new Member States. Life expectancy for males in 2008 is lowest in Estonia, Latvia, Lithuania, Hungary, Slovakia, Poland, Bulgaria and Romania between 66 and 71 years. Some catch-up takes place over the projection period, with increases in life expectancy over 10 years, the highest in the EU, projected in Estonia, Latvia, Lithuania, Hungary, Slovakia, Poland, Bulgaria and Romania, all below 71 years. Overall, and with the exception of Cyprus, life expectancy at birth is projected to remain below the EU average in all new Member States throughout the projection period, especially for males. This reflects a convergence of life expectancy. Still, by 2060 the life expectancy for many of these countries remains below the average in the EU.

Table 1.4 - Projection of life expectancy at birth in EUROPOP2008

	Males								Females							
	2008	2010	2020	2030	2040	2050	2060	change 2008-2060	2008	2010	2020	2030	2040	2050	2060	change 2008-2060
BE	76.7	77.0	78.7	80.2	81.7	83.1	84.4	7.8	82.3	82.6	84.0	85.4	86.6	87.8	88.9	6.6
BG	69.7	70.2	72.8	75.3	77.5	79.6	81.6	11.9	76.7	77.1	79.3	81.3	83.1	84.9	86.5	9.8
CZ	73.9	74.3	76.3	78.1	79.9	81.6	83.2	9.3	80.2	80.5	82.1	83.7	85.1	86.5	87.8	7.7
DK	76.4	76.8	78.4	80.0	81.5	82.9	84.3	7.8	81.0	81.4	83.0	84.5	85.9	87.2	88.4	7.4
DE	77.3	77.6	79.3	80.8	82.3	83.6	84.9	7.6	82.6	82.9	84.3	85.6	86.8	88.0	89.1	6.5
EE	68.0	68.6	71.4	74.0	76.5	78.8	80.8	12.8	78.7	79.1	81.1	82.9	84.5	86.1	87.5	8.8
IE	77.5	77.9	79.5	81.1	82.5	83.9	85.2	7.7	81.9	82.2	83.8	85.3	86.7	88.0	89.2	7.3
GR	77.4	77.8	79.4	80.9	82.3	83.6	84.8	7.4	82.6	82.8	84.1	85.3	86.5	87.6	88.7	6.1
ES	77.4	77.7	79.4	80.9	82.3	83.7	84.9	7.5	83.9	84.1	85.4	86.5	87.6	88.6	89.6	5.7
FR	77.5	77.8	79.5	81.0	82.5	83.9	85.1	7.7	84.3	84.6	85.8	87.0	88.1	89.1	90.1	5.8
IT	78.5	78.9	80.3	81.7	83.1	84.3	85.5	6.9	84.2	84.5	85.7	86.9	88.0	89.0	90.0	5.8
CY	78.2	78.5	80.0	81.5	82.8	84.0	85.2	7.0	81.7	82.0	83.5	84.9	86.2	87.5	88.7	7.0
LV	66.0	66.6	69.8	72.8	75.6	78.1	80.5	14.5	76.7	77.1	79.4	81.5	83.4	85.2	86.8	10.1
LT	65.9	66.6	69.8	72.8	75.6	78.1	80.4	14.6	77.4	77.9	80.0	81.9	83.7	85.3	86.9	9.4
LU	76.3	76.7	78.5	80.2	81.7	83.2	84.5	8.2	81.2	81.5	83.2	84.6	86.0	87.3	88.5	7.3
HU	69.7	70.2	72.9	75.4	77.7	79.9	81.9	12.2	78.1	78.5	80.5	82.4	84.2	85.8	87.3	9.2
MT	76.0	76.4	78.2	79.9	81.5	83.0	84.3	8.3	81.1	81.4	83.1	84.6	86.1	87.4	88.6	7.6
NL	77.9	78.2	79.7	81.1	82.5	83.7	84.9	7.0	82.2	82.5	83.9	85.3	86.6	87.8	88.9	6.7
AT	77.4	77.8	79.4	80.9	82.3	83.6	84.9	7.5	82.9	83.2	84.6	85.8	87.0	88.1	89.2	6.3
PL	71.4	71.9	74.3	76.6	78.8	80.7	82.5	11.1	79.9	80.3	82.1	83.7	85.3	86.7	88.0	8.1
PT	75.8	76.2	78.0	79.7	81.2	82.7	84.1	8.3	82.4	82.7	84.1	85.4	86.6	87.7	88.8	6.4
RO	69.8	70.3	73.0	75.5	77.8	79.9	81.9	12.1	76.6	77.1	79.3	81.3	83.2	85.0	86.6	10.0
SI	74.7	75.1	77.1	78.9	80.6	82.2	83.7	9.0	81.9	82.2	83.7	85.1	86.4	87.6	88.8	6.9
SK	70.9	71.4	73.8	76.0	78.2	80.2	82.0	11.1	78.7	79.1	81.0	82.7	84.4	85.9	87.4	8.6
FI	76.1	76.5	78.3	79.9	81.5	83.0	84.3	8.2	83.0	83.3	84.7	85.9	87.1	88.2	89.3	6.2
SE	79.0	79.2	80.6	81.9	83.1	84.3	85.4	6.5	83.1	83.4	84.7	86.0	87.2	88.3	89.3	6.2
UK	77.4	77.7	79.4	80.9	82.4	83.8	85.0	7.7	81.5	81.9	83.5	85.0	86.4	87.7	88.9	7.4
NO	78.4	78.7	80.1	81.5	82.8	84.1	85.2	6.8	82.9	83.2	84.5	85.8	87.0	88.1	89.2	6.3
EU27	76.1	76.5	78.4	80.1	81.7	83.2	84.6	8.4	82.1	82.5	84.0	85.4	86.7	87.9	89.1	6.9
EA	77.5	77.8	79.5	81.0	82.4	83.7	85.0	7.5	83.4	83.6	85.0	86.2	87.4	88.5	89.5	6.1
EA12	77.5	77.9	79.5	81.0	82.4	83.8	85.0	7.5	83.4	83.7	85.0	86.2	87.4	88.5	89.5	6.1
EU15	77.5	77.9	79.5	81.0	82.4	83.8	85.0	7.5	83.1	83.3	84.7	86.0	87.2	88.3	89.4	6.3
EU10	71.2	71.7	74.2	76.5	78.6	80.6	82.4	11.2	79.4	79.8	81.7	83.4	84.9	86.4	87.8	8.3
EU25	76.5	76.9	78.7	80.3	81.9	83.3	84.7	8.1	82.5	82.8	84.2	85.6	86.9	88.1	89.2	6.7

Source: Eurostat, EUROPOP2008.

Given the assumed "convergence hypothesis", the projection compresses the spread of life expectancy at birth for males across the Member States, from 13.1 years in 2008 (Sweden 79 and Lithuania 65.9) to 5 years in 2060 (85.5 in Italy compared with 80.4 in Lithuania). For females, the reduction of the differential in life expectancy at birth is lower, from 7.7 years in

2008 (84.3 in France and 76.6 in Romania) to 4.1 year in 2060 (90.1 in France and 86.5 in Bulgaria).

In the EU, life expectancy at age 65 is projected to increase by 5.4 years for males and by 5.2 years for females over the projection period. In 2060, life expectancy at age 65 will reach 21.8 years for males and 25.1 for females. The projected difference between male and female in 2060 is of 3.3 years, smaller than the 4.5 year difference in life expectancy at birth.

Table 1. 5 - Projection of life expectancy at 65 in EUROPOP2008

	Males								Females							
	2008	2010	2020	2030	2040	2050	2060	change 2008-2060	2008	2010	2020	2030	2040	2050	2060	change 2008-2060
BE	16.5	16.7	17.7	18.8	19.8	20.7	21.7	5.2	20.1	20.3	21.4	22.3	23.3	24.2	25.1	5.0
BG	13.1	13.4	14.8	16.1	17.5	18.8	20.0	6.9	16.1	16.4	17.8	19.2	20.5	21.8	23.1	7.0
CZ	14.7	15.0	16.2	17.4	18.6	19.7	20.8	6.1	18.1	18.3	19.5	20.7	21.9	23.0	24.0	6.0
DK	16.1	16.3	17.4	18.4	19.5	20.5	21.4	5.4	19.0	19.2	20.4	21.6	22.6	23.7	24.6	5.7
DE	16.8	17.0	18.1	19.1	20.1	21.1	22.0	5.2	20.1	20.3	21.4	22.4	23.3	24.3	25.1	5.0
EE	13.0	13.3	14.7	16.0	17.3	18.6	19.9	6.9	18.1	18.4	19.6	20.8	22.0	23.1	24.2	6.1
IE	16.8	17.0	18.1	19.2	20.3	21.3	22.2	5.5	19.7	20.0	21.2	22.3	23.4	24.4	25.4	5.6
GR	17.2	17.4	18.4	19.3	20.2	21.1	22.0	4.8	19.6	19.8	20.8	21.8	22.7	23.7	24.5	4.9
ES	17.1	17.3	18.3	19.3	20.3	21.2	22.1	5.0	21.0	21.2	22.1	23.0	23.9	24.7	25.5	4.5
FR	17.7	17.9	18.9	19.9	20.8	21.7	22.5	4.8	22.0	22.2	23.1	23.9	24.7	25.5	26.2	4.1
IT	17.5	17.7	18.7	19.7	20.6	21.5	22.4	4.9	21.4	21.6	22.5	23.4	24.3	25.1	25.9	4.5
CY	17.1	17.3	18.3	19.3	20.2	21.1	22.0	4.8	19.0	19.2	20.3	21.5	22.5	23.6	24.6	5.6
LV	12.7	13.0	14.5	16.0	17.4	18.8	20.1	7.5	17.1	17.4	18.8	20.1	21.4	22.6	23.8	6.6
LT	13.1	13.4	14.9	16.3	17.7	19.0	20.3	7.1	17.5	17.8	19.0	20.3	21.5	22.6	23.7	6.2
LU	16.8	17.0	18.0	19.1	20.1	21.0	21.9	5.1	19.7	19.9	21.0	22.0	23.0	23.9	24.8	5.0
HU	13.6	13.9	15.3	16.7	18.1	19.4	20.6	7.0	17.5	17.7	19.1	20.4	21.7	22.9	24.0	6.5
MT	15.9	16.1	17.2	18.3	19.4	20.4	21.4	5.5	19.1	19.4	20.5	21.7	22.8	23.8	24.8	5.7
NL	16.5	16.8	17.8	18.8	19.8	20.8	21.7	5.1	19.9	20.1	21.2	22.2	23.2	24.1	25.0	5.1
AT	17.1	17.3	18.3	19.3	20.2	21.2	22.0	5.0	20.3	20.5	21.5	22.5	23.4	24.3	25.2	4.9
PL	14.5	14.7	16.0	17.3	18.6	19.8	20.9	6.5	18.6	18.8	20.0	21.2	22.3	23.4	24.4	5.9
PT	16.3	16.6	17.6	18.7	19.7	20.7	21.6	5.2	19.9	20.1	21.1	22.1	23.0	23.9	24.8	4.9
RO	13.6	13.9	15.2	16.6	17.9	19.2	20.4	6.8	16.3	16.6	18.0	19.4	20.7	22.0	23.2	6.9
SI	15.7	15.9	17.1	18.2	19.3	20.4	21.4	5.7	19.6	19.8	20.9	22.0	23.0	24.0	24.9	5.3
SK	13.3	13.6	15.0	16.3	17.7	19.0	20.2	6.9	17.1	17.4	18.8	20.1	21.3	22.6	23.7	6.6
FI	16.6	16.9	17.9	18.9	19.9	20.9	21.8	5.2	20.7	20.9	21.8	22.8	23.7	24.5	25.4	4.7
SE	17.4	17.6	18.6	19.5	20.4	21.3	22.2	4.7	20.5	20.7	21.7	22.6	23.6	24.4	25.3	4.8
UK	16.9	17.1	18.2	19.2	20.3	21.2	22.1	5.3	19.5	19.8	20.9	22.1	23.1	24.1	25.1	5.6
NO	17.3	17.5	18.5	19.5	20.4	21.3	22.1	4.8	20.4	20.6	21.6	22.6	23.5	24.4	25.2	4.9
EU27	16.5	16.7	17.8	18.9	20.0	21.0	21.9	5.5	20.0	20.2	21.3	22.3	23.3	24.3	25.2	5.2
EA	17.1	17.3	18.4	19.4	20.3	21.3	22.2	5.0	20.8	21.0	22.0	22.9	23.8	24.7	25.5	4.7
EA12	17.1	17.3	18.4	19.4	20.4	21.3	22.2	5.0	20.8	21.0	22.0	22.9	23.8	24.7	25.5	4.7
EU15	17.1	17.3	18.3	19.3	20.3	21.3	22.2	5.1	20.6	20.8	21.8	22.8	23.7	24.6	25.4	4.8
EU10	14.2	14.5	15.8	17.2	18.4	19.6	20.8	6.6	18.2	18.4	19.7	20.9	22.1	23.2	24.2	6.1
EU25	16.6	16.9	18.0	19.0	20.1	21.0	22.0	5.3	20.2	20.4	21.5	22.5	23.5	24.4	25.3	5.1

Source: Eurostat, EUROPOP2008.

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 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

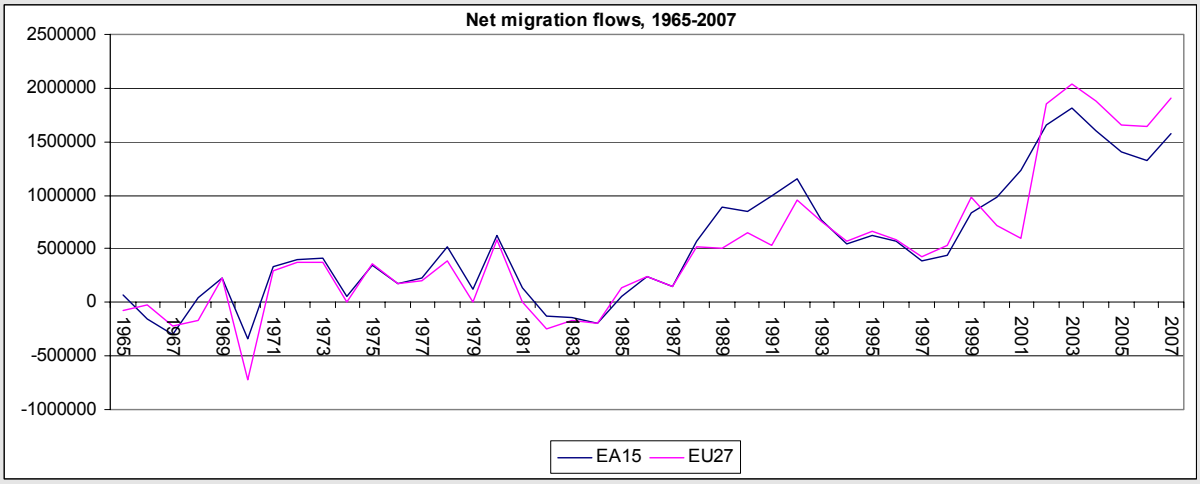
Turkey for Germany. Foreign labour recruitment stopped in 1974, after the first oil price shock and subsequent rise in unemployment;[10]

- 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.

Net inflows started rising at the end of the 1990s until 2003, from over 500,000 people in 1998 to close to 2 million in 2003. Some of this increase, however, does not only reflect new entries of migrants, but also large-scale regularisation programmes which made parts of the migrant population residing illegally in the EU visible in official statistics. Net flows show a recent tendency to stabilise, decreasing to a level of 1,800,000 in 2004.

Graph 1. 1 - Net migration flows, 1965-2007



Source: Eurostat.

[10] 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).

BOX: 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[11] 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 there has been a recent rise of migration flows to Italy, Spain and Ireland that have switched from countries of origin to destination countries. Spain recorded the highest net inflows in the EU in 2006, after recording net outflows during the 1960s and most of the 1970s and 80s. 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. Germany records a comparatively large number of arrivals, but the high number of outflows keeps net immigration, relative to total population, comparable to that of some other countries. Sinn et al. (2001) estimate that only 40% of immigrants were still living in Germany 10 years after their arrival, and less than 35% after 25 years.

[11] 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.

Table 1.6 - Past trends in net migration flows

	Net migration flows					
	1961	1970	1980	1990	2000	2006
BE	-39859	-32718	-2436	19547	14349	53357
BG	-67	-11031	-5	-94611	0	0
CZ	4911	-121345	-41216	-58893	6539	34720
DK	2745	21113	570	8553	10094	10118
DE	118435	-271686	304410	656166	167863	25814
EE	:	6066	6052	-5623	224	164
IE	-19662	-2796	-592	-7667	31812	68857
GR	-16761	-46393	55777	63920	29401	39995
ES	-82664	72947	112659	-20007	389774	604902
FR	:	:	:	:	158266	90115
IT	-136302	-107276	4914	22250	49526	:
CY	-6519	-903	-664	8708	3960	8666
LV	15467	6734	2445	-13085	-5504	-2451
LT	3690	14025	2122	-8848	-20306	-4857
LU	2415	1084	1344	3937	3431	5353
HU	909	0	0	18313	16658	21309
MT	:	-1944	380	857	9763	2135
NL	5924	32516	50557	48730	57033	-25903
AT	-2679	10406	9357	58562	17272	29379
PL	-61865	-293620	-24125	-12620	-409925	-36134
PT	-38078	-121955	41969	-39107	47000	26044
RO	:	-12190	-17804	-86781	-3729	-6483
SI	-4489	3713	5420	-245	2747	6267
SK	-5636	-35091	-11493	-2322	-22301	3854
FI	-11815	-36381	-2180	8604	2410	10600
SE	13115	46726	9606	34814	24386	50769
UK	87400	-14821	-33485	24662	143871	:
NO	694	-758	3741	1796	9707	23623
EU27	-171385	-894820	473582	627814	724614	1016590
EA	-232054	-501386	580915	824255	984607	945581
EA12	:	-502252	575779	814935	968137	928513
EU15	-117786	-449234	552470	882964	1146488	989400
EU10	-53532	-422365	-61079	-73758	-418145	33673
EU25	:	-871599	491391	809206	728343	1023073

Source: Eurostat.

1.4.2. The projection used in EUROPOP2008: methodology and results

Projected net migration flows in EUROPOP2008

The methodology used to project net migration in EUROPOP2008 is described in Eurostat (2008). Specifically, migration is assumed to converge to zero net migration in 2150. Additionally, migration is assumed to increase to cover 10% of any natural decrease in the working age population. This adjustment offsets in part the decline in the working age population and presents a slightly more favourable situation than would otherwise be the case for some countries.

Table 1.7 presents the projected net migration flows in the baseline of EUROPOP2008. For the EU as a whole, annual net inflows are projected to fall from about 1,680,000 people in 2008 (equivalent to 0.33% of the EU population) to 980,000 by 2020 and thereafter declining further to some 800,000 people by 2060 (0.16% of the EU population).

Over the entire projection period, the cumulated net migration to the EU is 59 millions, of which the bulk is concentrated in the euro area (46.2 millions). Net migration flows are projected to be concentrated to a few destination countries: Italy (12 millions cumulated up to 2060), Spain (11.6 millions), Germany (8.2 millions), and the UK (7.8 millions). According to the assumptions, the change of Spain and Italy from origin to destination countries would be confirmed in coming decades. For countries that currently experience a net outflow (EE, LT, LV, PL, BG and RO), this is projected to taper off or reverse in the coming decades.

Table 1.7 - Projection of net migration flows in EUROPOP2008

	Net migration ('000)							as % of total population		cumulated (1000's)
	2008	2010	2020	2030	2040	2050	2060	2008	2060	2008-2060
BE	51	47	36	31	27	25	23	0.5%	0.2%	1680
BG	-1	0	0	0	2	2	-1	0.0%	0.0%	43
CZ	24	26	25	23	27	22	17	0.2%	0.2%	1253
DK	10	10	8	9	6	6	6	0.2%	0.1%	389
DE	160	147	173	187	132	136	116	0.2%	0.2%	8183
EE	-1	0	0	0	0	0	0	0.0%	0.0%	-1
IE	63	53	22	9	6	7	9	1.4%	0.1%	869
GR	40	40	38	37	37	31	27	0.4%	0.2%	1875
ES	623	540	263	161	150	135	130	1.4%	0.3%	11655
FR	99	98	93	87	77	70	63	0.2%	0.1%	4375
IT	260	256	241	249	229	193	174	0.4%	0.3%	11994
CY	9	9	8	8	7	7	6	1.2%	0.4%	402
LV	-1	-1	0	-1	0	1	-1	0.0%	0.0%	-5
LT	-2	-2	0	0	0	1	0	-0.1%	0.0%	-4
LU	4	4	4	4	3	3	3	0.9%	0.4%	188
HU	20	19	22	17	22	18	15	0.2%	0.2%	1008
MT	1	1	1	1	1	1	1	0.2%	0.2%	50
NL	8	8	11	14	7	7	8	0.0%	0.1%	512
AT	33	33	31	31	26	25	22	0.4%	0.2%	1501
PL	-16	-15	14	-1	17	26	8	0.0%	0.0%	538
PT	52	51	48	46	45	39	34	0.5%	0.3%	2346
RO	-6	-5	6	-1	13	13	4	0.0%	0.0%	357
SI	6	5	4	3	3	3	2	0.3%	0.1%	193
SK	4	3	5	4	6	6	4	0.1%	0.1%	258
FI	10	10	8	6	5	5	4	0.2%	0.1%	334
SE	47	42	27	20	17	17	16	0.5%	0.1%	1212
UK	188	184	166	151	138	126	114	0.3%	0.1%	7821
NO	22	21	15	12	11	10	10	0.5%	0.2%	695
EU27	1684	1563	1253	1093	1005	924	804	0.3%	0.2%	59031
EA	1418	1302	980	873	756	687	623	0.4%	0.2%	46160
EA12	1402	1287	966	861	744	676	614	0.4%	0.2%	45515
EU15	1647	1523	1167	1041	906	825	750	0.4%	0.2%	54937
EU10	44	45	79	54	84	85	51	0.1%	0.1%	3694
EU25	1691	1568	1246	1094	990	910	801	0.4%	0.2%	58631

Source: Eurostat, EUROPOP2008.

1.5. Overall results of population projection to be used

Table 1.8 presents an overview of the baseline population projection (Eurostat's EUROPOP2008 projection) used in the 2009 EC-EPC projection exercise.

The age structure of the EU population is projected to dramatically change in coming decades due to the dynamics of fertility, life expectancy and migration rates. 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 495.4 millions in 2008) up to 2035 by almost 5%, when it will peak (at 520.1 million). Thereafter, a steady decline occurs and the population shrinks by nearly 3%. Nonetheless, according to the projections, the population in 2060 will be slightly higher than in 2008, at 505.7 millions.

While the EU population is projected to be slightly larger in 2060 compared to 2008, 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, IT, LV, LT, HU, MT, PL, RO, SI, SK. For the other Member States an increase is projected.

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

	Total population							% change		
	2008	2010	2020	2030	2040	2050	2060	2008-2020	2020-2060	2008-2060
BE	10.7	10.8	11.3	11.7	12.0	12.2	12.3	6.2	8.6	15.4
BG	7.6	7.6	7.2	6.8	6.3	5.9	5.5	-5.9	-23.7	-28.2
CZ	10.3	10.4	10.5	10.4	10.2	9.9	9.5	1.9	-9.8	-8.0
DK	5.5	5.5	5.7	5.8	5.9	5.9	5.9	3.4	4.6	8.1
DE	82.2	82.1	81.5	80.2	77.8	74.5	70.8	-0.9	-13.1	-13.9
EE	1.3	1.3	1.3	1.3	1.2	1.2	1.1	-2.1	-13.6	-15.4
IE	4.4	4.6	5.4	5.9	6.2	6.5	6.8	22.4	24.9	52.9
GR	11.2	11.3	11.6	11.6	11.6	11.4	11.1	3.0	-3.8	-0.9
ES	45.3	46.7	51.1	52.7	53.3	53.2	51.9	12.9	1.6	14.6
FR	61.9	62.6	65.6	68.0	69.9	71.0	71.8	6.0	9.4	16.0
IT	59.5	60.0	61.4	61.9	62.0	61.2	59.4	3.2	-3.3	-0.2
CY	0.8	0.8	1.0	1.1	1.2	1.3	1.3	20.1	38.3	66.2
LV	2.3	2.2	2.2	2.0	1.9	1.8	1.7	-5.2	-21.8	-25.9
LT	3.4	3.3	3.2	3.1	2.9	2.7	2.5	-4.3	-20.9	-24.3
LU	0.5	0.5	0.6	0.6	0.7	0.7	0.7	14.3	32.8	51.7
HU	10.0	10.0	9.9	9.7	9.4	9.1	8.7	-1.5	-11.9	-13.2
MT	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.0	-5.2	-1.4
NL	16.4	16.5	16.9	17.2	17.2	16.9	16.6	3.0	-1.8	1.2
AT	8.3	8.4	8.7	9.0	9.1	9.1	9.0	4.7	3.6	8.4
PL	38.1	38.1	38.0	37.0	35.2	33.3	31.1	-0.4	-18.0	-18.3
PT	10.6	10.7	11.1	11.3	11.5	11.4	11.3	4.6	1.4	6.1
RO	21.4	21.3	20.8	20.0	19.2	18.1	16.9	-2.8	-18.8	-21.0
SI	2.0	2.0	2.1	2.0	2.0	1.9	1.8	1.7	-13.6	-12.1
SK	5.4	5.4	5.4	5.3	5.1	4.9	4.5	0.6	-16.3	-15.8
FI	5.3	5.3	5.5	5.6	5.5	5.4	5.4	3.8	-1.8	1.9
SE	9.2	9.3	9.9	10.3	10.5	10.7	10.9	7.3	10.4	18.4
UK	61.3	62.0	65.7	69.2	72.0	74.5	76.7	7.2	16.7	25.1
NO	4.7	4.8	5.2	5.5	5.7	5.9	6.0	9.3	16.6	27.4
EU27	495.4	499.4	513.8	519.9	520.1	515.3	505.7	3.7	-1.6	2.1
EA	319.5	322.9	334.1	339.1	340.4	337.3	330.6	4.6	-1.1	3.5
EA12	316.3	319.6	330.7	335.6	336.8	333.8	327.1	4.5	-1.1	3.4
EU15	392.2	396.4	411.9	420.9	425.2	424.9	420.5	5.0	2.1	7.2
EU10	74.1	74.1	74.0	72.3	69.4	66.4	62.8	-0.2	-15.1	-15.3
EU25	466.3	470.5	485.8	493.1	494.6	491.2	483.3	4.2	-0.5	3.6

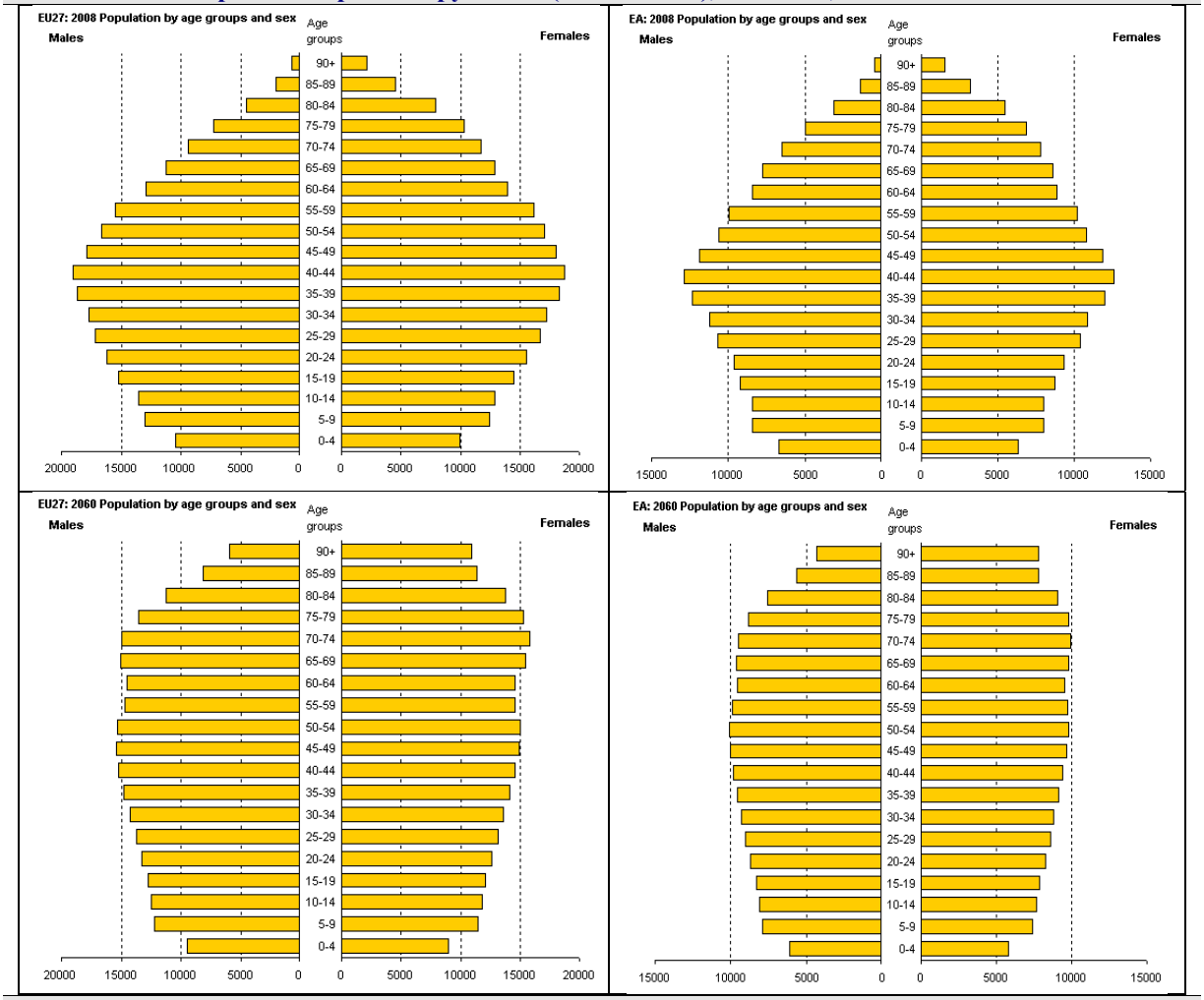
Source: Eurostat, EUROPOP2008.

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.[12] The most numerous cohorts in 2008 are around 40 years old for men and women. The median age is projected to rise from 40.4 years in 2008 to 47.9 years in 2060. Elderly people are projected to account for an increasing share of the population; this is due to 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.

[12] Population pyramids show the population density by sex and by age group.

Graph 1.2 - Population pyramids (in thousands), EU27/EA, in 2008 and 2060



Source: Eurostat, EUROPOP2008.

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), the elderly (65 and over) and the very old (80 and over). The young (aged 0-14) are projected to decline gradually from 2020 onwards.

According to the projections, the working-age population (aged 15-64) will start to decline as of 2010 and, over the whole projection period, it will drop by 15 per cent in the EU. However, it is projected to increase in 7 Member States (Belgium, Ireland, France, Cyprus, Luxembourg, Sweden and the UK).

The elderly population (aged 65 and above) will increase very markedly throughout the projection period. The number of elderly will almost double, rising from 85 million in 2008 to 151 million in 2060 in the EU.

The number of very old people aged 80 years and above is projected to increase even more in the EU; from 22 million in 2008 to 61 million in 2060, i.e. almost triple during the projection period.

The proportion of young people (aged 0-14) is projected to remain fairly constant by 2060 in the EU27 and the euro area, while those aged 15-64 will become a substantially smaller share.

Those aged 65 and over will become a much larger share (30% of the population), and those aged 80 and over (12%) will almost become as numerous as the young population (14%) in 2060.

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

	Population aged 0-14							% change		
	2008	2010	2020	2030	2040	2050	2060	2008-2020	2020-2060	2008-2060
BE	1.8	1.8	1.9	1.9	1.9	1.9	1.9	5.2	1.4	6.7
BG	1.0	1.0	1.0	0.8	0.8	0.7	0.7	0.0	-36.0	-36.0
CZ	1.5	1.5	1.5	1.3	1.2	1.2	1.2	4.8	-24.6	-21.0
DK	1.0	1.0	0.9	1.0	1.0	1.0	1.0	-6.2	1.6	-4.7
DE	11.3	11.0	10.3	10.1	9.5	9.0	8.9	-9.0	-13.4	-21.2
EE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	11.6	-28.5	-20.2
IE	0.9	1.0	1.1	1.1	1.1	1.1	1.1	26.5	0.6	27.2
GR	1.6	1.6	1.7	1.5	1.5	1.5	1.4	3.7	-13.4	-10.2
ES	6.6	7.0	7.9	7.0	6.8	7.0	6.7	19.7	-15.4	1.3
FR	11.3	11.5	11.9	11.8	11.9	12.1	12.0	5.2	0.3	5.6
IT	8.3	8.4	8.2	7.6	7.6	7.5	7.2	-1.6	-12.2	-13.6
CY	0.1	0.1	0.2	0.2	0.2	0.2	0.2	19.5	18.8	42.0
LV	0.3	0.3	0.3	0.3	0.2	0.2	0.2	6.0	-37.3	-33.5
LT	0.5	0.5	0.5	0.4	0.4	0.3	0.3	-7.8	-33.6	-38.8
LU	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.4	26.7	34.8
HU	1.5	1.5	1.5	1.3	1.2	1.2	1.1	-2.9	-24.6	-26.8
MT	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-6.8	-17.7	-23.3
NL	2.9	2.9	2.6	2.7	2.7	2.5	2.5	-9.7	-6.1	-15.3
AT	1.3	1.3	1.2	1.3	1.2	1.2	1.2	-2.1	-0.2	-2.3
PL	5.9	5.7	5.6	4.9	4.0	3.8	3.5	-5.0	-36.9	-40.0
PT	1.6	1.6	1.6	1.5	1.5	1.5	1.4	-1.4	-10.2	-11.5
RO	3.3	3.2	3.1	2.6	2.3	2.1	1.9	-6.2	-36.5	-40.4
SI	0.3	0.3	0.3	0.3	0.2	0.2	0.2	3.8	-21.9	-18.9
SK	0.9	0.8	0.8	0.7	0.6	0.6	0.5	-6.7	-36.2	-40.5
FI	0.9	0.9	0.9	0.9	0.9	0.9	0.9	2.2	-7.0	-4.9
SE	1.5	1.5	1.7	1.8	1.7	1.7	1.8	11.4	4.1	16.0
UK	10.7	10.8	11.6	12.2	12.1	12.4	12.7	8.4	9.0	18.2
NO	0.9	0.9	0.9	1.0	1.0	1.0	1.0	2.7	8.2	11.2
EU27	78	78	79	76	73	72	71	69	-10.1	-8.5
EA	49	50	50	48	47	47	46	62	-8.3	-6.7
EA12	49	49	50	48	47	46	45	45	-8.3	-6.7
EU15	62	62	64	63	61	62	61	59	-4.7	-1.8
EU10	11	11	11	10	8	8	7	17	-31.8	-33.6
EU25	73	73	75	72	70	70	68	75	-8.6	-6.7

Source: Eurostat, EUROPOP2008.

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

	Population aged 15-64							% change		
	2008	2010	2020	2030	2040	2050	2060	2008-2020	2020-2060	2008-2060
BE	7.0	7.1	7.2	7.1	7.1	7.1	7.1	2.5	-1.5	1.0
BG	5.3	5.2	4.7	4.3	3.9	3.3	3.0	-11.2	-37.2	-44.2
CZ	7.4	7.3	6.9	6.7	6.3	5.6	5.2	-6.7	-24.6	-29.7
DK	3.6	3.6	3.6	3.5	3.4	3.5	3.5	-1.1	-2.8	-3.8
DE	54.4	54.2	52.6	47.9	44.2	41.9	38.9	-3.3	-26.1	-28.5
EE	0.9	0.9	0.8	0.8	0.8	0.7	0.6	-7.4	-25.8	-31.2
IE	3.0	3.1	3.5	3.8	3.9	3.8	3.9	17.4	10.1	29.3
GR	7.5	7.6	7.5	7.3	6.8	6.3	6.2	-1.0	-17.3	-18.1
ES	31.1	31.9	33.9	34.0	31.8	29.1	28.4	8.8	-16.1	-8.7
FR	40.3	40.6	40.4	40.4	40.3	40.7	41.2	0.3	1.9	2.2
IT	39.2	39.4	39.3	38.1	35.3	33.7	32.7	0.1	-16.6	-16.5
CY	0.6	0.6	0.6	0.7	0.8	0.8	0.8	15.8	20.6	39.5
LV	1.6	1.6	1.4	1.3	1.2	1.0	0.9	-9.2	-36.9	-42.7
LT	2.3	2.3	2.2	2.0	1.8	1.6	1.3	-6.0	-38.1	-41.8
LU	0.3	0.3	0.4	0.4	0.4	0.4	0.4	12.9	19.7	35.2
HU	6.9	6.9	6.5	6.2	5.8	5.2	4.8	-6.4	-25.3	-30.1
MT	0.3	0.3	0.3	0.3	0.3	0.2	0.2	-3.1	-20.0	-22.5
NL	11.1	11.1	10.9	10.4	9.9	9.9	9.6	-1.4	-12.1	-13.3
AT	5.6	5.7	5.8	5.6	5.4	5.3	5.2	2.8	-10.6	-8.1
PL	27.1	27.2	25.4	23.6	22.1	18.9	16.3	-6.1	-35.8	-39.7
PT	7.1	7.2	7.3	7.2	6.9	6.5	6.3	1.9	-12.7	-11.1
RO	15.0	14.9	14.1	13.4	12.0	10.4	9.1	-5.5	-35.9	-39.4
SI	1.4	1.4	1.3	1.3	1.2	1.0	1.0	-5.0	-29.0	-32.5
SK	3.9	3.9	3.7	3.5	3.2	2.8	2.4	-4.0	-36.0	-38.5
FI	3.5	3.5	3.4	3.2	3.2	3.1	3.0	-5.0	-9.1	-13.6
SE	6.0	6.1	6.1	6.2	6.2	6.3	6.2	0.9	1.8	2.7
UK	40.7	41.1	42.0	42.8	43.8	45.0	45.0	3.4	7.1	10.7
NO	3.1	3.2	3.3	3.4	3.4	3.5	3.5	5.5	5.6	11.4
EU27	333.2	335.0	331.9	321.9	307.8	294.4	283.3	-0.4	-14.6	-15.0
EA	212.6	214.0	214.4	207.6	197.4	190.1	185.0	0.8	-13.7	-13.0
EA12	210.4	211.7	212.1	205.4	195.2	188.0	183.0	0.8	-13.7	-13.0
EU15	260.7	262.4	263.8	257.9	248.6	242.9	237.7	1.2	-9.9	-8.8
EU10	52.3	52.4	49.2	46.3	43.3	37.8	33.6	-5.9	-31.8	-35.8
EU25	313.0	314.8	313.0	304.2	292.0	280.7	271.3	0.0	-13.3	-13.3

Source: Eurostat, EUROPOP2008.

Table 1. 11 - Projection of the elderly population aged 65 and over (in millions)

	Population aged 65+							% change		
	2008	2010	2020	2030	2040	2050	2060	2008-2020	2020-2060	2008-2060
BE	1.8	1.9	2.2	2.7	3.0	3.1	3.3	21.6	47.6	79.5
BG	1.3	1.3	1.5	1.6	1.7	1.9	1.9	10.5	28.3	41.8
CZ	1.5	1.6	2.1	2.4	2.7	3.1	3.2	40.8	48.9	109.7
DK	0.9	0.9	1.1	1.3	1.5	1.4	1.5	33.5	30.2	73.8
DE	16.5	16.9	18.6	22.1	24.2	23.6	23.0	12.7	23.7	39.4
EE	0.2	0.2	0.2	0.3	0.3	0.3	0.3	7.1	41.4	51.4
IE	0.5	0.5	0.7	0.9	1.2	1.6	1.7	45.6	137.1	245.3
GR	2.1	2.1	2.4	2.8	3.3	3.6	3.5	16.8	44.1	68.4
ES	7.5	7.8	9.3	11.7	14.7	17.1	16.8	23.6	80.7	123.2
FR	10.2	10.5	13.2	15.8	17.7	18.2	18.6	29.7	40.6	82.4
IT	12.0	12.2	13.9	16.2	19.1	20.0	19.4	16.6	39.5	62.5
CY	0.1	0.1	0.1	0.2	0.2	0.3	0.3	45.7	140.8	250.8
LV	0.4	0.4	0.4	0.5	0.5	0.5	0.6	1.9	44.8	47.6
LT	0.5	0.5	0.6	0.7	0.8	0.8	0.9	6.1	56.3	65.9
LU	0.1	0.1	0.1	0.1	0.1	0.2	0.2	30.8	93.2	152.7
HU	1.6	1.7	2.0	2.1	2.3	2.7	2.8	20.7	42.0	71.3
MT	0.1	0.1	0.1	0.1	0.1	0.1	0.1	52.9	51.2	131.2
NL	2.4	2.5	3.3	4.1	4.6	4.5	4.5	38.6	35.2	87.3
AT	1.4	1.5	1.7	2.1	2.5	2.6	2.6	18.0	55.1	83.0
PL	5.1	5.2	6.9	8.5	9.1	10.5	11.3	34.8	62.9	119.5
PT	1.8	1.9	2.2	2.6	3.1	3.4	3.5	20.6	55.9	87.9
RO	3.2	3.2	3.6	4.1	4.9	5.6	5.9	13.7	62.9	85.2
SI	0.3	0.3	0.4	0.5	0.6	0.6	0.6	29.2	41.5	82.8
SK	0.6	0.7	0.9	1.1	1.3	1.5	1.6	38.0	83.9	153.9
FI	0.9	0.9	1.2	1.4	1.4	1.5	1.5	40.8	21.9	71.7
SE	1.6	1.7	2.1	2.3	2.5	2.6	2.9	27.5	41.1	79.9
UK	9.9	10.2	12.0	14.2	16.2	17.1	19.0	21.7	57.9	92.2
NO	0.7	0.7	0.9	1.2	1.4	1.4	1.5	35.1	63.7	121.3
EU27	84.6	86.8	103.1	122.5	139.6	148.4	151.5	21.8	47.0	79.0
EA	57.7	59.3	69.6	83.4	95.9	100.4	99.7	20.7	43.1	72.8
EA12	57.2	58.8	69.0	82.6	95.0	99.3	98.6	20.6	42.9	72.4
EU15	69.5	71.5	84.2	100.5	115.2	120.5	121.9	21.1	44.8	75.4
EU10	10.6	10.8	13.8	16.4	17.9	20.5	21.7	30.4	58.0	106.1
EU25	80.1	82.3	98.0	116.8	133.1	141.0	143.7	22.3	46.7	79.4

Source: Eurostat, EUROPOP2008.

Table 1. 12 - Projection of the very old population aged 80 and over (in millions)

	Population aged 80+							% change		
	2008	2010	2020	2030	2040	2050	2060	2008-2020	2020-2060	2008-2060
BE	0.5	0.5	0.6	0.8	1.0	1.2	1.3	26.7	99.5	152.7
BG	0.3	0.3	0.3	0.4	0.5	0.6	0.7	20.4	114.4	158.3
CZ	0.3	0.4	0.4	0.7	0.9	0.9	1.3	23.8	194.9	265.1
DK	0.2	0.2	0.3	0.4	0.5	0.6	0.6	18.0	123.8	164.1
DE	3.9	4.2	5.8	6.4	8.0	10.4	9.3	48.5	61.6	140.0
EE	0.0	0.1	0.1	0.1	0.1	0.1	0.1	40.8	77.7	150.1
IE	0.1	0.1	0.2	0.3	0.4	0.5	0.6	38.4	282.4	429.5
GR	0.5	0.5	0.7	0.8	1.0	1.3	1.5	63.0	99.9	225.8
ES	2.1	2.2	2.8	3.4	4.4	6.0	7.5	33.0	171.4	261.1
FR	3.1	3.3	4.0	5.0	6.5	7.5	7.7	27.3	95.9	149.3
IT	3.3	3.5	4.5	5.3	6.2	8.0	8.9	37.3	96.9	170.4
CY	0.0	0.0	0.0	0.0	0.1	0.1	0.1	47.1	250.6	415.7
LV	0.1	0.1	0.1	0.1	0.2	0.2	0.2	38.9	78.1	147.4
LT	0.1	0.1	0.2	0.2	0.2	0.3	0.3	43.4	93.4	177.4
LU	0.0	0.0	0.0	0.0	0.0	0.1	0.1	40.6	175.2	287.0
HU	0.4	0.4	0.5	0.6	0.8	0.8	1.1	26.3	134.1	195.7
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.6	146.4	268.6
NL	0.6	0.6	0.8	1.2	1.5	1.9	1.8	29.5	126.7	193.5
AT	0.4	0.4	0.5	0.6	0.8	1.0	1.0	17.9	126.4	167.0
PL	1.1	1.3	1.7	2.1	3.3	3.3	4.1	45.2	146.0	257.1
PT	0.4	0.5	0.6	0.8	1.0	1.2	1.4	44.1	123.7	222.5
RO	0.6	0.6	0.9	1.0	1.4	1.7	2.2	47.2	152.6	271.9
SI	0.1	0.1	0.1	0.1	0.2	0.2	0.2	56.4	121.3	246.1
SK	0.1	0.1	0.2	0.3	0.4	0.5	0.6	25.7	241.4	329.1
FI	0.2	0.2	0.3	0.5	0.6	0.6	0.6	35.5	87.8	154.5
SE	0.5	0.5	0.5	0.8	0.9	1.0	1.1	8.5	105.1	122.5
UK	2.8	2.9	3.3	4.3	5.2	6.7	6.9	18.0	110.7	148.5
NO	0.2	0.2	0.2	0.3	0.4	0.5	0.6	4.2	164.1	175.3
EU27	21.8	23.3	29.3	36.0	46.1	56.6	61.4	34.2	109.5	181.1
EA	15.2	16.3	20.9	25.1	31.7	40.0	42.2	37.5	101.5	177.0
EA12	15.1	16.2	20.8	24.9	31.4	39.6	41.8	37.3	101.1	176.2
EU15	18.6	19.8	24.8	30.4	38.0	47.9	50.3	33.5	102.7	170.5
EU10	2.3	2.6	3.2	4.2	6.1	6.5	8.1	37.8	149.8	244.3
EU25	21.0	22.3	28.1	34.6	44.2	54.4	58.4	34.0	108.1	178.8

Source: Eurostat, EUROPOP2008.

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

	2008				2060			
	(0-14)	(15-64)	(65+)	(80+)	(0-14)	(15-64)	(65+)	(80+)
BE	17%	66%	17%	5%	16%	58%	27%	10%
BG	13%	69%	17%	4%	12%	54%	34%	13%
CZ	14%	71%	15%	3%	12%	54%	33%	13%
DK	18%	66%	16%	4%	16%	59%	25%	10%
DE	14%	66%	20%	5%	13%	55%	32%	13%
EE	15%	68%	17%	4%	14%	55%	31%	11%
IE	20%	68%	11%	3%	17%	58%	25%	10%
GR	14%	67%	19%	4%	13%	55%	32%	13%
ES	15%	69%	17%	5%	13%	55%	32%	14%
FR	18%	65%	17%	5%	17%	57%	26%	11%
IT	14%	66%	20%	5%	12%	55%	33%	15%
CY	18%	70%	12%	3%	15%	59%	26%	9%
LV	14%	69%	17%	4%	12%	53%	34%	12%
LT	15%	69%	16%	3%	12%	53%	35%	12%
LU	18%	68%	14%	3%	16%	60%	24%	9%
HU	15%	69%	16%	4%	13%	55%	32%	13%
MT	16%	70%	14%	3%	13%	55%	32%	12%
NL	18%	67%	15%	4%	15%	58%	27%	11%
AT	15%	68%	17%	5%	14%	57%	29%	11%
PL	15%	71%	13%	3%	11%	52%	36%	13%
PT	15%	67%	17%	4%	13%	56%	31%	13%
RO	15%	70%	15%	3%	11%	54%	35%	13%
SI	14%	70%	16%	4%	13%	54%	33%	14%
SK	16%	72%	12%	3%	11%	53%	36%	13%
FI	17%	67%	17%	4%	16%	56%	28%	11%
SE	17%	66%	18%	5%	16%	57%	27%	10%
UK	18%	66%	16%	5%	17%	59%	25%	9%
NO	19%	66%	15%	5%	17%	58%	25%	10%
EU27	16%	67%	17%	4%	14%	56%	30%	12%
EA	15%	67%	18%	5%	14%	56%	30%	13%
EA12	15%	67%	18%	5%	14%	56%	30%	13%
EU15	16%	66%	18%	5%	14%	57%	29%	12%
EU10	15%	71%	14%	3%	12%	53%	35%	13%
EU25	16%	67%	17%	4%	14%	56%	30%	12%

Source: Eurostat, EUROPOP2008.

As a result of these different trends among age-groups, the old-age dependency ratio (people aged 65 or above relative to the working-age population aged 15-64) is projected to increase from 25.4% to 53.5% in the EU over the projection period, see Table 1.14. The largest increase will occur during the period 2015 and 2035, when year-on-year increases of over 2 p.p. are projected. Hence, the dependency ratio is projected to more than double by 2060. This entails that the EU would move from having 4 working-age people for every person aged over 65 years to a ratio of 2 to 1. The increase in the total 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 by nearly 30 percentage points (see Table 1.16).

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

	Old-age dependency ratio							% change (p.p.)
	2008	2010	2020	2030	2040	2050	2060	2008-2020
BE	25.8	26.1	30.6	37.6	42.3	43.9	45.8	20.0
BG	25.0	25.3	31.1	36.3	43.6	55.4	63.5	38.6
CZ	20.6	21.8	31.1	35.7	42.7	54.8	61.4	40.8
DK	23.6	25.0	31.8	37.8	42.7	41.3	42.7	19.1
DE	30.3	31.2	35.3	46.2	54.7	56.4	59.1	28.8
EE	25.2	25.0	29.2	34.4	39.0	47.2	55.6	30.3
IE	16.3	16.7	20.2	24.6	30.6	40.4	43.6	27.3
GR	27.8	28.2	32.8	38.5	48.2	57.0	57.1	29.3
ES	24.1	24.4	27.4	34.3	46.4	58.7	59.1	34.9
FR	25.3	25.8	32.8	39.0	44.0	44.7	45.2	19.9
IT	30.5	31.0	35.5	42.4	54.1	59.2	59.3	28.9
CY	17.7	18.0	22.3	27.4	30.8	37.7	44.5	26.8
LV	25.0	25.2	28.1	34.6	40.7	51.2	64.5	39.4
LT	23.0	23.2	26.0	34.7	42.8	51.1	65.7	42.6
LU	20.9	21.1	24.2	30.8	36.3	37.8	39.1	18.2
HU	23.5	24.2	30.3	34.1	40.1	50.8	57.6	34.1
MT	19.8	21.2	31.2	39.1	41.7	49.8	59.1	39.3
NL	21.8	22.8	30.7	40.0	46.8	45.6	47.2	25.3
AT	25.4	26.0	29.2	38.1	46.0	48.3	50.6	25.2
PL	18.9	19.0	27.2	36.0	41.3	55.7	69.0	50.0
PT	25.9	26.6	30.7	36.6	44.6	53.0	54.8	28.8
RO	21.3	21.3	25.7	30.3	40.7	54.0	65.3	43.9
SI	23.0	23.9	31.2	40.8	49.4	59.4	62.2	39.2
SK	16.6	16.9	23.8	32.3	40.0	55.5	68.5	51.9
FI	24.8	25.7	36.8	43.9	45.1	46.6	49.3	24.5
SE	26.7	27.8	33.7	37.4	40.8	41.9	46.7	20.1
UK	24.3	24.7	28.6	33.2	36.9	38.0	42.1	17.9
NO	22.1	22.7	28.3	34.3	40.2	41.4	43.9	21.8
EU27	25.4	25.9	31.1	38.0	45.4	50.4	53.5	28.1
EA	27.1	27.7	32.5	40.2	48.6	52.8	53.9	26.7
EA12	27.2	27.8	32.5	40.2	48.7	52.8	53.9	26.7
EU15	26.7	27.3	31.9	39.0	46.3	49.6	51.3	24.6
EU10	20.2	20.5	28.0	35.3	41.3	54.1	64.8	44.6
EU25	25.6	26.1	31.3	38.4	45.6	50.2	53.0	27.4

Source: Eurostat, EUROPOP2008.

Table 1. 15 - Very old age dependency ratio (80+/(15-64))

	Very old-age dependency ratio							% change (p.p.)
	2008	2010	2020	2030	2040	2050	2060	2008-2060
BE	7.1	7.4	8.8	10.6	14.2	17.0	17.7	10.6
BG	5.1	5.5	7.0	9.5	13.0	17.0	23.8	18.7
CZ	4.7	5.1	6.3	10.3	13.6	16.5	24.6	19.9
DK	6.2	6.3	7.4	11.7	14.0	16.4	17.1	10.9
DE	7.2	7.7	11.0	13.4	18.1	24.9	24.0	16.9
EE	5.3	5.8	8.1	9.3	12.6	15.6	19.4	14.1
IE	4.0	4.1	4.8	6.6	9.0	12.4	16.6	12.5
GR	6.1	6.8	10.1	11.3	15.2	20.3	24.3	18.2
ES	6.7	7.0	8.2	9.9	13.9	20.6	26.5	19.8
FR	7.7	8.2	9.8	12.3	16.2	18.3	18.8	11.1
IT	8.3	8.9	11.4	13.8	17.5	23.8	27.0	18.7
CY	4.0	4.0	5.0	7.0	9.4	11.8	14.7	10.7
LV	5.2	5.7	7.9	9.2	12.7	17.1	22.3	17.1
LT	4.8	5.3	7.3	8.8	12.8	18.4	22.7	17.9
LU	5.2	5.5	6.4	7.9	11.0	14.1	14.8	9.6
HU	5.4	5.7	7.3	9.6	13.5	15.8	22.8	17.4
MT	4.5	4.8	7.0	11.4	15.1	16.9	21.5	17.0
NL	5.6	5.8	7.3	11.5	15.6	19.0	18.8	13.3
AT	6.8	7.0	7.8	10.8	14.2	19.6	19.8	13.0
PL	4.2	4.6	6.5	8.9	15.0	17.7	24.9	20.7
PT	6.3	6.7	8.9	10.7	14.0	18.4	22.7	16.4
RO	4.0	4.3	6.2	7.4	11.9	16.5	24.4	20.5
SI	5.0	5.6	8.3	10.8	16.8	21.9	25.8	20.7
SK	3.6	3.8	4.7	7.2	12.3	16.4	25.0	21.4
FI	6.5	7.0	9.3	14.1	17.4	18.7	19.1	12.6
SE	8.1	8.1	8.8	12.7	14.1	16.2	17.6	9.5
UK	6.8	6.9	7.8	10.1	11.9	14.8	15.3	8.5
NO	7.0	6.9	6.9	10.2	13.2	15.8	17.2	10.3
EU27	6.5	6.9	8.8	11.2	15.0	19.2	21.7	15.1
EA	7.2	7.6	9.8	12.1	16.1	21.0	22.8	15.6
EA12	7.2	7.6	9.8	12.1	16.1	21.1	22.8	15.6
EU15	7.1	7.5	9.4	11.8	15.3	19.7	21.2	14.0
EU10	4.5	4.9	6.6	9.1	14.2	17.1	24.1	19.6
EU25	6.7	7.1	9.0	11.4	15.1	19.4	21.5	14.8

Source: Eurostat, EUROPOP2008.

Table 1.16 - Total age dependency ratio (0-14 plus 65+/(15-64))								
	Total dependency ratio							% change
	2008	2010	2020	2030	2040	2050	2060	2008-2060
BE	51.4	51.5	56.9	64.3	68.9	70.7	72.9	21.5
BG	44.3	44.8	52.9	55.9	63.2	77.3	85.8	41.4
CZ	40.7	41.8	53.6	55.6	62.3	77.1	84.0	43.3
DK	51.6	52.6	58.4	65.8	71.9	68.8	70.4	18.8
DE	51.0	51.5	54.8	67.4	76.2	78.0	81.9	30.9
EE	47.0	47.2	55.5	58.3	61.1	72.1	80.8	33.8
IE	46.1	47.1	52.3	53.7	58.1	70.2	72.9	26.8
GR	49.1	49.7	55.0	59.1	69.9	80.7	80.5	31.4
ES	45.4	46.4	50.8	55.0	67.7	82.8	82.7	37.3
FR	53.4	54.2	62.3	68.2	73.6	74.4	74.3	20.8
IT	51.7	52.3	56.4	62.3	75.5	81.6	81.4	29.6
CY	42.7	42.3	48.1	52.9	54.0	62.1	69.9	27.2
LV	44.9	45.0	51.2	55.8	60.1	73.0	87.5	42.6
LT	45.3	44.5	47.8	56.8	62.5	72.2	89.1	43.8
LU	47.8	47.6	49.6	57.4	63.6	64.5	65.9	18.1
HU	45.3	45.8	53.0	55.1	60.7	73.2	80.5	35.2
MT	43.1	43.6	53.7	61.7	62.4	71.3	82.1	39.1
NL	48.4	48.9	55.0	66.0	73.9	71.2	73.1	24.7
AT	48.1	48.1	50.8	60.8	69.0	71.5	74.7	26.6
PL	40.7	39.9	49.2	56.5	59.5	76.1	90.6	49.9
PT	48.7	49.5	52.7	57.5	66.2	75.8	77.5	28.7
RO	43.1	42.9	47.3	49.7	59.7	74.6	86.7	43.6
SI	42.8	43.8	52.9	61.5	69.9	82.7	86.0	43.2
SK	38.4	37.9	45.0	51.8	57.8	75.3	89.6	51.2
FI	50.1	50.7	64.0	72.0	71.9	73.9	77.2	27.1
SE	52.2	53.1	61.9	66.2	68.1	69.5	75.6	23.4
UK	50.7	50.9	56.3	61.7	64.5	65.4	70.3	19.7
NO	51.0	51.3	56.5	63.3	69.4	69.8	72.8	21.8
EU27	48.7	49.1	54.8	61.5	68.9	75.0	78.5	29.9
EA	50.3	50.9	55.8	63.3	72.4	77.5	78.7	28.4
EA12	50.3	51.0	55.9	63.4	72.5	77.5	78.7	28.3
EU15	50.5	51.0	56.1	63.2	71.0	74.9	76.9	26.4
EU10	41.7	41.5	50.2	56.0	60.3	75.3	87.1	45.4
EU25	49.0	49.4	55.2	62.1	69.4	75.0	78.2	29.2

Source: Eurostat, EUROPOP2008.

1.6. Population ageing in the EU in a global context

This section reviews the demographic prospects for the EU in comparison with other parts of the world. In particular, it looks at the 2006 UN population projection[13], and contrasts the projected population developments in the EU with other parts of the world.

The share of the population of what is the EU today halved from 14.7% of the world population in 1950 to 7.9% in 2000, and it is projected to drop close to 5% in 2050, despite net migration flows projected. The share of populations of Japan and the US was also declining over the last five decades. These declining trends over the period 1950 to 2000, was in contrast with opposing trends in Africa, Asia or Latin America, where the share of the population was rising.

[13] The United Nations Population Division produces global population projections revised every two years. The latest projections are the 2006 Revision.

Over the period 2000 to 2050, the share of the population in Asia is projected to account for close to 60% of the world population, however it will grow more slowly than the world population and its share is projected to fall by 3 p.p. This is particularly true for China, where the share of the population is projected to fall by 5p.p. The population in Africa is projected to increase much faster than during the period until 2050, exceeding 20% of the world population in 2050. The other regions of the world will roughly keep their share in the (growing) world population.[14]

Table 1.17 - Population as a percentage of world population based on the 2006 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	14.9	16.6	18.3	20.0	21.7	4.6	8.3
Asia	55.6	56.2	57.8	59.2	60.1	60.5	60.3	59.9	59.3	58.3	57.3	4.9	-3.2
China	21.9	21.7	22.5	22.4	21.7	20.7	19.6	18.5	17.5	16.4	15.3	-1.1	-5.4
India	14.7	14.7	14.9	15.5	16.2	17.1	17.7	18.0	18.1	18.1	18.0	2.4	1.0
Japan	3.3	3.1	2.8	2.6	2.3	2.1	1.8	1.6	1.4	1.3	1.1	-1.2	-1.0
Russian Federation	4.1	4.0	3.5	3.1	2.8	2.4	2.0	1.7	1.5	1.3	1.2	-1.6	-1.2
Europe	21.6	20.0	17.8	15.6	13.6	11.9	10.6	9.4	8.5	7.8	7.2	-9.7	-4.7
EU27	14.7	13.3	11.8	10.3	8.9	7.9	7.2	6.5	6.0	5.5	5.2	-6.9	-2.7
EA	9.3	8.4	7.4	6.5	5.6	5.0	4.6	4.2	3.9	3.6	3.4	-4.3	-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	-0.2
Northern America	6.8	6.7	6.3	5.7	5.4	5.2	5.0	4.9	4.9	4.8	4.8	-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	0.5	0.0	0.0

Source: UN World Population Prospects: The 2006 Revision.

Table 1. 18 shows the old-age dependency ratio in the world (people aged 65 and above over the working-age population). The UN projects an old-age dependency ratio of 51 in the EU27 in 2050 (compared with 50.4 according to EUROPOP2008), which is much larger than in the rest of the world with the exception of Japan, where it is projected to reach 74. The EU of today had the highest old-age dependency ratio already in 1950 (and higher still in the euro area), similar to those of the US, but its increase has been faster over the period 1950 to 2000, rising by 10 percentage points. Sharper increases in the old-age dependency ratio are projected during the period 2000 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 and the EU27 (by almost 30 p.p.).

Table 1. 18 - Old-age dependency ratio based on the 2006 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	11.7	14.3	18.0	22.1	25.4	2.4	14.5
Africa	5.9	5.9	6.2	6.1	6.0	6.1	6.2	6.7	7.5	8.5	10.6	0.1	4.6
Asia	6.8	7.2	7.1	7.4	7.7	9.1	10.2	13.2	17.4	22.9	27.2	2.3	18.1
China	7.2	8.6	7.7	7.9	8.1	10.0	11.6	17.1	24.4	35.7	38.8	2.8	28.8
India	5.3	5.3	5.8	6.3	6.8	7.6	8.3	10.1	12.9	16.4	21.5	2.3	13.9
Japan	8.3	9.0	10.3	13.4	17.2	25.3	35.1	47.3	52.3	64.7	73.8	17.0	48.6
Russian Federation	9.5	9.9	11.7	15.0	14.8	17.7	17.3	21.4	28.2	30.8	38.9	8.1	21.2
Europe	12.5	13.7	16.3	18.9	19.0	21.8	23.7	28.7	35.9	42.1	47.7	9.2	25.9
EU27	13.4	15.2	18.2	20.6	20.8	23.4	26.0	31.4	38.7	46.3	50.6	10.0	27.1
EA	13.9	15.9	19.0	21.0	21.2	24.5	27.9	32.9	41.2	49.8	52.9	10.6	28.4
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	19.1	24.8	31.7	33.8	35.0	5.9	16.4
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	16.9	21.3	26.3	29.6	31.2	3.6	15.9

Source: UN World Population Prospects: The 2006 Revision.

[14] The UN projects an increase in the world population from 6.1 billions in 2000 to 9.1 billions in 2050.

Table 1. 19 - Very old-age dependency ratio based on the 2006 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	2.4	2.9	3.6	5.1	6.8	0.9	5.0
Africa	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.9	1.0	1.3	1.7	0.2	1.0
Asia	0.6	0.7	0.8	0.8	0.9	1.3	1.8	2.4	3.1	4.8	7.0	0.7	5.7
China	0.5	0.6	0.9	0.7	0.9	1.3	2.0	2.9	4.3	7.4	12.0	0.9	10.7
India	0.6	0.6	0.6	0.6	0.7	1.0	1.3	1.7	2.1	3.2	4.6	0.4	3.7
Japan	0.8	1.1	1.3	2.0	3.4	5.6	9.8	15.2	21.8	25.7	30.3	4.8	24.7
Russian Federation	1.5	1.6	1.8	2.0	2.7	2.7	3.9	4.9	5.0	8.2	9.4	1.2	6.8
Europe	1.7	2.1	2.5	3.1	4.1	4.3	6.1	7.7	9.5	13.0	16.6	2.6	12.3
EU27	1.7	2.2	2.8	3.6	4.7	5.0	7.1	8.8	11.1	14.8	18.9	3.3	13.9
EA	1.8	2.3	3.0	3.8	5.1	5.4	7.8	9.8	12.2	16.2	21.0	3.6	15.6
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	5.5	5.8	8.2	11.4	12.8	3.0	7.9
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	4.5	5.1	7.1	9.4	11.0	1.9	7.6

Source: UN World Population Prospects: The 2006 Revision.

1.7. Comparison with the demographic projection used in the 2006 Ageing Report

This section provides a comparison of the main features of the EUROPOP2008 projection with the projection used in the 2006 Ageing Report.[15]

In the EU, there is a larger population in 2008 compared with the projection used in 2006 Ageing Report (see Table 1. 20). By 2050, the population is projected to be about 37 million larger. The higher population in 2050 is concentrated to the working-age population (15-64), but both more young persons and older persons are projected (see Table 1. 21- Table 1. 23).

As a result of recent observed increases in net migration inflows to the EU, especially in some Member States (ES, IT, UK), net migration flows in the EU are projected to be significantly higher in EUROPOP2008. Though, for some Member States (DE, NL, EE, LT, LV, MT, PL, and SI) net migration flows are projected to be lower compared to the 2006 projection. Overall, net migration inflow into the EU is projected to be about 785 thousand higher in 2010 compared with the previous projection, and gradually be reduced to about 90 thousands in 2050 (see Table 1. 25). Overall, EU net inward migration is projected to be 12.6 million higher and therefore constitutes about a third of the higher total population projected in EUROPOP2008 by 2050.

As a result, the increase in old-age dependency ratio (persons aged 65 and over in relation to persons aged 15-64) is lower in the EUROPOP2008 projection compared with the projection used in the 2006 Ageing Report in the EU25, rising less; by 24.6 percentage points between 2008 and 2050 according to EUROPOP2008 (by 25.8 percentage points in the previous projection over the same period), see Table 1. 24. Due to diverging changes of assumptions, the projected increase in the old-age dependency ratio is significantly lower in UK, ES, PT, CY, IE, AT, EL, BE and IT and significantly higher in MT, LV, LT, SK, PL, NL, DE, SI, EE (in the order of the magnitude).

[15] In the 2006 Ageing Report, an 'AWG variant' was used, building on and expanding the EUROPOPO2004 projection.

Table 1. 20 - Total population compared (EUROPOP2008 - 2006 Ageing Report) ('000)

	2008	2010	2020	2030	2040	2050	Diff in 2050 as % of total population 2005 AWG variant
BE	152	230	536	774	1036	1345	12.4
BG	:	:	:	:	:	:	:
CZ	192	272	642	727	838	998	11.2
DK	29	46	126	207	300	402	7.3
DE	-766	-967	-2028	-2511	-2891	-3250	-4.2
EE	11	19	63	65	58	56	4.9
IE	190	291	647	813	903	1056	19.3
GR	16	37	118	227	443	711	6.6
ES	1076	2060	5504	7236	8575	10252	23.9
FR	895	1109	2118	3043	4249	5897	9.1
IT	1214	1554	3026	4371	5916	7478	13.9
CY	29	37	89	151	215	276	28.3
LV	4	8	36	10	-29	-69	-3.7
LT	-14	-8	38	-9	-83	-144	-5.0
LU	13	17	30	39	48	54	8.4
HU	17	42	200	167	128	146	1.6
MT	-5	-9	-27	-48	-71	-93	-18.4
NL	-138	-171	-331	-439	-542	-718	-4.1
AT	123	149	286	480	718	957	11.7
PL	158	262	895	433	-154	-390	-1.2
PT	-21	35	329	639	997	1397	13.9
RO	:	:	:	:	:	:	:
SI	14	19	41	17	-7	-23	-1.2
SK	39	61	162	146	114	122	2.6
FI	30	43	96	126	169	230	4.4
SE	66	119	284	374	428	490	4.8
UK	752	1059	2754	4856	7332	10296	16.0
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	2822	4436	10432	14918	19756	25569	8.2
EA12	2784	4388	10329	14798	19619	25409	8.2
EU15	3632	5612	13492	20235	27680	36598	9.4
EU10	446	702	2138	1660	1009	878	1.3
EU25	4077	6314	15630	21895	28689	37475	8.3

Source: Eurostat, 2006 Ageing Report.

Table 1. 21 - Working-age (15-64) population compared (EUROPOP2008 - 2006 Ageing Report) ('000)

	2008	2010	2020	2030	2040	2050	Diff in 2050 as % of population 2005 AWG variant
BE	85	136	338	572	744	858	13.7
BG	:	:	:	:	:	:	:
CZ	112	150	384	538	562	562	11.2
DK	17	23	39	96	163	221	6.7
DE	-595	-716	-1382	-2088	-2741	-3118	-6.9
EE	3	7	33	36	24	16	2.4
IE	159	229	435	542	655	672	21.2
GR	-6	-2	39	163	316	458	7.8
ES	909	1576	3792	4985	5802	6183	27.0
FR	559	624	900	1687	2518	3296	8.8
IT	889	1103	2008	2980	3870	4385	14.9
CY	25	28	61	113	152	182	30.8
LV	3	7	37	17	-30	-65	-5.9
LT	-2	2	30	-10	-72	-127	-7.4
LU	10	12	22	29	32	30	7.6
HU	12	21	143	193	142	50	1.0
MT	-4	-6	-16	-31	-50	-67	-21.6
NL	-108	-129	-267	-417	-525	-697	-6.6
AT	92	112	217	357	502	623	13.3
PL	29	62	493	503	25	-498	-2.6
PT	4	51	315	540	796	998	18.1
RO	:	:	:	:	:	:	:
SI	6	4	13	8	-17	-37	-3.5
SK	24	34	87	107	78	31	1.1
FI	11	16	43	77	102	119	3.9
SE	44	80	182	243	279	248	4.1
UK	482	663	1606	3323	5470	7284	19.3
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	2038	3040	6519	9518	12156	13885	7.9
EA12	2011	3013	6461	9428	12071	13807	7.9
EU15	2553	3779	8289	13091	17983	21560	9.7
EU10	208	309	1267	1474	815	45	0.1
EU25	2762	4088	9555	14565	18798	21605	8.3

Source: Eurostat, 2006 Ageing Report.

Table 1. 22 - Population aged 0-14 compared (EUROPOP2008-2006 Ageing Report) ('000)

	2008	2010	2020	2030	2040	2050	Diff in 2050 as % of population 2005 AWG variant
BE	57	82	201	219	262	317	19.8
BG	:	:	:	:	:	:	:
CZ	60	93	184	82	98	130	11.6
DK	5	13	61	70	88	109	12.9
DE	-183	-277	-724	-572	-409	-485	-5.1
EE	5	7	17	9	8	5	3.0
IE	21	48	196	259	223	266	30.3
GR	12	24	61	75	133	193	14.8
ES	109	370	1379	1657	1676	2019	40.4
FR	207	328	1021	1169	1340	1756	17.0
IT	187	265	641	810	1047	1364	22.1
CY	4	10	33	38	48	59	45.4
LV	1	0	-13	-28	-29	-49	-17.8
LT	-5	-6	-1	-21	-47	-59	-15.0
LU	2	3	5	4	6	6	5.8
HU	8	24	68	-27	-62	-58	-4.7
MT	-2	-4	-9	-14	-18	-22	-29.5
NL	-59	-83	-154	-155	-183	-231	-8.4
AT	15	26	67	118	181	226	22.4
PL	77	127	234	-321	-539	-533	-12.2
PT	-34	-35	-19	70	122	178	13.6
RO	:	:	:	:	:	:	:
SI	5	9	19	1	-1	-4	-1.6
SK	12	20	43	-17	-53	-58	-9.5
FI	8	13	44	50	50	59	7.4
SE	13	26	81	98	73	76	4.6
UK	240	384	1394	2043	2412	2916	30.9
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	349	780	2762	3728	4477	5701	13.8
EA12	342	765	2720	3704	4449	5667	13.9
EU15	600	1187	4257	5914	7021	8769	16.6
EU10	166	281	575	-298	-596	-589	-6.8
EU25	766	1469	4831	5616	6426	8180	13.3

Source: Eurostat, 2006 Ageing Report.

Table 1. 23 - Population aged 65 and over compared (EUROPOP2008 - 2006 Ageing Report) ('000)

	2008	2010	2020	2030	2040	2050	Diff in 2050 as % of population 2005 AWG variant
BE	10	11	-3	-17	30	170	5.7
BG	:	:	:	:	:	:	:
CZ	19	29	73	107	179	307	11.2
DK	7	10	26	41	48	72	5.2
DE	12	25	77	149	259	353	1.5
EE	3	5	13	20	26	35	12.0
IE	9	14	16	12	25	118	8.3
GR	11	15	17	-10	-5	60	1.7
ES	57	114	333	594	1096	2049	13.6
FR	129	157	196	187	391	845	4.9
IT	138	187	376	581	998	1729	9.5
CY	0	-1	-5	-1	15	36	14.0
LV	0	1	11	21	29	45	9.3
LT	-7	-4	8	22	36	42	5.5
LU	1	1	3	6	10	18	12.6
HU	-4	-4	-11	1	48	154	6.1
MT	2	1	-1	-3	-3	-5	-4.0
NL	29	41	90	133	166	209	4.9
AT	16	12	1	4	35	108	4.4
PL	52	73	167	251	360	641	6.5
PT	9	19	34	29	79	222	6.9
RO	:	:	:	:	:	:	:
SI	2	6	10	9	11	18	3.1
SK	4	7	32	56	90	149	10.7
FI	11	14	9	-1	17	53	3.8
SE	9	14	20	33	77	166	6.7
UK	31	12	-247	-510	-550	96	0.6
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	436	615	1151	1672	3122	5983	6.3
EA12	432	610	1148	1667	3099	5934	6.4
EU15	479	645	947	1230	2675	6268	5.5
EU10	71	112	296	484	790	1422	7.5
EU25	550	757	1243	1714	3465	7690	5.8

Source: Eurostat, 2006 Ageing Report.

Table 1. 24 - Old-age dependency ratio (persons aged 65 and over in relations to persons aged 15-64) compared (EUROPOP2008 - 2006 Ageing Report) (percentage points)

	2008	2010	2020	2030	2040	2050	2008-2050
BE	-0.2	-0.3	-1.6	-3.5	-4.5	-3.3	-3.1
BG	:	:	:	:	:	:	:
CZ	-0.1	-0.1	-0.7	-1.4	-1.1	0.0	0.0
DK	0.1	0.1	0.4	0.1	-0.7	-0.6	-0.7
DE	0.3	0.5	1.0	2.2	3.7	4.7	4.3
EE	0.3	0.4	0.4	1.0	2.3	4.1	3.7
IE	-0.6	-0.8	-2.3	-3.7	-5.4	-4.8	-4.2
GR	0.2	0.2	0.1	-1.0	-2.4	-3.4	-3.6
ES	-0.5	-0.9	-2.3	-3.9	-6.1	-6.9	-6.4
FR	0.0	0.0	-0.3	-1.2	-1.9	-1.7	-1.6
IT	-0.3	-0.4	-0.9	-1.9	-3.5	-3.0	-2.6
CY	-0.8	-1.1	-3.2	-5.4	-5.3	-5.5	-4.7
LV	-0.1	-0.1	0.0	1.2	3.4	7.1	7.2
LT	-0.3	-0.2	0.0	1.3	3.6	6.3	6.5
LU	-0.5	-0.5	-0.5	-0.8	-0.4	1.7	2.2
HU	-0.1	-0.1	-0.9	-1.1	-0.2	2.5	2.6
MT	0.8	0.8	1.3	3.2	5.9	9.1	8.3
NL	0.5	0.6	1.5	2.8	3.9	5.0	4.5
AT	-0.1	-0.3	-1.1	-2.5	-4.0	-4.1	-4.0
PL	0.2	0.2	0.1	0.3	1.6	4.7	4.6
PT	0.1	0.1	-0.9	-2.5	-4.5	-5.6	-5.7
RO	:	:	:	:	:	:	:
SI	0.0	0.3	0.4	0.4	1.7	3.8	3.8
SK	0.0	0.0	0.3	0.6	1.9	4.8	4.8
FI	0.2	0.3	-0.2	-1.1	-0.9	-0.1	-0.3
SE	0.0	-0.1	-0.7	-1.0	-0.6	1.0	1.1
UK	-0.2	-0.4	-1.7	-4.1	-6.7	-7.1	-6.9
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	:	:	:	:	:	:	:
EA12	:	:	:	:	:	:	:
EU15	-0.1	-0.1	-0.7	-1.6	-2.5	-2.0	-1.9
EU10	:	:	:	:	:	:	:
EU25	-0.1	-0.1	-0.6	-1.3	-1.9	-1.2	-1.2

Source: Eurostat, 2006 Ageing Report.

Table 1. 25 - Net migration flows compared (EUROPOP2008 - 2006 Ageing Report) ('000)

	Net migration ('000)						Diff. in cum. Net migr. (2008-2050) in % of total pop. In 2050 in EUROPOP2008
	2010	2020	2030	2040	2050	2008-2050	
BE	28	17	13	9	7	626	5.1
BG	:	:	:	:	:	:	:
CZ	23	15	1	6	2	426	4.3
DK	3	1	2	0	-1	37	0.6
DE	-56	-21	6	-48	-43	-2299	-3.1
EE	2	0	-2	-2	-1	-23	-2.0
IE	38	8	-4	-7	-5	208	3.2
GR	0	-1	2	2	-4	15	0.1
ES	428	153	55	46	34	5680	10.7
FR	36	32	28	18	11	1144	1.6
IT	138	123	135	116	80	3708	6.1
CY	3	4	3	2	2	127	10.1
LV	2	0	-4	-3	-2	-46	-2.6
LT	4	1	-5	-5	-3	-63	-2.3
LU	1	1	1	1	0	39	5.6
HU	6	9	-4	2	-2	109	1.2
MT	-1	-1	-2	-2	-2	-61	-14.8
NL	-25	-22	-18	-25	-24	-950	-5.6
AT	9	10	12	6	4	379	4.1
PL	20	25	-37	-18	-7	-50	-0.1
PT	33	32	31	30	24	1311	11.4
RO	:	:	:	:	:	:	:
SI	-1	-1	-4	-4	-4	-96	-5.1
SK	6	4	-1	1	1	90	1.8
FI	4	2	0	-1	-1	24	0.4
SE	18	4	-2	-4	-5	79	0.7
UK	68	63	52	39	28	2208	3.0
NO	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:
EA	634	336	259	144	79	9855	2.9
EA12	634	334	261	147	82	9885	3.0
EU15	722	402	313	182	104	12209	2.9
EU10	63	56	-54	-21	-16	412	0.6
EU25	785	458	260	161	88	12622	2.6

Source: Eurostat, 2006 Ageing Report.

Annex 1.1: The EUROPOP2008 projection: key assumptions

Population projections

Population projections are what-if scenarios that aim to provide information about a likely future size and structure of the population. A projection is thus a conditional statement, an "if…then" declaration, whose numerical outcome is the result of an accepted set of assumptions (scenario).

Once developed the quantitative assumptions, for the calculation of the population projections the disaggregated base population is advanced each year of the projections period by using the respective – projected – age specific fertility rates, age specific mortality rates, immigration and emigration by sex and single year of age (cohort-component method).

Methodological framework: the Convergence scenario

Eurostat's Convergence scenario is one of several possible population change scenarios, with related assumptions for fertility, mortality and migration. The EUROPOP2008 Convergence scenario starts from the population on 1 January 2008 and it is based on the main assumption that the socio-economic and cultural differences between Member States of the European Union would fade away in the very long run. The convergence year has been assumed to be 2150 and agreed theoretical values have been set for the three demographic components (fertility, mortality and migration) for that year. The values for the intermediate years (2008-2060) were obtained by interpolating the latest country specific observed values and those in the convergence year for fertility, mortality and migration respectively. Convergent trajectories are thus ensured among countries for any intermediate year up to the target year 2060.

Fertility

In the convergence year 2150, fertility is assumed to converge to levels achieved by Member States that are considered as forerunners in the demographic process. The age specific fertility rates for the convergence year for the total fertility rate of 1.85 and the mean age at childbearing 30.3 years-old have been modelled using the model proposed by Schmertmann (2003) and the software he has made available (Schmertmann, 2005). This model describes the shape of the age fertility rates using only three parameters: the youngest age α at which fertility rises above zero, the age P at which fertility reaches its peak level and the youngest age H above P at which fertility falls to half of its peak level. The age specific fertility rates for the intermediate years were obtained by linear interpolation between the latest ASFR and those for the convergence year as from Schmertmann's model.

Life expectancy

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 the convergence year 2150 (e°(M): 92.9 years and e°(F): 96.3 years), the values for the age specific mortality rates for males and females were obtained using the model proposed by Booth *et al.* (2002), which is a variant of the Lee-Carter model. The model was applied on the aggregated data on deaths and exposure at risk population for twelve countries (BE, DK, DE, ES, FX, IT, NL, AT, PT, FI, SE and UK), for males and females respectively, fitted over the

period 1977-2005. The age specific mortality rates for the intermediate years were obtained by exponential interpolation between the smoothed latest available country specific mortality rates and those from the model in 2150.

Migration

Migration is assumed to converge to zero net migration in 2150. Additionally, migration in each country has been proportionally adjusted upwards if the working age population, after taking into account the converging migration, presented a deficit for the respective projection years.

The starting points for the immigration and emigration have been estimated from the available data of the latest years 2000-2006, without taking into account the lowest and highest values for the specific period. Data by single year of age have been obtained from available 5-year age groups using Sprague multipliers (Siegel and Swanson, 2004) and subsequently using the Rogers-Castro model (Rogers and Castro, 1981). The latter was used in order to remove random fluctuations and imperfections of the data.

2. LABOUR FORCE PROJECTIONS

2.1. Labour force projections in the long-term projection exercise

2.1.1. The approach used in the 2006 budgetary projections of the EPC

The EPC based its 2006 labour force projection on the cohort component methodology.[16] The methodology follows a dynamic approach.[17] Participation rates were projected for males and females by single year of age, taking into account the replacement of older cohorts by more recent ones. The labour force projection shows the outcome for the labour force of extrapolating recent trends in rates of entry and exit from the labour market. This baseline projection reflects the working assumption of "no policy change" and is neither a forecast nor a prediction in that it is not based on any assessment of more or less likely future changes in working patterns or economic conditions.

2.1.2. Past trends and main determinants of labour market performance

The rationale for choosing a cohort-component methodology is to reflect the substantial changes in the labour market situation amongst different age and gender groups over the past years and decades. In recent years, labour force participation has undergone substantial changes, especially for the young, women and the elderly. A variety of factors underlies these changes, in particular the following:

- social factors, such as longer schooling or change in the role of women in households;
- demographic factors, including the decline of fertility rates and modifications of the age structure;
- institutional factors, in particular early retirement schemes or changes in the age of retirement; and/or
- economic factors, such as the rate of unemployment, the average household income, the share of part-time employment or the share of the services sector in the economy.

Even if each country has its own evolution of the labour force (see Table 2. 1 to Table 2. 4), some common stylised facts warrant attention and need to be catered for in any projection exercise.[18] They can be summarised as follows:

- the participation rates of prime-age male workers (aged 25 to 54 years), at around 90%, remain the highest of all groups. In contrast, the participation rates of men aged 55 to 64 years have recorded a steady decline in the past decades, but there are signs of reversal in many countries since the turn of the century;

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16 The methodology was initially developed by the OECD, see Scherer (2002), Burniaux et al. (2003) and OECD (2003). The baseline scenario incorporates the projected evolution of a number of control variables (unemployment, fertility) and the projected impact of recent pension reforms, including measures to be phased in gradually. For another application of the same cohort method, see also Australian Productivity Commission (2005).

17 See Carone (2005), European Commission (2004) and European Commission (2005).

18 The figures reported in Table 2. 1 to Table 2. 4 are taken from Eurostat's Labour force survey database and reflect the annual average participation rates.

- female participation rates have steadily increased over the past 25 years;

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

- looking forward, the population of working-age is projected to decline substantially in coming decades, as large cohorts of people enter retirement and are replaced by smaller cohorts of young workers. The increasing share of older workers in the labour force could put downward pressure on the overall participation rate.

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

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

	Total					Males					Females				
Country	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006
BE	59.6	58.7	62.1	65.1	66.5	74.2	71.3	72.3	73.7	73.4	45.1	46.1	51.7	56.4	59.5
BG	:	:	:	60.7	64.5	:	:	:	66.2	68.8	:	:	:	55.6	60.2
CZ	:	:	:	71.3	70.3	:	:	:	79.1	78.3	:	:	:	63.6	62.3
DK	80.3	82.4	79.5	80.0	80.6	86.0	87.1	85.6	84.2	84.1	74.6	77.6	73.3	75.6	77.0
DE	66.2	69.9	70.5	71.0	75.3	81.1	82.1	79.6	78.8	81.3	51.7	57.6	61.3	63.0	69.3
EE	:	:	:	70.2	72.4	:	:	:	75.6	75.8	:	:	:	65.3	69.3
IE	60.9	60.7	61.6	68.2	71.8	82.2	78.8	76.1	79.9	81.5	39.1	41.9	47.1	56.3	61.9
GR	60.0	59.1	60.1	63.8	67.0	80.6	76.8	77.2	77.4	79.1	41.1	42.6	44.2	50.5	55.0
ES	:	58.7	60.6	65.4	70.8	:	77.5	75.5	78.8	81.3	:	40.6	45.8	52.0	60.2
FR	67.6	67.1	67.6	68.8	70.0	78.9	76.5	74.9	75.2	75.1	56.7	58.0	60.6	62.5	65.0
IT	58.8	59.8	57.6	60.1	62.7	78.6	77.0	73.2	74.1	74.6	39.7	43.2	42.4	46.3	50.8
CY	:	:	:	68.9	73.0	:	:	:	81.3	82.7	:	:	:	57.3	63.8
LV	:	:	:	67.0	71.3	:	:	:	72.3	76.2	:	:	:	62.1	66.7
LT	:	:	:	70.5	67.4	:	:	:	74.3	70.5	:	:	:	67.1	64.6
LU	60.4	60.2	60.4	64.2	66.7	79.0	77.6	75.7	76.4	75.3	42.1	42.3	43.7	51.7	58.2
HU	:	:	:	60.1	62.0	:	:	:	67.9	68.7	:	:	:	52.7	55.5
MT	:	:	:	58.2	59.2	:	:	:	80.3	79.7	:	:	:	35.8	38.3
NL	58.4	66.2	69.2	75.2	77.4	75.4	79.7	79.9	84.1	83.9	41.1	52.4	58.3	66.0	70.7
AT	:	:	71.5	71.0	73.7	:	:	80.8	80.1	80.5	:	:	62.3	62.0	67.0
PL	:	:	:	65.8	63.4	:	:	:	71.7	70.1	:	:	:	59.9	56.8
PT	:	68.8	67.4	71.4	73.9	:	81.4	76.4	79.2	79.5	:	57.1	59.1	63.9	68.4
RO	:	:	:	68.4	63.6	:	:	:	75.0	70.7	:	:	:	61.9	56.6
SI	:	:	:	67.5	70.9	:	:	:	71.9	74.9	:	:	:	62.9	66.7
SK	:	:	:	69.9	68.6	:	:	:	76.8	76.4	:	:	:	63.2	60.9
FI	:	:	72.1	74.5	75.2	:	:	74.8	77.2	77.1	:	:	69.4	71.9	73.3
SE	:	:	77.8	75.3	78.8	:	:	79.6	77.2	81.2	:	:	75.8	73.4	76.3
UK	73.6	76.5	74.7	75.4	75.5	86.2	86.8	83.3	82.8	82.1	61.0	66.1	66.0	68.2	69.2
NO	:	:	:	80.2	78.0	:	:	:	84.2	81.3	:	:	:	76.1	74.7
EU27	:	:	:	68.5	70.3	:	:	:	77.1	77.6	:	:	:	60.1	63.0
EA	:	:	65.5	67.6	70.7	:	:	76.4	77.2	78.5	:	:	54.6	58.0	62.8
EA12	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU15	:	:	67.2	69.0	71.7	:	:	77.7	78.2	79.2	:	:	56.8	59.9	64.3
EU10	:	:	:	66.6	65.2	:	:	:	73.0	72.2	:	:	:	60.4	58.5
EU25	:	:	:	68.6	70.7	:	:	:	77.3	78.0	:	:	:	60.0	63.4

Source: Commission services.

Table 2. 2 - Historical participation rates: young workers ages 15 to 24

	Total					Males					Females				
Country	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006
BE	42.3	35.5	33.9	35.3	34.7	43.1	37.1	36.0	38.7	37.4	41.4	34.2	31.7	31.8	31.9
BG	:	:	:	30.7	28.9	:	:	:	35.9	31.3	:	:	:	26.3	26.4
CZ	:	:	:	44.4	33.5	:	:	:	48.3	37.7	:	:	:	40.6	29.2
DK	75.6	73.5	73.2	70.7	69.9	78.7	76.4	77.1	73.4	70.5	72.1	70.5	69.4	67.8	69.3
DE	58.3	60.7	52.5	50.4	50.3	60.7	62.5	54.6	53.7	52.9	55.9	58.8	50.3	47.1	47.6
EE	:	:	:	37.4	35.9	:	:	:	42.0	41.2	:	:	:	32.7	30.6
IE	57.7	49.9	44.9	54.2	54.7	62.2	53.9	48.2	58.1	59.0	53.1	45.6	41.5	50.1	50.2
GR	40.6	39.5	36.7	39.0	32.4	48.2	44.0	41.3	41.7	36.1	34.0	35.3	32.5	36.2	28.7
ES	:	47.0	41.6	43.9	48.2	:	51.6	44.6	48.0	52.2	:	42.5	38.6	39.7	43.9
FR	51.4	44.6	35.5	35.5	38.4	55.3	47.7	37.3	38.6	42.2	47.8	41.6	33.8	32.4	34.6
IT	47.6	46.8	38.7	38.4	32.5	53.2	50.7	43.9	42.5	37.8	42.2	43.0	33.6	34.3	26.9
CY	:	:	:	40.9	41.5	:	:	:	42.4	44.9	:	:	:	39.6	38.3
LV	:	:	:	37.4	40.8	:	:	:	43.4	47.8	:	:	:	31.2	33.6
LT	:	:	:	36.1	26.3	:	:	:	41.7	29.3	:	:	:	30.5	23.1
LU	58.9	44.9	40.8	34.0	27.8	60.7	48.0	44.0	37.4	30.5	57.1	41.7	41.7	30.5	24.8
HU	:	:	:	38.3	26.8	:	:	:	43.2	30.1	:	:	:	33.3	23.4
MT	:	:	:	59.5	53.3	:	:	:	59.9	57.3	:	:	:	59.0	49.1
NL	46.9	59.6	62.0	72.9	70.8	46.3	59.9	62.2	73.7	71.5	47.5	59.2	61.8	72.0	70.1
AT	:	:	61.7	55.4	59.4	:	:	64.6	60.3	63.9	:	:	58.9	50.5	55.1
PL	:	:	:	37.8	34.2	:	:	:	40.9	37.5	:	:	:	34.8	30.7
PT	:	58.4	43.1	46.3	42.7	:	63.8	47.2	51.5	46.6	:	53.0	38.9	41.0	38.7
RO	:	:	:	41.4	30.6	:	:	:	46.0	35.1	:	:	:	36.8	25.9
SI	:	:	:	39.2	40.6	:	:	:	41.7	44.4	:	:	:	36.5	36.4
SK	:	:	:	46.0	35.3	:	:	:	49.4	39.7	:	:	:	42.5	30.8
FI	:	:	49.7	52.3	51.8	:	:	51.2	53.6	52.6	:	:	48.1	51.0	51.0
SE	:	:	45.5	40.7	51.3	:	:	44.1	41.1	50.8	:	:	46.8	40.4	51.9
UK	69.6	71.8	63.7	64.8	61.9	75.3	76.7	67.9	67.9	64.3	63.7	66.7	59.2	61.7	59.4
NO	:	:	:	64.4	57.4	:	:	:	66.3	56.9	:	:	:	62.4	58.0
EU27	:	:	:	45.3	44.1	:	:	:	48.8	47.4	:	:	:	41.8	40.6
EA	:	:	44.0	44.6	44.6	:	:	46.9	48.1	48.1	:	:	41.0	41.1	40.9
EA12	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU15	:	:	47.2	47.5	47.9	:	:	50.4	50.8	51.1	:	:	44.0	44.1	44.6
EU10	:	:	:	39.1	32.7	:	:	:	42.5	36.7	:	:	:	35.7	28.6
EU25	:	:	:	45.8	45.1	:	:	:	49.2	48.4	:	:	:	42.5	41.7

Source: Commission services.

Table 2. 3 - Historical participation rates: prime age workers aged 25 to 54

	Total					Males					Females				
Country	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006
BE	75.7	76.7	80.4	82.4	84.5	94.0	92.2	92.3	91.8	91.9	57.1	60.8	68.2	72.7	77.0
BG	:	:	:	80.6	82.3	:	:	:	83.3	85.1	:	:	:	78.0	79.4
CZ	:	:	:	88.4	88.2	:	:	:	94.9	94.8	:	:	:	81.8	81.3
DK	89.1	91.2	87.1	87.9	88.9	93.5	94.5	91.8	91.7	92.3	84.5	87.7	82.1	84.0	85.4
DE	77.0	80.0	83.3	85.4	87.6	94.6	93.9	93.1	93.7	93.8	59.2	65.6	73.2	77.0	81.4
EE	:	:	:	87.0	89.1	:	:	:	90.9	92.8	:	:	:	83.3	85.8
IE	66.1	69.5	72.8	78.3	81.5	94.3	93.3	91.0	92.0	92.1	37.1	45.1	54.8	64.7	70.7
GR	70.6	72.2	74.2	78.1	82.0	94.8	94.3	94.5	94.4	94.7	47.8	51.5	55.0	62.0	69.1
ES	:	70.0	74.3	78.0	82.0	:	94.2	92.9	93.1	92.5	:	46.7	55.7	62.8	71.2
FR	82.2	83.8	86.1	86.4	87.8	96.0	95.6	95.1	94.3	94.2	68.4	72.2	77.2	78.6	81.7
IT	70.4	72.8	71.9	74.3	77.8	95.2	94.0	90.3	90.6	91.3	46.5	52.1	53.6	57.9	64.3
CY	:	:	:	81.6	86.2	:	:	:	95.3	95.3	:	:	:	68.5	77.4
LV	:	:	:	85.5	86.4	:	:	:	87.8	90.0	:	:	:	83.3	82.9
LT	:	:	:	88.8	86.2	:	:	:	89.7	88.7	:	:	:	87.9	83.8
LU	69.7	72.9	73.9	79.8	84.5	94.9	95.4	93.6	94.2	95.3	43.4	49.4	53.3	64.9	73.8
HU	:	:	:	77.3	79.6	:	:	:	84.4	86.5	:	:	:	70.4	72.9
MT	:	:	:	64.2	68.0	:	:	:	93.5	94.1	:	:	:	34.5	41.2
NL	69.6	76.0	79.4	83.7	87.1	92.7	93.4	92.6	93.9	94.1	45.4	57.9	65.7	73.2	80.1
AT	:	:	83.3	85.3	87.1	:	:	93.2	94.0	93.2	:	:	73.3	76.5	80.9
PL	:	:	:	82.4	81.7	:	:	:	88.3	88.2	:	:	:	76.5	75.4
PT	:	79.8	83.4	84.8	87.7	:	94.0	93.6	92.5	92.9	:	66.9	74.1	77.4	82.7
RO	:	:	:	83.0	79.9	:	:	:	90.0	87.1	:	:	:	76.0	72.6
SI	:	:	:	87.4	89.0	:	:	:	90.6	91.0	:	:	:	84.2	87.0
SK	:	:	:	88.4	87.6	:	:	:	93.9	94.0	:	:	:	82.9	81.2
FI	:	:	85.4	87.9	87.8	:	:	88.3	90.8	90.3	:	:	82.4	84.9	85.3
SE	:	:	89.9	86.8	89.4	:	:	92.2	88.6	92.5	:	:	87.6	84.9	86.3
UK	81.6	84.0	83.4	83.9	84.5	95.5	95.0	92.7	91.8	91.6	67.7	73.0	74.0	76.2	77.6
NO	:	:	:	87.4	86.9	:	:	:	91.2	90.5	:	:	:	83.4	83.3
EU27	:	:	:	82.7	84.2	:	:	:	92.0	92.0	:	:	:	73.4	76.5
EA	:	:	80.0	82.0	84.5	:	:	92.8	92.9	93.1	:	:	67.2	71.1	75.9
EA12	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU15	:	:	80.7	82.4	84.7	:	:	92.8	92.7	92.8	:	:	68.6	72.2	76.5
EU10	:	:	:	83.7	83.3	:	:	:	89.5	89.5	:	:	:	78.0	77.1
EU25	:	:	:	82.6	84.5	:	:	:	92.2	92.3	:	:	:	73.1	76.7

Source: Commission services.

Table 2. 4 - Historical participation rates: older workers aged 55 to 64															
	Total					Males					Females				
Country	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006	1985	1990	1995	2000	2006
BE	27.3	22.2	24.2	27.1	33.6	45.1	35.4	35.9	37.5	42.7	11.1	9.9	13.3	17.1	24.6
BG	:	:	:	24.0	43.0	:	:	:	38.4	53.6	:	:	:	11.8	33.9
CZ	:	:	:	38.2	47.7	:	:	:	54.5	62.7	:	:	:	23.7	34.0
DK	53.1	57.0	53.6	58.2	63.2	65.6	69.3	68.0	66.7	69.6	42.4	45.9	40.0	49.0	56.7
DE	39.5	42.4	42.8	42.9	55.2	58.8	58.3	54.5	52.5	64.0	24.3	27.5	31.3	33.4	46.6
EE	:	:	:	51.3	61.0	:	:	:	63.6	61.6	:	:	:	42.0	60.5
IE	45.7	42.8	43.0	46.5	54.4	73.7	66.4	64.8	65.0	68.7	18.4	18.5	21.1	27.9	40.0
GR	46.0	41.4	41.9	40.5	43.9	67.3	59.4	61.0	57.3	61.0	26.4	24.3	24.5	25.4	28.0
ES	:	40.1	36.6	40.9	46.8	:	62.3	55.0	60.2	63.5	:	19.6	19.6	22.7	31.0
FR	35.6	32.9	31.4	31.7	40.5	44.4	39.4	36.1	35.4	43.1	27.7	26.9	27.1	28.2	38.0
IT	33.8	32.5	29.0	29.0	33.4	54.4	51.7	45.2	42.7	45.0	15.1	15.0	14.1	16.1	22.5
CY	:	:	:	51.2	55.5	:	:	:	69.5	74.1	:	:	:	33.4	37.8
LV	:	:	:	39.8	57.1	:	:	:	53.9	64.4	:	:	:	29.2	51.6
LT	:	:	:	45.4	52.9	:	:	:	57.9	59.9	:	:	:	35.9	47.6
LU	25.6	27.3	25.6	27.6	33.7	38.9	45.5	33.3	38.5	38.8	14.3	13.6	13.6	17.0	28.7
HU	:	:	:	22.9	34.9	:	:	:	34.5	43.1	:	:	:	13.5	28.2
MT	:	:	:	29.5	30.8	:	:	:	52.8	51.6	:	:	:	8.2	11.7
NL	30.3	30.9	29.9	39.0	49.6	49.2	45.8	41.5	51.2	60.4	13.1	16.9	18.5	26.7	38.6
AT	:	:	30.2	30.5	36.8	:	:	42.7	43.6	47.3	:	:	18.8	18.0	26.9
PL	:	:	:	31.3	30.7	:	:	:	40.4	42.6	:	:	:	23.6	20.3
PT	:	47.6	47.4	52.4	53.5	:	65.9	61.8	64.4	62.7	:	31.5	34.5	41.8	45.1
RO	:	:	:	50.0	42.8	:	:	:	56.9	52.0	:	:	:	43.9	34.8
SI	:	:	:	24.0	33.4	:	:	:	34.6	45.8	:	:	:	14.1	21.4
SK	:	:	:	24.3	36.7	:	:	:	41.0	55.2	:	:	:	10.7	20.9
FI	:	:	39.5	45.9	58.5	:	:	41.5	47.3	58.8	:	:	37.6	44.5	58.2
SE	:	:	67.2	68.4	72.8	:	:	71.1	72.1	76.0	:	:	63.4	64.6	69.6
UK	51.4	53.1	51.5	52.9	59.1	69.2	68.3	62.5	63.3	68.4	35.0	38.7	40.9	42.8	50.2
NO	:	:	:	65.8	68.2	:	:	:	72.3	74.0	:	:	:	59.4	62.1
EU27	:	:	:	39.7	46.4	:	:	:	50.6	56.2	:	:	:	29.5	37.2
EA	:	:	35.8	37.2	45.1	:	:	48.1	48.1	54.7	:	:	24.1	26.8	35.9
EA12	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU15	:	:	39.0	40.6	48.4	:	:	51.3	51.4	57.7	:	:	27.5	30.2	39.4
EU10	:	:	:	32.3	37.9	:	:	:	44.0	50.2	:	:	:	22.5	27.2
EU25	:	:	:	39.4	46.6	:	:	:	50.4	56.4	:	:	:	29.0	37.4

Source: Commission services.

2.2. Overview of the projection methodology and main assumptions in the 2009 exercise

Main features of the cohort methodology

The projection follows the cohort approach used in the 2006 budgetary projections exercise. It builds upon the OECD methodology with one modification, which is the use of single year of age instead of five-year age groups. The methodology takes into account implicitly that women belonging to any given cohort have their own specific level of participation, which is usually higher at all ages than the corresponding level of older generations. This participation gap between subsequent cohorts not only reflects socio-cultural factors, but also individual characteristics such as the number of children and level of education. Thus, compared with a standard projection based on the invariance of activity rates, the cohort-based projection contains an autonomous increase of female participation – referred to as a "cohort effect" – corresponding to the gradual replacement of currently older women, with relatively low participation rates, by younger women who have a much stronger attachment to the labour force. In the long-run, this effect leads to a homogenous female population with the same

individual characteristics as women who entered the labour force in 2007.[19] Similarly, the baseline incorporates a negative "cohort effect" for men because their participation rates have tended to decrease across generations in a large majority of countries, contrary to what is observed for women.

Two main steps in the labour force projection

There are two main steps in the labour force projection. Firstly, participation rates by single year of age and gender of people in the labour market are projected until 2060 using the cohort approach under the usual neutral assumption of "no-policy change". The overall participation rate PR (referred to both age groups 15 to 64 and 15 to 71) is calculated as a weighted average of age (i) and sex (s) specific participation rates as follows:

$$PR = \sum_{i=14}^{71} \sum_{s=m,f} PR_{is}^{t} * p_{is}^{t} \qquad \text{where } p_{is} = P_{is}/P \quad \text{and} \quad \text{P= Population} = \sum_{i,s} P_{is}^{t}$$

In the second step, the labour force and the number of people in employment are projected until 2060, given the assumption on unemployment rates in each country. The projection of the labour force growth and composition was obtained by combining the labour force participation rate projection with the projection of the working-age population. In essence, for any year *t,* the potential labour force supply for each age/sex cohort i (LF^{t}_{is}) is derived by multiplying the projected group-specific (by age/sex) labour force participation rate (PR^{t}_{is}) by its corresponding population projection: $LF_{is}^{t} = PR_{is}^{t} * P_{is}^{t}$.

Thus, the overall labour force supply in each year t is a weighted average of age-sex specific labour supply:

$$LF = \sum_{i=14}^{71} \sum_{s=m,f} LF_{is}^{t} = \sum_{i=14}^{71} \sum_{s=m,f} PR_{is}^{t} * P_{is}^{t}$$

The projected population and labour force series are then used to calculate the employment rates and the number of employees consistent with unemployment, following the profile agreed (see Annex 1 for a detailed description of the methodology used)..

Data sources and additional assumption on labour input

The basic data on labour force participation rates are derived from the Labour Force Surveys of Eurostat, in order to use comparable data on employment, unemployment and activity rates across the 27 EU Member States.[20] They consist of age-specific (single-year age groups) and gender-specific participation rates of people aged 15 to 71 years, covering the period 1998-2007. For the starting point of the projection, figures referring to 2007 are used, the most recent figures available.

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[19] The method used for the baseline projection is based on the assumption that lifetime participation profiles in the future are parallel to those observed in the past. This implies the assumption that the entry and exit rates calculated for the latest available cohorts (1998-2007) are kept constant in the future. Compared with a static baseline, this method implies a gradual increase of future female participation rates, mostly for women aged 35 and over. The assumption of constant rate of entry and exit, while representing progress compared with the assumption of constant participation rates, still remains mechanical, resting on the assumption that the cross-cohort deviations observed in 1998-2007 would remain unchanged over the future, see Burniaux et al. (2003).

[20] For Luxembourg, an adjustment to take account of the non-resident work force (cross-border workers) was implemented.

The employment projection refers to the number of people working and the total hours worked subject to the following specific assumptions decided by the EPC:

- the total amount of hours worked (in 2006) are kept constant by gender and by the proportion of part-time and full-time work over the entire projection period;
- the part-time share by gender and for the three age-groups 15-24, 25-54 and 55-71 (in 2006) are kept constant over the entire projection period;
- the wage share is assumed to remain constant throughout the projection period.[21]

2.3. Methodology used to project participation rates

2.3.1. Assumptions and adjustments for specific Member States

The projection was made using the population projections provided by Eurostat, and took on board the following elements:

- the participation rates in the labour market have been calculated, by single age and sex, by using the entry/exit rate calculated on the basis of the average of the participation rates observed over the period 1998-2007[22];
- the entry rates are assumed to be constant throughout the whole forecasting period. However, some countries are undergoing a period of large increase in education enrolment rates amongst young persons. As that may translate into higher participation rates in future years, the AWG has agreed to set a floor to the participation rates of the younger cohorts, in the age bracket 15-24, to avoid that any increase in the enrolment rates (and then any decrease in the corresponding participation rates) would result in a future decrease in the prime age participation rates according to the cohort approach method. This assumption implies that there is no projected decline in the participation rates in the age bracket 15-24;
- as for exit rates of older workers (aged 55-71), adjustments were made to take into account recent and the lagged effects of pension reforms in 20 countries. The descriptions of these reforms are provided in the Box below.

[21] The EPC decided that the Commission services' Spring 2008 economic forecast for the wage share (specifically, gross wages and salaries) until 2009 should be used to 'bridge' the main assumption of a constant wage share throughout the projection period.

[22] This is different from the methodology used in the 2006 Ageing Report, where the participation rates were calculated by using an average of entry/exit rates over the period 1998-2003 (see European Commission (2005)).

2.3.2. Impact of recently enacted pension reforms

2.3.2.1. Recent pension reforms in some EU Member States

An important feature of the projections is that the baseline scenario takes into account the potential effects of recently enacted pension reforms in 20 EU Member States, including measures to be phased in gradually, on the participation rates of older workers. Some countries have enacted legislation to increase the statutory retirement age for females or for both males and females. Others have changed some provisions of social security programmes (and sometimes of other transfer programmes used as alternative early retirement paths) that provided strong incentives to leave the labour force at an early age. The findings of a recent international research project based on micro-estimation results (based on a sample of individuals and the matching of individual retirement decisions and retirement incentives) are clear: changing pension plan provisions would have large effects on the labour force participation of older workers.[23]

The following pension reforms[24] are incorporated in the baseline scenario:

Box 2.1: Pension reforms enacted in the Member States

Belgium

The standard retirement age for women will increase gradually from 63 in 2003 to 64 in 2006 and 65 in 2009. Retirement age remains flexible from the age of 60 for men and women, provided that a 35-year career condition is satisfied. The "older unemployment scheme", reformed in 2002, will keep having an impact on participation rates between 50 and 58.

The law concerning the "Solidarity Pact between Generations" has come into force in 2006. It provided a series of measures to increase participation in the labour market. The statutory age for the early retirement ("*prépension*") scheme embedded in the unemployment insurance has been raised from 58 to 60 and the eligibility conditions (career length) have been made more restrictive. Conditions for entering this scheme before the statutory age ("*prépensions*" for labour market reasons) have also become tighter. Staying at work after the age of 62 is now rewarded by a specific supplement in the pension formula ("pension bonus"). Finally, a structural mechanism for linking benefits to prosperity has been introduced.

Czech Republic

Before the pension reform in 2003, men retired at the age of 60 and women at 53-57, depending on the number of children (one year less per child). Since January 2004 with modification of the retirement age from August 2008, the age of retirement is increased constantly over time (2 months per year for men and 4 months per year for women) to reach 65 years for men and 62-65 for women (still depending on the number of children) born in 1968 and later. Bonus for later retirement is 1.5% of person's calculation base for every additional completed 90 calendar days. Early retirements are subject to penalization, which is 0.9% of person's calculation base for every period of 90 calendar days before the statutory retirement age up to 720 days and 1.5% from the 721st day. But resulting earnings related component must not be lower than 770 CZK (approx. 28 Euro).

Denmark

Denmark introduced in 2006 a major reform package known as the "Welfare Agreement". This reform package affects mainly younger than age 48 at the end of 2006. It reverses the 2004 decision to lower

[23] See Gruber and Wise (2005).

[24] The information was provided by the Members of the EPC and AWG.

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.

Germany

Since the early nineties a series of major reforms have been passed, aiming at the financial and social sustainability of the public pension scheme. Highlighting the most important reform steps, the reform process began in the mid of the nineties with the increase of the statutory retirement age to the age of 65 years and the introduction of deductions on early retirement (3,6 % per year) accompanied with a bonus for deferred retirement (6,0 % per year). Secondly, at the beginning of this decade, a comprehensive promotion of second and third pillar pension schemes (Riester pension) by subsidising voluntary contributions was introduced. The aim of those reforms was to compensate the envisaged reduction of benefits in the statutory pension scheme by second and third pillar pensions. Thirdly, in 2005 the pension adjustment formula was augmented by a sustainability factor, which adjusts statutory pension payments to population dynamics, whereby the extent of the adjustment is determined by the change in the relation of the workforce to the number of retirees.

The most recent major reform took place in 2007. Though the transition process of increasing the retirement age to 65 years is not yet fully completed, a further increase of the statutory retirement age to the age of 67 was legislated (the age of retirement will be put back one month each year from 2012 on to 2024, then 2 months each year until the age of 67 years will be reached by 2029). The first aim of this reform was postponing the retirement age and thus decreasing the future financial burden. Secondly, the reform will partially compensate the expected decline of the workforce due to population ageing. Therefore, the increase of the retirement age is accompanied by the so-called "Initiative 50 plus" which aims to increase participation rates of older workers by a large range of different measures such as the extension of vocational training and the reduction of employment barriers for older workers.

Estonia

Changes in the PAYG system include raising the retirement age for females to 63 by 2016 and revising the benefit formula. Legislation passed in mid-September 2001 set up mandatory individual accounts in the second tier (starting operations in mid-2002), while voluntary accounts became the new third tier.

Spain

The latest reform of the pension system in 2002 (Law 35/2002) abolished mandatory retirement age (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 age 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 year old, with at least 30 years of paid contributions and registered as unemployed for at least 6 months, but with a high penalty, from 6% to 8% per year (8% for those with only 30 years of contribution, 6% for those with at least 40 years of contribution). 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 as 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.

France

The standard retirement age remains 60. Since 2004, gradual alignment of public sector with private sector by increasing the number of contribution years for entitlement to a full pension (from 37.5 to 40 years between 2004 and 2008). Since 2009, the numbers of contribution years will increase following the increase in life expectancy through a rule keeping constant the ratio of the number of contribution years and the number of years in pension to the level of 1.79 as in 2003. The number of contribution years will be increased to 41 in 2012 and 41.50 in 2020 due to the expected gains in life expectancy (by 1.5 years each 10 years). Introduction of a bonus (3% per year) in case of postponement of retirement. The penalty for early-retirement (before 40 years of contributions) will be changed. Since 2006, the amount of the penalty (la décote) will decrease gradually from 10% to 5% of pension per year of anticipation in 2015 for the private sector and will increase from 0.5% to 5% for civil servants).

Italy

Since 2006, the major changes to pension legislation concern the implementation of the 23rd July Agreement on welfare state between government and social partners (Law 127/2007 and Law 247/2007) and Law 133/2008) improving the possibility of accumulating pension and labour income.

A. Law 127/2007: increase of lower amount pensions through an additional lump sum of 420 euro per year from 2008 (327 euro in 2007) acknowledged to pensioners of 64 and over with an income lower than 1.5 times the minimum pension (8.504,73 euro per year in 2007). Such an increase is reduced or augmented by 20% for contribution careers inferior to 15 years or superior to 25, respectively (18 and 28, for the self-employed). Additional increases are also foreseen for social assistance pensions, starting from 2008, by way of the so-called 'social assistance additional lump sums' ('*maggiorazioni sociali*').

B. Law 247/2007 foresees the following:

- a slowdown of the process of elevating the minimum requirements for early retirement, keeping unchanged the phased-in values foreseen by Law 243/2004. In particular, in 2008 the age requirement, with 35 years of contribution, is 58 for the employees and 59 for the self-employed instead of 60 and 61. Starting from 2013 (it was 2014, according to Law 243/2004) the age requirement, with 35 years of contribution, is 62 for the employees and 63 for the self-employed. In addition, starting from July 2009, workers may access early retirement at an age lower by 1 year, provided that they possess at least 36 years of contributions. The age requirement may be reduced by at most 3 years (but never below the age of 57) for specific categories of workers involved in hard and stressful jobs ('*lavori usuranti*'), within a given amount of resources assigned to a specific fund;
- the application in 2010 of the transformation coefficients, revised on the basis of the procedure foreseen by Law 335/95. The subsequent revisions will be made every three years, instead of every ten years, through a simplified procedure falling entirely under the administrative sphere of competence;
- an increase of the contribution rate of the atypical workers by 3 percentage points (up to 26% in 2010) in order to improve pension adequacy for this category of workers.

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

Latvia

Under the new three-pillar system with a defined contribution PAYG based on notional accounts, set up in 1996, the standard age requirement for women (59.5 years in 2003) will increase by 6 months each year to reach 62 by 2008. Those for men reached 62 in 2003.

Lithuania

The standard minimum retirement age for women (55 years and 4 months in 1995, 58.5 years in 2003) will increase by 6 months each year to reach 60 years in 2006. The retirement age for men was gradually increased (2 months per year) from 60 years and 2 months (in 1995) up to 62.5 in 2003.

Hungary

The standard retirement age for women will increase to 60 by 2005, 61 by 2007 and 62 by 2009 (before the reform it was 57).

In 2006-2007, the Hungarian Parliament adopted (by two regulations) a package of reforms which specifies that the early retirement is allowed only 2 years before normal retirement instead of 3 before. Thus from 2013 the early retirement is possible from age 60 both for women and men. From 2013 all early pensions will be subject to a reduction. The rate of reduction, depending on the time remaining until retirement age, would 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 the benefits, a minimum contribution from 40-41 for early retirement and some favourable retirement conditions for those working in potentially health-damaging occupations. Finally, it includes also: a new pension benefits system that will reduce the replacement rate; the retirement benefits will be available only for the difference between earnings of the year and minimum wage for the first year of an early retirement; the pension contribution increases for early retirees; some measures to increase employment of persons with reduced working capacity; pensions and earnings are no more cumulated in early retirement if earnings > minimum wage; changes in contribution levels payable by the employer and by the employee.

Malta

In December 2006, the Maltese Government completed the legislative process associated with the enactment of the pensions reform bill. Among the most important elements of the reform there is a staggered rise in pension age from 60 years for females and 61 years for males to 65 years for both by 2026 and the gradual lengthening of the contribution period for full entitlement to the two-thirds pension from 30 years to 40 years. Meanwhile, the calculation of pensionable income will reflect the yearly average income during the best 10 calendar years within the last forty years, as opposed to the previous regime which consisted of the best 3 years of the last ten years for employed persons and the average of the best ten years for self-employed persons. In addition, prior to the reform, the maximum pensionable income was fixed by the law though in recent years it was revised in line with the cost of living adjustment. Following the reform, maximum pensionable income will evolve in a more dynamic fashion and will be increased annually by 70 per cent of the national average wage and 30 per cent of the inflation rate as from 1 January 2014 for persons born after 1 January 1962.

Austria

The minimum retirement age for men will increase from 61.5 years to 65 years; for women the age will rise from 56.5 to 60 years. The increase will be phased in gradually beginning in July 2004 and by 2017 early retirement will be eliminated. Meanwhile, larger penalties are imposed on early retirement (4.2% of reduction per year instead of the former 3.75%, up to a maximum of 15%), within the age of 62-65. The statutory retirement age for women will be increased gradually between 2019 and 2034 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. From January 2005, harmonised guaranteed pension accounts is established (Act on the harmonisation of pension system, approved in November 2004). In the new system of individual, transparent pension accounts (with a clear reporting of benefits accrued from contributions paid in and other credits acquired, such as from active child and elderly care) the key rule will be : 45-65-80 (45 contribution years, retirement age of 65 and a gross replacement rate of 80% of average life earnings). Pension benefits will be adjusted to consumer price index, starting in 2006.

Poland

All insured persons born after 1948 are covered by the new defined contribution PAYG with notional accounts and three-pillar pension system. The standard retirement age remains 65 for male and 60 for female. There will be no early pension for those born after 1948 and retiring after 2006, with the exception of those who worked long enough (20 years) in special conditions.

Portugal

Portugal introduced in 2007 a "Sustainability factor" linking initial benefits to average life expectancy when the worker retires (at 65, which is the legal retirement age). Individuals have the option of postponing retirement beyond legal retirement age to compensate (at least partially) the financial penalty given by the sustainability factor. They introduced also a "national strategy for the promotion of active ageing" which is a package of measures that encourages older workers to remain in the labour force (trainings, improvement of older workers employment, higher penalty in case of early retirement and benefits granted in case of long contributive careers).

Slovenia

Under the new Pension and Disability Insurance Act entered into force on 1 January 2000 (a three-pillar modernised 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 53 for women and 58 for men 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 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, plus the normal rate of accrual, 1.5% per year).

Slovakia

Under the reformed (from 2004) three–pillar pension system, the standard retirement age will increase from 60 to 62 for men (9 month per year) by 2007 and from the former 57 (reduced by 1 year per child, to reach age 53) to 62 for women by 2016. A worker can still retire earlier if the combined benefit from the first and the newly introduced second pillar equal at least 60% of the minimum living standard determined by the government. In this case, the pension is reduced by 6% per year, while a bonus of 6% is introduced for those postponing their retirement. It is also possible to get pension benefit while working.

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 57-65).

Sweden

The pension reform was approved by Parliament in 1999. Under the new notional defined contribution system is possible to retire from age 61 onwards, with an actuarially fair compensation for those who stay on in the labour force. Every year of contributions is important for the pension benefit. A person with an average wage will increase his yearly pension benefit by nearly 60 per cent if he postpones his retirement decision till age 67 compared to leaving at age 61. Yearly "statement of account" informs the individual of costs and benefits of retirement. The new system is phased in gradually for generations born between 1938 and 1953, and will affect generations born after 1953 fully.

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 in which we have the gradual increase of the state pension age between 2024 and 2046 to 68 for men and women (instead of 65 before).

2.3.2.2. Impact of pension reforms in the baseline labour force projection

Pension reforms are modelled by considering the likely impact of reforms on the probability of withdrawing from the labour market when ageing due to changes in the statutory "normal" age of retirement, or "early-retirement age" (that is the age at which benefits are first available), or in the rules governing pension rights. This likely impact is incorporated in the baseline labour force projection by means of the probabilistic model already used by the European Commission for the calculation of the *average exit age* from the labour force, using estimated cumulative probabilities of exit from the labour market [25].

More specifically, the analysis of the distribution of the probability of retiring at different ages (from age 50 to 71, separately for males and females) is done for the period 1998 to 2007 for the 20 EU Member States concerned. Then, the relationship between changes in the parameters of the pension systems and the retiring behaviour of older workers is examined. Existing empirical evidence is also taken into account, such as econometric estimates of the impact of changes in the implicit tax rate on continuing to work and retirement behaviour.[26]

As a starting point, the probability of retirement and the cumulative distribution function (the cumulated distribution of probability of retirement) observed in 2007 are analysed, along with the calculated average exit age, see Graph 2. 1. While the age profiles of the probability of retirement vary across countries, because of differences in the pension system, a common feature is that the distribution is clearly skewed towards the earliest possible retirement age. The distribution of the retirement age presents evidence of spikes at both the minimum age for an early-retirement and the normal/ average retirement age, which is either 60 (especially for women) or 65.

[25] For details on the methodology used, see Carone (2005).

[26] See Börsch-Supan (2003), Duval (2003), Gruber and Wise (2005).

2.3.2.3. Simulating the impact of the pension reforms on the participation rate of older workers

Methodology used to assess 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 by calculating the impact of reforms that have either increased the statutory retirement age or removed early retirement schemes on the participation rates. This is made as follows:

- first, by changing the probability of retiring according to our considered judgement about the factors that affect the retirement decision.[27] More specifically, the distribution of the frequency (density function and cumulative distribution function) observed in 2007 is shifted. For example, let us assume that in a given country a concentration of the probability of retiring is observed at age 58 over the last 5 to 6 years, while a reform removes early retirement schemes or increases the minimum years of contribution. To calculate the impact of this reform, we shift the peak of the retirement probability away from the previously observed peak at 58 years and closer to the statutory average age (usually 65 for men and 60 for women).[28] Within the same methodological framework, another simulation is done, by applying a progressive shift of the probability distribution of retiring for females. This is done for Member States that have recently legislated a progressive increase of the statutory retirement age of females to that of males (usually from 60 to 65), such as Belgium, the United Kingdom and some others, especially among the new Member States;

- secondly, the new probabilities of retirement resulting from the simulation are converted into a change in exit rates (following the algorithm presented in Annex 2.1);

- finally, the observed exit rates (the average over the period 1998-2007) are replaced (at a different time for each country, in line with the timing of reform implementation) with the new estimated exit rates in the cohort-based projection model. Consequently, the participation rates initially estimated, without taking into account the impact of pension reforms, have changed. The magnitude of the expected impact of pension reforms can be inferred by comparing the participation rates calculated with and without the effect of reforms.

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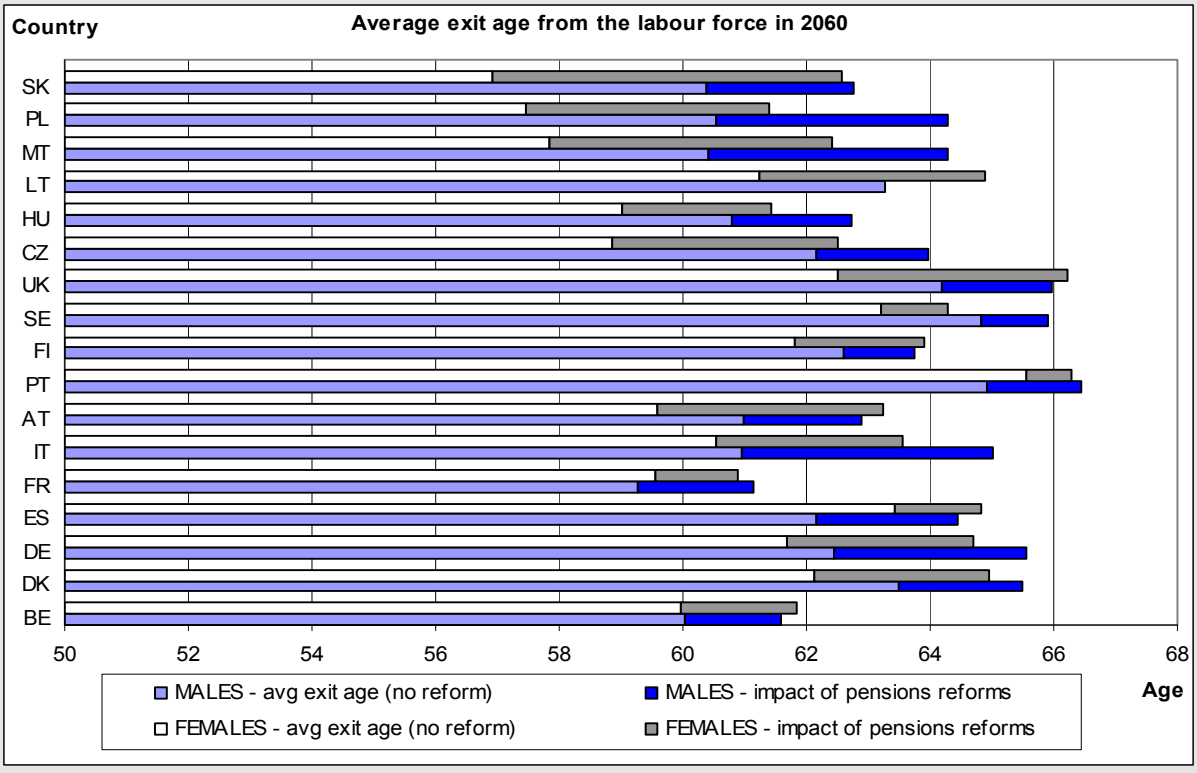
[27] As regards the impact of delay in eligibility ages, recent estimates by Gruber and Wise (2002) for France, Belgium and the Netherlands suggest for example that in these three countries a three-year delay in eligibility ages to old-age and early retirement schemes could raise the labour force participation of the 55-64 age group by about 20 percentage points. According to Duval (2003), "past experience suggests a more moderate outcome". For instance, the five-year increase in eligibility ages in New Zealand throughout the 1990s led to a 15 percentage point increase in labour force participation".

[28] Technically speaking, the shift in the distribution function of retirement probability can be done rather mechanically in this way. The retirement probability for a generic cohort of people is given by a density function f(x). The cumulated probability is given by a cumulative distribution function F(x). Any time a reform of the pension system (such as changes in the statutory retirement age) has an effect on the age of retirement, it has an effect on the density function. Thus, for example, if the possibility of retirement at age 57 (x=57) is no longer possible and the new age of statutory retirement become n=60 than f(x) = 0 for x<n. To calculate the new density function d(x) one can use a shift in the cumulative distribution function of f(x). The new density function d(x) is s*f(x), where s= 1/ (1-F(n)). For a similar approach, see Baldacci-Tuzi (2003), Carone (2005).

Estimates of the impact of pension reforms

The expected postponement of retirement is summarised by the difference in the *average exit age* from the labour force in 2060. As a result of recently enacted pension reforms, the effective retirement age for males is expected to increase by as much as three years or more in Germany, Italy, Malta and Poland and by between two and three years in Denmark, Spain, Austria, and Slovakia. The expected postponement of retirement for females is similar, or even higher than for males, reflecting in several cases a progressive alignment of the retirement age of females to that of males.

Graph 2. 1 - Impact of pension reforms on the average exit age from the labour force



Source: Commission services, EPC.

Table 2. 5 shows the estimated impact of pension reforms on participation rates. Pension reforms are projected to have a sizeable impact on the labour market participation of older workers (aged 55 to 64) in most of the EU Member States in which future implementation of already enacted pension reforms is planned. A stronger impact is expected from changes in the parameters affecting the statutory age of retirement. For example, the labour participation in the group aged 55 to 64 in Italy is projected to record an additional increase of 14 p.p. by 2030. This is the estimated impact of the recent reform postponing the statutory age of retirement and the gradual move towards a notional defined contribution pension system.[29] In Germany, Finland, Hungary, Slovenia the impact is estimated to be more than 10 p.p. by 2020. In the Czech Republic and Slovakia, the impact is estimated to be higher than 15 p.p. by 2020. Overall, in the EU, the participation rate of older people (55-64) is estimated to be

[29] For an empirical analysis on the retirement decision of Italian employees see Brugiavini and Peracchi (2003). According to their prediction of retirement probabilities under alternative policies that change social security wealth and derived incentive measures, the male employment rate at age 55 are projected to be 84.3 under the Dini/ Prodi pension regime (1995 and 1997 reforms) as compared to 65.6 under the pre-1992 reform regime, see also Brugiavini and Peracchi (2005).

about 8 p.p. higher in 2020 and 13 p.p. higher in 2060 due to the estimated impact of pension reforms. In the euro area, the impact is estimated to be slightly larger, at about 9 p.p. in 2020 and 13.5 p.p. 2060, respectively.

Given that changes in overall participation rates are mainly driven by changes in the labour force attachment of prime-age workers, as this group accounts for more than 70% of the total labour force, even such high projected increases in the participation rates of older workers will only have a rather limited impact on the overall participation rate. For example, the 18 percentage point increase in the participation rate of workers aged 55 to 64 years projected in Germany will lead to an increase in the overall participation rate (workers aged 15 to 64 years) of about 4 percentage points by 2060.

Table 2. 5 - Estimated impact of pension reform on participation rates (2020, 2060), in percentage points (comparison of projections with and without incorporating recent pension reforms)

	BE		CZ		DK		DE		EE		ES		FR		IT		LT		HU	
Male	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.3	2.1	2.0	3.3	0.1	2.0	3.7	3.8	0.0	0.0	1.4	3.1	2.0	2.7	3.9	6.8	0.0	0.0	2.1	2.7
15-71	2.5	2.5	2.7	4.7	-0.2	3.4	3.9	5.3	0.0	0.0	1.6	3.5	2.2	2.9	3.7	6.8	0.0	0.0	2.2	3.0
55-64	9.1	9.1	10.3	15.3	0.7	9.3	14.7	16.1	0.0	0.0	6.1	13.9	10.9	14.8	17.1	29.0	0.0	0.0	10.8	11.0
Females	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.6	2.7	3.6	7.2	0.3	2.5	2.5	4.4	1.3	1.8	1.1	2.1	1.3	1.5	2.0	2.7	3.8	3.5	3.9	3.9
15-71	2.5	2.7	4.8	8.9	0.2	4.3	2.8	5.6	-1.4	-1.1	1.1	2.0	1.6	2.0	2.0	2.9	4.5	5.1	3.7	3.7
55-64	10.4	11.6	16.9	32.5	1.5	12.2	10.5	19.3	5.7	8.8	4.9	9.0	6.1	7.6	10.2	15.2	15.5	14.6	17.4	17.4
Total	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.4	2.4	2.8	5.2	0.2	2.3	3.1	4.1	0.7	0.9	1.2	2.6	1.6	2.1	2.9	4.8	1.9	1.8	3.3	3.3
15-71	2.5	2.6	3.8	6.8	0.0	3.8	3.4	5.4	-0.7	-0.6	1.4	2.8	1.9	2.5	2.8	4.9	2.3	2.6	3.3	3.3
55-64	9.8	10.4	13.6	23.9	1.1	10.8	12.6	17.7	3.2	4.5	5.5	11.5	8.4	11.2	13.6	22.2	8.7	7.5	14.3	14.3

	MT		AT		PL		PT		SI		SK		FI		SE		UK		EU27	
Male	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.6	6.5	1.6	3.3	2.0	5.3	0.9	1.9	0.1	0.2	2.1	2.6	2.0	2.1	1.1	1.2	0.0	1.4	1.8	2.9
15-71	2.2	6.8	1.7	3.5	1.8	5.7	1.2	3.0	-0.5	-0.2	3.4	4.7	1.9	2.1	1.9	2.2	0.0	2.6	1.9	3.5
55-64	11.9	28.3	8.1	16.1	8.0	21.6	3.7	7.7	2.7	3.3	10.6	11.0	9.1	10.4	5.6	5.9	0.0	7.0	8.5	13.5
Females	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	3.8	3.8	4.0	4.0	4.7	4.7	1.4	1.4	5.2	5.2	7.6	7.6	2.9	2.9	0.7	0.7	1.8	3.4	1.8	2.7
15-71	3.5	3.5	5.5	5.5	5.6	5.6	1.8	1.8	4.9	4.9	10.1	10.1	3.7	3.7	1.6	1.8	1.7	5.2	1.9	3.5
55-64	14.0	14.0	18.2	18.2	16.9	16.9	5.0	5.0	22.9	22.9	31.4	31.4	13.8	13.8	3.1	2.9	8.1	16.9	7.9	12.8
Total	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	5.2	5.2	3.6	3.6	5.0	5.0	1.6	1.6	2.7	2.7	5.1	5.1	2.5	2.5	0.9	0.9	0.9	2.4	1.8	2.8
15-71	5.2	5.2	4.5	4.5	5.6	5.6	2.4	2.4	2.3	2.3	7.4	7.4	2.9	2.9	1.8	2.0	0.9	3.9	1.9	3.5
55-64	21.2	21.2	17.1	17.1	19.2	19.2	6.4	6.4	12.9	12.9	21.2	21.2	12.1	12.1	4.3	4.5	4.2	12.0	8.2	13.1

	EA		EA12		EU15		EU10		EU25	
Male	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.4	3.4	2.4	3.4	2.0	2.9	1.8	3.7	2.0	3.0
15-71	2.5	3.9	2.5	3.9	2.1	3.6	1.8	4.3	2.1	3.7
55-64	10.7	15.5	10.7	15.6	9.0	13.8	8.0	15.8	8.8	14.1
Females	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	1.7	2.4	1.6	2.4	1.6	2.5	2.9	4.9	1.8	2.8
15-71	1.8	2.9	1.8	2.9	1.7	3.3	3.1	5.7	2.0	3.6
55-64	7.5	11.6	7.5	11.6	7.4	12.3	12.0	19.8	8.1	13.3
Total	2020	2060	2020	2060	2020	2060	2020	2060	2020	2060
15-64	2.0	2.9	2.0	2.9	1.8	2.7	2.4	4.3	1.9	2.9
15-71	2.2	3.4	2.2	3.4	1.9	3.5	2.5	5.0	2.0	3.7
55-64	9.1	13.5	9.1	13.6	8.2	13.1	10.1	17.8	8.4	13.7

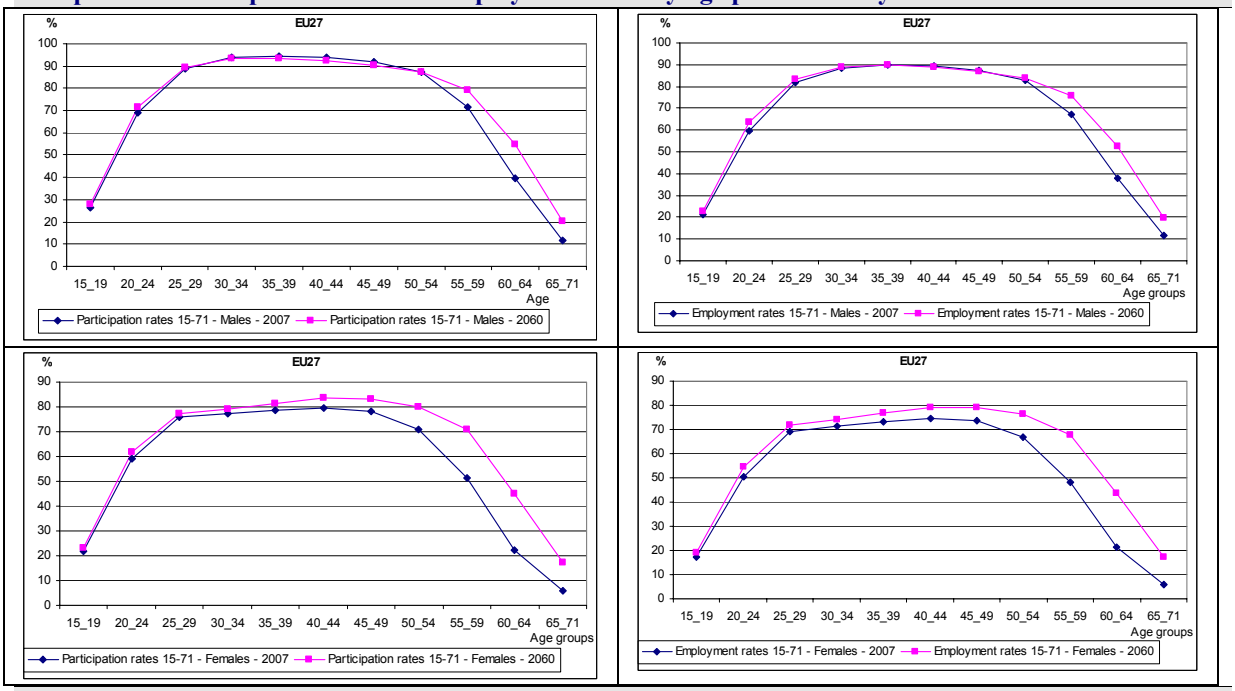
Source: Commission services, EPC.

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

2.4.1. Projection of participation rates

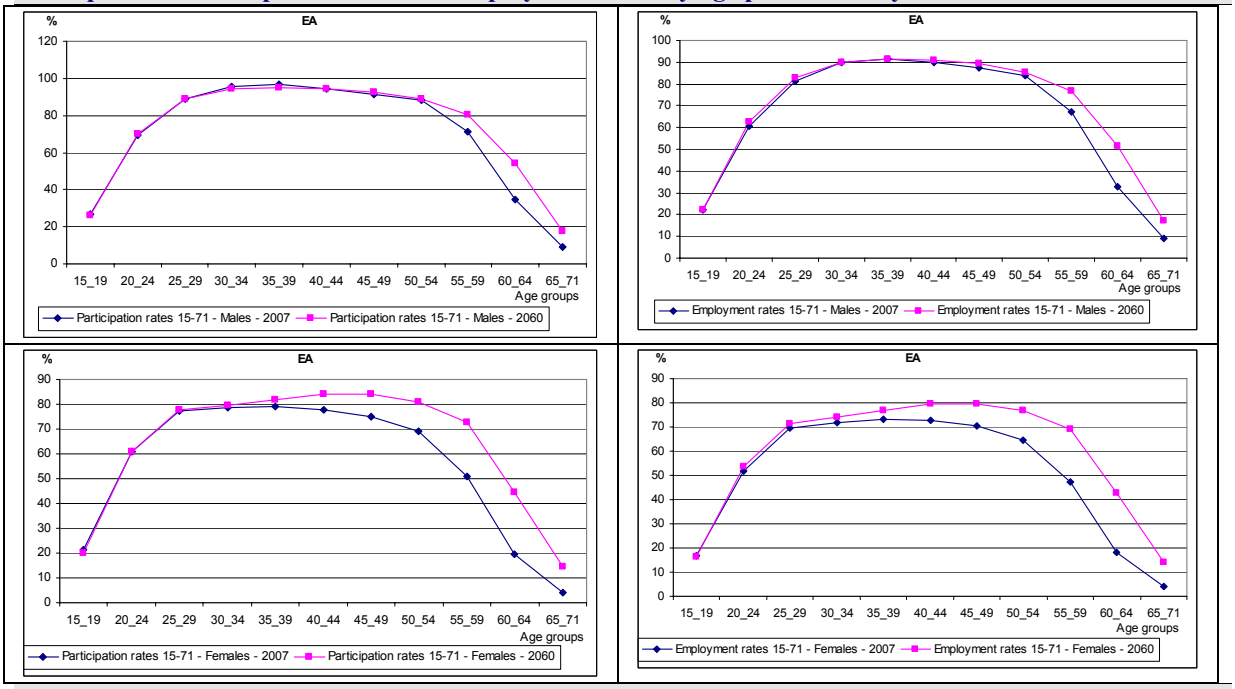
The methodology used leads to a projected upward shift in the participation rates of older age groups (mainly from the age of 45) that is particularly strong for women while, by assumption, the participation rate profiles of the young are assumed to remain generally stable, or increase moderately over time (see Graph 2. 2 and Graph 2. 3).

Graph 2. 2 - Participation rates and employment rates by age profile and by sex in 2007 and 2060 - EU27



Source: Commission services, EPC.

Graph 2. 3 - Participation rates and employment rates by age profile and by sex in 2007 and 2060 - EA



Source: Commission services, EPC.

Table 2. 6 presents the projection of the overall participation rates. To summarise the baseline scenario projection, the overall participation rate (for the age group 15 to 64) in the EU27 is projected to increase by 3.6 percentage points over the period 2007-2060 (from 70.6% in 2007 to 74.1% in 2060). For the euro area, a similar increase is projected, (from 70.8% in 2007 to 74.5% in 2060). For the age-group 15-71, the current and projected participation rates as well as the increase are smaller. Almost all of the increase is projected to materialize in the period up to 2020.

Table 2. 6 - Projected changes in participation rates

Country	AGE GROUP 15 to 64					AGE GROUP 15 to 71				
	Level	Level	Changes in participation rates			Level	Level	Changes in participation rates		
	2007	2060	2007-2060	2007-2020	2020-2060	2007	2060	2007-2060	2007-2020	2020-2060
Belgium	67.3	69.7	2.4	2.4	0.0	61.8	62.3	0.5	1.3	-0.7
Bulgaria	66.8	69.3	2.4	3.5	-1.0	61.2	60.9	-0.4	2.4	-2.7
Czech Republic	70.0	73.5	3.6	4.0	-0.4	65.3	66.3	1.0	2.1	-1.2
Denmark	80.3	80.8	0.6	-0.7	1.2	74.3	74.3	0.0	-2.4	2.4
Germany	76.2	79.8	3.6	2.9	0.7	68.0	71.6	3.6	3.7	-0.1
Estonia	72.9	74.5	1.6	2.5	-0.9	68.0	66.1	-1.9	1.1	-3.0
Ireland	72.5	76.3	3.9	3.2	0.6	68.9	70.5	1.6	2.3	-0.7
Greece	67.1	68.8	1.7	2.3	-0.6	61.4	61.3	-0.1	1.7	-1.8
Spain	71.6	77.3	5.7	4.1	1.7	66.3	69.0	2.7	3.1	-0.4
France	70.3	71.6	1.3	0.5	0.8	65.0	64.5	-0.5	-1.5	1.0
Italy	62.6	67.7	5.1	3.8	1.3	56.8	60.4	3.6	3.3	0.3
Cypros	72.9	78.0	5.1	5.6	-0.5	68.9	71.2	2.3	4.6	-2.3
Latvia	72.9	74.2	1.3	2.4	-1.1	67.8	63.5	-4.3	0.9	-5.2
Lithuania	68.1	68.2	0.1	2.9	-2.9	63.0	59.6	-3.4	3.3	-6.8
Luxembourg	66.4	66.8	0.4	0.5	-0.1	61.5	59.7	-1.8	-0.6	-1.3
Hungary	61.7	65.0	3.2	4.9	-1.6	56.7	57.3	0.6	3.3	-2.8
Malta	59.5	64.4	4.9	3.5	1.4	55.1	55.6	0.5	0.6	-0.1
Netherlands	78.7	80.2	1.6	0.8	0.8	73.1	72.1	-1.0	-1.0	-0.1
Austria	74.8	77.6	2.8	1.1	1.7	68.6	70.1	1.5	1.0	0.5
Poland	63.3	66.3	3.0	2.8	0.1	59.3	58.0	-1.3	0.3	-1.6
Portugal	74.1	76.3	2.2	2.1	0.2	69.6	71.4	1.9	1.9	0.0
Romania	63.0	61.3	-1.7	1.8	-3.6	60.0	56.3	-3.7	1.1	-4.8
Slovenia	71.4	71.9	0.6	2.0	-1.4	66.3	64.1	-2.2	-0.2	-2.1
Slovak Republic	68.8	71.2	2.4	4.1	-1.7	64.5	63.1	-1.4	3.2	-4.5
Finland	75.8	79.1	3.3	2.5	0.8	69.8	71.0	1.3	-0.1	1.3
Sweden	79.2	82.5	3.3	3.0	0.3	73.3	74.6	1.3	2.1	-0.9
United Kingdom	75.6	78.7	3.1	1.6	1.5	70.4	72.8	2.4	0.7	1.7
Norway	78.8	78.0	-0.9	-0.5	-0.3	74.5	70.7	-3.8	-2.4	-1.4
EU27	70.6	74.1	3.5	2.6	0.9	65.0	66.8	1.8	1.7	0.1
EA	70.8	74.5	3.6	3.0	0.7	64.8	67.0	2.3	2.2	0.1
EA12	70.9	74.5	3.6	2.9	0.7	64.8	67.0	2.3	2.2	0.1
EU15	71.8	75.6	3.7	2.7	1.0	65.9	68.4	2.6	2.0	0.6
EU10	65.2	69.0	3.7	4.1	-0.4	60.9	61.0	0.1	1.8	-1.7
EU25	70.7	74.8	4.0	3.0	1.0	65.0	67.5	2.4	2.0	0.4

Source: Commission services, EPC.

Table 2. 7 provides an overview of changes in different age- and sex-groups. The biggest increase in participation rates is projected for older workers (around 20 percentage points for females and 10 p.p. for males) in the EU27, and a slightly higher increase in the euro area (22 p.p. for males and 13 p.p. for females). As a result of these dynamics, the gap between male and female participation rates is projected to gradually narrow down, especially in countries with a large gap in 2007.

Table 2. 7 - Projected changes in participation rates by age-groups, 2007-2060

	2007				2060				change 2007-2060			
TOTAL	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	67.3	34.4	85.3	36.2	69.7	35.6	86.7	49.1	2.4	1.2	1.4	13.0
BG	66.8	32.0	84.0	46.6	69.3	31.7	86.1	50.2	2.4	-0.3	2.1	3.6
CZ	70.0	32.0	87.7	48.9	73.5	31.9	86.9	67.5	3.6	-0.1	-0.9	18.6
DK	80.3	70.8	89.0	61.3	80.8	72.5	87.3	69.3	0.6	1.7	-1.7	8.1
DE	76.2	51.5	87.9	57.3	79.8	52.2	89.5	73.9	3.6	0.8	1.6	16.5
EE	72.9	38.5	88.4	62.4	74.5	40.0	87.8	64.1	1.6	1.5	-0.7	1.7
IE	72.5	55.4	82.0	55.1	76.3	53.9	85.7	69.1	3.9	-1.5	3.7	14.0
GR	67.1	32.8	82.1	44.3	68.8	32.7	84.9	51.7	1.7	-0.1	2.8	7.5
ES	71.6	48.2	82.9	47.5	77.3	46.6	87.4	74.0	5.7	-1.6	4.5	26.4
FR	70.3	39.4	88.3	41.0	71.6	40.2	88.9	49.3	1.3	0.8	0.6	8.3
IT	62.6	31.2	77.6	34.7	67.7	32.3	78.8	63.1	5.1	1.1	1.2	28.4
CY	72.9	44.2	86.7	57.6	78.0	43.4	91.8	65.1	5.1	-0.8	5.0	7.4
LV	72.9	43.4	87.1	60.4	74.2	44.1	87.3	58.1	1.3	0.7	0.2	-2.3
LT	68.1	28.3	86.0	55.5	68.2	29.1	83.7	54.1	0.1	0.8	-2.3	-1.4
LU	66.4	27.4	84.2	33.0	66.8	29.5	86.1	41.3	0.4	2.1	1.9	8.4
HU	61.7	26.1	80.0	34.1	65.0	26.2	81.1	49.3	3.2	0.1	1.0	15.2
MT	59.5	55.4	69.9	31.6	64.4	56.0	71.8	50.3	4.9	0.6	1.9	18.7
NL	78.7	72.7	87.7	53.3	80.2	73.8	90.2	57.6	1.6	1.1	2.5	4.2
AT	74.8	61.5	87.4	40.0	77.6	63.3	89.3	55.4	2.8	1.7	1.9	15.4
PL	63.3	33.9	81.8	32.1	66.3	32.9	82.1	46.5	3.0	-1.0	0.3	14.4
PT	74.1	42.3	87.8	54.5	76.3	41.6	89.0	67.8	2.2	-0.8	1.2	13.3
RO	63.0	30.6	78.9	42.4	61.3	31.3	75.1	45.4	-1.7	0.6	-3.9	3.1
SI	71.4	40.9	89.3	34.5	71.9	40.1	88.7	49.1	0.6	-0.8	-0.6	14.6
SK	68.8	34.8	87.5	39.4	71.2	34.5	87.5	52.8	2.4	-0.4	-0.1	13.4
FI	75.8	54.4	88.1	59.4	79.1	55.5	90.1	67.7	3.3	1.1	2.1	8.3
SE	79.2	51.8	90.0	73.2	82.5	56.5	92.2	76.6	3.3	4.7	2.2	3.4
UK	75.6	62.0	84.5	59.7	78.7	62.4	85.9	71.1	3.1	0.4	1.3	11.4
NO	78.8	58.8	87.4	69.9	78.0	60.5	87.5	65.6	-0.9	1.6	0.0	-4.2
EU27	70.6	44.6	84.5	47.5	74.1	46.6	86.0	62.5	3.5	2.0	1.6	15.1
EA	70.8	45.3	84.5	45.4	74.5	44.9	87.1	63.1	3.6	-0.5	2.5	17.7
EA12	70.9	45.4	84.5	45.5	74.5	44.9	87.1	63.2	3.6	-0.4	2.5	17.7
EU15	71.8	48.7	84.6	48.6	75.6	49.1	86.9	65.0	3.7	0.4	2.3	16.4
EU10	65.2	34.0	83.4	36.9	69.0	32.8	84.4	52.4	3.7	-1.2	1.0	15.5
EU25	70.7	45.9	84.4	46.7	74.8	47.2	86.6	63.4	4.0	1.3	2.2	16.7
MALES	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	73.9	36.6	92.5	44.8	73.4	38.4	91.3	50.6	-0.5	1.8	-1.2	5.8
BG	71.4	35.4	87.3	56.3	72.9	35.2	88.7	56.8	1.4	-0.2	1.4	0.5
CZ	78.3	36.8	95.0	63.3	78.9	36.9	92.8	71.9	0.6	0.1	-2.3	8.6
DK	84.0	72.2	92.5	67.5	82.5	73.7	88.9	71.4	-1.5	1.5	-3.7	3.9
DE	82.1	54.0	93.8	66.0	83.0	54.7	93.2	76.1	0.9	0.7	-0.6	10.1
EE	77.3	44.3	93.5	63.7	77.7	45.2	91.5	63.0	0.3	0.9	-2.1	-0.6
IE	81.4	58.6	91.6	69.7	81.1	57.2	92.1	70.0	-0.3	-1.4	0.5	0.3
GR	78.8	36.0	94.6	61.2	76.4	37.1	93.6	58.7	-2.4	1.1	-1.0	-2.5
ES	81.5	52.6	92.6	63.3	81.6	51.2	92.6	75.3	0.2	-1.4	0.0	12.0
FR	75.1	43.0	94.2	43.6	75.2	44.1	92.6	52.0	0.1	1.1	-1.6	8.5
IT	74.5	36.5	91.0	46.6	77.9	37.9	89.6	75.4	3.4	1.5	-1.4	28.8
CY	81.2	47.4	95.0	74.8	82.7	47.0	95.3	74.7	1.5	-0.4	0.3	0.0
LV	77.8	49.9	90.9	67.6	77.9	49.4	91.0	60.3	0.1	-0.5	0.0	-7.3
LT	71.2	32.8	87.9	63.4	69.4	33.2	84.9	53.2	-1.8	0.4	-3.0	-10.3
LU	74.7	30.9	94.7	38.1	72.1	33.0	94.6	38.2	-2.6	2.1	-0.1	0.2
HU	68.7	29.9	87.0	42.9	69.2	30.3	85.8	52.0	0.5	0.4	-1.1	9.0
MT	78.5	58.1	94.3	50.4	83.0	58.2	93.5	72.7	4.5	0.1	-0.8	22.3
NL	84.8	73.0	94.0	64.7	82.4	74.0	93.0	59.1	-2.4	1.0	-1.0	-5.5
AT	81.7	65.7	93.7	51.3	82.0	67.1	93.5	60.5	0.3	1.4	-0.2	9.2
PL	70.1	37.8	88.0	45.1	71.6	36.4	85.6	57.7	1.4	-1.3	-2.4	12.6
PT	79.3	45.5	92.9	63.0	79.0	44.8	91.6	70.5	-0.3	-0.7	-1.3	7.5
RO	70.1	35.9	85.9	52.1	66.3	36.7	79.2	52.6	-3.7	0.8	-6.7	0.4
SI	75.8	46.3	91.3	46.5	74.3	45.1	91.1	49.6	-1.5	-1.2	-0.2	3.1
SK	76.6	38.9	93.9	57.6	76.2	39.2	92.9	56.6	-0.4	0.3	-1.0	-1.0
FI	77.5	55.2	90.4	59.5	80.1	55.8	91.9	66.5	2.6	0.7	1.5	7.0
SE	81.5	51.4	92.9	76.6	84.1	55.9	93.6	81.5	2.7	4.5	0.7	4.9
UK	82.1	64.8	91.6	69.4	82.8	65.0	90.9	73.4	0.6	0.3	-0.7	4.1
NO	81.6	57.8	90.8	74.8	78.6	59.4	88.4	67.1	-3.0	1.7	-2.4	-7.7
EU27	77.8	48.1	91.9	57.3	78.8	50.1	91.0	67.0	1.0	2.0	-0.9	9.7
EA	78.4	48.8	92.7	54.8	79.3	48.6	92.4	67.4	0.9	-0.2	-0.2	12.6
EA12	78.5	48.8	92.7	54.8	79.3	48.6	92.4	67.4	0.9	-0.2	-0.3	12.6
EU15	79.1	51.9	92.5	57.8	80.1	52.4	92.1	68.9	1.0	0.5	-0.4	11.1
EU10	72.1	38.3	89.5	48.8	73.9	36.9	88.7	59.7	1.8	-1.4	-0.8	10.9
EU25	77.9	49.3	92.0	56.4	79.4	50.7	91.7	67.7	1.4	1.3	-0.3	11.3
FEMALES	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	60.7	32.1	78.1	27.7	65.9	32.7	81.9	47.6	5.2	0.6	3.9	19.9
BG	62.3	28.4	80.7	38.1	65.6	28.0	83.4	43.8	3.3	-0.3	2.7	5.6
CZ	61.6	26.9	80.2	35.7	68.1	26.8	80.9	63.2	6.5	-0.1	0.7	27.5
DK	76.5	69.4	85.4	55.1	79.1	71.3	85.6	67.2	2.6	1.8	0.2	12.2
DE	70.2	48.9	81.8	48.8	76.5	49.7	85.6	71.6	6.3	0.8	3.9	22.8
EE	68.8	32.5	83.7	61.4	71.4	34.6	83.9	65.1	2.6	2.1	0.2	3.7
IE	63.3	52.1	72.1	40.4	71.3	50.6	79.0	68.2	8.0	-1.6	6.9	27.8
GR	55.2	29.3	69.2	28.4	61.0	28.1	75.9	44.7	5.7	-1.2	6.7	16.3
ES	61.5	43.6	72.7	32.7	72.9	41.9	82.0	72.6	11.4	-1.7	9.2	40.0
FR	65.6	35.6	82.5	38.5	67.9	36.0	85.1	46.6	2.3	0.4	2.6	8.1
IT	50.7	25.6	64.1	23.4	56.8	26.3	67.4	50.5	6.2	0.6	3.3	27.1
CY	64.7	41.0	78.7	41.5	73.2	39.8	88.2	55.3	8.4	-1.3	9.5	13.8
LV	68.3	36.8	83.5	54.9	70.4	38.5	83.6	56.0	2.1	1.7	0.1	1.1
LT	65.2	23.6	84.2	49.6	66.9	24.9	82.5	55.0	1.8	1.3	-1.7	5.4
LU	57.9	23.7	73.5	27.7	61.4	25.8	77.4	44.4	3.5	2.1	3.9	16.7
HU	55.0	22.1	73.2	26.9	60.7	21.9	76.2	46.8	5.7	-0.2	3.0	19.9
MT	39.9	52.7	44.5	13.3	45.1	53.7	49.3	27.4	5.2	1.1	4.8	14.1
NL	72.4	72.4	81.2	41.8	78.0	73.5	87.1	55.9	5.6	1.2	5.9	14.1
AT	68.0	57.2	81.1	29.3	73.1	59.2	84.9	50.3	5.1	2.0	3.9	21.0
PL	56.6	30.0	75.6	20.8	60.9	29.3	78.4	35.4	4.3	-0.7	2.8	14.7
PT	68.9	39.0	82.9	46.9	73.5	38.2	86.4	65.0	4.6	-0.8	3.5	18.1
RO	56.0	25.2	72.0	33.8	56.1	25.5	70.8	38.4	0.1	0.3	-1.2	4.6
SI	66.7	35.1	87.3	22.8	69.5	34.9	86.2	48.6	2.8	-0.2	-1.0	25.8
SK	61.2	30.6	81.1	23.8	66.1	29.6	81.9	49.1	4.9	-1.0	0.8	25.3
FI	74.1	53.6	85.6	59.4	78.1	55.1	88.3	68.9	4.0	1.5	2.7	9.5
SE	76.8	52.2	87.1	69.8	80.8	57.0	90.8	71.7	4.0	4.9	3.7	1.9
UK	69.0	59.0	77.6	50.4	74.4	59.5	80.6	68.9	5.4	0.4	3.0	18.5
NO	75.9	60.0	83.9	64.8	77.3	61.6	86.5	64.1	1.4	1.6	2.6	-0.7
EU27	63.4	41.0	76.9	38.2	69.4	42.9	80.8	58.1	5.9	2.0	4.0	19.9
EA	63.2	41.7	76.3	36.4	69.5	41.0	81.5	58.8	6.3	-0.7	5.2	22.4
EA12	63.2	41.8	76.2	36.6	69.5	41.0	81.5	58.9	6.3	-0.7	5.2	22.4
EU15	64.5	45.3	76.7	39.8	70.8	45.5	81.6	61.1	6.3	0.2	4.9	21.3
EU10	58.5	29.6	77.3	26.6	64.0	28.6	80.1	45.1	5.5	-1.0	2.8	18.6
EU25	63.5	42.4	76.8	37.6	70.0	43.6	81.4	59.0	6.5	1.3	4.6	21.5

Source: Commission services, EPC.

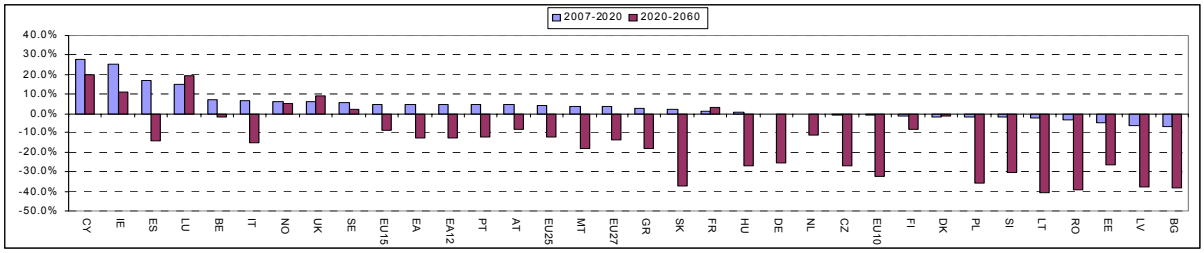
2.4.2. Projection of labour supply

The labour force over the next 50 years is projected by combining the projections of population and of rates of participation by gender/ age group. To sum up the outcome of the baseline scenario, the overall labour force (aged 15 to 71) in the EU27 is projected to increase by 3.7% from 2007 to 2020. In terms of people, this means an increase in labour force of roughly 8.6 millions. In the euro area, an increase of almost 5% is projected (see Table 2. 8 and Graph 2. 4).

The increase in labour supply over the period 2007 to 2020 is mainly due to the increase in female labour supply, while the male labour force is projected to remain substantially unchanged. However, the positive trend in female labour supply is projected to reverse during the period 2020-2060 and, along with the drop in male labour supply, the overall labour force is expected to decrease by as much as 13.6%, equivalent to around 33 million of people (24.4 million if compared with the level in 2007) in the EU. In the euro area, the projected fall in labour supply between 2020 and 2060 is 12.6%, which translates into 20.4 million people (13 million if compared with the level in 2007).

In the first part of the projection (2007 to 2020), a majority of EU countries (excluding DK, NL, FI, CZ, EE, LT, LV, PL, SI, BG, RO), are projected to record an increase in labour supply (see Graph 2. 4). This trend is projected to reverse in the second part of the projection period (2020 to 2060), when most countries are projected to record a decrease, except for CY (+19.8%), LU(+19.5%), IE (+11%), FR (+3.1%) SE (+2.2%) and the UK (+9.2%). As already mentioned, the projected negative labour force growth over the period 2020-2060 in the EU is to be ascribed almost exclusively to negative demographic developments, given that the participation rates over the period 2020-2060 are projected to continue to increase, albeit at a lower pace than during 2007-2020.

Graph 2. 4 - Labour force projections, 2007-2060 (percentage change of total people aged 15 to 64)



Source: Commission services, EPC.

2.4.3. Decomposing the population composition effect and the participation effect on labour supply

Table 2. 9 and Table 2. 10 show a decomposition of projected changes of the aggregate participation rate and the overall labour force over the period 2007 to 2060, in order to identify the respective influences of projected changes in participation rates and working-age population, focusing on both age and gender dimensions. The negative effect of the population composition on the overall participation rate (the population effect is negative in all EU Member States), is very clear and is caused by projected developments in the prime–age population to a great extent. The participation effect, due to changes in the participation rates of specific cohorts, is generally positive. The participation effect is moderately negative for the young in some countries, notably Greece, Spain, Ireland, Italy and Portugal.

Table 2. 8 - Labour supply projections, 2007-2060 (age group: 15 to 64)

	Males					Females					Total						
	Number of persons ('000)			Annual growth rate		Number of persons ('000)			Annual growth rate		Number of persons ('000)			Annual growth rate		% change	
	2007	2020	2060	2007-2020	2020-2060	2007	2020	2060	2007-2020	2020-2060	2007	2020	2060	2007-2020	2020-2060	2007-2020	2020-2060
BE	2593	2693	2655	0.29%	-0.04%	2105	2343	2305	0.83%	-0.04%	4698	5036	4960	0.53%	-0.04%	7.2%	-1.5%
BG	1890	1745	1092	-0.61%	-1.17%	1667	1559	953	-0.51%	-1.22%	3557	3304	2045	-0.57%	-1.19%	-7.1%	-38.1%
CZ	2884	2811	2060	-0.20%	-0.77%	2242	2264	1743	0.08%	-0.65%	5126	5075	3803	-0.08%	-0.72%	-1.0%	-25.1%
DK	1525	1481	1462	-0.23%	-0.03%	1363	1364	1347	0.01%	-0.03%	2888	2845	2808	-0.12%	-0.03%	-1.5%	-1.3%
DE	22674	22373	16354	-0.10%	-0.78%	18916	19257	14686	0.14%	-0.68%	41590	41630	31040	0.01%	-0.73%	0.1%	-25.4%
EE	340	326	245	-0.31%	-0.71%	326	310	221	-0.39%	-0.83%	666	636	467	-0.35%	-0.77%	-4.5%	-26.6%
IE	1217	1467	1609	1.45%	0.23%	927	1217	1371	2.12%	0.30%	2144	2684	2980	1.74%	0.26%	25.2%	11.0%
GR	2987	2971	2391	-0.04%	-0.54%	2050	2204	1848	0.56%	-0.44%	5036	5175	4240	0.21%	-0.50%	2.8%	-18.1%
ES	12618	14023	11769	0.82%	-0.44%	9295	11622	10208	1.73%	-0.32%	21913	25645	21978	1.22%	-0.39%	17.0%	-14.3%
FR	14995	15084	15773	0.05%	0.11%	13229	13532	13730	0.17%	0.04%	28224	28615	29503	0.11%	0.08%	1.4%	3.1%
IT	14554	15133	13100	0.30%	-0.36%	9882	10943	9054	0.79%	-0.47%	24435	26076	22154	0.50%	-0.41%	6.7%	-15.0%
CY	218	270	325	1.67%	0.46%	178	236	281	2.19%	0.44%	396	506	606	1.91%	0.45%	27.8%	19.8%
LV	592	550	351	-0.55%	-1.12%	555	521	314	-0.49%	-1.25%	1147	1071	666	-0.52%	-1.18%	-6.6%	-37.8%
LT	799	772	462	-0.26%	-1.27%	781	775	456	-0.06%	-1.32%	1580	1547	918	-0.16%	-1.30%	-2.0%	-40.7%
LU	122	135	161	0.76%	0.44%	92	112	134	1.52%	0.45%	214	246	295	1.10%	0.45%	15.2%	19.5%
HU	2341	2317	1686	-0.08%	-0.79%	1938	1991	1452	0.21%	-0.79%	4279	4308	3138	0.05%	-0.79%	0.7%	-27.1%
MT	113	115	94	0.14%	-0.50%	56	60	49	0.58%	-0.50%	169	175	143	0.29%	-0.50%	3.8%	-18.3%
NL	4720	4542	4038	-0.29%	-0.29%	3958	4119	3653	0.31%	-0.30%	8678	8662	7691	-0.01%	-0.30%	-0.2%	-11.2%
AT	2291	2347	2150	0.18%	-0.22%	1901	2046	1864	0.57%	-0.23%	4192	4393	4014	0.36%	-0.23%	4.8%	-8.6%
PL	9404	9117	5926	-0.24%	-1.07%	7681	7706	4902	0.02%	-1.12%	17085	16823	10828	-0.12%	-1.10%	-1.5%	-35.6%
PT	2798	2886	2539	0.24%	-0.32%	2485	2652	2305	0.50%	-0.35%	5283	5538	4844	0.36%	-0.33%	4.8%	-12.5%
RO	5254	5016	3052	-0.36%	-1.23%	4224	4156	2503	-0.13%	-1.26%	9478	9172	5554	-0.25%	-1.25%	-3.2%	-39.4%
SI	545	524	358	-0.31%	-0.95%	461	464	330	0.05%	-0.85%	1006	988	688	-0.14%	-0.90%	-1.8%	-30.4%
SK	1480	1482	924	0.01%	-1.17%	1193	1249	784	0.35%	-1.16%	2673	2731	1708	0.16%	-1.17%	2.2%	-37.5%
FI	1374	1349	1245	-0.14%	-0.20%	1286	1279	1168	-0.04%	-0.23%	2660	2628	2412	-0.09%	-0.21%	-1.2%	-8.2%
SE	2477	2617	2666	0.43%	0.05%	2260	2384	2443	0.41%	0.06%	4737	5001	5109	0.42%	0.05%	5.6%	2.2%
UK	16551	17208	18886	0.30%	0.23%	13985	15219	16523	0.65%	0.21%	30536	32427	35409	0.46%	0.22%	6.2%	9.2%
NO	1281	1346	1391	0.38%	0.08%	1154	1245	1333	0.58%	0.17%	2436	2591	2724	0.48%	0.13%	6.4%	5.1%
EU27	129354	131353	113374	0.12%	-0.37%	105034	111584	96628	0.47%	-0.36%	234388	242937	210003	0.28%	-0.36%	3.6%	-13.6%
EA	83819	85911	74561	0.19%	-0.35%	66819	72086	62987	0.59%	-0.34%	150638	157997	137548	0.37%	-0.35%	4.9%	-12.9%
EA12	82943	85002	73784	0.19%	-0.35%	66125	71326	62327	0.58%	-0.34%	149067	156328	136112	0.37%	-0.35%	4.9%	-12.9%
EU15	103495	106307	96798	0.21%	-0.23%	83733	90293	82640	0.58%	-0.22%	187228	196601	179438	0.38%	-0.23%	5.0%	-8.7%
EU10	18715	18285	12433	-0.18%	-0.96%	15410	15575	10532	0.08%	-0.97%	34125	33860	22965	-0.06%	-0.97%	-0.8%	-32.2%
EU25	122210	124592	109231	0.15%	-0.33%	99143	105868	93172	0.51%	-0.32%	221353	230460	202403	0.31%	-0.32%	4.1%	-12.2%

Source: Commission services, EPC.

Table 2. 9 - Contribution to the overall change in participation rates, 2007-2060 (changes in %)*

	Participation	Total change	Contribution of group-specific changes in participation rates to change in overall participation rate												Demographic effect						Interaction
		in	Total	Young	Prime age	Older	Male	Young	Prime age	Older	Female	Young	Prime age	Older	Total	Young	Prime age	Older	Male	Female	
	rates in 2060	participation rates (%)																			effect
BE	69.7	2.4	3.3	0.2	0.9	2.3	0.3	0.2	-0.4	0.5	3.1	0.1	1.2	1.8	-1.2	0.1	-2.1	0.8	0.4	-0.3	0.2
BG	69.3	2.4	1.8	0.0	1.3	0.7	0.4	0.0	0.4	0.0	1.4	0.0	0.8	0.6	0.5	-0.7	0.3	0.8	0.7	-0.7	0.1
CZ	73.5	3.6	3.1	0.0	-0.5	3.6	0.1	0.0	-0.7	0.8	3.0	0.0	0.2	2.8	0.3	-0.4	0.2	0.6	0.1	-0.1	0.2
DK	80.8	0.6	0.8	0.3	-1.1	1.6	-0.6	0.1	-1.2	0.4	1.4	0.2	0.1	1.2	-0.3	1.4	-1.7	0.0	0.5	-0.4	0.1
DE	79.8	3.6	4.0	0.1	1.0	2.9	0.7	0.1	-0.2	0.9	3.3	0.1	1.2	2.0	-1.2	-0.5	-3.7	3.0	0.0	0.0	0.8
EE	74.5	1.6	0.1	0.3	-0.4	0.3	-0.5	0.1	-0.6	0.0	0.7	0.2	0.1	0.3	1.5	-1.6	1.7	1.3	1.8	-1.6	0.0
IE	76.3	3.9	4.0	-0.3	2.4	2.0	0.0	-0.2	0.2	0.0	4.0	-0.2	2.2	2.0	-0.7	-0.8	-2.0	2.1	0.2	-0.2	0.5
GR	68.8	1.7	3.0	0.0	1.8	1.3	-0.5	0.1	-0.3	-0.2	3.5	-0.1	2.2	1.4	-1.6	0.1	-3.4	1.7	0.2	-0.1	0.2
ES	77.3	5.7	6.9	-0.3	3.1	4.1	0.8	-0.1	0.0	0.9	6.1	-0.1	3.1	3.2	-2.2	0.6	-5.2	2.4	0.1	-0.1	1.0
FR	71.6	1.3	2.0	0.2	0.4	1.5	0.4	0.1	-0.5	0.7	1.6	0.0	0.8	0.7	-0.9	0.2	-1.6	0.5	0.9	-0.8	0.1
IT	67.7	5.1	5.8	0.2	0.8	5.2	2.2	0.1	-0.5	2.5	3.7	0.0	1.1	2.5	-2.2	0.3	-4.0	1.4	1.0	-0.7	1.1
CY	78.0	5.1	4.0	-0.2	3.2	1.1	0.0	0.0	0.1	0.0	3.9	-0.1	3.0	1.1	0.7	-2.0	0.2	2.4	1.0	-0.8	0.4
LV	74.2	1.3	-0.2	0.2	0.1	-0.4	-0.5	-0.1	0.0	-0.5	0.3	0.2	0.0	0.1	1.5	-2.4	1.8	2.1	1.5	-1.3	-0.1
LT	68.2	0.1	-1.4	0.2	-1.4	-0.2	-1.5	0.0	-0.9	-0.7	0.1	0.1	-0.5	0.5	1.7	-1.8	-0.2	3.7	0.8	-0.7	-0.1
LU	66.8	0.4	2.9	0.4	1.3	1.3	0.2	0.2	0.0	0.0	2.7	0.2	1.3	1.3	-2.8	0.4	-4.5	1.4	-0.1	0.1	0.3
HU	65.0	3.2	3.3	0.0	0.7	2.7	0.4	0.0	-0.4	0.7	2.9	0.0	1.0	2.0	-0.7	-0.4	-1.4	1.2	0.9	-0.7	0.5
MT	64.4	4.9	4.8	0.1	1.1	3.6	1.9	0.0	-0.3	2.1	2.9	0.1	1.4	1.4	-0.5	-2.2	0.8	0.9	0.1	-0.1	0.5
NL	80.2	1.6	2.5	0.2	1.6	0.8	-0.7	0.1	-0.3	-0.5	3.3	0.1	1.9	1.3	-1.0	0.3	-2.8	1.5	0.6	-0.5	0.0
AT	77.6	2.8	4.0	0.3	1.2	2.5	0.8	0.1	-0.1	0.7	3.2	0.2	1.3	1.8	-1.9	-0.4	-3.2	1.7	0.5	-0.4	0.6
PL	66.3	3.0	2.0	-0.2	0.2	2.2	0.0	-0.2	-0.7	0.9	2.0	-0.1	0.9	1.2	-0.2	-2.2	-0.2	2.1	0.7	-0.6	1.0
PT	76.3	2.2	2.8	-0.1	0.8	2.3	0.1	-0.1	-0.4	0.6	2.7	-0.1	1.2	1.6	-1.3	-0.3	-3.6	2.7	0.9	-0.8	0.6
RO	61.3	-1.7	-2.0	0.1	-2.4	0.5	-2.0	0.1	-2.1	0.0	0.0	0.0	-0.4	0.4	-0.2	-1.6	-1.6	3.0	0.6	-0.5	0.3
SI	71.9	0.6	1.9	-0.1	-0.4	2.5	0.1	-0.1	-0.1	0.3	1.8	0.0	-0.3	2.2	-1.9	-0.2	-3.1	1.3	-0.5	0.4	0.6
SK	71.2	2.4	1.8	-0.1	0.0	2.0	-0.4	0.0	-0.3	-0.1	2.2	-0.1	0.2	2.1	-0.6	-2.1	-1.5	3.0	0.6	-0.5	1.0
FI	79.1	3.3	3.2	0.2	1.3	1.7	1.2	0.1	0.4	0.7	1.9	0.1	0.8	1.0	0.2	0.1	0.6	-0.5	0.3	-0.3	-0.1
SE	82.5	3.3	2.9	0.9	1.3	0.7	1.2	0.5	0.2	0.5	1.7	0.5	1.1	0.2	0.4	-0.1	2.0	-1.5	0.3	-0.3	0.0
UK	78.7	3.1	2.9	0.1	0.8	2.0	0.2	0.0	-0.2	0.4	2.7	0.0	0.9	1.7	0.1	-0.7	0.4	0.4	0.7	-0.6	0.1
NO	78.0	-0.9	-0.4	0.3	0.0	-0.8	-1.3	0.2	-0.8	-0.7	0.9	0.2	0.8	-0.1	-0.4	0.2	-1.6	1.1	-0.1	0.1	-0.1
EU27	74.1	3.5	3.9	0.4	1.0	2.6	0.7	0.2	-0.3	0.8	3.2	0.2	1.3	1.8	-0.9	-0.4	-2.2	1.6	0.6	-0.5	0.4
EA	74.5	3.6	4.6	-0.1	1.6	3.1	1.0	0.0	-0.1	1.1	3.6	-0.1	1.7	2.0	-1.5	0.1	-3.3	1.6	0.5	-0.4	0.5
EA12	74.5	3.6	4.6	-0.1	1.6	3.1	1.0	0.0	-0.1	1.1	3.6	-0.1	1.7	2.0	-1.5	0.2	-3.3	1.6	0.5	-0.4	0.5
EU15	75.6	3.7	4.4	0.1	1.5	2.9	0.9	0.0	-0.1	1.0	3.5	0.0	1.6	1.9	-1.1	0.1	-2.6	1.4	0.5	-0.4	0.4
EU10	69.0	3.7	2.8	-0.3	0.6	2.5	0.4	-0.1	-0.3	0.8	2.4	-0.1	0.9	1.6	-0.1	-1.6	-0.3	1.9	0.7	-0.5	0.8
EU25	74.8	4.0	4.5	0.2	1.4	2.9	1.0	0.1	-0.1	1.0	3.5	0.1	1.5	1.9	-1.0	-0.3	-2.2	1.5	0.6	-0.4	0.5

Source: Commission services, EPC.

** (age group: 15 to 64), 'young' refers to the age group 15-24, 'prime-age' to 25-54, 'older' to 55-64. The interaction effect is the residual remaining after the decomposition was made (see Carone (2005) for a further discussion of this decomposition.*

Table 2. 10 - Contribution to the overall change in labour force, 2007-2060 (changes 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	4960	5.6	5.0	0.3	1.3	3.4	0.4	0.2	-0.6	0.7	4.5	0.1	1.8	2.6	0.1	0.4	-1.6	1.3	1.7	0.4	0.5
BG	2045	-42.5	2.7	-0.1	1.9	1.0	0.7	0.0	0.6	0.1	2.1	0.0	1.2	0.9	-44.2	-4.7	-34.2	-5.3	-23.0	-21.4	-1.2
CZ	3803	-25.8	4.4	0.0	-0.8	5.2	0.1	0.0	-1.0	1.1	4.3	0.0	0.3	4.0	-29.1	-2.9	-22.8	-3.4	-16.4	-13.0	-1.1
DK	2808	-2.8	1.0	0.4	-1.4	2.0	-0.8	0.2	-1.4	0.5	1.8	0.2	0.1	1.5	-3.8	1.2	-4.4	-0.6	-1.3	-2.1	0.0
DE	31040	-25.4	5.3	0.2	1.4	3.7	1.0	0.1	-0.3	1.1	4.3	0.1	1.6	2.6	-29.9	-3.9	-25.0	-0.9	-15.6	-13.1	-0.8
EE	467	-29.9	0.1	0.5	-0.6	0.4	-0.8	0.1	-0.8	-0.1	0.9	0.3	0.1	0.5	-30.0	-5.3	-21.7	-3.1	-14.4	-16.9	-0.1
IE	2980	39.0	5.5	-0.4	3.3	2.7	0.0	-0.2	0.2	0.0	5.5	-0.2	3.0	2.7	30.8	3.9	19.6	7.3	18.6	13.5	2.6
GR	4240	-15.8	4.5	0.0	2.7	1.9	-0.7	0.1	-0.5	-0.3	5.2	-0.2	3.2	2.1	-19.8	-1.4	-18.5	0.1	-10.4	-7.4	-0.6
ES	21978	0.3	9.7	-0.4	4.3	5.7	1.1	-0.2	0.0	1.3	8.6	-0.2	4.3	4.5	-10.0	0.0	-12.4	2.4	-4.0	-3.1	0.6
FR	29503	4.5	2.8	0.2	0.6	2.1	0.5	0.2	-0.7	1.1	2.3	0.1	1.2	1.0	1.4	0.6	-0.2	1.0	2.7	0.1	0.2
IT	22154	-9.3	9.3	0.3	1.3	8.3	3.5	0.2	-0.8	4.1	5.8	0.1	1.7	4.1	-19.1	-0.9	-18.5	0.3	-8.3	-7.4	-0.1
CY	606	53.1	5.5	-0.2	4.3	1.5	0.1	-0.1	0.1	0.0	5.4	-0.2	4.1	1.5	44.3	1.9	32.5	9.9	25.6	17.8	3.1
LV	666	-41.9	-0.3	0.2	0.2	-0.5	-0.7	-0.1	0.0	-0.7	0.4	0.3	0.0	0.1	-41.8	-7.7	-30.0	-4.1	-21.0	-21.8	0.0
LT	918	-41.9	-2.1	0.3	-2.1	-0.3	-2.2	0.1	-1.3	-1.0	0.1	0.2	-0.8	0.7	-40.5	-5.5	-32.9	-2.1	-20.5	-21.3	0.8
LU	295	37.7	4.4	0.6	1.9	1.9	0.3	0.3	0.0	0.0	4.1	0.3	2.0	1.9	31.1	3.4	22.1	5.6	20.8	16.1	2.2
HU	3138	-26.7	5.4	0.0	1.1	4.4	0.7	0.1	-0.6	1.2	4.7	0.0	1.6	3.2	-31.1	-2.9	-26.5	-1.7	-15.6	-14.5	-1.1
MT	143	-15.1	8.0	0.2	1.9	6.1	3.2	0.0	-0.4	3.6	4.9	0.2	2.4	2.3	-22.3	-7.1	-14.2	-1.0	-14.3	-7.2	-1.1
NL	7691	-11.4	3.2	0.2	2.0	1.0	-0.9	0.1	-0.4	-0.7	4.2	0.1	2.4	1.6	-14.2	-1.9	-12.4	0.1	-6.5	-6.5	-0.4
AT	4014	-4.2	5.4	0.4	1.6	3.4	1.1	0.2	-0.1	1.0	4.3	0.2	1.7	2.4	-10.0	-1.7	-9.8	1.5	-3.6	-4.0	0.3
PL	10828	-36.6	3.2	-0.4	0.3	3.5	0.0	-0.2	-1.2	1.4	3.2	-0.1	1.4	1.9	-39.7	-6.9	-31.7	-1.1	-21.0	-18.3	-0.4
PT	4844	-8.3	3.8	-0.2	1.1	3.1	0.2	-0.1	-0.6	0.8	3.7	-0.1	1.6	2.2	-12.5	-1.5	-12.9	1.8	-4.7	-6.2	0.3
RO	5554	-41.4	-3.1	0.2	-3.9	0.7	-3.2	0.1	-3.4	0.1	0.1	0.1	-0.6	0.6	-39.9	-5.6	-33.1	-1.2	-21.4	-18.2	1.4
SI	688	-31.6	2.7	-0.2	-0.6	3.4	0.1	-0.2	-0.1	0.4	2.6	0.0	-0.4	3.1	-34.0	-3.5	-29.1	-1.3	-17.9	-14.3	-0.3
SK	1708	-36.1	2.6	-0.1	-0.1	2.9	-0.5	0.0	-0.5	-0.1	3.2	-0.2	0.3	3.0	-38.8	-6.0	-32.1	-0.6	-20.6	-17.5	-0.1
FI	2412	-9.3	4.2	0.3	1.7	2.2	1.6	0.1	0.6	0.9	2.5	0.2	1.1	1.3	-12.9	-1.6	-8.5	-2.7	-6.4	-6.7	-0.6
SE	5109	7.9	3.7	1.2	1.7	0.9	1.5	0.6	0.3	0.6	2.2	0.6	1.4	0.2	4.1	0.3	5.0	-1.3	2.2	1.3	0.1
UK	35409	16.0	3.8	0.1	1.1	2.7	0.2	0.0	-0.3	0.5	3.5	0.1	1.3	2.2	11.5	0.8	8.5	2.2	7.2	4.4	0.6
NO	2724	11.9	-0.5	0.4	0.0	-1.0	-1.7	0.2	-1.0	-0.9	1.1	0.2	1.0	-0.1	12.6	2.1	6.8	3.7	6.7	6.4	-0.2
EU27	210003	-10.4	5.5	0.5	1.4	3.7	1.0	0.3	-0.4	1.1	4.5	0.3	1.8	2.5	-15.8	-2.2	-13.8	0.2	-7.4	-7.1	-0.3
EA	137548	-8.7	6.4	-0.1	2.3	4.3	1.4	0.0	-0.1	1.5	5.0	-0.1	2.4	2.8	-14.4	-1.2	-13.8	0.6	-6.4	-6.0	-0.2
EA12	136112	-8.7	6.4	-0.1	2.3	4.3	1.4	0.0	-0.1	1.5	5.1	-0.1	2.4	2.8	-14.4	-1.2	-13.8	0.6	-6.4	-6.0	-0.2
EU15	179438	-4.2	6.0	0.1	2.1	4.0	1.2	0.1	-0.2	1.3	4.8	0.0	2.2	2.6	-9.7	-0.9	-9.6	0.8	-3.9	-4.2	0.0
EU10	22965	-32.7	4.3	-0.4	1.0	3.9	0.6	-0.2	-0.4	1.3	3.7	-0.2	1.3	2.5	-35.7	-5.5	-28.7	-1.4	-18.8	-16.6	-0.8
EU25	202403	-8.6	6.3	0.3	2.0	4.1	1.4	0.2	-0.1	1.3	4.9	0.2	2.1	2.7	-14.1	-1.9	-12.6	0.4	-6.4	-6.3	-0.2

Source: Commission services, EPC.

** (age group: 15 to 64), 'young' refers to the age group 15-24, 'prime-age' to 25-54, 'older' to 55-64. The interaction effect is the residual remaining after the decomposition was made (see Carone (2005) for a further discussion of this decomposition.*

2.5. Assumptions on structural unemployment

The calculation of the NAIRU was used as a proxy for a projection of the structural unemployment rate under the "*no policy change*" scenario. As a general rule, the unemployment rates converge to the estimated EU15 NAIRU in 2009 (6.2%), based on the Spring 2008 economic forecasts by European Commission (DG ECFIN), for each country and afterwards they are kept constant at that rate. This was considered as a reasonable assumption with the advantage of ensuring consistency with other EU budgetary surveillance procedures. Indeed, these NAIRU estimates are already used for the calculation of the output gap, agreed upon by the Output Gap Working Group (OGWG) of the EPC. They are also used in the European Commission multilateral budgetary surveillance within the context of the EU fiscal framework the Stability and Growth Pact (SGP).

To avoid extrapolating forward high levels of NAIRU for countries still above the estimated medium-term EU15 average of the NAIRU (6.2%)[30] (Belgium, Germany, Greece, Spain, France, Portugal, Hungary, Malta and Slovakia), the EPC agreed that these countries should convergence to this unemployment rate in the period up to 2020.

In order to avoid that the agreed levels of the overall structural unemployment rates $\overline{UR^t}$ change over time as a result of the interaction between cohort-specific structural unemployment rates (Ur_i) and the evolution of size and composition of different age/gender cohorts, the age-specific unemployment rates (by gender) for each projection year (t) are calculated as follows:

$$Ur_{i,s}^{t} = \frac{NAIRU_{TOT}^{t} \times LF_{TOT}^{t}}{\sum_{i} Ur_{i,s}^{2007} \times LF_{i,s}^{t}} \times Ur_{i,s}^{2007}$$

This means that the age/gender specific unemployment rate structure observed in the base year (2007) is kept unchanged and that the relative adjustment of the initially observed age/sex-specific unemployment rates are the same for all ages and by gender.

Table 2. 11 shows the results of the projection. Overall, a reduction in the unemployment rate of around 1 ½ percentage points is projected (from 7.2% in 2007 to 5.7% in 2020). A fall of a similar magnitude is projected for the euro area (from 7.5% in 2007 5.9% in 2020).

[30] Based on the Spring 2008 economic forecast by the European Commission (DG ECFIN).

Table 2. 11 - Unemployment rate assumptions (age 15-64, in percentage)												
	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	*Change 2007-2020*
BE	7.5	6.8	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-1.3
BG	7.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	-2.3
CZ	5.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	-0.9
DK	3.9	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	-0.6
DE	8.7	7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-2.5
EE	4.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-1.3
IE	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	0.4
GR	8.5	7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-2.3
ES	8.3	7.5	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-2.1
FR	8.0	7.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-1.8
IT	6.2	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	-0.4
CY	4.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	-0.9
LV	6.1	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	-1.2
LT	4.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-0.9
LU	4.2	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	0.4
HU	7.4	7.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-1.2
MT	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	0.0
NL	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	-0.2
AT	4.5	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	-0.2
PL	9.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	-3.9
PT	8.5	6.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-2.3
RO	6.8	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-0.8
SI	4.9	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	-0.3
SK	11.1	8.6	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	-4.9
FI	7.0	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	-1.2
SE	6.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	-0.3
UK	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	0.0
NO	2.5	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	1.6
EU27	7.2	6.2	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	-1.5
EA	7.5	6.5	5.9	5.9	5.9	5.8	5.8	5.8	5.8	5.8	5.8	-1.6
EA12	7.5	6.5	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	-1.7
EU15	7.1	6.3	5.8	5.8	5.8	5.8	5.7	5.7	5.7	5.7	5.7	-1.3
EU10	8.3	5.8	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.4	-2.8
EU25	7.3	6.2	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	-1.5

Source: Commission services, EPC.

2.6. Employment projection

Given the population projection, the unemployment rate assumptions and the labour force projection, the overall employment rates (of people age 15 to 64) in the EU are projected to increase from 65.5% in 2007 to 69% in 2020, and to almost reach 70% in 2060, as shown in Table 2. 12. In the euro area, a similar development is projected and employment reaches 70% at the end of the projection period.

The employment rate of females is projected to rise from 58.4% in 2007 to 63.4% in 2020 and to 65.1% in 2060. The employment rate for older workers will increase even more, from 44.9% in 2007 to 54.5% in 2020 and further to 59.8% in 2060. For the euro area, the increase in the employment rate of older workers (55-64) is higher than in the EU, rising by 17.7 p.p. compared with 14.9 p.p. in the EU. The older workers employment rate in 2060 is projected to be 59.8% in the EU and 60.3% in the euro area, see Table 2. 12.

Table 2. 12 - Employment rate projections 2007-2060 (15-64)

	Total (15-64)				Females (15-64)				Older workers (55-64)			
	2007	2015	2020	2060	2007	2015	2020	2060	2007	2015	2020	2060
BE	62.3	64.7	65.4	65.4	55.5	59.6	60.8	61.4	34.6	44.2	47.1	47.4
BG	62.1	66.6	67.0	66.0	57.7	62.5	63.0	62.3	43.4	45.1	45.9	47.9
CZ	66.2	70.2	70.6	70.2	57.4	62.3	63.0	64.3	46.6	54.8	55.9	65.2
DK	77.2	77.2	77.0	78.2	73.2	74.1	74.2	76.3	59.1	59.4	60.9	67.5
DE	69.6	73.1	74.2	74.9	64.0	68.3	69.5	71.8	51.4	62.0	65.0	68.7
EE	69.4	72.8	72.8	72.0	66.0	68.6	69.5	69.3	60.2	58.8	61.0	62.2
IE	69.1	71.4	71.8	72.4	60.6	65.0	66.3	68.1	53.8	60.6	63.8	67.3
GR	61.4	64.4	65.1	64.6	48.0	52.7	54.5	55.4	42.8	45.7	47.3	50.4
ES	65.6	69.5	71.0	72.5	54.8	61.3	64.1	67.2	44.7	55.1	60.5	70.5
FR	64.7	65.6	66.4	67.2	60.0	61.5	62.4	63.4	38.9	41.0	44.3	47.4
IT	58.7	62.0	62.6	63.8	46.6	51.1	52.1	52.8	33.8	47.5	52.7	61.6
CY	69.7	74.3	75.8	75.3	61.6	68.1	70.1	70.4	55.9	59.6	61.1	63.4
LV	68.5	72.4	71.6	70.6	64.5	68.7	68.1	67.3	57.7	57.8	56.4	56.0
LT	65.1	68.1	68.5	65.8	62.3	66.2	66.8	64.6	53.4	58.1	57.6	52.6
LU	63.6	64.0	63.8	63.7	55.0	57.3	57.8	58.1	32.3	38.2	39.8	40.5
HU	57.2	60.9	62.5	61.0	50.8	55.8	57.3	56.8	32.7	44.8	45.8	47.8
MT	55.8	57.4	59.1	60.4	37.0	39.8	40.8	41.6	30.5	30.9	36.6	48.0
NL	76.1	77.0	77.1	77.8	69.7	73.0	73.7	75.3	51.4	53.5	54.3	55.7
AT	71.5	72.6	72.7	74.3	64.5	67.2	67.7	69.6	38.8	44.4	48.3	54.0
PL	57.1	61.3	62.2	62.4	50.6	55.1	56.5	57.0	29.9	34.0	33.5	44.6
PT	67.8	70.8	71.4	71.6	61.9	66.2	67.5	68.2	51.0	57.8	60.5	64.5
RO	58.7	60.9	61.0	57.6	52.8	55.3	55.8	53.3	41.4	45.4	46.2	44.5
SI	67.8	69.1	69.9	68.6	62.7	65.8	66.8	65.6	33.4	41.6	47.4	47.8
SK	61.2	65.6	68.4	66.8	53.4	58.8	62.0	61.5	36.2	46.4	48.0	50.4
FI	70.5	72.5	73.8	74.6	68.8	70.7	72.4	73.4	55.6	58.8	63.2	64.3
SE	74.3	77.0	77.3	77.6	71.8	74.6	74.8	75.7	70.3	72.1	72.5	73.7
UK	71.5	72.7	73.0	74.4	65.5	67.9	68.5	70.7	57.8	60.6	62.0	68.9
NO	76.8	75.1	75.1	74.8	74.1	73.2	73.5	74.2	69.2	65.7	65.4	64.6
EU27	65.5	68.2	69.0	69.9	58.4	62.2	63.4	65.1	44.9	51.3	54.5	60.0
EA	65.5	68.6	69.5	70.1	57.8	62.0	63.4	64.9	42.6	51.2	54.8	60.3
EA12	65.5	68.6	69.5	70.1	57.8	62.0	63.4	64.9	42.6	51.2	54.9	60.3
EU15	66.7	69.5	70.3	71.2	59.4	63.4	64.6	66.4	45.9	53.0	56.2	62.3
EU10	59.9	64.4	65.6	65.2	53.3	58.4	59.9	60.2	34.8	41.8	43.0	50.4
EU25	65.6	68.7	69.5	70.5	58.4	62.6	63.8	65.7	44.1	51.2	54.3	60.7

Source: Commission services, EPC.

Table 2. 13 - Employment projections, 2007-2060 (15-64)

	Persons (in thousands)			Changes (in thousands)			Changes (in %)			Annual growth rate	
	2007	2020	2060	2007-2020	2020-2060	2007-2060	2007-2020	2020-2060	2007-2060	2007-2020	2020-2060
BE	4346	4723	4652	378	-71	307	8.7	-1.5	7.1	0.64	-0.04
BG	3307	3148	1949	-160	-1199	-1359	-4.8	-38.1	-41.1	-0.38	-1.19
CZ	4850	4846	3632	-4	-1214	-1218	-0.1	-25.1	-25.1	-0.01	-0.72
DK	2777	2752	2717	-24	-35	-59	-0.9	-1.3	-2.1	-0.07	-0.03
DE	37971	39049	29116	1077	-9933	-8856	2.8	-25.4	-23.3	0.22	-0.73
EE	634	614	451	-20	-163	-183	-3.1	-26.6	-28.9	-0.24	-0.77
IE	2044	2548	2829	505	281	786	24.7	11.0	38.4	1.71	0.26
GR	4606	4854	3977	248	-877	-629	5.4	-18.1	-13.7	0.40	-0.50
ES	20089	24055	20615	3966	-3440	526	19.7	-14.3	2.6	1.40	-0.39
FR	25966	26841	27674	875	833	1708	3.4	3.1	6.6	0.26	0.08
IT	22925	24576	20880	1651	-3696	-2045	7.2	-15.0	-8.9	0.54	-0.41
CY	379	489	585	110	97	207	29.0	19.8	54.5	1.98	0.45
LV	1077	1019	633	-57	-386	-443	-5.3	-37.8	-41.2	-0.42	-1.18
LT	1510	1493	886	-17	-607	-624	-1.1	-40.7	-41.3	-0.09	-1.30
LU	205	235	281	30	46	76	14.8	19.5	37.1	1.07	0.45
HU	3962	4041	2944	79	-1097	-1018	2.0	-27.1	-25.7	0.15	-0.79
MT	158	164	134	6	-30	-24	3.9	-18.3	-15.1	0.29	-0.50
NL	8400	8401	7460	1	-941	-939	0.0	-11.2	-11.2	0.00	-0.30
AT	4004	4205	3842	201	-363	-162	5.0	-8.6	-4.0	0.38	-0.23
PL	15407	15834	10191	427	-5642	-5215	2.8	-35.6	-33.9	0.21	-1.10
PT	4835	5195	4544	360	-651	-291	7.4	-12.5	-6.0	0.55	-0.33
RO	8837	8624	5222	-213	-3402	-3615	-2.4	-39.4	-40.9	-0.19	-1.25
SI	956	941	656	-15	-286	-300	-1.5	-30.4	-31.4	-0.12	-0.90
SK	2376	2562	1602	186	-960	-774	7.8	-37.5	-32.6	0.58	-1.17
FI	2474	2476	2273	2	-203	-201	0.1	-8.2	-8.1	0.01	-0.21
SE	4444	4704	4805	261	101	362	5.9	2.2	8.1	0.44	0.05
UK	28875	30666	33486	1791	2820	4611	6.2	9.2	16.0	0.46	0.22
NO	2374	2484	2612	110	127	237	4.6	5.1	10.0	0.35	0.13
EU27	217411	229055	198036	11644	-31018	-19375	5.4	-13.5	-8.9	0.40	-0.36
EA	139357	148753	129518	9396	-19235	-9839	6.7	-12.9	-7.1	0.50	-0.35
EA12	137864	147158	128143	9294	-19015	-9721	6.7	-12.9	-7.1	0.50	-0.35
EU15	173959	185281	169152	11322	-16129	-4807	6.5	-8.7	-2.8	0.49	-0.23
EU10	31308	32002	21714	695	-10289	-9594	2.2	-32.1	-30.6	0.17	-0.96
EU25	205266	217283	190865	12017	-26418	-14401	5.9	-12.2	-7.0	0.44	-0.32

Source: Commission services, EPC.

Table 2. 14 - Employment rate projections by age and sex, 2007-2060 (15-64)

	2007				2060				change 2007-2060			
TOTAL	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	62.3	27.9	79.7	34.6	65.4	30.1	81.9	47.4	3.1	2.2	2.2	12.7
BG	62.1	27.3	78.8	43.4	66.0	28.5	82.5	47.9	3.9	1.2	3.6	4.5
CZ	66.2	28.6	83.4	46.6	70.2	29.0	83.2	65.2	4.0	0.4	-0.2	18.5
DK	77.2	65.2	86.3	59.1	78.2	67.9	85.0	67.5	1.0	2.7	-1.3	8.4
DE	69.6	45.4	80.9	51.4	74.9	47.9	84.5	68.7	5.3	2.5	3.5	17.3
EE	69.4	34.7	84.7	60.2	72.0	37.2	85.1	62.2	2.6	2.5	0.3	2.0
IE	69.1	50.4	78.7	53.8	72.4	48.1	81.9	67.3	3.4	-2.2	3.2	13.5
GR	61.4	25.3	75.7	42.8	64.6	27.0	80.0	50.4	3.1	1.6	4.3	7.6
ES	65.6	39.5	76.8	44.7	72.5	40.1	82.7	70.5	6.9	0.6	5.8	25.8
FR	64.7	32.1	82.2	38.9	67.2	34.4	84.1	47.4	2.5	2.3	1.9	8.5
IT	58.7	24.9	73.5	33.8	63.8	25.7	74.8	61.6	5.0	0.9	1.3	27.7
CY	69.7	39.5	83.8	55.9	75.3	39.4	89.1	63.4	5.6	-0.1	5.4	7.6
LV	68.5	38.9	82.3	57.7	70.6	40.4	83.3	56.0	2.1	1.4	1.0	-1.7
LT	65.1	26.0	82.5	53.4	65.8	27.1	80.9	52.6	0.6	1.1	-1.6	-0.8
LU	63.6	23.2	81.2	32.3	63.7	24.8	82.8	40.5	0.1	1.5	1.6	8.2
HU	57.2	21.4	74.6	32.7	61.0	22.0	76.2	47.8	3.8	0.6	1.6	15.1
MT	55.8	48.3	66.5	30.5	60.4	48.6	68.1	48.0	4.6	0.3	1.6	17.6
NL	76.1	68.4	85.5	51.4	77.8	69.8	88.0	55.7	1.7	1.4	2.6	4.3
AT	71.5	56.2	84.1	38.8	74.3	57.9	85.9	54.0	2.8	1.7	1.8	15.1
PL	57.1	26.7	75.0	29.9	62.4	28.3	77.7	44.6	5.3	1.6	2.7	14.7
PT	67.8	35.3	81.0	51.0	71.6	36.3	83.9	64.5	3.8	1.0	2.9	13.6
RO	58.7	24.5	74.5	41.4	57.6	25.3	71.0	44.5	-1.1	0.7	-3.5	3.2
SI	67.8	36.8	85.3	33.4	68.6	36.0	84.8	47.8	0.7	-0.7	-0.5	14.4
SK	61.2	27.8	78.6	36.2	66.8	30.3	82.2	50.4	5.6	2.5	3.6	14.2
FI	70.5	45.4	83.4	55.6	74.6	47.8	86.1	64.3	4.0	2.4	2.7	8.7
SE	74.3	41.9	86.1	70.3	77.6	46.5	88.3	73.7	3.3	4.7	2.2	3.4
UK	71.5	53.1	81.4	57.8	74.4	53.1	82.5	68.9	2.9	0.0	1.1	11.1
NO	76.8	54.5	85.8	69.2	74.8	53.4	84.7	64.6	-2.1	-1.1	-1.0	-4.6
EU27	65.5	37.7	79.2	44.9	69.9	40.5	81.8	60.0	4.4	2.8	2.6	15.1
EA	65.5	38.6	79.0	42.6	70.1	39.3	82.6	60.3	4.6	0.7	3.6	17.7
EA12	65.5	38.5	78.9	42.6	70.1	39.3	82.5	60.3	4.6	0.7	3.6	17.7
EU15	66.7	41.5	79.5	45.9	71.2	42.6	82.7	62.3	4.5	1.2	3.2	16.4
EU10	59.9	27.9	77.4	34.8	65.2	28.7	80.2	50.4	5.4	0.8	2.8	15.6
EU25	65.6	38.9	79.1	44.1	70.5	41.1	82.4	60.7	4.9	2.2	3.2	16.6
MALES	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	69.0	30.4	87.0	43.2	69.3	33.0	86.8	49.2	0.4	2.6	-0.2	6.0
BG	66.7	30.5	82.2	52.7	69.6	31.8	85.2	54.3	2.9	1.3	2.9	1.6
CZ	74.9	33.0	91.7	60.4	76.0	33.5	89.9	69.3	1.1	0.6	-1.8	8.8
DK	81.0	66.1	90.2	65.4	80.0	68.8	86.9	69.7	-1.0	2.6	-3.2	4.3
DE	75.0	47.2	86.5	59.6	77.9	49.9	88.0	71.0	2.9	2.7	1.6	11.4
EE	73.0	39.0	89.6	59.4	74.5	41.2	88.7	59.7	1.5	2.3	-0.9	0.3
IE	77.3	52.8	87.7	67.9	76.6	50.4	87.7	67.9	-0.7	-2.3	0.0	0.0
GR	74.5	30.3	90.1	59.4	73.4	32.6	90.4	57.4	-1.1	2.2	0.2	-2.0
ES	76.2	44.6	87.6	60.2	77.7	45.2	89.0	72.6	1.5	0.6	1.4	12.4
FR	69.5	35.4	88.3	41.2	70.8	38.1	88.1	49.9	1.3	2.7	-0.2	8.7
IT	70.8	29.8	87.3	45.4	74.1	31.0	86.0	73.4	3.3	1.2	-1.3	28.0
CY	78.0	41.9	92.3	72.5	80.1	42.3	93.1	72.8	2.2	0.3	0.8	0.3
LV	72.7	44.5	85.6	64.3	73.8	45.0	86.6	57.7	1.1	0.6	1.0	-6.6
LT	68.1	30.5	84.3	60.9	67.0	31.2	82.0	51.5	-1.1	0.8	-2.3	-9.4
LU	72.0	26.5	91.9	37.2	69.2	28.1	91.6	37.4	-2.8	1.5	-0.3	0.1
HU	63.7	24.7	81.3	41.0	65.0	25.6	81.0	50.1	1.3	0.9	-0.4	9.1
MT	74.0	49.4	90.3	48.8	78.6	49.2	89.4	70.5	4.6	-0.2	-0.9	21.6
NL	82.4	68.9	92.1	62.2	80.2	70.2	91.3	57.0	-2.3	1.4	-0.9	-5.2
AT	78.4	60.2	90.6	49.8	78.8	61.7	90.4	59.0	0.4	1.4	-0.2	9.1
PL	63.7	30.3	81.2	41.8	67.6	31.6	81.4	55.1	3.9	1.4	0.2	13.3
PT	73.8	39.4	87.2	58.6	74.9	40.2	87.4	66.9	1.1	0.8	0.2	8.3
RO	64.7	28.4	80.5	50.3	61.8	29.3	74.4	51.0	-2.9	1.0	-6.1	0.7
SI	72.7	42.0	88.1	45.1	71.5	41.0	88.1	48.4	-1.3	-1.0	-0.1	3.3
SK	69.0	31.0	85.7	53.1	72.0	34.4	88.1	54.3	3.0	3.4	2.4	1.1
FI	72.3	46.1	86.0	55.4	75.6	48.2	88.1	62.9	3.4	2.0	2.1	7.5
SE	76.6	41.9	89.1	73.3	79.4	46.4	89.9	78.1	2.7	4.5	0.9	4.8
UK	77.4	54.5	88.2	66.6	78.0	54.4	87.4	70.5	0.6	-0.1	-0.8	3.9
NO	79.5	53.0	89.1	74.0	75.3	51.7	85.7	66.0	-4.3	-1.3	-3.4	-8.0
EU27	72.6	40.8	86.8	54.2	74.6	43.6	87.0	64.2	2.0	2.8	0.2	10.0
EA	73.2	41.9	87.4	51.5	75.2	42.8	88.3	64.5	2.0	1.0	0.9	13.0
EA12	73.2	41.9	87.4	51.5	75.2	42.9	88.3	64.5	2.0	1.0	0.9	13.0
EU15	74.0	44.3	87.5	54.6	75.9	45.6	88.1	66.0	1.9	1.3	0.6	11.4
EU10	66.6	31.8	83.7	45.9	70.1	32.5	84.7	57.3	3.5	0.7	1.0	11.4
EU25	72.7	42.0	86.9	53.3	75.2	44.1	87.7	64.9	2.4	2.2	0.8	11.6
FEMALES	Total	Young	Prime age	Older	Total	Young	Prime age	Older	Total	Young	Prime age	Older
	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)	(15-64)	(15-24)	(25-54)	(55-64)
BE	55.5	25.4	72.3	26.2	61.4	27.1	76.9	45.5	5.8	1.6	4.6	19.3
BG	57.7	24.0	75.4	35.3	62.3	25.1	79.6	41.5	4.6	1.1	4.2	6.2
CZ	57.4	24.0	74.8	34.0	64.3	24.2	76.3	61.1	7.0	0.2	1.5	27.1
DK	73.2	64.2	82.4	52.8	76.3	66.9	83.0	65.2	3.1	2.7	0.6	12.4
DE	64.0	43.5	75.2	43.4	71.8	45.8	80.8	66.3	7.7	2.4	5.6	22.9
EE	66.0	30.2	80.1	60.9	69.3	32.9	81.3	64.7	3.3	2.6	1.2	3.8
IE	60.6	47.9	69.5	39.6	68.1	45.7	75.8	66.6	7.5	-2.2	6.3	27.1
GR	48.0	19.9	60.8	27.2	55.4	21.1	69.3	43.3	7.4	1.2	8.5	16.1
ES	54.8	34.1	65.7	30.2	67.2	34.8	76.1	68.5	12.4	0.7	10.4	38.4
FR	60.0	28.7	76.2	36.6	63.4	30.6	80.0	44.9	3.4	1.9	3.8	8.3
IT	46.6	19.7	59.6	22.9	52.8	20.1	62.8	49.4	6.2	0.4	3.3	26.5
CY	61.6	37.1	75.4	40.1	70.4	36.5	85.1	53.9	8.8	-0.6	9.6	13.8
LV	64.5	33.1	79.1	52.8	67.3	35.4	80.0	54.4	2.8	2.3	0.9	1.6
LT	62.3	21.3	80.8	47.8	64.6	22.9	79.7	53.6	2.3	1.6	-1.1	5.8
LU	55.0	19.7	70.3	27.2	58.1	21.2	73.8	43.6	3.2	1.5	3.5	16.4
HU	50.8	18.0	67.9	25.9	56.8	18.3	71.4	45.5	6.1	0.3	3.5	19.6
MT	37.0	47.2	41.8	12.6	41.6	48.0	45.9	25.1	4.5	0.8	4.1	12.5
NL	69.7	67.9	78.7	40.5	75.3	69.4	84.6	54.3	5.6	1.5	5.9	13.8
AT	64.5	52.1	77.5	28.4	69.6	54.0	81.2	48.9	5.1	1.9	3.8	20.6
PL	50.6	22.9	68.8	19.6	57.0	24.7	73.8	34.2	6.5	1.8	5.1	14.6
PT	61.9	31.1	74.9	44.2	68.2	32.3	80.3	62.2	6.3	1.2	5.4	18.1
RO	52.8	20.5	68.5	33.6	53.3	21.0	67.5	38.1	0.5	0.5	-1.0	4.6
SI	62.7	31.2	82.4	21.9	65.6	31.0	81.6	47.1	2.9	-0.2	-0.8	25.2
SK	53.4	24.5	71.4	21.6	61.5	26.0	76.2	46.6	8.1	1.6	4.8	24.9
FI	68.8	44.6	80.7	55.9	73.4	47.4	84.0	65.7	4.7	2.8	3.3	9.8
SE	71.8	41.8	83.0	67.3	75.7	46.6	86.6	69.2	3.9	4.8	3.7	1.9
UK	65.5	51.6	74.6	49.2	70.7	51.8	77.4	67.3	5.2	0.2	2.8	18.1
NO	74.1	56.0	82.3	64.3	74.2	55.2	83.7	63.3	0.2	-0.8	1.4	-1.0
EU27	58.4	34.5	71.5	36.1	65.1	37.2	76.4	55.7	6.7	2.7	4.9	19.6
EA	57.8	35.1	70.4	33.9	64.9	35.5	76.6	56.0	7.1	0.4	6.2	22.1
EA12	57.8	35.1	70.3	34.0	64.9	35.5	76.5	56.1	7.1	0.4	6.2	22.1
EU15	59.4	38.5	71.4	37.5	66.4	39.5	77.1	58.5	7.0	1.0	5.7	21.0
EU10	53.3	23.9	71.1	25.3	60.2	24.8	75.5	43.6	7.0	0.9	4.5	18.4
EU25	58.4	35.7	71.3	35.4	65.7	37.8	76.9	56.6	7.3	2.1	5.6	21.2

Source: Commission services, EPC.

Table 2. 15 - Employment composition, 2007-2060

TOTAL	2007			2060		
	Young (15-24)	Prime age (25-54)	Older (55-64)	Young (15-24)	Prime age (25-54)	Older (55-64)
BE	8%	82%	10%	9%	77%	14%
BG	8%	78%	13%	7%	77%	15%
CZ	8%	78%	14%	7%	74%	19%
DK	15%	70%	15%	17%	66%	17%
DE	11%	76%	13%	11%	69%	21%
EE	11%	75%	14%	10%	74%	16%
IE	16%	73%	11%	13%	70%	17%
GR	7%	81%	12%	7%	76%	16%
ES	10%	79%	11%	10%	70%	20%
FR	10%	80%	11%	10%	76%	13%
IT	7%	83%	10%	7%	72%	22%
CY	13%	75%	12%	9%	74%	16%
LV	13%	74%	14%	10%	75%	15%
LT	9%	78%	12%	7%	76%	17%
LU	6%	86%	8%	7%	80%	12%
HU	7%	83%	10%	6%	77%	17%
MT	18%	72%	11%	13%	69%	18%
NL	16%	72%	12%	16%	68%	15%
AT	14%	77%	9%	14%	71%	15%
PL	11%	81%	8%	7%	77%	16%
PT	9%	78%	13%	9%	72%	20%
RO	9%	80%	11%	7%	76%	17%
SI	10%	82%	8%	9%	76%	14%
SK	10%	81%	9%	7%	76%	17%
FI	12%	72%	16%	12%	71%	17%
SE	11%	70%	19%	12%	71%	17%
UK	15%	71%	14%	14%	69%	17%
NO	13%	70%	16%	14%	69%	17%
EU27	11%	77%	12%	10%	72%	18%
EA	10%	78%	11%	10%	72%	18%
EA12	10%	78%	11%	10%	72%	18%
EU15	11%	77%	12%	11%	71%	18%
EU10	10%	80%	10%	7%	76%	17%
EU25	11%	77%	12%	10%	72%	18%
MALES	Young (15-24)	Prime age (25-54)	Older (55-64)	Young (15-24)	Prime age (25-54)	Older (55-64)
BE	8%	81%	11%	9%	77%	14%
BG	9%	77%	14%	8%	76%	16%
CZ	8%	77%	15%	8%	74%	19%
DK	14%	70%	16%	17%	66%	17%
DE	11%	75%	13%	11%	69%	20%
EE	13%	75%	12%	10%	75%	14%
IE	15%	73%	12%	13%	71%	16%
GR	7%	80%	13%	8%	76%	16%
ES	10%	78%	12%	10%	71%	19%
FR	10%	79%	10%	11%	76%	13%
IT	7%	82%	11%	7%	71%	22%
CY	12%	74%	14%	9%	73%	17%
LV	15%	73%	13%	11%	75%	15%
LT	11%	77%	12%	8%	76%	16%
LU	6%	86%	8%	8%	82%	10%
HU	7%	82%	11%	7%	77%	16%
MT	14%	74%	12%	10%	70%	20%
NL	15%	71%	14%	16%	69%	15%
AT	14%	76%	10%	14%	71%	15%
PL	11%	79%	10%	8%	75%	18%
PT	10%	77%	13%	9%	71%	19%
RO	10%	79%	11%	8%	74%	18%
SI	11%	79%	10%	10%	76%	14%
SK	10%	79%	11%	8%	75%	17%
FI	12%	72%	15%	12%	72%	16%
SE	11%	70%	19%	11%	71%	18%
UK	15%	70%	15%	14%	70%	16%
NO	13%	71%	17%	13%	70%	17%
EU27	11%	77%	12%	11%	72%	17%
EA	10%	78%	12%	10%	72%	18%
EA12	10%	78%	12%	10%	72%	18%
EU15	11%	76%	13%	11%	71%	17%
EU10	10%	79%	11%	8%	75%	17%
EU25	11%	77%	13%	11%	72%	17%
FEMALES	Young (15-24)	Prime age (25-54)	Older (55-64)	Young (15-24)	Prime age (25-54)	Older (55-64)
BE	8%	83%	8%	8%	77%	15%
BG	8%	80%	12%	7%	79%	14%
CZ	8%	80%	12%	6%	74%	20%
DK	15%	70%	15%	17%	66%	18%
DE	12%	76%	12%	10%	69%	21%
EE	10%	74%	16%	9%	74%	18%
IE	17%	74%	9%	13%	69%	18%
GR	7%	83%	10%	7%	77%	17%
ES	10%	81%	9%	9%	70%	21%
FR	9%	80%	11%	10%	77%	14%
IT	6%	84%	9%	6%	72%	21%
CY	13%	77%	10%	9%	76%	15%
LV	11%	74%	15%	9%	75%	16%
LT	7%	80%	13%	6%	76%	18%
LU	6%	86%	8%	7%	78%	15%
HU	6%	84%	10%	5%	77%	17%
MT	26%	67%	7%	19%	68%	14%
NL	17%	72%	11%	17%	68%	16%
AT	14%	78%	7%	14%	72%	15%
PL	10%	84%	6%	7%	80%	14%
PT	9%	79%	13%	8%	72%	20%
RO	8%	82%	10%	6%	77%	16%
SI	9%	85%	6%	8%	77%	15%
SK	10%	84%	7%	7%	76%	17%
FI	12%	71%	17%	12%	70%	18%
SE	11%	69%	19%	12%	71%	17%
UK	15%	71%	14%	14%	68%	18%
NO	14%	70%	16%	14%	69%	17%
EU27	11%	78%	11%	10%	72%	18%
EA	10%	79%	11%	10%	72%	18%
EA12	10%	79%	11%	10%	72%	18%
EU15	11%	77%	11%	11%	71%	18%
EU10	9%	82%	9%	7%	77%	16%
EU25	11%	78%	11%	10%	72%	18%

Source: Commission services, EPC.

The number of people employed (according to the European Labour Force Survey definition) is projected to record an annual growth rate of only 0.4% over the period 2007 to 2020 (compared to 1.3% over the period 1998-2007), which will reverse to a negative annual growth rate of a similar magnitude in the subsequent period 2020 to 2060 (see Table 2. 13). As a result of these opposite trends, the overall employment in the EU is projected to shrink by about 19.4 million people over the period 2007 to 2060. Rises in immigration levels in some countries and increases in labour force participation rates moderate the fall in employment owed to the ageing of the population and the negative population growth projected for the period 2020 to 2060.

As a result of different trends in the age composition of the population, the age structure of the labour force is projected to undergo a number of relevant changes. The share of older workers (aged 55 to 64) in the total labour force is projected to rise by 50%, rising from 11.6% in 2007 to about 17.4% in 2060 in the EU (see Table 2. 16). In the euro area, it is projected to rise slightly more, reaching 17.8% in 2060. The increase projected is particularly high in Italy (from 10.1% to 20.8%), Spain (from 10.3% to 19.7%) and Slovakia (from 8.6% to 16.9%).

Most of the increase materializes in the period to 2020 in the EU and in the euro area. The share of older workers are projected to fall in the latter part of the projection period between 2020 and 2060 in some other Member States (BE, DE, FI, SE, EE, LV and SI).

Table 2. 16 - Share of older workers (labour force aged 55 to 64 as a percentage of the labour force aged 15 to 64)

	Males			Females			Total			Change		
	2007	2020	2060	2007	2020	2060	2007	2020	2060	2007-2020	2020-2060	2007-2060
BE	10.5	14.7	13.4	8.1	14.8	14.4	9.4	14.8	13.9	5.3	-0.9	4.4
BG	14.1	14.3	15.9	12.4	13.7	14.2	13.3	14.0	15.1	0.7	1.1	1.7
CZ	14.9	15.5	18.6	11.8	14.2	19.2	13.6	14.9	18.9	1.3	4.0	5.3
DK	16.1	16.3	17.1	14.7	15.6	17.5	15.4	16.0	17.3	0.5	1.3	1.9
DE	13.6	21.9	20.4	12.3	20.2	21.2	13.0	21.1	20.8	8.1	-0.3	7.8
EE	12.0	14.5	14.5	15.9	18.9	17.3	13.9	16.6	15.8	2.7	-0.8	1.9
IE	12.1	13.1	15.3	9.1	14.1	17.5	10.8	13.5	16.3	2.8	2.8	5.5
GR	12.7	14.8	16.0	9.2	13.6	15.5	11.3	14.3	15.8	3.1	1.4	4.5
ES	11.5	15.7	18.7	8.6	16.7	20.8	10.3	16.1	19.7	5.8	3.5	9.4
FR	10.2	12.7	13.0	10.6	13.6	13.3	10.4	13.1	13.1	2.7	0.0	2.7
IT	11.0	18.0	21.3	8.7	17.0	20.2	10.1	17.6	20.8	7.5	3.3	10.8
CY	13.7	15.3	17.4	9.9	12.3	14.7	12.0	13.9	16.1	1.9	2.3	4.2
LV	12.4	14.3	14.5	14.3	17.5	16.0	13.3	15.9	15.2	2.6	-0.6	2.0
LT	12.0	15.3	16.4	12.8	19.1	18.2	12.4	17.2	17.3	4.8	0.1	4.9
LU	7.9	10.8	10.1	7.3	12.9	14.4	7.6	11.7	12.1	4.1	0.3	4.4
HU	10.4	12.2	15.8	9.5	14.3	16.8	10.0	13.1	16.3	3.1	3.2	6.3
MT	12.1	14.5	19.4	6.7	8.4	13.7	10.3	12.4	17.4	2.1	5.0	7.1
NL	14.0	15.6	15.2	10.7	14.6	15.5	12.5	15.1	15.3	2.6	0.2	2.8
AT	10.1	14.5	15.2	7.3	13.5	14.6	8.9	14.1	14.9	5.2	0.9	6.1
PL	9.4	12.0	17.5	6.1	8.9	13.2	7.9	10.6	15.5	2.7	5.0	7.7
PT	12.9	16.3	19.4	12.1	16.9	19.6	12.6	16.6	19.5	4.1	2.9	7.0
RO	10.7	13.3	17.5	9.8	12.3	15.7	10.3	12.8	16.6	2.5	3.8	6.3
SI	10.0	14.0	13.9	5.9	15.2	14.3	8.1	14.6	14.1	6.5	-0.5	6.0
SK	10.5	13.3	16.7	6.3	13.3	17.1	8.6	13.3	16.9	4.7	3.6	8.2
FI	15.5	17.2	16.1	16.9	19.5	17.7	16.2	18.3	16.9	2.1	-1.4	0.7
SE	18.9	18.1	17.6	18.7	17.0	16.4	18.8	17.6	17.0	-1.2	-0.5	-1.8
UK	14.8	15.4	16.0	13.2	16.2	17.6	14.1	15.8	16.7	1.7	0.9	2.7
NO	16.4	16.6	16.6	15.4	15.6	16.4	16.0	16.1	16.5	0.1	0.4	0.5
EU27	12.3	16.1	17.3	10.7	15.8	17.6	11.6	16.0	17.4	4.4	1.4	5.8
EA	12.0	17.1	17.6	10.4	16.7	18.0	11.3	16.9	17.8	5.6	0.9	6.5
EA12	12.0	17.1	17.6	10.4	16.7	18.1	11.3	16.9	17.8	5.6	0.9	6.5
EU15	12.7	16.8	17.3	11.2	16.6	17.9	12.0	16.7	17.6	4.7	0.8	5.6
EU10	10.8	13.1	17.1	8.2	11.9	15.4	9.6	12.5	16.3	2.9	3.8	6.7
EU25	12.4	16.3	17.3	10.7	15.9	17.6	11.6	16.1	17.4	4.5	1.3	5.8

Source: Commission services, EPC.

2.7. Economic dependency ratios emerging from the labour force projection

These trends are mirrored in the effective economic old-age dependency ratio (the number of inactive people aged 65 and above, as a percentage of population aged 15-64 employed), see Table 2. 17, and in the total economic dependency ratio, see Table 2. 18. It is important to consider the effective economic old-age dependency ratio when assessing the impact of ageing on budgetary expenditure, pension public schemes above all. This indicator shows the balance between the inactive elderly and the economically active (employed) population. The indicator is a result of interacting projected demographic trends with projected developments in the labour force participation rates and unemployment rates. The ratio is projected to rise sharply for the EU27 from 37% in 2007 to 42% in 2020 and 72% in 2060. In the euro area, a similar evolution is projected, with the effective old-age dependency ratio rising from 39% in 2007 to 45% in 2020 and 73% in 2060. Extremely high values are projected in some EU countries. In Poland and Romania, the projections point to a situation in which there will be as many or more inactive old persons as employed in 2060 (106% and 99%, respectively). Also, the effective economic old-age dependency ratio will be 90% or more in Bulgaria, Lithuania, Hungary, Malta and Slovakia. By contrast, it is projected to be two thirds or less in DK, IE, FR, CY, LU, NL, AT, PT, FI, SE, UK and NO.

The total economic dependency ratio is the ratio between total inactive population and employed people (15-64). It gives an indication of the average number of people that each economically active person 'supports', and thus is relevant when considering the prospects for potential GDP per capita growth. It is projected to decline in the first period of projection (up to 2020) in the EU (from 125% in 2007 to 122% in 2020). Thereafter, it increases to 151% by 2060. A similar development is projected in the euro area. These results need to be interpreted carefully. They show that overall economic dependency is projected to decline up to 2020 mostly due to a better labour market performance (especially the projected increase in female employment rates), but also due to low fertility (i.e. smaller numbers of young people imply a decline in the youth dependency ratio). However, these effects taper-off after 2020 and the increase in the total economic dependency ratio between 2020 and 2060 is evident for all Member States. There are however large cross-country differences. For some MS (Lithuania, Poland, Slovakia and Romania) it rises by 60 percentage points or more between 2020 and 2060, while for some others (Denmark, France, Finland, Sweden and the UK) it is projected to rise more modestly, by 20 percentage points or less.[31]

[31] For more detailed information on the evolution of the economic dependency ratios per Member State, see the Statistical Annex.

Table 2. 17 - Effective economic old-age dependency ratio (inactive population aged 65 and above as a percentage of employed population aged 15 to 64)

	Males			Females			Total			Change		
	2007	2020	2060	2007	2020	2060	2007	2020	2060	2007-2020	2020-2060	2007-2060
BE	30	36	57	54	56	81	41	45	68	4.2	22.8	27.0
BG	29	32	74	50	56	111	39	43	91	4.3	48.1	52.3
CZ	20	30	67	42	53	97	29	40	81	10.7	40.9	51.6
DK	22	34	43	35	46	57	28	40	50	11.3	10.1	21.4
DE	31	36	63	53	55	84	41	45	73	3.8	28.2	32.0
EE	20	23	56	44	52	92	32	37	73	5.1	35.5	40.6
IE	16	20	47	29	31	64	21	25	55	3.7	29.8	33.5
GR	30	35	69	64	67	108	43	48	86	5.2	37.4	42.6
ES	26	29	66	51	48	94	36	37	79	1.1	41.5	42.6
FR	29	39	55	49	58	78	38	48	66	9.4	17.7	27.2
IT	34	39	66	75	76	124	50	55	89	4.8	34.7	39.5
CY	18	21	44	30	32	64	23	26	53	3.0	27.2	30.2
LV	19	24	70	46	51	109	32	38	88	5.4	50.8	56.2
LT	22	24	79	45	45	105	33	34	92	1.2	57.8	59.1
LU	23	31	51	45	46	73	33	38	61	5.1	23.3	28.4
HU	24	32	74	51	63	112	36	46	91	9.9	45.1	55.0
MT	21	35	66	61	86	152	34	53	95	18.4	42.9	61.3
NL	20	31	49	35	43	66	27	37	57	9.8	20.2	30.0
AT	24	31	55	45	47	74	34	38	63	4.6	25.2	29.8
PL	21	30	84	45	56	132	32	42	106	9.9	63.9	73.8
PT	24	28	56	43	47	80	33	37	67	4.6	30.0	34.5
RO	20	25	78	38	48	124	28	35	99	6.8	63.8	70.7
SI	21	33	77	43	53	98	31	42	87	11.2	44.7	55.9
SK	18	22	78	38	41	117	27	31	96	4.4	64.7	69.0
FI	26	39	55	42	55	71	34	47	63	13.5	15.6	29.1
SE	27	34	49	41	46	63	34	40	56	6.4	15.7	22.1
UK	25	31	44	40	43	59	32	36	51	4.8	14.3	19.1
NO	21	30	50	33	39	60	27	35	55	7.8	20.6	28.4
EU27	27	33	60	49	54	86	37	42	72	5.8	29.4	35.2
EA	29	35	61	53	56	88	39	45	73	5.1	28.6	33.7
EA12	29	35	61	53	56	88	40	45	73	5.1	28.5	33.6
EU15	28	34	57	50	54	81	38	43	68	5.2	24.7	29.9
EU10	21	29	77	45	54	117	32	40	95	8.8	54.6	63.4
EU25	27	33	59	49	54	85	37	43	71	5.8	28.2	34.0

Source: Commission services, EPC.

Table 2. 18 - Total economic dependency ratio (total inactive population as a percentage of employed population aged 15 to 64 and 15 to 71)

	Total inactive population as % of employed (15-64)					Total inactive population as % of employed (15-71)				
	2007	2020	2060	Change 2007-2020	Change 2020-2060	2007	2020	2060	Change 2007-2020	Change 2020-2060
BE	143	138	162	-5	24	142	136	159	-6	23
BG	131	125	176	-6	51	130	121	168	-8	47
CZ	111	114	155	3	42	110	109	146	0	37
DK	95	104	113	9	9	93	102	108	9	6
DE	115	106	137	-9	31	114	103	130	-11	26
EE	108	111	147	3	36	104	108	141	4	33
IE	109	109	134	0	24	107	106	127	-1	21
GR	141	136	177	-5	41	138	133	172	-5	38
ES	121	111	149	-10	38	120	109	145	-10	36
FR	137	143	158	6	15	136	141	155	5	14
IT	156	148	181	-9	33	154	145	174	-9	29
CY	103	92	120	-11	28	101	89	113	-12	24
LV	108	110	163	2	53	104	108	158	4	50
LT	122	112	180	-10	68	120	108	167	-12	59
LU	132	134	160	2	26	132	134	159	1	26
HU	153	143	193	-11	50	152	140	187	-13	47
MT	157	160	199	3	39	156	159	194	3	35
NL	94	98	119	5	21	92	95	115	3	19
AT	106	106	130	0	25	104	104	125	-1	21
PL	146	138	201	-8	63	144	135	191	-9	56
PT	114	108	139	-6	30	108	102	127	-6	25
RO	138	135	210	-3	75	131	126	184	-4	58
SI	108	116	168	8	51	106	114	162	8	48
SK	127	108	177	-18	69	126	104	166	-22	62
FI	112	120	134	8	15	110	117	130	6	13
SE	103	106	122	3	16	101	102	117	1	14
UK	109	112	123	3	12	107	109	116	2	8
NO	95	105	128	10	22	93	102	123	9	21
EU27	125	122	151	-3	29	123	119	144	-5	25
EA	127	122	151	-4	29	125	120	146	-5	26
EA12	127	122	151	-4	29	125	120	146	-5	26
EU15	123	120	144	-3	24	121	117	139	-4	21
EU10	135	129	184	-7	56	133	125	175	-8	50
EU25	125	121	149	-3	28	123	118	143	-4	24

Source: Commission services, EPC.

2.8. Projection of total hours worked

Given the population projection, the unemployment rate assumptions, the labour force projection, the projected employment rates (of people age 15 to 71) and the assumptions on changes in hours worked per person (see section 2.2 above), the total hours worked are projected in the EU Member States. Compared with the projections in the 2006 Ageing Report, this definition of labour input has been adopted so as to ensure consistency with the commonly agreed production function[32] used to calculate output gaps for the purpose of, inter alia, estimating cyclically adjusted budget balances (CABs) in the context of the European Commission's multilateral budgetary surveillance.

Total hours worked are projected to increase by 5.4% in the period to 2020 in the EU. However, from 2020 onwards the situation is projected to reverse and hours worked will fall by 12.9% between 2020 and 2060. Over the entire projection period, total hours worked are projected to fall by 8.2% in the EU. For the euro area, the projected fall is less marked (-5.7% between 2007 and 2060). In terms of annual average growth rates, hours worked are projected to fall by 0.2% over 2007-2060 in the EU and by 0.1% in the euro area, see Table 2. 19.[33] These trends in hours worked reflect the employment trends discussed above in section 2.6 and also a composition effect, that is the increasing share over time of employed persons working part-time. As a result of this composition effect, average hours worked per person will change over time.

Table 2. 19 - Hours worked projections, 2007-2060 (15-71)

	Hours worked			Changes (in %)			Annual growth rate		
	2007	2020	2060	2007-2020	2020-2060	2007-2060	2007-2020	2020-2060	2007-2060
BE	6811725	7399271	7328685	8.6	-1.0	7.6	0.64	-0.02	0.14
BG	6086043	6013689	3763873	-1.2	-37.4	-38.2	-0.09	-1.16	-0.90
CZ	10065931	10265402	7561245	2.0	-26.3	-24.9	0.15	-0.75	-0.54
DK	4337645	4263439	4337642	-1.7	1.7	0.0	-0.13	0.04	0.00
DE	56477313	57824880	44071237	2.4	-23.8	-22.0	0.18	-0.67	-0.47
EE	1251928	1223064	906329	-2.3	-25.9	-27.6	-0.17	-0.75	-0.61
IE	3916593	4837319	5436890	23.5	12.4	38.8	1.64	0.31	0.62
EL	9932662	10534369	8666089	6.1	-17.7	-12.8	0.45	-0.48	-0.26
ES	34141734	40571919	35007024	18.8	-13.7	2.5	1.34	-0.34	0.05
FR	39388759	40917784	42325893	3.9	3.4	7.5	0.29	0.09	0.14
IT	45587744	48822601	42123305	7.1	-13.7	-7.6	0.53	-0.35	-0.15
CY	717137	904274	1101631	26.1	21.8	53.6	1.80	0.51	0.82
LV	2058438	1955897	1228970	-5.0	-37.2	-40.3	-0.39	-1.16	-0.97
LT	2804346	2852439	1740942	1.7	-39.0	-37.9	0.13	-1.22	-0.89
LU	537855	709267	848400	31.9	19.6	57.7	2.16	0.45	0.87
HU	7759623	7929924	5822693	2.2	-26.6	-25.0	0.17	-0.75	-0.54
MT	272100	282489	234971	3.8	-16.8	-13.6	0.29	-0.45	-0.28
NL	11926435	11982687	10691803	0.5	-10.8	-10.4	0.04	-0.28	-0.21
AT	7042953	7370820	6874922	4.7	-6.7	-2.4	0.35	-0.16	-0.05
PL	29802231	30720638	20259082	3.1	-34.1	-32.0	0.24	-1.02	-0.72
PT	9150381	9764107	8742888	6.7	-10.5	-4.5	0.50	-0.26	-0.09
RO	18215626	18258586	11452667	0.2	-37.3	-37.1	0.02	-1.14	-0.87
SI	1651397	1643158	1155942	-0.5	-29.7	-30.0	-0.04	-0.87	-0.67
SK	3856145	4249614	2728630	10.2	-35.8	-29.2	0.75	-1.07	-0.65
FI	4242813	4282158	3958545	0.9	-7.6	-6.7	0.07	-0.19	-0.13
SE	7310995	7736562	7960944	5.8	2.9	8.9	0.44	0.07	0.16
UK	48239708	50402272	56529915	4.5	12.2	17.2	0.34	0.28	0.30
NO	3405200	3663082	3858101	7.6	5.3	13.3	0.57	0.13	0.24
EU27	373586260	393718628	342861156	5.4	-12.9	-8.2	0.40	-0.34	-0.16
EA	231797601	247847104	218568224	6.9	-11.8	-5.7	0.52	-0.30	-0.11
EA12	229156968	245017182	216075681	6.9	-11.8	-5.7	0.52	-0.30	-0.11
EU15	289045316	307419455	284904183	6.4	-7.3	-1.4	0.48	-0.18	-0.03
EU10	60239274	62026899	42740433	3.0	-31.1	-29.0	0.23	-0.91	-0.64
EU25	349284591	369446354	327644616	5.8	-11.3	-6.2	0.43	-0.29	-0.12

Source: Commission services, EPC.

There are major differences between the Member States, mainly reflecting different demographic trends. A reduction in hours worked of 20% or more between 2007 and 2060 is

[32] See Chapter 3 below for a detailed account of the production function used in the projections.

[33] The total hours worked for 2007 - 2009 are those estimated using the production function framework described in Chapter 3. For the remainder of the projection period, the Cohort Simulation Model (CSM) described in this chapter was used.

projected for BG, CZ, DE, EE, LV, LT, HU, PL, RO, SI and SK. In contrast, for some other Member States (BE, IE, ES, FR, CY, LU, SE and the UK) an increase is projected over the same period.

2.9. Comparison with the projection in the 2006 Ageing Report

This section provides a brief comparison of the main results in the current projection exercise with the 2006 Ageing Report.

In the EU25, the participation rate (15-64) is now projected to increase at virtually the same pace as in the 2006 projection up to 2050, by 4p.p. By contrast, the older workers (55-64) participation rates are projected to increase more than in the 2006 projection. The structural unemployment rate in 2007 (7.3%) is lower than in the 2006 projection, but the decrease in the unemployment rate is projected to be smaller in the current projection. Similarly, regarding the employment rate, it is higher in 2007 in the current projection exercise, but is projected to increase less in the period to 2050. The reverse is the case for the employment rate of older workers (55-64), which is now projected to increase more.

Table 2. 20 - Labour force projections, 2009 projection, 2007-2050

	Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)		
	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change
BE	62.3	65.4	3.1	34.6	47.6	13.0	67.3	69.7	2.3	36.2	49.4	13.2	7.5	6.2	-1.3
BG	62.1	64.7	2.5	43.4	45.4	2.0	66.8	67.9	1.0	46.6	47.6	1.0	7.0	4.7	-2.3
CZ	66.2	70.2	4.0	46.6	64.5	17.8	70.0	73.5	3.5	48.9	66.8	17.9	5.4	4.5	-0.9
DK	77.2	78.3	1.2	59.1	68.4	9.3	80.3	81.0	0.7	61.3	70.3	9.0	3.9	3.2	-0.6
DE	69.6	74.8	5.2	51.4	68.7	17.3	76.2	79.7	3.5	57.3	73.9	16.5	8.7	6.2	-2.5
EE	69.4	71.2	1.8	60.2	60.1	-0.1	72.9	73.7	0.8	62.4	61.9	-0.5	4.8	3.5	-1.3
IE	69.1	72.5	3.4	53.8	66.5	12.7	72.5	76.3	3.9	55.1	68.3	13.1	4.7	5.1	0.4
GR	61.4	64.8	3.4	42.8	50.0	7.2	67.1	69.1	1.9	44.3	51.3	7.0	8.5	6.2	-2.3
ES	65.6	72.8	7.2	44.7	69.7	24.9	71.6	77.6	6.0	47.5	73.1	25.6	8.3	6.2	-2.1
FR	64.7	67.1	2.4	38.9	46.5	7.7	70.3	71.5	1.2	41.0	48.4	7.5	8.0	6.2	-1.8
IT	58.7	64.0	5.3	33.8	61.3	27.5	62.6	67.9	5.3	34.7	62.8	28.2	6.2	5.8	-0.4
CY	69.7	75.3	5.6	55.9	63.7	7.9	72.9	78.0	5.1	57.6	65.4	7.8	4.4	3.4	-0.9
LV	68.5	68.5	0.1	57.7	52.4	-5.3	72.9	72.0	-0.9	60.4	54.4	-6.0	6.1	4.8	-1.2
LT	65.1	65.2	0.1	53.4	53.2	-0.2	68.1	67.6	-0.5	55.5	54.8	-0.7	4.4	3.5	-0.9
LU	63.6	64.0	0.4	32.3	41.4	9.1	66.4	67.1	0.6	33.0	42.3	9.3	4.2	4.6	0.4
HU	57.2	60.9	3.7	32.7	47.8	15.1	61.7	64.9	3.2	34.1	49.4	15.2	7.4	6.2	-1.2
MT	55.8	60.4	4.6	30.5	48.8	18.3	59.5	64.4	4.9	31.6	51.1	19.5	6.2	6.2	0.0
NL	76.1	78.0	1.8	51.4	55.9	4.5	78.7	80.4	1.7	53.3	57.8	4.5	3.2	3.0	-0.2
AT	71.5	74.2	2.7	38.8	54.6	15.7	74.8	77.5	2.7	40.0	56.0	16.0	4.5	4.3	-0.2
PL	57.1	61.7	4.6	29.9	44.3	14.3	63.3	65.5	2.2	32.1	46.2	14.1	9.8	5.9	-3.9
PT	67.8	71.8	4.0	51.0	64.3	13.3	74.1	76.6	2.5	54.5	67.5	13.0	8.5	6.2	-2.3
RO	58.7	56.9	-1.9	41.4	43.4	2.0	63.0	60.5	-2.5	42.4	44.2	1.8	6.8	6.0	-0.8
SI	67.8	68.3	0.4	33.4	47.0	13.6	71.4	71.6	0.3	34.5	48.3	13.8	4.9	4.7	-0.3
SK	61.2	66.0	4.9	36.2	50.2	14.0	68.8	70.4	1.6	39.4	52.6	13.1	11.1	6.2	-4.9
FI	70.5	74.5	4.0	55.6	65.1	9.4	75.8	79.1	3.3	59.4	68.5	9.1	7.0	5.8	-1.2
SE	74.3	77.5	3.2	70.3	74.1	3.8	79.2	82.4	3.2	73.2	77.1	3.9	6.2	5.9	-0.3
UK	71.5	74.3	2.8	57.8	69.0	11.2	75.6	78.6	3.0	59.7	71.3	11.6	5.4	5.4	0.0
NO	76.8	74.8	-2.1	69.2	65.5	-3.7	78.8	78.0	-0.8	69.9	66.5	-3.4	2.5	4.1	1.6
EU27	65.5	69.7	4.2	44.9	59.4	14.5	70.6	73.9	3.3	47.5	62.0	14.5	7.2	5.7	-1.5
EA	65.5	70.4	4.8	42.6	60.8	18.2	70.8	74.7	3.9	45.4	63.7	18.3	7.5	5.8	-1.6
EA12	65.5	70.4	4.8	42.6	60.9	18.2	70.9	74.7	3.9	45.5	63.8	18.3	7.5	5.9	-1.7
EU15	66.7	71.4	4.7	45.9	62.8	16.9	71.8	75.7	3.9	48.6	65.6	17.0	7.1	5.7	-1.4
EU10	59.9	65.0	5.2	34.8	50.9	16.1	65.2	68.8	3.6	36.9	52.9	16.0	8.3	5.5	-2.8
EU25	65.6	70.5	5.0	44.1	60.9	16.8	70.7	74.8	4.1	46.7	63.6	16.9	7.3	5.7	-1.6

Source: Commission services, EPC.

Table 2. 21 - Labour force projections, 2009 projection - 2006 projection, 2007-2050

	Employment rate (15-64)			Employment rate (55-64)			Participation rate (15-64)			Participation rate (55-64)			Unemployment rate (15-64)		
	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change	2007	2050	p.p. change
BE	1.4	-0.1	-1.5	4.3	3.3	-1.0	1.6	-0.3	-1.9	5.1	4.5	-0.6	0.1	-0.3	-0.4
BG	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
CZ	0.7	0.5	-0.2	0.9	5.6	4.6	-1.1	-1.1	0.0	1.5	6.7	5.2	-2.5	-2.0	0.5
DK	0.9	0.5	-0.4	-2.6	1.6	4.2	0.6	-0.4	-1.0	-2.6	1.3	3.9	-0.4	-1.0	-0.6
DE	1.6	1.3	-0.3	6.4	3.0	-3.4	1.5	0.7	-0.7	6.6	4.7	-1.9	-0.4	-0.8	-0.4
EE	3.1	0.4	-2.7	6.1	-1.6	-7.7	0.7	-2.4	-3.1	5.0	-1.8	-6.7	-3.4	-3.5	-0.2
IE	-0.3	-2.1	-1.8	1.0	-2.4	-3.4	0.6	-0.9	-1.5	1.5	-1.3	-2.7	1.3	1.6	0.4
GR	0.0	-0.3	-0.3	-1.1	-3.0	-1.9	-0.5	-0.9	-0.3	-0.8	-2.4	-1.6	-0.8	-0.8	0.0
ES	1.4	1.4	0.0	1.0	7.2	6.2	0.7	0.8	0.1	1.3	9.2	7.9	-1.1	-0.8	0.3
FR	0.9	-0.9	-1.8	-3.0	-6.3	-3.3	0.3	-1.6	-1.9	-2.6	-5.7	-3.1	-0.9	-0.8	0.1
IT	-0.2	-1.6	-1.5	1.1	6.7	5.6	-1.3	-2.3	-1.0	0.9	7.5	6.5	-1.6	-0.7	0.8
CY	-2.7	-2.0	0.6	-1.6	-5.3	-3.7	-2.2	-2.7	-0.5	-1.7	-5.2	-3.5	0.7	-0.8	-1.5
LV	1.4	-2.8	-4.2	8.3	-6.3	-14.6	0.1	-4.7	-4.8	8.0	-6.1	-14.1	-1.7	-2.2	-0.5
LT	-0.1	-6.5	-6.4	3.0	-13.0	-16.0	-4.1	-9.5	-5.5	0.3	-13.6	-13.9	-5.2	-3.5	1.7
LU	-0.2	-1.5	-1.3	-1.5	-0.4	1.1	-0.2	-1.3	-1.1	-1.2	0.1	1.3	0.0	0.4	0.4
HU	-2.5	-2.4	0.1	-2.7	-1.7	1.0	-0.9	-1.5	-0.6	-1.9	-0.7	1.2	2.7	1.4	-1.2
MT	0.4	-1.0	-1.4	-0.5	15.7	16.2	-1.2	-1.6	-0.4	-0.3	17.3	17.6	-2.6	-0.8	1.8
NL	1.2	0.1	-1.1	4.3	0.8	-3.5	1.2	-0.1	-1.3	5.3	1.8	-3.5	0.0	-0.2	-0.2
AT	-0.5	-2.2	-1.6	4.2	-3.5	-7.7	0.3	-1.5	-1.8	3.9	-3.2	-7.1	1.1	0.9	-0.2
PL	2.5	-4.4	-6.8	-1.5	-4.4	-2.9	-2.9	-5.5	-2.6	-1.7	-3.1	-1.4	-7.7	-1.1	6.6
PT	-3.1	-1.5	1.6	-3.8	-0.4	3.4	-1.0	-1.1	-0.1	-2.2	1.3	3.4	2.9	0.6	-2.3
RO	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
SI	1.6	-1.1	-2.7	-0.9	-5.6	-4.7	1.3	-1.8	-3.1	-0.3	-4.8	-4.4	-0.6	-0.9	-0.3
SK	0.7	-2.7	-3.4	2.2	-1.0	-3.2	-3.4	-3.5	-0.1	2.1	0.6	-1.6	-5.2	-0.8	4.4
FI	0.4	0.1	-0.2	0.9	0.2	-0.7	0.4	-0.5	-0.9	2.0	1.0	-1.0	0.0	-0.7	-0.7
SE	-0.2	-0.1	0.0	-0.4	-2.5	-2.1	1.4	1.3	-0.1	0.1	-2.0	-2.1	1.9	1.6	-0.3
UK	-0.7	-0.4	0.3	2.2	5.1	2.9	-0.1	0.2	0.3	2.6	6.0	3.4	0.8	0.8	0.0
NO	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EU27	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EA	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
EA12	0.4	-0.1	-0.5	0.9	2.1	1.2	0.0	-0.6	-0.6	1.1	3.3	2.1	-0.6	-0.6	0.0
EU15	0.1	-0.1	-0.3	0.8	2.5	1.7	-0.1	-0.4	-0.3	1.1	3.6	2.5	-0.3	-0.3	0.0
EU10	1.1	-2.0	-3.1	-1.7	-1.0	0.7	-2.4	-3.0	-0.6	-1.8	0.1	2.0	-4.8	-1.1	3.7
EU25	0.3	-0.3	-0.6	0.4	2.1	1.6	-0.4	-0.7	-0.2	0.6	3.2	2.5	-1.0	-0.4	0.6

Source: Commission services, EPC.

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

Overall approach of the cohort methodology

The dynamic cohort method used in the projections[34] is based on a model that calculates the rates of entry and exit from labour market for each of the latest available generation[35]. This is the same methodology initially developed by the OECD[36], with one difference, the single-year of age rather than the 5-year age groups are used.

The dynamic cohort approach is based on the estimates of the exit and entry rates into the labour market of a "synthetic" generation/cohort. The cohort is "synthetic" because, due to the lack of true longitudinal data on participation behaviour of each individual, we do not really observe the same person over years but we assume that those aged x+1 at year t+1 are representative of the same generation (aged x at time t) observed one year later. 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 each other.[37]

The participation rate projections are produced by applying the entry and exit rates observed over the period 1998-2007 to each projected single-year cohort of the working age population over the period 2008-2060. These entry and exit rates are kept constant over the entire projection period. Thus, for example, we calculate the entry (or exit) rate of persons aged X, for X =15 to 71 (and thus of the generation born in 2008-X) and apply this rate to persons aged X in 2008, 2009, 2010 and so on up to 2060 to get projections of future participation rates. This is different from the static projection method, which keeps constant over the period of projection the participation rate of persons aged X. In this way, the method takes implicitly into account that women belonging to any given generation or cohort have their own specific level of participation, and this is usually higher at all ages than the corresponding level of participation of older cohorts. This participation gap between subsequent generations reflects not only socio-cultural factors but also individual characteristics, such as number of children and the level of education. Thus, the cohort approach used in the simulation tends to produce an autonomous increase of female participation – referred to as a "cohort effect" - corresponding to the gradual replacement of currently older women by younger women.

The calculation of entry rates

We calculate the rate of entry into the labour market for people previously inactive, as follows.

The number of persons who enter the labour market, while taking into account of the upper limit on participation (the maximum amount of people in the labour force is the number of persons in working age for each age-group) can be expressed as:

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

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34 See Carone (2005).

35 The method is a dynamic version of the Latulippe (1996) methodology, developed by Sherer (2002).

36 See Burniaux et al. (2003).

37 This means for example that if in year t there are 100 persons aged x in the labour force and that the years after when aged x+1 these same persons leave the labour force (for whatever reason, such as being discouraged, have died or emigrated), but they are replaced for by 100 different persons 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 we calculate net rates of exit and entry that are equal to zero, while the actual (gross) value is 100 per cent.

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 age x and x+1, Popmax_{wa} is the maximum population in working age that can potentially enter the labour market (which is usually a bit less 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), we get:

$$NLF_x^{t+1} = \left[\ (\mathrm{Pr}_{\max} - \mathrm{Pr}_x^t) - (\mathrm{Pr}_{\max} - \mathrm{Pr}_{x+1}^{t+1}) \ \right] * Pop_x^t$$

where Pr_{max} is the upper limit to the participation rate (we assume 0.99 for both male and female[38]). 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:

$$Ren = \frac{NLF_x^{t+1}}{Pop_{\max_{wa}} - LF_x^t} = \left[\ (\mathrm{Pr}_{\max} - \mathrm{Pr}_x^t) - (\mathrm{Pr}_{\max} - \mathrm{Pr}_{x+1}^{t+1}) \ \right] * \frac{Pop_x^t}{Pop_{\max_{wa}} - LF_x^t}$$

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

$$Ren_{x+1} = \left[\ (\mathrm{Pr}_{\max} - \mathrm{Pr}_x^t) - (\mathrm{Pr}_{\max} - \mathrm{Pr}_{x+1}^{t+1}) \ \right] * \frac{1}{(\mathrm{Pr}_{\max} - \mathrm{Pr}_x^t)}$$

or $$Ren_{x+1} = \left[\ 1 - \frac{(\mathrm{Pr}_{\max} - \mathrm{Pr}_{x+1}^{t+1})}{(\mathrm{Pr}_{\max -} \mathrm{Pr}_x^t)} \ \right] \geq 0$$

or $$Ren_{x+1} = \frac{(\mathrm{Pr}_{x+1}^{t+1} - \mathrm{Pr}_x^t)}{(1 - \mathrm{Pr}_x^t)} \ \right] \geq 0 \text{ when } \mathrm{Pr}_{max}=1$$

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

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

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=2008-2060). 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 1998-2007.

[38] 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 can calculate the *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:

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

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

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

Average exit age from the labour force[39]

In order to estimate the "average exit age" (or effective retirement age) from the labour force the methodology employed by the European Commission was used, which is a probability model using the single-year cohort 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 stay in the labour force at age a in the year t, (conditional upon stay in labour force in year t-1), can be calculated using the observed activity rates (Pr) as follows:

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

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

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

If we assume that nobody will retire before a 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 probability to stay from age *m* to age *a-1*:

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

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:

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

By assuming that everybody will be retired by a given age *M* (e.g. *M= 71),* 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 60-71), where the weights are the probability of retiring at each age *a*, as follows:

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

[39] See Carone (2005).

3. LABOUR PRODUCTIVITY AND GDP

3.1. Background and general approach

The approach used in the 2006 projection exercise

A general consensus was reached on the merits of using a production function framework, rather than a purely mechanical approach as it allows one to shed light on the main components 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).[40] This "production function" approach also aims at obtaining richer medium term dynamics, taking due account of the effect of population growth on labour productivity in the medium run, through the change in capital intensity. The approach based on a production function is also fairly standard in mainstream macro-models and is often used to make short-term (2-3 years) forecast of productivity by international institutions.[41] The production function framework requires making some specific statistical assumptions regarding long-run developments in each of its component. A key assumption for the long-term projection is that of the productivity growth rate; the EPC agreed that all countries should converge to the same productivity growth rate (1.7%) at the end of the projection period (in 2050).

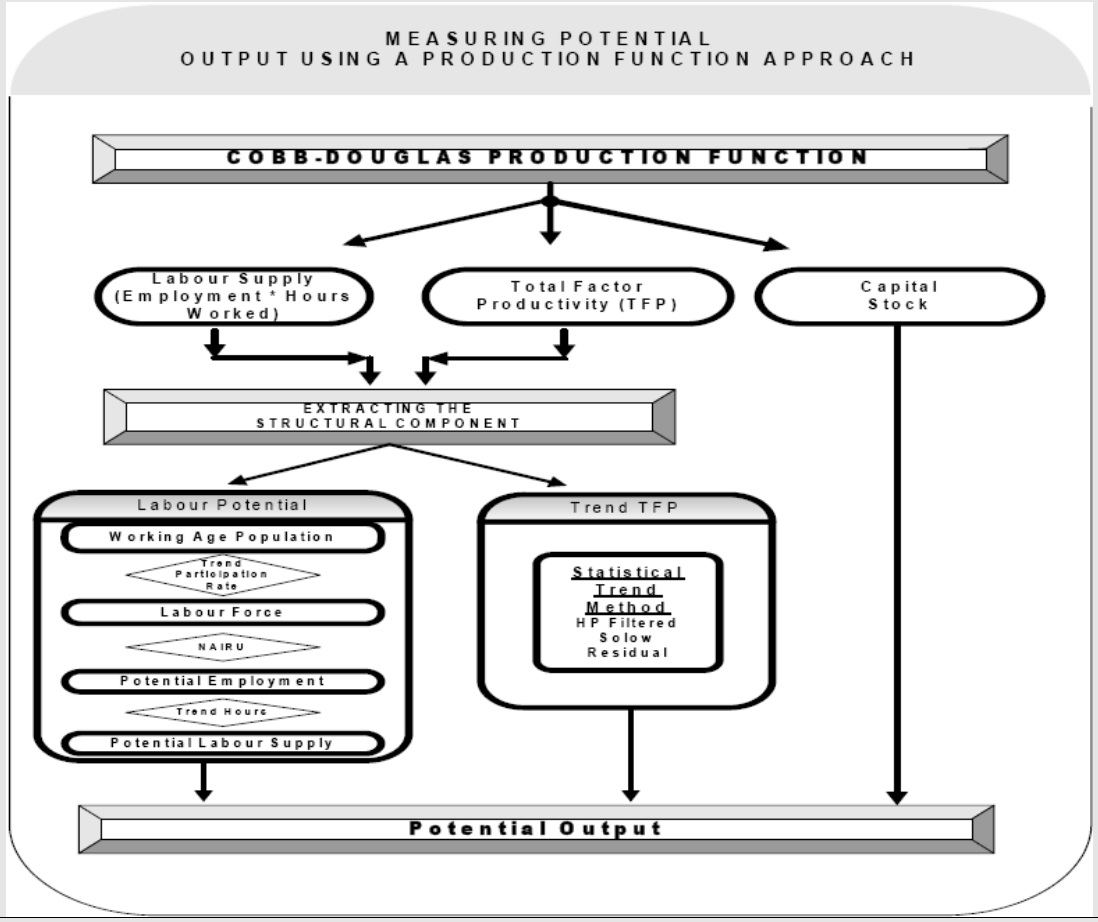
The approach agreed in the 2009 projection exercise

The production function approach has been used for projecting output growth also in the 2009 projection exercise. It was also agreed to adopt total hours worked as labour input (as opposed to the number of persons employed used in the 2006 Ageing Report), in line with the incorporation of this concept of labour input 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 2. 5 illustrates the building blocks of the production function used in the projection. The methodology is described below.

[40] See European Commission (2008) for a discussion on the Stability and Growth Pact.

[41] International institutions and bodies such as the OECD, the ECB and the IMF use such a framework in their model. Moreover, *medium-term* projections of productivity (say with a horizon of 5 or 10 years) are based on the idea that, after some time, actual labour productivity growth equals the potential labour productivity, which is the ratio of potential output to potential employment (or hours worked). For instance, Downes *et al.* (2003) develop a medium-term reference scenario on the basis of the production function used to build the long-run supply-side conditions of the OECD's INTERLINK models.

Graph 2. 5 - Overview of the production function



Source: Denis et al. (2006).

3.2. Methodology used to project potential output

3.2.1. Short 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.

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

where:

Y is total output (GDP);

L is the supply of labour, i.e. total hours worked;

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.[42]

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

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

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:

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

It should also be noted that, in the steady state, the contribution of capital deepening to output growth is a simple function of TFP[43], which becomes the single driver of labour productivity.[44]

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

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.

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42 Although there is some debate about the recent and observed decline of the labour share, most economists assume that it should 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 2009 was introduced, specifically allowing for a variation in the wage share in 2008-2009. 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.

43 As the labour share β is set equal to 0.65, the long-run contribution of capital deepening to labour productivity growth is 0.538 times TFP growth rate. With the assumption of a long-run TFP growth rate equivalent to 1.1% per annum (see section 3.2.3), this implies a long-run contribution of capital deepening to labour productivity growth equal to 0.6% and hence a labour productivity growth rate of 1.7%.

44 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".

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 (NAIRU). It equals *LF*(1-NAIRU)*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*[45], 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:

$$Log(Y_p)=Log(trendTFP)+\beta Log(LF*(1-Nairu)*Hours)+(1-\beta)logK)$$

3.2.2. Specific assumptions on the components of the production function in the short term (2008-2009)

The PF 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 2008-2009 the Commission services spring 2008 forecasts was used.

3.2.3. Specific assumptions on the components of the production function in the longer run (2010-2060)

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

- 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. So, it was assumed that there should be convergence in *growth rates* over the long-term projection exercise. However, the level matters 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

[45] It is expressed in terms of labour-augmenting efficiency for the OECD and the IMF. In the IMF's model, MULTIMOD, the production function for each country is specified as a Cobb-Douglas relationship between output and two factor input –the labour force and the real net capital stock – with a constant and exogenous growth rate of total factor productivity.

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 of allowing for a certain period of 'fast' convergence.

Total Factor Productivity: the driving force of 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). 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 1.1%; this rate is also close to that experienced in the US, the leading economy in the world (see the AMECO database). As a result of this assumption, the growth rate in labour productivity (output per worker/hour), is projected to be 1.7% in the long-term.

However, the speed of convergence to this growth rate was assumed 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.

The Ageing Working Group held a series of discussions throughout 2008 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.

The assumptions agreed by the EPC in 2008 were as follows:

- the *'leader'* is the group of countries that have a GDP per capita above the EU27 average in 2007 (see Table 3. 1). For these countries, TFP growth is assumed to converge to a 1.1% growth rate (by 2030 if higher than 1.1% in 2009 and by 2015 if lower than 1.1% in 2009), similar to the previous projection exercise;

- the *'follower'* group of countries are those with GDP per capita below the EU-27 average (see Table 3. 1). For this group of countries, a differentiation is made depending on the distance to the EU-27 average in 2007 (See Table 3. 2).

Table 3. 1 - Potential GDP per capita in 2007[46]

Country	LU	IE	SE	NL	AT	DK	FI	BE	UK	DE	FR	IT	EU27	ES
GDP per capita (PPS)	55.9	31.0	27.7	27.6	27.4	26.9	26.4	25.9	25.2	24.0	23.2	22.8	21.3	21.0
in % of EU27	263	146	131	130	129	127	124	122	118	113	109	107	100	99
Country	EL	SI	CY	CZ	MT	PT	EE	SK	HU	LT	LV	PL	BG	RO
GDP per capita (PPS)	20.3	19.3	18.9	17.1	16.9	15.4	14.5	14.0	14.0	12.7	12.5	11.8	8.0	7.5
in % of EU27	96	91	89	80	79	72	68	66	66	60	59	56	38	35

Source: Commission services, EPC.

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

"Leaders" (GDP per capita in 2007 higher than EU27 average)	Countries with an estimated TFP growth rate above 1.1% in 2009 are assumed to convergence to 1.1% by 2030		DK, IE, FI, SE, UK
	Countries with a TFP growth rate below 1.1% in 2009 are assumed to convergence to 1.1% by 2015		BE, DE, FR, IT, LU, NL, AT, NO
"Followers" (GDP per capita in 2007 lower than EU27 average)	• Countries converging to a 1.75% TFP growth rate according to the distance to the EU27 average at present *(1)* by a certain year *(2)*		
	Thresholds (% of EU-27 GDP per capita)	*Fast convergence period up to:*	*Countries*
	(1)	*(2)*	*(3)*
	76-100	2020	ES, EL, SI, CY, CZ, MT
	50-75	2030	EE, HU, SK, LT, LV, PL PT
	0-50	2040	BG, RO
	• and subsequently converge to 1.1% TFP growth rate by 2050		

Source: Commission services, EPC.

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 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.[47]

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.

[46] This is the potential real GDP per capita expressed in 2000 PPS, as estimated by the Commission (DG ECFIN) in the spring 2008 forecast.

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

Capital formation

Up to 2009, the "*Investment Rule"* is applied: capital stocks are derived from the ratio of investment to GDP ratio until 2009. As the latter is extrapolated from historical values using time-series techniques, it turns out broadly constant up to 2009. 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.[48] 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: the so-called *"Capital Rule"* provides that the growth rate of the capital stock is set equal to the sum of growth rate of employment and labour augmenting technical progress. As seen in section 3.2.1, 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 2010 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, the EPC decided that a transition between the investment rule and the capital rule should be worked out 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 2009, which is kept broadly constant *("investment rule"*);
- the transition to the constant capital/labour (in efficiency units) ratio assumption is introduced gradually in the period 2010-2030 in a linear manner *("transition rule"*);
- the capital/labour (in efficiency units) ratio is constant from 2030 onwards*("capital rule"*).

3.3. Main results of baseline projections

Results for EU27 and the euro area

The outcome of the projections for potential growth rates up to 2060 as well as its determinants is given in Table 3. 3 to Table 3. 8.

The annual average potential GDP growth rate in the EU is projected to decline sharply, from 2.4% in the period 2007-2020, to 1.7% in the period 2021-30 and then being reduced to 1.3%

[48] Indeed, movements in interest rates are supposed to broadly follow developments in potential output in the long run, as indicated in the 'golden rule' of the Solow model.

in the period 2041-2060. Over the whole period 2007-2060, 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 in the beginning of the projection period (up to 2020s) is lower than for the EU27 and the decline is therefore less sharp.

Table 3. 3 - Projected potential growth rates (based on the underlying assumptions used in the projection exercise (annual average growth rates)

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	2.3	1.6	1.7	1.7	1.7	*1.8*
BG	4.4	2.0	1.5	0.7	0.6	*1.9*
CZ	4.0	1.7	1.1	0.8	0.9	*1.8*
DK	1.8	1.7	1.7	1.9	1.7	*1.7*
DE	1.7	1.0	1.0	1.1	1.0	*1.2*
EE	5.0	2.3	1.4	0.7	0.9	*2.1*
IE	3.8	2.6	2.1	1.6	1.8	*2.4*
EL	3.1	1.8	1.1	1.1	1.3	*1.8*
ES	3.1	2.4	1.3	0.9	1.4	*1.9*
FR	2.0	1.8	1.8	1.8	1.8	*1.8*
IT	1.6	1.6	1.1	1.2	1.4	*1.4*
CY	3.7	3.2	2.6	2.0	1.8	*2.8*
LV	5.0	1.9	1.0	0.2	0.5	*1.8*
LT	5.0	1.8	0.9	0.4	0.3	*1.8*
LU	4.2	2.3	2.2	2.2	2.0	*2.7*
HU	2.9	2.1	1.5	0.9	0.9	*1.7*
MT	2.6	2.1	1.4	1.0	0.9	*1.7*
NL	1.9	1.3	1.4	1.5	1.4	*1.5*
AT	2.1	1.6	1.6	1.5	1.5	*1.7*
PL	4.3	2.3	1.0	0.3	0.4	*1.7*
PT	1.8	2.1	2.2	1.5	1.3	*1.8*
RO	4.9	2.1	1.6	0.6	0.4	*2.0*
SI	3.7	1.4	0.8	0.7	1.0	*1.6*
SK	5.3	2.3	0.9	0.3	0.4	*2.0*
FI	2.6	1.5	1.6	1.5	1.4	*1.7*
SE	2.5	1.8	1.8	1.8	1.6	*1.9*
UK	2.4	2.0	2.1	2.1	1.8	*2.1*
NO	2.6	1.8	1.8	1.9	1.8	*2.0*
EU27	2.4	1.7	1.4	1.3	1.3	*1.7*
EA	2.1	1.7	1.3	1.3	1.4	*1.6*
EA12	2.1	1.7	1.3	1.3	1.4	*1.6*
EU15	2.2	1.7	1.5	1.5	1.5	*1.7*
EU10	4.2	2.1	1.1	0.6	0.6	*1.8*
EU25	2.3	1.8	1.4	1.3	1.4	*1.7*

Source: Commission services, EPC.

Table 3. 2 and Table 3. 3 show the contribution of productivity per hour worked and hours worked to projected potential growth rates. For the EU27, productivity growth is projected to remain fairly stable and close to 1.7% throughout the projection period. The small increase up to the 2030s is due to the assumed higher productivity growth in the catching up MSs up to the 2030s, which eventually is assumed to converge to the 1.7% growth rate by 2050. Since the starting point of productivity growth in the euro area is below the assumed long-term EU average of 1.7% annual growth, this leads to a higher assumed increase in productivity growth up to the 2030s.

Labour input in the EU and in the euro area is projected to increase up to the 2020s. Thereafter, the demographic changes, with a reduction in the working-age population, are projected to act as a drag on growth in both the EU and the euro area.

Table 3. 4 and Table 3. 5 show the contribution of the main determinants of labour productivity (per hour worked), i.e. TFP growth and capital deepening. TFP growth explains most of productivity growth per hour worked. This follows from the fact that in the long-run, the capital deepening contribution follows TFP growth (times the labour share). By construction, TFP growth converges toward the rate of 1.1% by 2050 for all Member States, which, given the use of the "capital rule", implies a labour productivity growth rate of 1.7% for all countries in the steady state reached in 2050 for all Member States (see footnote 43).

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

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	1.6	1.7	1.7	1.7	1.7	*1.7*
BG	3.8	3.0	2.7	2.2	1.7	*2.7*
CZ	3.6	2.2	1.7	1.7	1.7	*2.2*
DK	1.9	1.7	1.7	1.7	1.7	*1.7*
DE	1.6	1.7	1.7	1.7	1.7	*1.7*
EE	4.6	2.9	1.9	1.7	1.7	*2.6*
IE	1.9	1.8	1.7	1.7	1.7	*1.8*
EL	2.4	2.2	1.7	1.7	1.7	*2.0*
ES	1.5	2.3	1.8	1.7	1.7	*1.8*
FR	1.6	1.7	1.7	1.7	1.7	*1.7*
IT	1.0	1.7	1.7	1.7	1.7	*1.6*
CY	1.9	2.3	1.9	1.7	1.7	*1.9*
LV	4.7	3.0	1.9	1.7	1.7	*2.7*
LT	4.4	3.0	1.9	1.7	1.7	*2.6*
LU	1.8	1.8	1.7	1.7	1.7	*1.7*
HU	2.8	2.6	2.3	1.9	1.7	*2.3*
MT	2.1	2.1	1.7	1.7	1.7	*1.9*
NL	1.7	1.7	1.7	1.7	1.7	*1.7*
AT	1.7	1.7	1.7	1.7	1.7	*1.7*
PL	3.4	2.8	1.9	1.7	1.7	*2.4*
PT	1.4	2.1	2.5	2.0	1.7	*1.9*
RO	4.6	3.0	2.7	2.0	1.7	*2.9*
SI	3.4	2.3	1.7	1.7	1.7	*2.2*
SK	4.5	2.9	1.9	1.7	1.7	*2.6*
FI	2.3	1.8	1.7	1.7	1.7	*1.8*
SE	1.9	1.7	1.7	1.7	1.7	*1.7*
UK	2.2	1.7	1.7	1.7	1.7	*1.8*
NO	1.5	1.7	1.7	1.7	1.7	*1.7*
EU27	1.9	2.0	1.8	1.7	1.7	*1.8*
EA	1.5	1.8	1.7	1.7	1.7	*1.7*
EA12	1.5	1.8	1.7	1.7	1.7	*1.7*
EU15	1.6	1.8	1.7	1.7	1.7	*1.7*
EU10	3.4	2.7	1.9	1.7	1.7	*2.4*
EU25	1.8	1.9	1.8	1.7	1.7	*1.8*

Source: Commission services, EPC.

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

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	0.8	-0.1	0.0	0.0	0.0	*0.2*
BG	0.6	-1.0	-1.2	-1.4	-1.1	*-0.8*
CZ	0.4	-0.5	-0.6	-0.9	-0.7	*-0.4*
DK	-0.1	-0.1	0.0	0.2	0.0	*0.0*
DE	0.1	-0.7	-0.7	-0.6	-0.7	*-0.5*
EE	0.4	-0.6	-0.6	-1.0	-0.8	*-0.6*
IE	1.9	0.8	0.4	-0.1	0.1	*0.7*
EL	0.7	-0.4	-0.6	-0.6	-0.4	*-0.2*
ES	1.6	0.2	-0.5	-0.8	-0.3	*0.1*
FR	0.3	0.0	0.1	0.1	0.1	*0.1*
IT	0.7	0.0	-0.6	-0.5	-0.3	*-0.1*
CY	1.9	0.9	0.7	0.3	0.1	*0.8*
LV	0.3	-1.0	-0.9	-1.5	-1.2	*-0.9*
LT	0.7	-1.2	-1.1	-1.3	-1.4	*-0.8*
LU	2.4	0.5	0.5	0.5	0.4	*0.9*
HU	0.1	-0.5	-0.8	-1.0	-0.8	*-0.5*
MT	0.5	0.0	-0.3	-0.7	-0.8	*-0.2*
NL	0.2	-0.4	-0.3	-0.2	-0.3	*-0.2*
AT	0.4	-0.1	-0.1	-0.2	-0.2	*0.0*
PL	0.9	-0.5	-0.9	-1.4	-1.3	*-0.7*
PT	0.5	0.0	-0.3	-0.5	-0.4	*-0.1*
RO	0.3	-0.9	-1.1	-1.4	-1.3	*-0.8*
SI	0.2	-0.9	-1.0	-1.0	-0.7	*-0.6*
SK	0.8	-0.6	-1.0	-1.4	-1.3	*-0.6*
FI	0.2	-0.3	-0.1	-0.2	-0.2	*-0.1*
SE	0.6	0.1	0.1	0.1	-0.1	*0.2*
UK	0.3	0.3	0.4	0.4	0.1	*0.3*
NO	1.1	0.1	0.1	0.2	0.1	*0.3*
EU27	0.5	-0.2	-0.4	-0.4	-0.4	*-0.1*
EA	0.6	-0.2	-0.4	-0.4	-0.3	*-0.1*
EA12	0.6	-0.2	-0.4	-0.4	-0.3	*-0.1*
EU15	0.5	-0.1	-0.2	-0.2	-0.2	*0.0*
EU10	0.7	-0.6	-0.8	-1.2	-1.1	*-0.6*
EU25	0.6	-0.2	-0.3	-0.4	-0.3	*-0.1*

Source: Commission services, EPC.

For the countries with a relatively low GDP per capita (see section 3.2.3), 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 0.6 p.p., as the growth in the capital stock slowly adjusts to growth in hours worked.

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

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	1.0	1.1	1.1	1.1	1.1	*1.1*
BG	1.3	1.7	1.7	1.4	1.1	*1.5*
CZ	2.4	1.3	1.1	1.1	1.1	*1.4*
DK	1.1	1.1	1.1	1.1	1.1	*1.1*
DE	1.0	1.1	1.1	1.1	1.1	*1.1*
EE	2.2	1.8	1.2	1.1	1.1	*1.5*
IE	1.2	1.1	1.1	1.1	1.1	*1.1*
EL	1.2	1.3	1.1	1.1	1.1	*1.2*
ES	0.7	1.5	1.2	1.1	1.1	*1.1*
FR	1.0	1.1	1.1	1.1	1.1	*1.1*
IT	0.6	1.1	1.1	1.1	1.1	*1.0*
CY	1.0	1.5	1.2	1.1	1.1	*1.2*
LV	2.4	1.8	1.2	1.1	1.1	*1.5*
LT	2.2	1.8	1.2	1.1	1.1	*1.5*
LU	1.0	1.1	1.1	1.1	1.1	*1.1*
HU	1.4	1.6	1.5	1.2	1.1	*1.4*
MT	1.3	1.3	1.1	1.1	1.1	*1.2*
NL	1.1	1.1	1.1	1.1	1.1	*1.1*
AT	1.1	1.1	1.1	1.1	1.1	*1.1*
PL	1.6	1.7	1.2	1.1	1.1	*1.4*
PT	0.8	1.4	1.6	1.3	1.1	*1.2*
RO	2.1	1.8	1.8	1.3	1.1	*1.6*
SI	1.6	1.3	1.1	1.1	1.1	*1.3*
SK	2.8	1.8	1.2	1.1	1.1	*1.6*
FI	1.6	1.1	1.1	1.1	1.1	*1.2*
SE	1.3	1.1	1.1	1.1	1.1	*1.1*
UK	1.2	1.1	1.1	1.1	1.1	*1.1*
NO	1.1	1.1	1.1	1.1	1.1	*1.1*
EU27	1.1	1.2	1.1	1.1	1.1	*1.1*
EA	0.9	1.2	1.1	1.1	1.1	*1.1*
EA12	0.9	1.2	1.1	1.1	1.1	*1.1*
EU15	1.0	1.2	1.1	1.1	1.1	*1.1*
EU10	1.9	1.6	1.3	1.1	1.1	*1.4*
EU25	1.1	1.2	1.1	1.1	1.1	*1.1*

Source: Commission services, EPC.

Table 3. 7 - Determinants of labour productivity: capital deepening (contribution in p.p.)

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	0.6	0.6	0.6	0.6	0.6	*0.6*
BG	2.5	1.2	1.0	0.8	0.6	*1.3*
CZ	1.2	0.9	0.6	0.6	0.6	*0.8*
DK	0.8	0.6	0.6	0.6	0.6	*0.6*
DE	0.5	0.6	0.6	0.6	0.6	*0.6*
EE	2.4	1.2	0.7	0.6	0.6	*1.2*
IE	0.7	0.7	0.6	0.6	0.6	*0.6*
EL	1.2	0.9	0.6	0.6	0.6	*0.8*
ES	0.8	0.8	0.6	0.6	0.6	*0.7*
FR	0.7	0.6	0.6	0.6	0.6	*0.6*
IT	0.4	0.6	0.6	0.6	0.6	*0.5*
CY	0.8	0.8	0.6	0.6	0.6	*0.7*
LV	2.3	1.2	0.7	0.6	0.6	*1.1*
LT	2.2	1.2	0.7	0.6	0.6	*1.1*
LU	0.8	0.7	0.6	0.6	0.6	*0.7*
HU	1.4	1.0	0.8	0.7	0.6	*0.9*
MT	0.8	0.7	0.6	0.6	0.6	*0.7*
NL	0.6	0.6	0.6	0.6	0.6	*0.6*
AT	0.6	0.6	0.6	0.6	0.6	*0.6*
PL	1.7	1.1	0.7	0.6	0.6	*1.0*
PT	0.5	0.7	0.9	0.7	0.6	*0.7*
RO	2.5	1.2	1.0	0.7	0.6	*1.2*
SI	1.9	1.0	0.6	0.6	0.6	*1.0*
SK	1.7	1.2	0.7	0.6	0.6	*1.0*
FI	0.7	0.7	0.6	0.6	0.6	*0.6*
SE	0.6	0.6	0.6	0.6	0.6	*0.6*
UK	0.9	0.6	0.6	0.6	0.6	*0.7*
NO	0.4	0.6	0.6	0.6	0.6	*0.6*
EU27	0.8	0.7	0.6	0.6	0.6	*0.7*
EA	0.6	0.7	0.6	0.6	0.6	*0.6*
EA12	0.6	0.7	0.6	0.6	0.6	*0.6*
EU15	0.6	0.7	0.6	0.6	0.6	*0.6*
EU10	1.6	1.1	0.7	0.6	0.6	*1.0*
EU25	0.7	0.7	0.6	0.6	0.6	*0.7*

Source: Commission services, EPC.

Table 3. 6 presents the projections for GDP per capita growth rates over the period 2007-2060. As expected, the projected decline in output per capita growth rates in both the EU27 and the euro area is a bit smaller than the projected fall in output growth rates, since total population growth rates are also projected go down over time.

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

Country	2007-2020	2021-2030	2031-2040	2041-2050	2051-2060	*2007-2060*
BE	1.7	1.3	1.5	1.6	1.6	*1.5*
BG	4.9	2.6	2.2	1.4	1.4	*2.5*
CZ	3.8	1.8	1.4	1.1	1.3	*1.9*
DK	1.5	1.4	1.5	1.9	1.7	*1.6*
DE	1.8	1.2	1.3	1.6	1.5	*1.5*
EE	5.2	2.7	1.7	1.1	1.3	*2.4*
IE	1.8	1.7	1.5	1.1	1.4	*1.5*
EL	2.8	1.8	1.1	1.2	1.6	*1.8*
ES	1.8	2.1	1.2	0.9	1.6	*1.6*
FR	1.4	1.4	1.5	1.6	1.7	*1.5*
IT	1.2	1.6	1.1	1.3	1.7	*1.4*
CY	2.1	2.0	1.7	1.3	1.2	*1.7*
LV	5.6	2.5	1.6	0.8	1.2	*2.4*
LT	5.5	2.3	1.5	1.1	1.0	*2.3*
LU	2.9	1.3	1.4	1.6	1.6	*1.8*
HU	3.0	2.3	1.8	1.3	1.3	*2.0*
MT	2.1	2.0	1.6	1.2	1.1	*1.7*
NL	1.6	1.1	1.4	1.7	1.6	*1.5*
AT	1.7	1.3	1.4	1.5	1.6	*1.5*
PL	4.4	2.6	1.5	0.9	1.0	*2.1*
PT	1.4	1.9	2.0	1.5	1.5	*1.7*
RO	5.3	2.5	2.1	1.1	1.2	*2.5*
SI	3.4	1.6	1.1	1.2	1.5	*1.8*
SK	5.2	2.5	1.3	0.8	1.0	*2.3*
FI	2.2	1.4	1.7	1.7	1.5	*1.7*
SE	1.9	1.4	1.6	1.6	1.4	*1.6*
UK	1.7	1.5	1.7	1.7	1.5	*1.6*
NO	1.8	1.2	1.3	1.6	1.5	*1.5*
EU27	2.0	1.7	1.5	1.5	1.6	*1.7*
EA	1.6	1.5	1.3	1.4	1.6	*1.5*
EA12	1.6	1.5	1.3	1.4	1.6	*1.5*
EU15	1.7	1.5	1.4	1.5	1.6	*1.6*
EU10	4.2	2.4	1.5	1.0	1.2	*2.1*
EU25	1.9	1.6	1.4	1.5	1.6	*1.6*

Source: Commission services, EPC.

Cross-country differences

While 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. 1. 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 differentiation of assumed productivity growth rates according to the catching-up potential. In the latter part of the projection period, developments in labour input has a dominant role due to different demographic developments and the mechanical effect of productivity growth convergence.

Sources of growth

In addition to falling potential GDP growth rates, the sources of growth will alter dramatically. Labour will make a positive contribution to growth in both the EU and the euro area up to 2020, but turn significantly negative thereafter (see Table 3. 3). Over time, productivity will become the dominant source of growth.

In order to assess the relative contribution to GDP growth of its two main components, labour productivity and labour utilisation, Table 3. 8 uses the standard growth accounting framework. For the EU and for the euro area, a slight increase in the size of the population and an increasing employment rate (which on average contributes 0.1 percentage points each to average GDP growth over the entire projection period) is more than offset by a decline in the share of the working-age population (which is a negative drag on growth by an average of -0.3 percentage points). As a result, labour input contributes negatively to output growth on average over the projection period (by 0.1 p.p.).

Table 3. 9 - Decomposition of GDP growth, 2007-2060

		Due to growth in :								
	GDP growth in 2007-2060	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 2007-2060
Country	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	1.8	1.7	1.1	0.6	0.2	0.3	0.0	-0.2	-0.01	1.5
BG	1.9	2.7	1.5	1.3	-0.8	-0.6	0.1	-0.3	0.01	2.5
CZ	1.8	2.2	1.4	0.8	-0.4	-0.1	0.0	-0.3	-0.02	1.9
DK	1.7	1.7	1.1	0.6	0.0	0.2	0.0	-0.1	-0.02	1.6
DE	1.2	1.7	1.1	0.6	-0.5	-0.3	0.1	-0.3	-0.03	1.5
EE	2.1	2.6	1.5	1.2	-0.6	-0.3	0.0	-0.3	0.01	2.4
IE	2.4	1.8	1.1	0.6	0.7	0.9	0.0	-0.2	-0.03	1.5
EL	1.8	2.0	1.2	0.8	-0.2	0.0	0.1	-0.3	0.00	1.8
ES	1.9	1.8	1.1	0.7	0.1	0.3	0.2	-0.3	-0.05	1.6
FR	1.8	1.7	1.1	0.6	0.1	0.3	0.0	-0.2	-0.02	1.5
IT	1.4	1.6	1.0	0.5	-0.1	0.0	0.1	-0.3	-0.01	1.4
CY	2.8	1.9	1.2	0.7	0.8	1.0	0.0	-0.2	-0.02	1.7
LV	1.8	2.7	1.5	1.1	-0.9	-0.6	0.0	-0.3	0.00	2.3
LT	1.8	2.6	1.5	1.1	-0.8	-0.5	0.0	-0.3	0.03	2.3
LU	2.6	1.7	1.1	0.7	0.9	0.8	0.2	-0.1	-0.02	1.8
HU	1.7	2.3	1.4	0.9	-0.5	-0.3	0.0	-0.3	-0.01	2.0
MT	1.7	1.9	1.2	0.7	-0.2	0.0	0.1	-0.3	-0.04	1.7
NL	1.5	1.7	1.1	0.6	-0.2	0.0	0.0	-0.2	-0.04	1.5
AT	1.7	1.7	1.1	0.6	0.0	0.2	0.0	-0.2	-0.02	1.5
PL	1.7	2.4	1.4	1.0	-0.7	-0.4	0.1	-0.4	-0.01	2.1
PT	1.8	1.9	1.2	0.7	-0.1	0.1	0.1	-0.3	-0.02	1.7
RO	2.0	2.9	1.6	1.2	-0.8	-0.5	-0.1	-0.3	0.04	2.5
SI	1.6	2.2	1.3	1.0	-0.6	-0.2	0.0	-0.4	-0.01	1.8
SK	2.0	2.6	1.6	1.0	-0.6	-0.3	0.0	-0.4	0.01	2.3
FI	1.7	1.8	1.2	0.6	-0.1	0.1	0.1	-0.2	-0.02	1.7
SE	1.9	1.7	1.1	0.6	0.2	0.3	0.0	-0.2	0.00	1.6
UK	2.1	1.8	1.1	0.7	0.3	0.5	0.0	-0.2	-0.04	1.6
NO	2.0	1.7	1.1	0.6	0.3	0.5	0.0	-0.1	0.00	1.5
EU27	1.7	1.8	1.1	0.7	-0.1	0.1	0.1	-0.3	-0.03	1.6
EA	1.6	1.7	1.1	0.6	-0.1	0.1	0.1	-0.3	-0.02	1.5
EA12	1.6	1.7	1.1	0.6	-0.1	0.1	0.1	-0.3	-0.02	1.5
EU15	1.7	1.7	1.1	0.6	0.0	0.2	0.1	-0.2	-0.02	1.6
EU10	1.8	2.4	1.4	1.0	-0.6	-0.3	0.1	-0.3	-0.01	2.1
EU25	1.7	1.8	1.1	0.7	-0.1	0.1	0.1	-0.3	-0.03	1.6

Source: Commission services, EPC.

Summing up

Given the decline in labour supply, the annual average potential GDP growth rate of 2.4% for the EU27 in the period 2007 to 2020 is projected to decline to 1.3% in the period 2041-2060. The projected fall in potential growth rates is lower in the euro area, chiefly reflecting lower growth rates in the beginning of the projection period. The new Member States are projected to exhibit a larger decline in potential growth rates over the projection period. This stems from the assumption that productivity growth rates are assumed to converge for all Member

States by 2050 and that the demographic projections are less favourable in the new Member States compared with the old Member States. It should be borne in mind that these projections of GDP are based on projections of future growth in labour productivity and employment. In particular, projected labour productivity growth relies on assumptions about total factor productivity growth and capital stock developments. Although such patterns may or may not be realised in practice, it is based on the agreed reasonable principle that cross-country discrepancies in labour productivity growth should be allowed at the start of the projection but should fade away towards the end of the projection horizon.

3.4. Comparison with the previous 2006 long-term budgetary projection exercise

Table 3. 9 shows a comparison between the current projection of output growth and its components and the projection in the 2006 exercise (over the period 2004-2050). Annual average potential GDP growth over the period 2004-2050 in the EU25 and in the euro area is projected to be 1.8%, compared with 1.7% in the 2006 projection (figures for EU27 was not available in the 2006 exercise). The higher average growth rate in the EU25 can be attributed to a more favourable demographic outlook in the current exercise (higher growth in the total population and a less adverse population composition effect), which is partly offset by a worsened employment outlook.

Table 3. 10 - 2009 and 2006 projections compared, 2004-2050 (2009 projection minus 2006 projection), % points

	GDP growth in 2004-2050	Due to growth in :								GDP per capita growth in 2004-2050
		Productivity	*TFP*	*Capital deepening*	*Labour input*	*Total population*	*Employment rate*	*Share of working age population*	*average hours worked*	
	1=2+5	2=3+4	3	4	5=6+7+8+9	6	7	8	9	10=1-6
BE	0.2	-0.1	-0.1	0.0	0.2	0.2	-0.1	0.1		-0.1
BG										
CZ	0.2	-0.2	0.2	-0.3	0.4	0.2	0.0	0.2		-0.1
DK	0.1	-0.1	-0.1	0.0	0.1	0.2	0.0	0.0		0.0
DE	-0.1	0.1	0.0	0.1	-0.2	-0.1	-0.1	0.0		0.0
EE	0.0	-0.1	-0.1	0.0	0.1	0.1	-0.1	0.1		-0.1
IE	-0.1	-0.5	-0.4	-0.1	0.3	0.4	-0.2	0.2		-0.5
EL	0.5	0.3	0.3	0.0	0.0	0.1	-0.2	0.1		0.4
ES	0.6	0.0	0.1	0.0	0.4	0.5	-0.2	0.2		0.1
FR	0.1	0.0	0.0	0.1	0.1	0.2	-0.1	0.1		-0.1
IT	0.1	-0.1	-0.1	0.0	0.2	0.3	-0.1	0.1		-0.2
CY	0.1	-0.5	-0.2	-0.2	0.4	0.5	-0.2	0.2		-0.4
LV	-0.6	-0.4	-0.2	-0.2	-0.2	-0.1	-0.2	0.1		-0.5
LT	-0.4	-0.3	-0.1	-0.1	-0.2	-0.1	-0.3	0.1		-0.3
LU	-0.2	-0.1	0.0	-0.1	-0.1	0.2	-0.3	0.0		-0.4
HU	-0.1	0.0	0.1	-0.1	-0.1	0.0	-0.2	0.1		-0.1
MT	-0.5	0.0	0.1	-0.1	-0.6	-0.4	-0.2	0.1		-0.1
NL	-0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	0.0		0.0
AT	0.2	0.0	0.0	0.0	0.2	0.2	-0.2	0.1		0.0
PL	-0.2	-0.2	-0.2	0.1	-0.2	0.0	-0.4	0.2		-0.2
PT	0.4	-0.1	0.0	0.0	0.5	0.3	0.1	0.2		0.1
RO										
SI	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	0.1		-0.2
SK	0.2	0.1	0.1	0.0	0.0	0.1	-0.3	0.2		0.1
FI	0.1	0.0	-0.1	0.1	0.1	0.1	0.0	0.1		0.0
SE	-0.1	-0.2	-0.2	0.0	0.1	0.1	-0.1	0.0		-0.2
UK	0.3	-0.1	-0.1	0.0	0.4	0.3	0.0	0.1		-0.1
NO										
EU27										
EA										
EA12	0.2	0.0	0.0	0.0	0.1	0.2	-0.1	0.1		0.0
EU15	0.2	0.0	0.0	0.0	0.2	0.2	-0.1	0.1		0.0
EU10	-0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.3	0.2		-0.2
EU25	0.1	0.0	0.0	0.0	0.1	0.2	-0.1	0.1		0.0

Source: Commission services, EPC.

4. INTEREST RATES

4.1. Background

In the 2006 projection exercise, the EPC decided:

to assume a constant real interest rate in the baseline scenario with a prudent value of 3.0%.[49]

- 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 in the US over the long-term. Over the last forty years, the average real interest rates have ranged from around 2.5% to 3.5% in most EU countries and the US. Average rates in Belgium, Germany were about 3.5%, while in France, Italy, the Netherlands, the UK they have been below 3% and in the US it was 2.9%.

Table 4. 1 - Average of real long-term interest rates (1961-2007) (%)

1961-2007	BE	DK	DE	FR	IT	NL	FI	SE	UK	US
Real interest rate	3.6	4.3	3.6	2.8	1.7	2.7	2.8	2.6	2.5	2.9

Source: *Ameco database.*

Note: The long-term interest rate corresponds to an aggregate measure of government bond yields (10 years' maturity), deflated using the GDP deflator.
Data for Western Germany until 1991.

4.2. Assumptions on interest rates to be used in the 2009 EPC projection of age-related expenditure

In view of the analysis of fiscal sustainability, an important aspect is the fulfilment of the dynamic efficiency condition.[50] This condition is ensured in the long-term for all countries in the Commission's analysis of fiscal sustainability by assuming a time-varying interest rate/growth rate differential.[51] Moreover, in view of minimizing assumptions-driven revisions and thereby ensuring consistency between budgetary projection exercises, the EPC decided that the real interest rate assumption of 3% for all countries should be maintained also in the 2009 projection exercise, that inflation should be assumed to be 2% and that the projections should be reported in 2007 prices.

[49] The EPC agreed that the 2006 projections should be reported in 2004 prices. However, 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%.

[50] 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.

[51] See the Sustainability Report, European Commission (2006), 'The long-term sustainability of the public finances in the European Union', European Economy, No. 4, 2006. It may be noted that the constant interest rate assumption entails that the interest rate/GDP growth rate differential increases over time, as the GDP growth rate is projected to decrease.

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. In presenting the results of the projection of age-related expenditure, and when using the projections to assess the sustainability of public finances, it is important to avoid giving the impression that the baseline scenario represents the "best guess" as regards likely future developments in coming years. Instead, the baseline scenario should be presented as a prudent "no policy change" scenario which is a starting point for making projections. Moreover, when analyzing the economic and budgetary impact of ageing populations, a wide range of scenarios (baseline and sensitivity tests) are useful in providing information on the key factors driving the projection results and the potential sources of risk to future expenditure developments.

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 below. 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 impact can also be read as a kind of 'elasticity' parameter. Thus, the sensitivity tests enable an assessment of the impact of possible policy changes with an effect on key assumption variables.

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

Population		Labour force		Productivity	Interest rate
High life expectancy	**Zero migration**	**Higher employment rate**	**Higher employment rate older workers**	**Higher labour productivity**	**Higher 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 zero migration compared with the baseline projection.	A scenario with the employment rate being 1 p.p. higher compared with the baseline projection. The increase is introduced linearly over the period 2010-2020 and remains 1 p.p. higher thereafter. The higher employment rate is assumed to be achieved by lowering the rate of structural unemployment (the NAIRU).	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 2010-2020 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 0.25 percentage points higher than in the baseline scenario. The increase is introduced linearly during the period 2010-2020, and remains 0.25 p.p. above the baseline thereafter.	A scenario with the real interest being 1 percentage point above that in the baseline scenario, i.e. 4%.

Source: Commission services, EPC.

5.2. Projection results

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 Table 5. 2 through Table 5. 6 below.[52]

[52] 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 was only applied to the pension projections, where feasible and appropriate.

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

	GDP growth in 2007-2060	Due to growth in :						GDP per capita growth in 2007-2060
		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	1.9	1.7	0.2	0.3	0.1	-0.2	-0.02	1.6
BG	1.9	2.7	-0.8	-0.6	0.2	-0.3	0.01	2.5
CZ	1.8	2.2	-0.4	-0.1	0.1	-0.3	-0.02	1.9
DK	1.8	1.7	0.0	0.2	0.0	-0.1	-0.02	1.6
DE	1.2	1.7	-0.4	-0.3	0.2	-0.3	-0.03	1.5
EE	2.1	2.6	-0.5	-0.3	0.1	-0.3	0.01	2.4
IE	2.4	1.8	0.7	0.9	0.1	-0.2	-0.03	1.6
EL	1.8	2.0	-0.2	0.0	0.1	-0.3	0.00	1.8
ES	1.9	1.8	0.1	0.3	0.2	-0.3	-0.05	1.6
FR	1.9	1.7	0.2	0.3	0.1	-0.2	-0.02	1.6
IT	1.5	1.6	-0.1	0.0	0.2	-0.3	-0.01	1.4
CY	2.8	1.9	0.9	1.0	0.1	-0.2	-0.02	1.8
LV	1.8	2.7	-0.9	-0.6	0.0	-0.3	0.00	2.4
LT	1.8	2.6	-0.8	-0.5	0.0	-0.3	0.03	2.3
LU	2.7	1.7	0.9	0.8	0.3	-0.1	-0.02	1.9
HU	1.8	2.3	-0.5	-0.3	0.1	-0.3	-0.01	2.0
MT	1.7	1.9	-0.2	0.0	0.1	-0.3	-0.04	1.7
NL	1.5	1.7	-0.2	0.0	0.0	-0.2	-0.04	1.5
AT	1.7	1.7	0.0	0.2	0.1	-0.2	-0.02	1.5
PL	1.8	2.4	-0.6	-0.4	0.1	-0.4	-0.01	2.1
PT	1.8	1.9	-0.1	0.1	0.1	-0.3	-0.02	1.7
RO	2.1	2.9	-0.8	-0.5	-0.1	-0.3	0.04	2.5
SI	1.6	2.2	-0.6	-0.2	0.0	-0.4	-0.02	1.8
SK	2.0	2.6	-0.6	-0.3	0.1	-0.4	0.01	2.3
FI	1.7	1.8	-0.1	0.1	0.1	-0.2	-0.02	1.7
SE	1.9	1.7	0.2	0.3	0.0	-0.2	0.00	1.6
UK	2.1	1.8	0.3	0.5	0.1	-0.2	-0.04	1.7
NO	2.0	1.7	0.3	0.5	0.0	-0.1	0.00	1.5
EU27	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.7
EA	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.6
EA12	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.6
EU15	1.7	1.7	0.0	0.2	0.1	-0.2	-0.02	1.6
EU10	1.8	2.4	-0.6	-0.3	0.1	-0.3	-0.01	2.1
EU25	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.6

Source: Commission services, EPC.

Table 5. 3 - Sensitivity tests: higher employment rate

	GDP growth in 2007-2060	Due to growth in :						GDP per capita growth in 2007-2060
		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	1.9	1.7	0.2	0.3	0.1	-0.2	-0.01	1.6
BG	1.9	2.7	-0.8	-0.6	0.2	-0.3	0.01	2.5
CZ	1.8	2.2	-0.4	-0.1	0.1	-0.3	-0.02	1.9
DK	1.8	1.7	0.0	0.2	0.0	-0.1	-0.02	1.6
DE	1.2	1.7	-0.4	-0.3	0.2	-0.3	-0.03	1.5
EE	2.1	2.6	-0.5	-0.3	0.1	-0.3	0.01	2.4
IE	2.4	1.8	0.7	0.9	0.1	-0.2	-0.03	1.6
EL	1.8	2.0	-0.2	0.0	0.1	-0.3	0.00	1.8
ES	1.9	1.8	0.1	0.3	0.2	-0.3	-0.05	1.6
FR	1.9	1.7	0.2	0.3	0.1	-0.2	-0.02	1.6
IT	1.5	1.6	-0.1	0.0	0.2	-0.3	-0.01	1.4
CY	2.8	1.9	0.9	1.0	0.1	-0.2	-0.02	1.8
LV	1.8	2.7	-0.9	-0.6	0.0	-0.3	0.00	2.4
LT	1.8	2.6	-0.8	-0.5	0.0	-0.3	0.03	2.3
LU	2.7	1.7	0.9	0.8	0.3	-0.1	-0.02	1.9
HU	1.8	2.3	-0.5	-0.3	0.1	-0.3	-0.01	2.0
MT	1.7	1.9	-0.2	0.0	0.1	-0.3	-0.04	1.7
NL	1.5	1.7	-0.2	0.0	0.0	-0.2	-0.04	1.5
AT	1.7	1.7	0.0	0.2	0.1	-0.2	-0.02	1.5
PL	1.8	2.4	-0.6	-0.4	0.1	-0.4	-0.01	2.1
PT	1.8	1.9	-0.1	0.1	0.1	-0.3	-0.02	1.7
RO	2.1	2.9	-0.8	-0.5	-0.1	-0.3	0.04	2.5
SI	1.6	2.2	-0.6	-0.2	0.0	-0.4	-0.01	1.8
SK	2.0	2.6	-0.6	-0.3	0.1	-0.4	0.01	2.3
FI	1.7	1.8	-0.1	0.1	0.1	-0.2	-0.02	1.7
SE	2.0	1.7	0.2	0.3	0.0	-0.2	0.00	1.6
UK	2.1	1.8	0.3	0.5	0.1	-0.2	-0.04	1.7
NO	2.0	1.7	0.3	0.5	0.0	-0.1	0.00	1.5
EU27	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.6
EA	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.6
EA12	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.7
EU15	1.7	1.7	0.0	0.2	0.1	-0.2	-0.02	1.6
EU10	1.8	2.4	-0.6	-0.3	0.1	-0.3	-0.01	2.1
EU25	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.6

Source: Commission services, EPC.

Table 5. 4 - Sensitivity tests: higher productivity growth

	GDP growth in 2007-2060	Due to growth in :						GDP per capita growth in 2007-2060
		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	2.1	1.9	0.2	0.3	0.0	-0.2	-0.01	1.8
BG	2.1	2.9	-0.8	-0.6	0.1	-0.3	0.01	2.7
CZ	2.0	2.4	-0.4	-0.1	0.0	-0.3	-0.02	2.1
DK	2.0	1.9	0.0	0.2	0.0	-0.1	-0.02	1.8
DE	1.4	1.9	-0.5	-0.3	0.1	-0.3	-0.03	1.7
EE	2.3	2.9	-0.6	-0.3	0.0	-0.3	0.01	2.6
IE	2.6	2.0	0.7	0.9	0.0	-0.2	-0.03	1.7
EL	2.0	2.2	-0.2	0.0	0.1	-0.3	0.00	2.0
ES	2.1	2.0	0.1	0.3	0.2	-0.3	-0.05	1.8
FR	2.0	1.9	0.1	0.3	0.0	-0.2	-0.02	1.7
IT	1.6	1.8	-0.1	0.0	0.1	-0.3	-0.01	1.6
CY	3.0	2.1	0.8	1.0	0.0	-0.2	-0.02	2.0
LV	2.0	2.9	-0.9	-0.6	0.0	-0.3	0.00	2.5
LT	2.0	2.8	-0.8	-0.5	0.0	-0.3	0.03	2.5
LU	2.9	2.0	0.9	0.8	0.2	-0.1	-0.02	2.0
HU	1.9	2.5	-0.5	-0.3	0.0	-0.3	-0.01	2.2
MT	1.9	2.1	-0.2	0.0	0.1	-0.3	-0.04	1.9
NL	1.7	1.9	-0.2	0.0	0.0	-0.2	-0.04	1.7
AT	1.9	1.9	0.0	0.2	0.0	-0.2	-0.02	1.7
PL	1.9	2.6	-0.7	-0.4	0.1	-0.4	-0.01	2.3
PT	2.0	2.1	-0.1	0.1	0.1	-0.3	-0.02	1.9
RO	2.2	3.1	-0.8	-0.5	-0.1	-0.3	0.04	2.7
SI	1.8	2.4	-0.6	-0.2	0.0	-0.4	-0.01	2.0
SK	2.2	2.8	-0.6	-0.3	0.0	-0.4	0.01	2.5
FI	1.9	2.0	-0.1	0.1	0.1	-0.2	-0.02	1.9
SE	2.1	2.0	0.2	0.3	0.0	-0.2	0.00	1.8
UK	2.3	2.0	0.3	0.5	0.0	-0.2	-0.04	1.9
NO	2.2	1.9	0.3	0.5	0.0	-0.1	0.00	1.7
EU27	1.9	2.0	-0.1	0.1	0.1	-0.3	-0.03	1.7
EA	1.8	1.9	-0.1	0.1	0.1	-0.3	-0.02	1.7
EA12	1.8	1.9	-0.1	0.1	0.1	-0.3	-0.02	1.8
EU15	1.9	1.9	0.0	0.2	0.1	-0.2	-0.02	1.8
EU10	2.0	2.6	-0.6	-0.3	0.1	-0.3	-0.01	2.3
EU25	1.9	2.0	-0.1	0.1	0.1	-0.3	-0.03	1.8

Source: Commission services, EPC.

Table 5. 5 - Sensitivity tests: Higher life expectancy

	GDP growth in 2007-2060	Due to growth in :						GDP per capita growth in 2007-2060
		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	1.8	1.7	0.2	0.3	0.0	-0.2	-0.01	1.5
BG	1.9	2.7	-0.8	-0.6	0.1	-0.4	0.01	2.5
CZ	1.8	2.2	-0.4	-0.1	0.0	-0.4	-0.02	1.9
DK	1.7	1.7	0.0	0.2	0.0	-0.2	-0.02	1.6
DE	1.2	1.7	-0.5	-0.3	0.1	-0.3	-0.03	1.5
EE	2.1	2.6	-0.6	-0.3	0.0	-0.3	0.01	2.4
IE	2.4	1.8	0.7	0.9	0.0	-0.2	-0.03	1.5
EL	1.8	2.0	-0.2	0.0	0.1	-0.3	0.00	1.7
ES	1.9	1.8	0.1	0.3	0.2	-0.3	-0.05	1.6
FR	1.8	1.7	0.1	0.3	0.0	-0.2	-0.02	1.5
IT	1.4	1.6	-0.1	0.0	0.1	-0.3	-0.01	1.4
CY	2.8	1.9	0.8	1.0	0.0	-0.2	-0.02	1.7
LV	1.8	2.7	-0.9	-0.5	0.0	-0.3	0.00	2.3
LT	1.8	2.6	-0.8	-0.5	0.0	-0.3	0.03	2.3
LU	2.7	1.7	0.9	0.8	0.2	-0.2	-0.02	1.8
HU	1.7	2.3	-0.5	-0.2	0.0	-0.3	-0.01	2.0
MT	1.7	1.9	-0.2	0.0	0.1	-0.3	-0.04	1.7
NL	1.5	1.7	-0.2	0.0	0.0	-0.2	-0.04	1.5
AT	1.7	1.7	0.0	0.2	0.0	-0.2	-0.02	1.5
PL	1.7	2.4	-0.7	-0.4	0.1	-0.4	-0.01	2.1
PT	1.8	1.9	-0.1	0.1	0.1	-0.3	-0.02	1.7
RO	2.0	2.9	-0.8	-0.4	-0.1	-0.4	0.04	2.5
SI	1.6	2.2	-0.6	-0.2	0.0	-0.4	-0.01	1.8
SK	2.0	2.6	-0.6	-0.3	0.0	-0.4	0.01	2.3
FI	1.7	1.8	-0.1	0.1	0.1	-0.2	-0.02	1.7
SE	1.9	1.7	0.2	0.4	0.0	-0.2	0.00	1.6
UK	2.1	1.8	0.3	0.5	0.0	-0.2	-0.04	1.6
NO	2.0	1.7	0.3	0.5	0.0	-0.2	0.00	1.5
EU27	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.5
EA	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.5
EA12	1.6	1.7	-0.1	0.1	0.1	-0.3	-0.02	1.6
EU15	1.7	1.7	0.0	0.2	0.1	-0.3	-0.02	1.5
EU10	1.8	2.4	-0.6	-0.3	0.1	-0.4	-0.01	2.1
EU25	1.7	1.8	-0.1	0.1	0.1	-0.3	-0.03	1.6

Source: Commission services, EPC.

Table 5. 6 - Sensitivity tests: zero migration

	GDP growth in 2007-2060	Due to growth in :						GDP per capita growth in 2007-2060
		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	1.3	1.7	-0.3	-0.1	0.0	-0.2	-0.01	1.5
BG	1.8	2.7	-0.9	-0.7	0.1	-0.4	0.01	2.5
CZ	1.4	2.2	-0.9	-0.5	0.0	-0.4	-0.02	1.8
DK	1.5	1.7	-0.3	-0.1	0.0	-0.2	-0.02	1.5
DE	0.7	1.7	-0.9	-0.6	0.1	-0.4	-0.03	1.4
EE	2.0	2.6	-0.6	-0.4	0.0	-0.3	0.01	2.4
IE	1.9	1.8	0.2	0.4	0.1	-0.3	-0.03	1.5
EL	1.2	2.0	-0.8	-0.5	0.1	-0.4	0.00	1.6
ES	1.2	1.8	-0.6	-0.3	0.2	-0.4	-0.05	1.5
FR	1.6	1.7	-0.1	0.1	0.0	-0.2	-0.02	1.5
IT	0.7	1.6	-0.8	-0.5	0.1	-0.4	-0.01	1.3
CY	1.6	1.9	-0.4	0.0	0.0	-0.3	-0.02	1.6
LV	1.7	2.7	-0.9	-0.6	0.0	-0.3	0.00	2.3
LT	1.8	2.6	-0.8	-0.5	0.0	-0.3	0.03	2.3
LU	1.6	1.7	-0.2	-0.1	0.2	-0.2	-0.02	1.7
HU	1.4	2.3	-0.9	-0.5	0.0	-0.3	-0.01	1.9
MT	1.3	1.9	-0.7	-0.3	0.0	-0.3	-0.03	1.6
NL	1.3	1.7	-0.4	-0.1	0.0	-0.2	-0.04	1.4
AT	0.9	1.7	-0.8	-0.4	0.0	-0.3	-0.02	1.3
PL	1.7	2.4	-0.7	-0.4	0.1	-0.4	-0.01	2.1
PT	1.1	1.9	-0.8	-0.5	0.1	-0.4	-0.02	1.6
RO	2.0	2.9	-0.9	-0.5	-0.1	-0.4	0.04	2.5
SI	1.2	2.2	-1.0	-0.5	0.0	-0.4	-0.01	1.7
SK	1.8	2.6	-0.8	-0.4	0.0	-0.4	0.01	2.3
FI	1.5	1.8	-0.3	-0.1	0.1	-0.2	-0.02	1.7
SE	1.5	1.7	-0.2	0.0	0.0	-0.2	0.00	1.5
UK	1.6	1.8	-0.2	0.0	0.0	-0.2	-0.04	1.6
NO	1.5	1.7	-0.1	0.1	-0.1	-0.2	0.00	1.4
EU27	1.2	1.8	-0.6	-0.3	0.1	-0.3	-0.04	1.4
EA	1.1	1.7	-0.6	-0.3	0.1	-0.3	-0.04	1.4
EA12	1.1	1.7	-0.6	-0.3	0.1	-0.3	-0.04	1.6
EU15	1.2	1.7	-0.5	-0.3	0.1	-0.3	-0.04	1.5
EU10	1.6	2.4	-0.8	-0.5	0.0	-0.4	-0.01	2.0
EU25	1.2	1.8	-0.6	-0.3	0.1	-0.3	-0.04	1.5

Source: Commission services, EPC.

PART II

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

6. PENSIONS

6.1. Main features of the pension projection

While the projections of expenditure on health-care, long-term care, education and unemployment benefits are carried out by common models developed by the Commission (DG ECFIN) in cooperation with the AWG (see Chapters 7 through 10 for detailed descriptions), the projection of pension expenditure are carried out by the Member States using national models on the basis of the commonly agreed underlying assumptions described in Part I of this report.

Using different, country-specific projection models may introduce an element of non-comparability of the projection results. Nevertheless, this approach was chosen by the EPC because pension systems and arrangements are very diverse in the EU Member States, making it extremely difficult 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, a peer review was carried out when preparing the projections. The projection results were discussed and revised where deemed necessary by the AWG members and the European Commission during the projection exercise.

6.2. Coverage of the pension projection

The core of the projection exercise is *government expenditure on pensions* for *both the private and public sectors*, as in the 2006 pension projection exercise. The members of the AWG agreed to provide pension projections for the following items:

- Gross pension expenditure
- Number of pensions/pensioners
- Number of contributors
- Contributions to public pension schemes
- Assets accumulated by public pension schemes

In addition, Member States can, as in the 2006 exercise, cover on a voluntary basis:

- Occupational and private (mandatory) pension expenditures

Moreover, the AWG decided that for the 2009 pension projection exercise Member States can provide projections on a voluntary basis on the following items:

- Replacement rates and benefit ratios
- Taxes on pensions and net pension expenditures
- Private (non-mandatory) pension expenditures

A complete list of the items covered by the 2009 pension projection exercise is provided in Annex 6.1.

Building on and extending the 2006 reporting framework

The 2006 pension projection exercise forms a solid point of departure for the current round of projection exercise. In order to improve further the pension reporting framework, a few additional changes were introduced in the 2009 projection exercise. All of the introduced amendments were duly discussed by AWG and EPC delegates, and reflect recent developments and the expected advancement over the projection period as regards the features of the pension systems in the Member States. However, since many of the Member States found it difficult to provide figures concerning the recently introduced amendments, the EPC (AWG) agreed that they would be voluntary (see Annex 6.1 for the complete pension questionnaire).

The amendments to the 2009 reporting framework mainly stem from the following considerations:

- further information on privately managed pension schemes is necessary as the reliance on private pension provision seems to increase in the future. The reporting framework is extended to cover private pension schemes to a greater degree, i.e. information on both mandatory and non-mandatory private schemes is proposed to be provided by MSs;

- there is a need to provide projections of taxes on both private and public pensions, since for some countries these can become an important source of revenue in the future;

- a large number of countries have implemented pension reforms that make the public pension systems less generous. In order to shed light on potential risks to future pension development, the evolution of pension levels is crucial to analyse so as to better understand the projection results. Thus, it was agreed that Member States also, on a voluntary basis, should calculate the evolution of the gross average replacement rate at retirement (for both public pensions and private - second and third pillars);

- when the fiscal sustainability is assessed, it is necessary to distinguish between consolidated and non-consolidated figures. As regards assets in public pension schemes, 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; and,

- allowing for the fact that the same person may be a recipient of several types of pensions, the number of pensions and a number of pensioners could differ in some cases. Since each figure provides different type of information, both the number of pensioners and the number of pensions are requested.

On this basis, the 2009 pension reporting framework was considerably expanded compared with the 2006 version; in particular, private pension coverage; tax on pensions; the benefit ratio; and, (iii) the gross average replacement rate.[53]

[53] A full version of the questionnaire is presented in Annex 6.1.

6.3. Definitions and clarifications

This part aims at recalling the fundamental definitions of the 2009 pension reporting framework. The definitions relate to variables listed in the pension questionnaire. In addition, unified reporting norms are presented.

6.3.1. Reporting norms

Member States will run the projections for the period **from 2007** (the base year) **up to 2060**. Member States should report outturn data back to 2000, so that a comparison with projected figures in the 2006 exercise can be made. The data to be provided are annual data for each year of the projections. Both the statistical information for the years 2000- 2006 and the projections for years 2007-2060 have to be presented in fixed prices of 2007. The base year of the projections is 2007.

The **GDP projections** for each country for the period between 2007 and 2060 are those generated by using the Commission' production function model on the basis of the agreed labour force and productivity projections.

All countries report **monetary values in millions of Euros**. For countries which are not part of the euro, the conversion should be made on the basis of the average exchange rate for 2007, except for the ERM II countries for which the conversion was based on the central rates.

The level of expenditure items should be adjusted to the level of national accounts for the base year of 2007 and the preceding years 2000-2006.

The pension projections include the impact of **the most recent pension reforms that had entered into legislation by September 2008** (the cut-off date for the submission of the pension projections). That is, reforms legislated by September 2008 are included in the projections. To this end, Member States provide detailed descriptions of the projections, including recently introduced reforms, their implementation and their impact on the projection outcome in their updated country fiches.[54]

6.3.2. Additional definitions and clarifications

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

Pensions should include earnings-related pensions, flat-rate and means-tested pensions that aim at providing a social minimum pension, 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 such as supplements aimed at supporting the purchase of home or health care services. Pensions and benefits can be paid out from specific schemes or

[54] The country fiches prepared by each Member State are envisaged to be published in a forthcoming publication in the European Commission's *European Economy* series; see European Commission-European Economy (2009, forthcoming), *"The 2009 Ageing Report: Pension schemes and projection models in the EU-27 Member States"*.

directly from government budgets. In particular, social assistance should be included if it is equivalent to 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 and prolonged unemployment benefits to older workers 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.

Gross pension

Pensions should be recorded as **gross pension expenditure**, i.e. without a deduction of tax and compulsory social security contributions by beneficiaries paid on benefits. In those countries where pensions are not taxable income, the gross pensions are equal to net pensions.

Net pension

Pensions should be recorded as net pensions, once deducting tax on pension and compulsory social security contributions paid by beneficiaries on pensions from the gross pensions. It was suggested that it should be possible to provide consistent and comparable projections of tax on pension for both public and private pensions for all Member States. Especially, attention ought to be paid to progressivity of the tax system on this source of public revenue.

Categories of pension expenditures

Social security pensions and other public pensions are the schemes that are statutory and that the general government sector administers. The aim is to cover those pension schemes that affect public finances, in other words, the schemes that are considered to belong to the general government sector in the national account system. Usually, there is a specific social security contribution to the scheme, which is defined as part of total taxes in the national accounting system but the scheme can also be financed, either partially or fully, by general taxes and 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, should be included in this category.

As to the statutory funded part of the old-age pension schemes that are attached to notional defined contribution schemes in some countries, this should be excluded from social security schemes and included in the private sector schemes in accordance with the Eurostat decision[55].

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

Occupational pensions are pensions provided by schemes that, rather than being statutory by law, link the access of an individual to such a scheme to an employment relationship between her/him and the scheme provider and that 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).

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 while the participation for 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 an equivalent role to social security schemes in the pension provision.

Private pension For the most part, **private individual pension** schemes are non-mandatory but they can be also mandatory.[56] Consequently, 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.

Mandatory private pension schemes are close to social security schemes. The transactions are between the individual and the insurance provider and they are not recorded as government revenues or government expenditure and, therefore, do not have an impact on government surplus or deficit. The pension expenditure projections should cover the individual schemes that switch 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 the future in a number of countries.

In some cases, there are government guarantees to these pension schemes, which increase the government involvement. 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 pension 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 the state may in some cases contribute to the plan. Such schemes may also be adhered to through membership in an association.

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

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

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.

6.3.3. Breakdown of social security pensions

Old-age and early pensions should be considered as a single category of pension 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 sexes and will increase or become more flexible with time. Early pensions should include in addition to genuine (actuarial) early retirement schemes also other early pensions that are granted to a specified (age) group at an age below the statutory retirement age, primarily on the basis of reduced work capacity or labour market reasons. In addition, disability and widow's pensions paid out to persons over the standard retirement age shall also be included in this category in order to reflect properly the expenditure related to old-age. Pensions of this category shall include both earnings-related pensions and flat-rate or means-tested minimum pensions.

Other pensions should include disability, survivors' and partial pensions paid to persons below the standard retirement age and without any lower age limit. These should include both earnings-related pensions and flat-rate or means-tested minimum pensions of these types.

Within the category of old-age and early social security 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. The flat-rate or means-tested minimum pensions that are not based on employment, but which only guarantee a certain social minimum, should be excluded (while the minima of earnings-related pension scheme 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 pension 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.

6.3.4. The level of pensions

A large number of countries have implemented pension reforms that make the public pension systems considerably more resilient against the impact of ageing populations. This has

generally been done by making the pension systems less generous and sometimes by 'privatizing' part of the formerly public pension system, and at the same time partly increasing the contributory periods, partly increasing the retirement age, partly reducing the uprating of pensions (rights).

In order to shed light on the future relative levels of pensions, relevant for the policy debate on the potential risks to the adequacy of pensions in the future, some extensions of the reporting framework was envisaged. The evolution of the benefit ratio is crucial to analyse and understand the projection results. Yet, it is sometimes quite difficult to understand what explains its evolution. Member States would be in the best position to gather additional information to this purpose. It was agreed that, in addition to the benefit ratio[57], the evolution of the gross average replacement at retirement would have been calculated as follows:

Gross Average Replacement Rate is a ratio of the first pension of those who retire in a given year over an economy-wide average wage in the same year based on National Accounts. In case of social security pension scheme, the Gross Average Replacement Rate reflects only old-age and early pensions, i.e. other types of pensions are excluded.

The gross average replacement rates will be provided for all type of pension schemes if possible.

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

The number of pensioners reflects the number of the recipients of the specific pension. Each type of pension should be considered separately. The detailed lines should reflect the number of the recipients of the specific pension. Ideally, the number of all pensioners 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.

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

In addition, a second break-down is suggested for the number of pensioners and pensions, namely, to report the number of all pensioners and pensions by age groups. This break-down is suggested to increase transparency and consistency between population, labour force and pensioners' projections.

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 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.

57 Benefit Ratio equals the average pension divided by an economy-wide average wage based on National Accounts.

It would be most important to provide estimates of pension contributions to social security and private mandatory schemes, notably concerning the category of old-age and early pensions. 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.

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. Thus, the number of contributors should approach the number of employed persons or active-age population.

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 (disability, survivors) 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.

The information on **the total value of assets in pension schemes**, including pre-financing to specific reserves within the government sector, is requested separately for social security schemes, occupational pension schemes and private 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 increases to the pension funds 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.

6.4. Country-specific coverage

Table 6. 1 and Table 6. 2 provide an overview of their pension systems, and detailed information of the coverage of each Member States' coverage in the projection, respectively.

Table 6. 1 - Overview of the pension systems in Member States			
	Social security pensions (public sector schemes)	**Occupational pension schemes (private sector schemes)**	**Individual (private) pension schemes (private sector schemes)**
BE	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance (GRAPA-IGO). *Earnings-related social security 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 (social security) 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. Prepension (early retirement) 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.	Voluntary private schemes exist only to a minor extent.
BG	*Minimum guarantee pensions:* Social pension for old age. Disability pensions. *Earnings-related social security pensions:* One DC pension scheme covering all employees and self-employed. Minimal pension for periods of insurance and old age (stipulated in the annual Law on the PSI Budget). Social insurance contributions of civil servants, military and police - at the expense of the state. Self-insured persons pay the whole contributions amount at their own expense. Social insurance contributions of judges and magistrates - at the expense of the Budget of the Judicial Power. Teachers Pension Fund. Survivors' pensions (stipulated in the Social Insurance Code (SIC)). *Non-contributory pensions:* Special merits pensions	Supplementary voluntary pension funds under occupational schemes (3rd pillar). Legal framework established in 2006. Funded DC scheme.	Supplementary mandatory private schemes - Universal and Professional Pension Funds (2nd pillar). Individual pension savings plans (2.6 million contributors end of 2007). Statutory private schemes transferred from the social security pension scheme, mandatory for persons born after 1.1.1960. The transferred contribution rate is 5%. Funded DC schemes. Supplementary voluntary private schemes (3rd pillar).
CZ	*Minimum guarantee pensions:* No special scheme, it is embedded in the pension formula (flat-rate component). *Earnings-related social security pensions:* One scheme covering the whole population, covering old-age, disability and survivors' pensions.	Do not exist.	Voluntary private pension scheme at an early accumulation stage; low replacement rate (contribution 2.1% of wage; covers about half labour force.

DK	*Minimum guarantee pensions:* Universal flat-rate pensions for every citizen 65+ (subject to the time lived in DK), means-tested supplements, tax-financed. Disability pensions to those below 65. *Earnings-related social security 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). Special pension savings plan (SP). Labour market supplementary pensions for recipients of disability pension (SAP) Employees' capital fund (LD). All these schemes are fully funded.	Individual pension savings plans (1.1 million contributors).
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 social security pensions:* General scheme covering private and public sector employees, the scheme covers old-age, disability, early retirement and widow's pensions; specific schemes for life-time civil servants as well as farmers and miners.	Occupational pension provision existing; benefits account for 1.4% of GDP; supported by SSC exemptions up to 4% of SSC ceiling, equal to 2520€ in 2007, and by tax exemption up to 4320€. In 2007, about 64% of the employees contribute to occupational schemes.	Individual funded pensions of growing importance since the 2001 reform (supported by tax exemptions and direct allowances; contribution rate 4% of wages since 2008. Currently, about 12 mill. so-called Riester-contracts exist.
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 social security 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.	Statutory private schemes for the switched part of the social security pension scheme, mandatory for persons born 1983 or later and voluntary for old persons; in 2005, over 50% of workers had joined the funded scheme. The switched contribution rate 4% + an additional 2% contribution paid by the insured person.
GR	*Minimum guarantee pensions:* Means-tested minimum pensions (non-contributory) for uninsured people aged 65+. *Earnings-related social security pensions:* A great number of separate 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.	Do not exist (legal framework has been established but no scheme was operational yet in 2004).	Voluntary private pension schemes cover about 5% of the population.
ES	*Minimum guarantee pensions:* Means-tested minimum pension scheme (non-contributory).[1] Means-tested minimum pension (contributory). *Earnings-related social security pensions:* One main social insurance scheme, covering the private sector employees, self-employed and the regional and local public administrations, providing earnings-related	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.	Voluntary private schemes (funded DC schemes).

	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 flat-rate old-age, disability and survivors' pensions, though 5 different levels of pensions according to the career level. [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		
FR	*Minimum guarantee pensions:* Means-tested minimum pension scheme. *Earnings-related social security pensions:* A great number of separate pension insurance schemes for different sectors and occupational groups providing earnings-related pensions, additionally mandatory 'second tier' supplementary funds that complement the pension provision; schemes cover old-age, early retirement and survivors' pensions; benefit levels across insurance schemes were aligned in the 2004 reform. 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 250 thousands people for a total amount of contributions of 769 million € in 2006. Also an old occupational pension scheme (art. 82 and 83, and art. 39 of CGI) covering roughly 2.7 million of people for a total amount of contributions of 59 billion € in 2006. Self-employed occupational pension scheme (Madelin law n° 94 and law n°97) covering 1 million of people for a total amount of contributions of 15 billions € in 2006.	Voluntary Individual pension scheme (PERP) introduced by 2003 reform is now covering 1.8 million of people for a total amount of contributions of 2.3 billion € in 2006. Voluntary individual pension schemes for civil servants (PREFON, COREM, …) covering 816 thousands of people for a total amount of contributions of 11 billion € in 2006.
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 54% in the first quarter of 2008.	Voluntary individual schemes also play a role in the Irish pension system. Incentives to encourage private pension provision are in place.
IT	*Minimum guarantee income to the elderly:* Means-tested old age allowance (5,143 euro per year, in 2008) and social assistance additional lump sums: provided to the elderly with a personal income (including social security pensions) below certain limits and up to them. In 2008, income limits are 5,311 euro per year, in the age bracket 65-69, and 7,540 in the age bracket 70+. For married people, the amount of social assistance benefits, determined as above, is provided as long as the total income of the couple falls below 11,071 euro per year, in	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) increased the provisions for occupational pensions through the possibility to transform TFR (end-of-service allowance) into an	Voluntary private pension schemes are of limited importance.

	the age bracket 65-69, and 12,683 in the age bracket 70+ and, in any case, up to these income limits. *Social security pension system:* One main social security pension scheme covering the whole population, providing old-age, early retirement, disability and survivors' pensions. It is composed of three schemes: DB (earnings-related), Mixed and NDC (contributions-based). *DB and Mixed pension schemes*: Old DB scheme fully applied to workers with at least 18 years of contributions at the end of 1995. Transition scheme (mixed regime: partly DB and partly NDC, according to the pro rata rule) for workers with less than 18 years of contribution in 1995; Means-tested topping-up to a minimum pension (5,761 euro per year, in 2008) is foreseen, subject to the fulfilment of the general eligibility requirements. *NDC pension scheme*: Fully applied to persons 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 workers with an age below 65 must be at least 1,2 times the old age allowance.	occupational pension scheme. Contributors and contributions have increased significantly. Current pension expenditure is 0.1% as a share of GDP.	
CY	*Minimum guarantee pensions:* Through Social (means-tested) Pension scheme and special allowances to pensioners. *Earnings-related social security pensions:* One general social insurance scheme covering all employees and self-employed persons, providing old-age, disability and survivors' pensions. Government Employees Pension Scheme (paid from the Government budget) and other public sector (local gov.) employees pension schemes.	Voluntary Provident Funds (providing defined-contribution lump-sum benefits), covering about 103.000 employees.	
LV	*Minimum guarantee pensions:* Through the state social security benefit, if the person's insurance record <10years. *Earnings-related social security pensions:* The minimum of the earnings-related pension system is paid with a length-of-service supplement to the amount of the state social security benefit, if the contribution record exceeds 10 years. One social insurance old-age pension scheme, which is a defined-benefit scheme for those, retired before 1996 and a 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 social security system. Specific public sector service pensions (selected professions) paid from the state budget.	Do not exist.	Statutory private schemes for the switched part of the social security pension scheme (mandatory for persons under the age of 30 on 1st July 2001, voluntary to persons aged 30-49. The contribution rate to be raised from 2 to 10% of wages between 2001 and 2011. Voluntary private schemes.

LT	*Minimum guarantee pensions:* Through a social assistance pension (also to young disabled persons and orphans). *Earnings-related social security 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, officers and military personnel. *Non-contributry pensions:* 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 (State budget).	Do not exist.	Voluntary switch of a part of the Social Insurance pension to a private fund (started in 2004 with a contribution rate of 2.5% of wages, which will increase to 5.5% by 2007).
LU	*Minimum guarantee pensions:* Through means-tested minimum income provision (RMG) *Earnings-related social security 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 social security pensions:* One social security pension scheme covering all employees and the self-employed, providing old-age, early retirement, disability and survivors' pensions.	Do not exist.	Statutory private schemes for the switched part of the social security pension scheme (mandatory for new entrants to the labour market as of 1998, voluntary to workers already in the labour market). The contribution rate is 8% of wages. The scheme covers 60% of all workers. Voluntary private pension schemes cover 30% of all workers.
MT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance (non-contributory) scheme to persons not qualified for the contributory scheme. *Earnings-related social security pensions:* One social security (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.	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:*	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.	Exists to some degree.

	General flat-rate old-age pensions (AOW) to all citizens. Separate disability benefits (WAO) and survivors' pensions (ANW); flat-rate or earnings-related benefits.		
AT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance scheme ("Ausgleichszulagen"). *Earnings-related social security pensions:* Harmonised social security pension schemes covering all employees (incl. civil servants) and the self-employed (gradually harmonised as of 2005), providing old-age, disability and survivors' pensions.	The 2002 reform increased occupational pension provision through the obligation to transform the earlier severance pay into a supplementary occupational scheme (with a contribution rate of 1.53% of wages).	Exists only to a minor extent but the introduction of tax-favoured private scheme (Zukunftsvorsorge) will increase their importance.
PL	*Minimum guarantee pensions:* Means-tested minimum pensions financed from the state budget, topping-up benefits paid out from mandatory pension schemes. *Earnings-related social security 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).	Statutory private schemes for the switched part of the social security pension scheme as of 1999 (mandatory for new entrants; voluntary switch already closed). Contribution rate is 7.3% of wages.
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 social security 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.	Exists only to a very minor extent.
RO			
SI	*Minimum guarantee pensions:* National, means-tested pensions. *Earnings-related social security pensions:* One social security pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions.	Mandatory supplementary insurance for some high-risk professions (about 26000 workers, minor importance), voluntary collective supplementary pensions (covering half the employees).	Voluntary individual supplementary pensions (of minor importance in 2003).

	Flat-rate pensions to farmers, military personnel of the Yugoslav army and for retirees from other republics of the former SFRY.		
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 social security pensions:* One PAYG DB social security pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions. First pillar of the pension scheme.	Do not exist.	Statutory private funded DC scheme for the switched part of the social security pension scheme as of 2005. At the beginning it was compulsory for new entrants and voluntary for current employees. As of 2008, this scheme is voluntary for new entrants. Contribution rate is 9% of wages. Second pillar of the pension scheme. Voluntary pension funded DC scheme introduced in 1996. Third pillar of the pension scheme.
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. *Earnings-related social security pensions:* Several but harmonised social security pension schemes for different sectors of employees and the self-employed, covering all gainfully employed, providing old-age, early retirement, disability and survivors' pensions.	Supplementary occupational pensions, accounting for about 2 % of total pension benefits.	Voluntary individual private pension insurance, accounting for about 1% of total pension benefits but the insured people account for about 15% of working-age population. Contributions are roughly 4 % of total social security pension contributions.
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). *Earnings-related social security pensions:* The PAYG general social security (NDC) pension scheme covering all employees and the self-employed, providing old-age pensions. The old earnings-related ATP scheme works in parallel during the phasing-out period. Separate disability and survivors' pension schemes. The former formally counted as health insurance. The widow's pension (part of survivors' pensions) is being phased out.	Supplementary occupational old-age pensions for all sectors, covering 80-90% of employees.	Statutory private schemes (premium pension) for the funded part of the social security pension scheme; contribution rate is 2.5% of wages. (Note: Reported as social security pension in the AWG pension report 2006.)
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).	Personal pension provisions with tax subsidies for persons without access to occupational schemes were introduced in 1998. Stakeholder pension provision with tax subsidies without access to company (occupational) pension schemes was introduced in 2001.

NO	*Minimum guarantee pensions:* Minimum income guarantee. *Earnings-related social security pensions:* Earnings-based benefit. Disability pensions. Voluntary early retirement pensions.	Central government occupational pension scheme financed by employee contributions and transfers from State budget. Supplement to social security old age pension. Local government occupational pension schemes are funded systems. Supplement to social security old age pension. Mandatory private sector occupational schemes are funded defined contribution systems. Supplement to social security old age pension.	Yes.

Source: Commission services, EPC.

Table 6. 2 - Coverage and specification of pension schemes in the 2009 projections

	Schemes covered in the 2009 projections *(*E-r = earnings-related)*	**Schemes <u>not</u> covered**
BE	***Social security pensions: old age and early pensions*** Old age pension: w64 (65 by 2009)/m65. 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. Prepension (early retirement embedded in the unemployment scheme): 60+, private sector. Prepension (heavy jobs): 58+, private sector. Prepension for labour market reasons: 52-55, private sector. Means-tested minimum benefit: guaranteed income for elderly persons (assistance scheme) 64+ (65+ by 2009). ***Social security 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). ***Private pensions:*** (non-mandatory).
BG	Old Age Pensions: Old Age and Periods of Insurance Pensions (including farmers, COOP, military officials) - 63m; 59.5w for 2008. Social pension for old age - 70m; 70w. Survivors pensions according to relationship with the deceased: Widows - 58+m, 55.5+w; Child; Widows aged 50/60; Non-working Widows – all ages; Disabled Children; Non-working Parents - 63m, 55.5w; Parents; Other Survivor; Orphans up to 26. Disability Pensions: Disability (including farmers, COOP, military officials); Disability due to Work Injury and Professional Disease (including farmers, COOP, military officials) - persons at working age. Supplementary mandatory insurance - universal pension schemes providing supplementary life-long old-age pension.	Teachers Pension Fund of the social security scheme. Professional Pension Funds of the private mandatory scheme. Supplementary voluntary pension funds. Supplementary voluntary pension funds under occupational schemes.
CZ	***Social security 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, 55+. Early pensions (with permanent reductions). ***Social security pensions: other*** Widows and disability pensions -54. Orphans pensions.	
DK	***Social security 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. ***Social security pensions: other*** Disability and survivors' pensions, -64.	***Occupational pensions*** Labour market pensions: Labour market supplementary pensions (ATP), Labour market supplementary pensions (SP), Labour market supplementary pensions for recipients of disability pension (SAP) *Social security pensions: other* Survivors' pensions ***Private pensions*** Individual pension savings plans
DE	***Social security 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. ***Social security pensions: other*** (covered above; not shown separately).	***Social security:*** Minimum benefits to elderly (social assistance); 0.1% of GDP. Farmers and miners pensions (0.5% of GDP). ***Occupational pensions:*** Of growing importance, pension expenditure 1.4% of GDP in 2007. Currently 64% of the

		employees contribute to occupational schemes. ***Individual funded pensions:*** Schemes at a building stage, only contributions to the schemes.
EE	***Social security 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, 63+ for both sexes as of 2016, all sectors (Pension Ins. Fund). Early pensions (possible to retire 3 years before the statutory retirement age), all sectors. ***Social security 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.	
GR	***Social security pensions: old age and early pensions*** Minimum pensions (State budget and EKAS (Pensioners Social solidarity Fund)). Old-age flat-rate pensions, uninsured people aged 65+ (OGA). Old-age pensions, other self-employed (OAEE). 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). E-r supplementary pensions, public sector (auxiliary funds). Disability pensions, all ages. Widows pensions, all ages. Early pensions, fund-specific age. ***Social security pensions: other*** Orphans pensions.	Occupational and Individual Private pension schemes.
ES	***Social security 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 (contributory) Flat-rate old-age and early retirement pensions for central government employees and the military, including war pensions. ***Social security 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 (contributory). Private (supplementary and voluntary) pension schemes: occupational and individual.	Means-tested minimum pension scheme (non-contributory).[1] [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 (0,19% GDP). Indexation by Annual Budget Law (2% in 2009).
FR	Social security pensions: old age and early pensions. Minimum old-age and widows' pensions (State budget). E-r old-age pensions, 60+, private sector (CNAVTS, national pension fund for salaried workers). E-r old-age pensions, 60+, agricultural workers (MSA, mutual agricultural solidarity fund). Mandatory supplementary funded old-age pensions, all workers in the private sector (ARRCO, association of suppl. pension schemes for non-executive employees). Mandatory supplementary funded old-age pensions, executive workers, private sector (AGIRC, general association of pension institutions for executives). E-r old-age pensions, 60+, public sector (Civil and military pension code, CNRACL, local government and hospitals), specific funds for public sector enterprise workers). E-r old-age pensions, self-employed (CANCAVA (craftsmen),	Small anticipatory pension schemes: The new disability scheme (within health insurance), established in 2004.

	ORGANIC (tradesmen), CNBF (lawyers), CNAVPL (independent professions)). Disability and widows pensions, 60+, all sectors (FSV). Anticipated old-age and early retirement pension (UNEDIC).	
IE	***Social security 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, 66+), all sectors.[2] Carers non-contributory, 66+, all sectors.[2] Flat-rate **contributory** 66+ and transition pensions, 65+(also includes invalidity) [1], private sector, self-employed and some public servants.[3] Widow(er)s contributory pensions, 66+, all sectors. Carers contributory, 65+, private sector, self-employed and some public servants.[3] ***Social security 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 public servants.[3] Carers, contributory, 64-, private sector, self-employed, some public servants.[3] Widow(ers) contributory pension, 65-, all sectors. ***Public service (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 a contributory social security pension, along with a public service occupational pension which is "integrated". They also qualify for a range of other social welfare benefits. By contrast, most public servants hired before 6 April 1995 pay a lower "modified" social insurance contribution and as such, do not qualify for a contributory social security pension (they do normally qualify for a public service occupational pension on retirement) but may qualify for some other social welfare benefits.	***Occupational pensions:*** Private sector schemes and public sector commercial bodies
IT	***Social security pensions and social assistance benefits:*** Old-age, disability and survivors' pensions, w60+/m65+, all sectors, all social security schemes (DB, Mixed, NDC)). Early retirement, disability and survivors' pensions, w-59/m-64, all sectors, all social security schemes (DB, Mixed, NDC)- Old age allowances and social assistance additional lump sums (State budget).	***Occupational pensions:*** They are not part of the public pension system definition to be utilised 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 that provided by the public pension system. No risk is taken by the State on investment returns.
CY	***Social security pensions: old age and early pensions*** General Social Insurance scheme covering e-r old-age and widows' pensions. Early old-age pensions, 58-64. Invalidity and disablement pensions, -62. Government Employees Pension scheme covering old-age, widows' and disability pensions.	***Social security pensions: old age and early pensions*** Social (minimum) pension scheme and special allowances to pensioners ***Occupational pensions:*** Voluntary provident Funds.
LV	***Social security pensions: old age and early pensions*** Old-age minimum guaranteed pension, 62+. E-r old-age DB pensions, granted -1995, all sectors. E-r old-age NDC pensions, 62+, granted 1996+, all sectors. Special service pensions (early pensions), selected professions,	

	public sector. Disability pensions, granted -1995 and not transformed to old-age pensions, all sectors. Survivors' pensions (for widows during the transition period). ***Social security pensions: other*** Disability pensions, -62, all sectors. Survivors' pensions -24. Special service, public sector. ***Private mandatory pensions*** Individual funded old-age pension, mandatory for persons born 1971+.	
LT	***Social security pensions: old age and early pensions*** Social assistance pensions, w60+/m62.5+ ; (State budget) Old-age, disability and widows pensions, w60+/m62.5+, all sectors (Soc insurance scheme) Officials and military personnel disability and widows pensions, w60+/m62.5+, public sector (State budget) 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); Early retirement unemployment benefit (Unemployment fund), changed into early retirement pension as of mid 2004 (Social insurance scheme as of mid 2004). Officials and military personnel pensions for service (State budget); length of service pensions, compensation for extraordinary working conditions (Soc. insurance. scheme); ***Social security pensions: other*** Social assistance pensions (disability and widows pensions), -w59/-m62.4 (State budget) Disability and widows pensions, -w59/-m62.4, all sectors (Soc. Insurance scheme) *State pensions : other* Officials and military personnel disability and widows pensions, -w59/-m62.4, public sector (State budget) ***Private mandatory pensions*** Individual funded old-age pension, voluntary, all sectors	
LU	***Social security 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. ***Social security pensions: other*** Disability (-64 years) and survivors' pensions, all sectors.	Minimum benefits (RMG, social assistance).
HU	***Social security 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. Survivor's pensions, 62+, all sectors. Disability pensions, 62+, all sectors. ***Social security pensions: other*** Disability pensions, -61, all sectors. Survivor's pensions, -61, all sectors. Pension-like regular social allowances, -61. ***Private mandatory pensions*** Individual funded pensions, mandatory to persons entering the labour market.	

MT	***Social security 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. ***Social security 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.	
NL	***Social security pensions: old age and early pensions*** Public flat-rate old-age pensions, 65+, all citizens (AOW). Widows pensions, w55+, all sectors (ANW). ***Social security pensions: other*** Disability benefits, all sectors (WAO). ***Occupational pensions*** Occupational old-age pensions, 65+, all sectors. Occupational early retirement pensions, all sectors (VUT).	
AT	***Social security 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, w60+/m65+, public sector (civil service). ***Social security pensions: other*** Survivors' pensions, all ages, all sectors. Disability pensions, all ages, all sectors.	***Social security pensions: old age and early pensions:*** Minimum pensions (Ausgleichszulagen), financed by general tax revenues (in 2007 approximately 0.3% of GDP). ***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	***Social security 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 2006, private and public sector, self-employed (ZUS, Social ins. institute). 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 insurance fund). E-r DB old-age, disability and widows pensions, all ages, farmers (KRUS, Farmers social ins. scheme). Armed forces old-age pensions (State budget). ***Social security pensions: other*** Disability and widows 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.	***Social security pensions: old age and early pensions:*** Minimum means-tested pensions. ***Occupational pensions:*** (of minor importance).
PT	***Social security 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.	***Private pensions:*** Individual (non-mandatory) private pension schemes (of minor importance).

	Includes supplements to ensure minimum pensions value. ***Social security pensions: other*** Social pensions (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 example) and complementary schemes for other DB and DC pensions.	
RO		
SI	***Social security 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 (including mandatory pensions to workers in high risk occupations)*** Collective (semi – mandatory) and individual supplementary pensions.	National (state) pensions (State budget). 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	***Social security pensions: old age and early pensions*** E-r old-age, w53-57+/m60+ (w62+ 2016 and m62+ 2006), disability and widows pensions, all sectors (Social insurance scheme). ***Social security pensions: other*** Disability and widows pensions, orphans. Pensions. ***Private mandatory pensions:*** Individual funded old-age pension, mandatory to persons entering labour market 2008+ (assumed entry rate 95%).	Social assistance benefits to those with low pensions as no minimum pension exists. Voluntary pension funded DC scheme introduced in 1996. Third pillar of the pension scheme.
FI	***Social security pensions: old age and early pensions*** National (minimum) pension (Nat. pension insurance), 65+. E-r old-age, 63+, early pensions, private sector and the self-employed: (TyEL, private sector employees), (YEL, self-employed), (MYEL, farmers), and the public sector: (VEL (central government employees), KuEL (municipal sector employees), KiEL (church empl.). Unemployment pensions, 60-62, to be phased out by 2014. ***Social security pensions: other*** National (minimum) disability and survivors' pensions, -64. E-r disability and survivors pensions, -62, all sectors (early pensions change into old- age pensions at the age of 63 and then included in the above category).	***Occupational pensions:*** Collective mandatory and voluntary supplementary schemes.
SE	***Social security pensions: old age and early pensions:*** Minimum pensions and housing supplement for pensioners (State budget). E-r NDC old-age and anticipated pensions, flexible age, all sectors (Social insurance scheme). ***Social security pensions: other*** Disability pensions, 19-64, and survivors benefits, all ages. ***Occupational pensions:*** Occupational (supplementary) pensions, private and public sector employees (old and new schemes). Individual mandatory funded old-age pensions, premium pensions.	

UK	***Social security (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). Widow's benefits are covered for individuals above State Pension Age. E-r old-age p.ensions, 60+, public sector employees (State budget) ***Social security pensions: other***	***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.
NO	***Social security pensions: old age and early pensions*** Minimum income guarantee. Earnings-based benefit. ***Social security pensions: other*** Disability pensions.	Central government occupational pension scheme financed by employee contributions and transfers from State budget. Supplement to social security old age pension. Local government occupational pension schemes are funded systems. Supplement to social security old age pension. Mandatory private sector occupational schemes are funded defined contribution systems. Supplement to social security old age pension. Labour market supplementary pensions for recipients of anticipatory pension. Voluntary early retirement pensions.

Source: Commission services, EPC.

Annex 6.1: Pension projection reporting sheet

DG ECFIN Unit B3

Draft reporting framework: Pension expenditure and contributions - in millions EUROs, fixed prices of 2007

Country:

Scenario: Baseline

A. Fixed table

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	…	2060
	Outturn data in 2007 prices							Base year	Projections in 2007 prices				
GDP (ECFIN projection, in 2007 prices)													
GDP (used in projections, in 2007 prices)													
Pension expenditure													
Social security pensions, gross, in millions €													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions, gross, in millions €													
Private pensions, gross, in millions €													
Mandatory private scheme													
Non-mandatory private scheme													
Total pension expenditure, gross, in millions €													
Social security pensions, net, in millions €													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions, net, in millions €													
Private pensions, net, in millions €													
Mandatory private scheme													
Non-mandatory private scheme													
Total pension expenditure, net, in millions €													
Tax on pension													
Social security pensions													
Occupational pensions													
Private mandatory pensions													
Private non-mandatory pensions													
Total tax on pension													
Benefit ratio													
Social security pensions													
Occupational pensions													
Private mandatory pensions													
Private non-mandatory pensions													
Total benefit ratio													
Gross replacement rate													
Social security pensions													
Occupational pensions													
Private mandatory pensions													
Private non-mandatory pensions													
Total gross replacement rate													
Number of pensions, in 1000													
Social security pensions													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions													
Private pensions													
Mandatory private scheme													
Non-mandatory private scheme													
All pensions, in 1000													
Of which: aged -54													
aged 55-59													
aged 60-64													
aged 65+													

Number of pensioners, in 1000													
Social security pensions													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions													
Private pensions													
Mandatory private scheme													
Non-mandatory private scheme													
All pensions, in 1000													
Of which: aged -54													
aged 55-59													
aged 60-64													
aged 65+													
Contributions (employee+employer)													
Social security pensions, in millions €													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions, in millions €													
Private pensions, in millions €													
Mandatory private scheme													
Non-mandatory private scheme													
Total pension contributions, in millions €													
Number of contributors (employees), in 1000													
Social security pensions													
Old-age and early pensions													
Of which: earnings-related pensions													
Private sector employees													
Public sector employees													
Other pensions (disability, survivors)													
Occupational pensions													
Private pensions													
Mandatory private scheme													
Non-mandatory private scheme													
All pensions, in 1000													
Assets of pension funds and reserves													
Social security pensions, in millions €													
Liquid assets (Non-consolidated)													
Liquid assets (Consolidated)													
Other assets													
Savings to the funds													
Payments from the funds													
Occupational pensions, in millions €													
Private mandatory pensions, in millions €													
Private non-mandatory pensions, in millions €													
All pensions, in millions €													

B. Additional information

Additional information													

7. HEALTH CARE

7.1. Background

This section outlines the approach that will be used to project public spending on health care in the 27 Member States of the EU and Norway. While preparing the new round of projections, the Commission issued a number of notes and working documents which were circulated to the delegates of the AWG and subsequently discussed at the AWG meetings. In order to agree on the data sources to be used and to establish a commonly agreed methodology for health and long-term care projections, based to the highest possible degree on the available empirical data and current state-of-the-art in the field of health economics, public health and epidemiology, the Commission organised two workshops gathering a number of experts from academia, national administration and research institutes. The first one, held on 18 April 2007, addressed the issues of data availability and comparability[58]. The second one, held on 4 October 2007, concentrated mainly on various drivers of health expenditure (evolution of health status, national and individual income, role of technology, etc.), the ways to measure their impact on public spending and consequently on possible improvements in the projections methodology[59].

The projections on health care need to be viewed in the context of the overall projection exercise, and as such the following consideration should be borne in mind:

- the health care projections will be made on the basis of the baseline assumptions on population, labour force and macroeconomic variables agreed by the EPC and outlined in the chapters 1 to 4 of this report. Also, some sensitivity tests agreed by the EPC and described in chapter 5 of this report will be reflected in the projections on health care spending;

- a separate projection exercise will be made for spending on long-term care which is described in the next chapter;

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[58] The workshop was constructed around a series of presentations addressing specific problematic issues that need to be discussed before deciding on the way to proceed with the data collection and establishing calculation methodology. The first part of the workshop started with the issue of defining the concept, coverage and borderlines of health and long-term care, which was introduced by David Morgan (OECD). The topic was further specified by Dorota Kawiorska (Eurostat) who described the System of Health Accounts (SHA) and presented the main differences between it and the European System of Integrated Social Protection Statistics (ESSPROS). She clarified what items of expenditure are covered by the two classifications and explained the pros and cons of using each dataset in the projection exercise. The second part of the workshop was devoted to measuring disability and health status. Didier Dupré (Eurostat) provided a general overview of how disability, morbidity and health status is measured and reported in the common databases, while Gaëtan Lafortune (OECD) presented a recently completed project which aimed at comparing the trends in disability across a number of the OECD countries.

[59] External experts were invited to present their respective research projects and suggest possible improvements to the methodology used by the AWG. Martin Weale (NIESR, London) presented the econometric model estimating the impact of several demographic, economic, social and institutional variables on health care expenditure in the EU, and suggested which ones should be incorporated in the projection model as highly statistically significant (e.g. share of public sector in total health expenditure, female labour force participation). Luc Bonneux (NIDI, The Hague) presented a series of studies on the recent trends in morbidity and mortality suggesting that according to empirical evidence a constant increase in life expectancy occurs at the cost of increasing morbidity and disability. Therefore while it is impossible to predict future evolution in the prevalence of various diseases, the most probable hypothesis would be some kind of morbidity expansion. Erika Schulz (DIW, Berlin) presented methodology, sources of data, and results of recently completed projections of health and long-term care expenditure in Germany. Joaquim Oliveira Martins (OECD) presented a stylised method to incorporate technological progress in health and long-term care expenditure projections, based on the decomposition of past trends and extrapolation of the residual assumed to reflect the impact of technology.

- the methodology used to project future expenditure on health care in a multilateral setting of 27 Member States is constrained by the availability and comparability of data. Although much effort has been made to assure highest possible consistency (common databases were used to the largest possible extent, reducing arbitrariness and room for interpretation of the data provided individually by the Member States) some inconsistency is still unavoidable.

7.2. Capturing the various demographic and non-demographic drivers of spending: six different types of scenarios

Health care spending is determined by a complex series of demand and supply side factors. According to the literature, the demand for health care depends ultimately on the health status and functional ability of citizens, and not on age *per se*. While age is a useful indicator of the health status of an elderly population (as shown by the steep upward slope of age-related expenditure profiles), it is not the causal factor. On the other hand, a number of supply (economic, social and institutional) factors are also proven to affect health expenditure in the long term. Health care spending is therefore mostly driven by:

- the health status of the population;
- economic growth and development;
- new technologies and medical progress;
- the organisation and financing of the health care system;
- health care resource inputs, both human and capital.

Given the difficulties in modelling many of the factors found as drivers of public health care expenditure and the possible interactions between them, it has been found unfeasible to construct an all-encompassing projection methodology to capture all demographic and non-demographic factors. Instead, it was agreed to run several different projection scenarios in order to tackle the issue from a variety of different angles and be able to analyse the impact of each quantifiable factor separately. The AWG and EPC envisage choosing a baseline scenario for health care expenditure in connection with the release of the final Ageing Report with the budgetary projections, as was the case in the 2006 Ageing Report.

The overview of the scenarios is presented in Table 7. 1 below.

Table 7. 1 - Overview of different scenarios to project health care expenditure

	Pure demographic scenario	High life expectancy scenario	Constant health scenario	Death-related costs scenario	Income elasticity scenario	Labour intensity scenario	EU12 cost convergence scenario
Population projection	AWG scenario - baseline	AWG scenario - high life expectancy	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline
Age-related expenditure profiles	Base year profiles held constant over projection period	Base year profiles held constant over projection period	Base year age profile shifting according to changes in age-specific life expectancy	Base year profiles split into separate profiles for decedents and survivors	Base year profiles held constant over projection period	Base year profiles held constant over projection period	For EU12, individual base year profiles converge to average EU15 profile by the end of the projection period
Unit cost development	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per capita	GDP per worker	GDP per capita
Income elasticity of demand	1	1	1	1	1,1 in base year converging to 1 over the projection period	1	1

Source: Commission services, EPC.

7.2.1. Pure demographic scenario

The *pure demographic scenario* attempts to isolate the 'pure' effects of an ageing population on health care spending. It assumes that age-related spending per capita on health care in the base year (2007) remains constant over time. This way all gains in life expectancy are assumed to be spent in bad health while the number of years spent in good health remains constant. As such, this scenario is inspired by the '*expansion of morbidity*' hypothesis quoted in the literature[60], as it *de facto* assumes that the gains in life expectancy up to 2060 are spent in bad health. The constant age profile is applied to the baseline AWG population scenario with an assumption that the unit costs evolve in line with GDP per capita.

Formal illustration

In the *pure demographic* scenario, all gains in life expectancy are assumed to be spent in bad health while the number of years spent in good health remains constant. The extension of lifespan will not affect an average individual's health status at any given age, and consequently his or her age-related expenditure on health care will not change over time. One can approximate this situation by assuming that health care cost per capita for each year of age remains constant in GDP per capita-adjusted terms over the whole projection period. Based on this assumption, the projection is then made in the following manner.

First, for the time horizon of the projection exercise (2007-60), the age-related expenditure profiles (showing the average health care spending per capita for each year of age (from 0 to

[60] *The expansion of morbidity hypothesis* posits that as life expectancy increases, older people become more vulnerable to chronic diseases and spend more time in ill-health. In other words, a higher proportion of people with health problems survive to an advanced age. 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.

100 or less, according to data availability) are assumed to grow in line with the macroeconomic cost driver, i.e. GDP per capita. Therefore:

$$c'_{g,a,n} = c_{g,a}\Delta Ypc_n \quad [1]$$

where:

$c'_{g,a,n}$ is cost per capita of a person of a given gender g and age a in a given year n of the projection period adjusted to the GDP per capita growth;

$c_{g,a}$ is constant cost per capita of a person of a given gender g and age a;

ΔYpc_n is GDP per capita rate growth in year n,

$$\Delta Ypc_n = \left(\frac{Y_n}{\sum p_{g,a,n}} - \frac{Y_{n-1}}{\sum p_{g,a,n-1}} \right) / \left(\frac{Y_{n-1}}{\sum p_{g,a,n-1}} \right) \quad [2]$$

Y_n is GDP in year n;

$p_{g,a,n}$ is the projected population of a given gender g and age a in a given year n.

Second, this unit cost for each year is multiplied by the projected population of each year of age (using the baseline population projection)

$$S_{g,a,n} = c'_{g,a,n}\, p_{g,a,n} \quad [3]$$

where:

$S_{g,a,n}$ is spending on health care realised by people of a given gender g and age a in a given year n.

Next, the resulting total health care spending is divided by the GDP projected using the rates of change agreed by the Ageing Working Group in order to obtain share of health care expenditure in GDP:

$$T_n = \frac{\sum S_{g,a,n}}{Y_n} \quad [4]$$

where:

T_n is the share of total health care spending in GDP in a given year n.

7.2.2. High life expectancy scenario

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 (for details see section 5). In terms of methodology, the scenario does not differ from the *pure demographic* scenario, apart from the fact that the baseline demographic projections (structure of the population evolving over the projection period and the consequent evolution in the macroeconomic assumptions) used as input data are replaced with the alternative, high life expectancy, variant.

7.2.3. Constant health scenario considering improvements in the health status of elderly citizens

As pointed out above, 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 so-called '*dynamic equilibrium*' hypothesis[61] and captures the potential impact of possible improvements in the health care status of elderly citizens. It assumes that the number of years spent in bad health during a life time remains constant over the projection period, i.e. all future gains in life expectancy are spent in good health. This assumption is modelled by progressively shifting the age-related expenditure profile of the base year outwards in direct proportion to the projected gains in age and gender specific life expectancy, embedded in the baseline population projection. 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

To capture possible changes in the health care status (morbidity) of populations over time, an additional assumption is required to run the *constant health*. This is achieved by 'linking' changes in life expectancy to changes in morbidity (proxied by the age-related expenditure profile). In other words, for each year and for each age/gender, the age-related expenditure profile is shifted outwards – i.e. providing modified values of cost per capita, which are then applied in the same manner as the *pure demographic* scenario described above to the projected population. The outward shift in the age-related expenditure profile is directly proportional to the increase in life expectancy for each cohort.

First, the change in life expectancy in relation to the base year is found for each year of the projections (for example, total life expectancy for a 50-year-old man in Austria is expected to increase from 29.15 years in 2004 to 33.07 years in 2030, thus by 3.92 years)[62]:

$$\Delta e_{g,a,n} = e_{g,a,n} - e_{g,a,2007} \qquad [5]$$

where:

$e_{g,\,a,\,n}$ is life expectancy of an average person of a given gender g and age a in year n.

Second, for each year of projection, the respective reference age on the original age profile curve is obtained by subtracting the change in life expectancy from the concerned age

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61 The dynamic equilibrium hypothesis posits that the postponement of death to higher ages due to falling mortality is accompanied by a parallel postponement of morbidity and/or disability. Consequently, healthy life expectancy grows at the same rate as total life expectancy and the number of years spent in bad health remains the same. The term 'dynamic equilibrium' is meant to capture the overall changes in life expectancy and severe disability.

62 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 x, 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 x at time $t+1$ will be the same as the health status (and health care spending) of cohort of age x-n at time t.

cohort[63]. This is done only for those sections of the age-profile where the cost per capita is growing[64] (for example for the age cohort of 50 years-old, the value of cost per capita for that age in 2030 will be the same as the value of cost per capita for the age cohort of 50-3.92 = 46.08 ≈ 46.1 years in 2007).

Third, the precise value of cost per capita assigned to that reference age is picked up:

$$c_{g,a,n} = c_{g,a-\Delta e_{g,a,n},2007} \qquad [6]$$

where:

$c_{g,\,a,\,n}$ is cost per capita assigned to a person of a given gender *g* and age *a* in a given year *n* of the projection period;

$c_{g,\,a\text{-}\Delta eg,a,n,\,2007}$ is cost per capita assigned to a person of a given gender and age $a\text{-}\Delta e_{g,a,n}$ (specified with a precision to a decimal part of a year) in the base year (2007).

Fourth, the resulting value of cost per capita is used as an input value to the basic calculations presented earlier in equations [1] – [4].

7.2.4. Death-related costs scenario

Death-related costs scenario links health care spending to years of remaining life. There is strong empirical evidence that a large share of total spending on health care during a person's life is concentrated in the final year(s) of life.[65] Based on figures provided by the national authorities and complemented with some additional scientific data, a profile of 'death-related' costs by age is constructed, with unit costs differentiated between decedents (those who die within a calendar year) and survivors. Then two separate profiles are applied to two groups of population calculated using mortality rates.

Formal illustration

The methodology to calculate spending on health care taking into account the number of remaining years of life is a further improvement of the methodology used in the pure demographic scenario. The difference lies in the way the unit cost of health care is calculated.

In the death-related costs scenario, the population of each gender and year of age 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 *n* expected to die within two years from year *t* is calculated as population aged *n* in year *t* multiplied by the probability of dying within two years which is expressed as: probability of surviving year *t* by persons aged *n* times probability of surviving year *t+1* by persons aged *n+1* times probability of dying in year *t+2* by persons aged *n+2*).

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63 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 can be obtained by simple extrapolation/trend-smoothening method from the existing average figures. This way it is possible to assign a concrete value of cost per capita to each tenth part of a year of age.

64 For the young and the oldest old the reference age remains the same over the whole projection period.

65 For an overview of empirical studies, see Raitano (2006).

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 which gives total spending of each subgroup and the sum of total spending borne by the subgroups is total spending on health care in a given year.

In a formalised way, the methodology can be presented as follows.

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, or 1, or 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 will die in the x^{th} year after a given year n can be expressed by the following equation:

$$d_{g,a,n,x} = \prod_{i=0}^{x-1}(1 - M_{g,a+i,n+i}) \cdot M_{g,a+x,n+x} \qquad [7]$$

where:

$M_{g,a+i,n+i}$ is the mortality rate of people of gender g aged $a+i$ in the i^{th} year after given year n and: $x \in (0,1,2...z)$

where 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 n will survive z^{th} year can be expressed in a following way:

$$s_{g,a,n} = \prod_{i=0}^{z}(1 - M_{g,a+i,n+i}) \qquad [8]$$

So, number of persons of a given gender g and age a who are going to die in x^{th} year from a given year n can be expressed in the following way:

$$Nd_{g,a,n,x} = d_{g,a,n,x} \cdot p_{g,a,n} \qquad [9]$$

where:

$p_{g,a,n}$ is projected population of a given gender g and age a in a given year n

The number of those who are going to survive x^{th} year is:

$$Ns_{g,a,n} = s_{g,a,n} \cdot p_{g,a,n} \qquad [10]$$

Second, ***the unit health care cost of each person in a population is calculated***. Contrary to the usual 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. One must find the cost per capita of a

person of a given gender *g* and age *a*, who is going to die within *x* years' time from a given 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:

$$f_{g,a,x} = \frac{cd_{g,a,x}}{cs_{g,a}} \qquad [11]$$

where:

$cd_{g,a,x}$ is health care cost per capita of a person of a given 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 to the AWG by Member States. 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:

$$c_{g,a} = \frac{\sum_{x=0}^{z} cd_{g,a,x} \cdot Nd_{g,a,x,2007} + cs_{g,a} \cdot Ns_{g,a,2007}}{p_{g,a,2007}} \qquad [12]$$

It must be borne in mind that the unit costs of decedents and survivors are calculated for the base year 2007 (thus index *2007* used in the equations) and are kept constant over the whole projection period.

Substituting for $cd_{g,a,x}$ using [11], one gets:

$$c_{g,a} = \frac{\sum_{x=0}^{z} f_{g,a,x} \cdot cs_{g,a} \cdot Nd_{g,a,x,2007} + cs_{g,a} \cdot Ns_{g,a,2007}}{p_{g,a,2007}} \qquad [13]$$

or:

$$c_{g,a} = \frac{cs_{g,a}\left(\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2007} + Ns_{g,a,2007}\right)}{p_{g,a,2007}} \qquad [13a]$$

This way, both $cs_{g,a}$ and – coming back to equation [12] - $cd_{g,a,x}$ can be calculated:

$$cs_{g,a} = \frac{c_{g,a} \cdot p_{g,a,2007}}{\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2007} + Ns_{g,a,2007}} \quad [14]$$

$$cd_{g,a,x} = f_{g,a,x} \cdot \frac{c_{g,a} \cdot p_{g,a,2007}}{\sum_{x=0}^{z} f_{g,a,x} \cdot Nd_{g,a,x,2007} + Ns_{g,a,2007}} \quad [15]$$

As in *pure demographic* scenario and scenarios on health status, for the time horizon of the projection exercise (2007-60) 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:

$$cd'_{g,a,x,n} = cd_{g,a,x,n} \cdot \Delta Ypc_n \quad [16]$$

where:

$cd'_{g,a,x,n}$ is cost per capita of a person of a given gender *g* and age *a* who is going to die within *x* years, in a given year *n* of the projection period adjusted to the GDP per capita growth;

ΔYpc_n is GDP per capita rate growth in year *n*, as in [2]

The same procedure applies to construct $cs'_{g,a,n}$ on the basis of $cs_{g,a,n}$, i.e. to adjust the per capita cost of the subgroup of survivors.

Third, ***by multiplying the size of each subgroup by its respective cost per capita, the total cost can be calculated***. Total expenditure on health care borne by those of a given gender *g* and age *a*, who are going to die within *x* years' time from a given year *n* can be expressed in the following way:

$$ed_{g,a,x,n} = Nd_{g,a,x,n} \cdot cd_{g,a,x,n} \quad [17]$$

and total expenditure of those of gender *g* and age *a* who are going to survive z^{th} year:

$$es_{g,a,n} = Ns_{g,a,n} \cdot cs_{g,a,n} \quad [18]$$

Adding total expenditures of all the subgroups (those dying within *0,1,2,..., z* years time plus those surviving z^{th} year) gives total expenditure on health care borne by entire population of gender *g* and age *a* in a given year *n*:

$$E_{g,a,n} = \sum_{x=1}^{z} ed_{g,a,n,x} + es_{g,a,n} \quad [19]$$

Finally, ***total expenditure on health care borne by entire population in a given year n expressed as a share of the country's GDP is calculated*** as follows:

$$T_n = \frac{\sum_g \sum_a E_{g,a,n}}{Y_n} \qquad [20]$$

7.2.5. Income elasticity scenario

The effect of national and individual income on demand for health care goods and services is an essential factor driving total spending on health care. It can be proxied by applying different levels of income elasticities to the basic GDP per capita evolution path. Broadly speaking, income elasticity exceeding 1 is an indicator that health care is considered by the society as a 'luxury good'. However, economic growth and process of real convergence between countries over long term drive elasticity down towards common unity level. Based on those theoretical considerations, the *income elasticity* scenario is identical to the *pure demographic* scenario except that the income elasticity of demand is equal to 1.1 in the base year and converges in a linear manner to 1 by the end of projection horizon in 2060. The elasticity coefficient at the beginning of the period has been chosen arbitrarily, although taking account of empirical evidence on developments in this value over recent decades.

Formal illustration

The projections of health care spending follow similar methodology as the pure demographic scenario with a change in the way cost per capita is evolving over the projection period. Income elasticity is taken into account by replacing equation [1] by the following one:

$$c'_{g,a,n} = c_{g,a} \Delta Ypc_n \varepsilon_n \qquad [21]$$

where:

$c'_{g,a,n}$ is cost per capita of a person of a given gender g and age a in a given year n of the projection period adjusted to the GDP per capita growth;

$c_{g,a}$ is constant cost per capita of a person of a given gender g and age a;

ΔYpc_n is GDP per capita rate growth in year n;

ε_n is income elasticity of demand, converging from ε_{2007} in the base year to ε_{2060} in 2060. Therefore:

$$\varepsilon_n = \varepsilon_{2007} - (n - 2007) \cdot \frac{\varepsilon_{2007} - \varepsilon_{2060}}{2060 - 2007} \qquad [22]$$

In the specific case where income elasticity of demand converges from 1.2 in 2004 to 1 in 2060, the value will be the following

$$\varepsilon_n = 1.1 - (n - 2007) \cdot \frac{1.1 - 1}{2060 - 2007} \qquad [22a]$$

After unit cost has been calculated, the following equations [3]-[4] do not change.

7.2.6. Labour intensity scenario

This scenario is identical to the *pure demographic* scenario except that costs are assumed to evolve in line with the evolution of GDP per worker. This assumption reflects the argument

that health care is still a highly labour-intensive sector, where supply side (and more precisely wages) predominates over demand side (illustrated by national income par capita being the driver of costs) in driving expenditure. As wages are projected to grow faster than GDP per capita, this scenario provides an insight into the effects of unit costs in the health care sector increasing by more than in the economy as a whole. To be fully neutral, the scenario needs extra assumptions to be done: wages in the health care sector (on which there is no reliable data available) must evolve in line with wages in the economy as a whole which, in turn, must follow strictly the evolution of labour productivity (GDP per worker).

Formal illustration

The only difference between this scenario and *pure demographic* scenario is the change in the development pattern of unit costs. GDP per capita is replaced by GDP per worker, thus equation [1] takes the following form:

$$c'_{g,a,n} = c_{g,a}\Delta Ypw_n \qquad [23]$$

where:

ΔYpw_n is GDP per worker rate growth in year n,

$$\Delta Ypw_n = \left(\frac{Y_n}{\sum w_{g,a,n}} - \frac{Y_{n-1}}{\sum w_{g,a,n-1}} \right) / \left(\frac{Y_{n-1}}{\sum w_{g,a,n-1}} \right) \qquad [24]$$

$w_{g,\,a,\,n}$ is the projected number of people employed of a given gender g and age a in a given year n.

The following equations [3]-[4] do not change.

7.2.7. EU12 cost convergence scenario

This scenario presents a different way to model the real convergence process expected to take place in the EU over medium-to-longer term. It assumes that the unit costs of health care provision in the individual EU12 Member States evolve over time to reach the average EU15 cost structure, in addition to the usual yearly evolution driven by growth in the national income per capita.

Formal illustration

The projections of health care spending follow similar methodology as the *pure demographic* scenario with a change in the way cost per capita is evolving over the projection period. Real convergence between EU15 and RAMS12 countries is assumed by replacing equation [1] by the following one:

$$c'_{g,a,n} = c_{g,a}\Delta Ypc_n f_n \qquad [25]$$

where:

$c'_{g,\,a,\,n}$ is cost per capita of a person of a given gender g and age a in a given year n of the projection period adjusted to the GDP per capita growth;

$c_{g,\,a}$ is constant cost per capita of a person of a given gender g and age a;

ΔYpc_n is GDP per capita rate growth in year n;

f_n is a hypothetical rate of growth of unweighted average EU12 unit cost (calculated in the base year) in a given year n with respect to the base year if it was to converge to unweighted average EU15 level by 2060 (calculated in the base year). Therefore:

$$f_n = (n - 2007) \cdot \frac{\overline{c_{g,a,EU15}} - \overline{c_{g,a,RAMS12}}}{2060 - 2007} \qquad [26]$$

where:

$\overline{c_{g,a,EU15}}$ is unweighted EU15 average cost per capita of a given gender g and age a calculated in the base year;

$\overline{c_{g,a,RAMS12}}$ is unweighted RAMS12 average cost per capita of a given gender g and age a calculated in the base year.

After unit cost has been calculated the following equations [3]-[4] apply unchanged.

7.3. Data sources

An important quality improvement in comparison with the previous rounds of projections is related to the enhanced comparability of the input data which comes mainly from the commonly agreed databases of the international organisations, such as Eurostat, OECD and WHO. This way, the use of common classifications and definitions is assured and individual interpretations of the data reduced to a necessary minimum.

The data required to successfully run the projection exercise in the field of health care include:

- public expenditure on health care;
- per capita public spending on health care (so-called 'age profiles of expenditure') decomposed by gender and age cohorts;
- per capita public spending on health care decomposed by the number of remaining years of life (required to run the *death-related costs* scenarios).

The data-collection procedure has included two steps. First, the Commission prepared a list of data required to perform the exercise, made an overview of existing common international databases managed by international organisations (mainly Eurostat, OECD and WHO) and gathered the figures which are available there. Then a questionnaire with all required data was prepared and pre-filled with figures coming from those databases. The questionnaire was then circulated to the Member States which were asked to endorse the pre-filled figures and complement the data missing from the common databases. Such completed questionnaires were used as a starting point for calculations.

Public expenditure on (acute) health care is defined according to the System of Health Accounts classification as expenditure financed by general government (HF1) devoted to the following health care functions:

- 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); plus,
- investment in medical facilities (HC.R.1),

the latter is classified as a health-related function.

Such definition includes current expenditure on health care (HC.1-HC.7), except for the services of long-term nursing care (HC.3), and investment in medical facilities (HC.R.1). Given that Eurostat database does not include capital investment, the questionnaire splits total health care expenditure into two separate items to be completed by the countries for which the data on investment are missing. In order to avoid double-counting, while reporting the investment figures, Member States should verify if they have not been included in the items of current expenditure following a depreciation principle.

The figures on public expenditure on health care are available in two separate databases, which partly differ but are compatible to each other given common collection methodology (data is classified according to the System of Health Accounts, established jointly by the OECD, WHO and Eurostat): 1) Eurostat database available at NewCronos Website, containing information on the health expenditure collected following the Joint Questionnaire[66], and 2) parallel OECD database 'OECD Health Data'[67].

The data in both datasets are compatible to each other given the same methodological principles, but differ in geographical coverage, precision of classification and specific items being available. Therefore, in order to obtain the figures needed to run the projection exercise, the AWG agreed that a combination of the two databases will be the (second) best solution.

The Eurostat database currently includes data for 16 EU Member States only (BG, BE, CZ, DK, DE, EE, ES, FR, CY, LT, LU, NL, PL, PT, RO, SI), due to the validation process not being completed in the other countries. The data currently available in the Eurostat database covers three years of observations: 2003, 2004 and 2005.

On the other hand, the OECD Health Data includes only OECD members, while eight EU Member States not being at the same time OECD members (BG, EE, LV, LT, HU, MT, RO, and SI) are not covered. Among the OECD member states, four countries (GR, IE, IT, UK) have provided only aggregate expenditure on health, without specifying spending on (acute) health care and long-term care. To estimate the shares of the two components for those four countries, ESSPROS data served as a proxy. Data from SE was collected following a slightly

66 Available on-line at: http://epp.eurostat.ec.europa.eu/pls/portal/url/page/PGP_QUEEN/PGE_QUEEN_TREE?screen=welcomeref&open=/&product=EU_MASTER_health&depth=2 (go to 'Public Health', and 'Health Care Expenditure')

67 The most recent version CD-ROM "OECD Health Data 2008", or available on-line at: http://www.ecosante.org/index2.php?base=OCDE&langh=ENG&langs=ENG&sessionid

different non-SHA methodology, but the OECD has put efforts to assure the largest possible comparability between the two classifications. OECD database covers, in most cases, years up to 2007.

Further data, in particular per capita public spending on health care (so-called 'age profiles of expenditure') decomposed by gender and age cohorts, and per capita public spending on health care decomposed by the number of remaining years of life (required to run the 'death-related costs' scenarios), not being available in any common databases, were provided exclusively by AWG delegates.

8. LONG TERM CARE

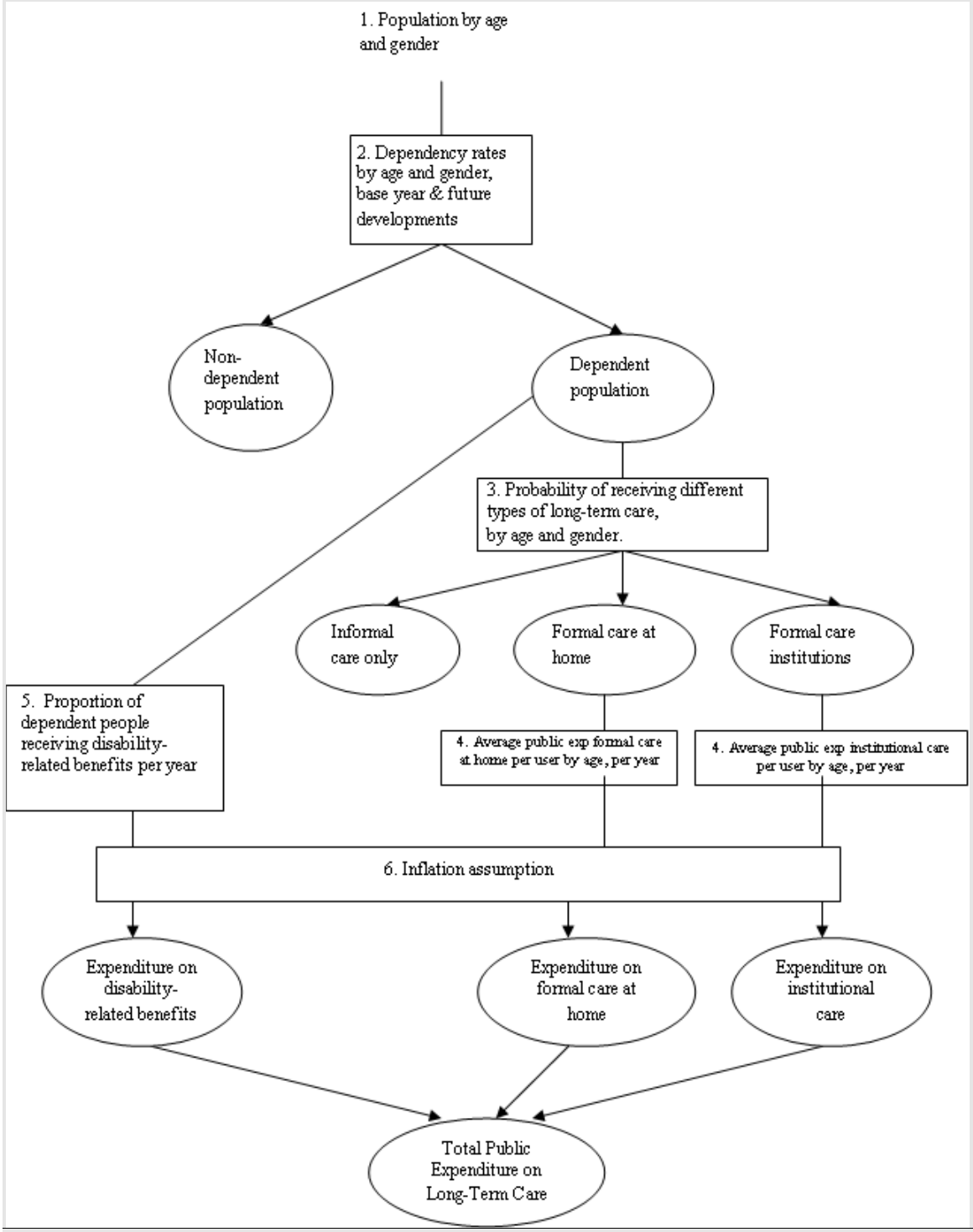
8.1. Short overview of the projection methodology

The long-term care projection methodology is based on a simple macro simulation model. The approach aims to maximise the number of factors affecting future long-term care expenditure that can be examined, while making sure that the projections can be carried out using mostly macro-level data so as to ensure that a large number of Member States can be included in the projections. Specifically, the methodology aims at analysing the impact of changes in the assumptions about:

- the future numbers of elderly people (through changes in the population projections used);
- the future numbers of dependent elderly people (by making changes to the prevalence rates of dependency);
- the balance between formal and informal care provision (due to a given shift in demand or to exogenous changes in the availability of informal carers resulting from socio-demographic processes);
- the balance between home (domiciliary) care and institutional care within the formal care system;
- the cost of a unit of care.

Graph 8. 1 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.

Graph 8. 1 - Model structure



Source: Commission services, EPC.

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 applying age and gender-specific dependency ratios in the base year (estimated using existing indicators of disability from comparable sources: SHARE survey, Survey of Income and Living Conditions) to the baseline population projection. It is worth stressing at this point the difference between the terms "dependency" and "disability". The term "disability" refers to some functional impairment of an individual. The term "dependent" refers to the share of the population having some disability which requires the provision of a care service. There are many people with some form of disability who can lead completely independent lives without the need for care services. More specifically, the projections make use of the concept of ADL-dependency which refers to difficulties in performing at least one Activity of Daily Living (ADL)[68].

Step 2

This step relates to splitting, by age and gender, the dependent elderly population into three groups depending on the type of care they receive, namely (i) informal care (provided by family members, friends, neighbours, etc. or purchased with a person's own financial resources), 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). Given lack of information on actual provision of informal care it is considered as a default category by assuming 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

This step involves the calculation of public spending for the two types of long-term care service, by multiplying the number of people receiving long-term care services (at home and in institutions) by the average age-specific public expenditure of formal care (at home and in institutions) per year and per user. Average expenditure is 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). This approach requires an underlying assumption that current expenditure in services divided

[68] *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.

by the number of users equals the long-run unit costs of services and that the age structure of long-term care expenditure is the same for both types of care[69].

Step 4

By adding up the expenditure on formal care at home and in institutions, total public expenditure on long-term care services is obtained. Public expenditure on cash benefits for people with ADL-dependency is then 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.

Overall, given the availability of a numerical measure of disability, the projection methodology described above is more precise than that used in health care projections 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 stress is that while dependency rates are an indicator of the need for care, those needs may not necessarily translate into actual public expenditure, as most long-term care is 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.

8.2. Scenarios carried out in the projection exercise

The advantage of the methodology described above is that it allows one to examine different scenarios regarding the evolution of dependency rates, unit costs and policy settings.

Consequently, similarly to the health care projection exercise, a series of scenarios analysing separate impact of several factors and possible policy changes will be performed. The AWG and EPC envisage choosing a baseline scenario for long-term care expenditure in connection with the release of the final Ageing Report with the budgetary projections, as was the case in the 2006 Ageing Report. The overview of the scenarios is presented in Table 8. 1 below.

[69] In practice, average expenditure (aged 65 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. The model uses average public expenditure in formal care and in institutional care to project future expenditure in both types of services.

Table 8. 1 - Overview different scenarios to project long-term care expenditure

	Pure demographic scenario	High life expectancy scenario	Constant disability scenario	Demand driven spending scenario	Shift from informal to formal care	Labour market/family structure scenario	Convergence scenario
Population projection	AWG scenario - baseline	AWG scenario - high life expectancy	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline
Age-related expenditure profiles	Base year profiles held constant over projection period	Base year profiles held constant over projection period	Base year age profile shifting according to changes in age-specific life expectancy	Base year profiles held constant over projection period	Base year profiles held constant over projection period	Base year profiles held constant over projection period	Base year profiles held constant over projection period
Policy setting - probability of receiving formal/ informal care	Probability of receiving care held constant at base year level	Probability of receiving care held constant at base year level	Probability of receiving care held constant at base year level	Probability of receiving care held constant at base year level	Gradual decrease in number of persons receiving informal care over the first ten years of the projection period; respective increase in number of persons receiving formal care at home and/or in institutions	Probability of receiving informal care evolving according to the availability of spouses and children; respective change in the provision of formal care	Probability of receiving formal care converging from base year level to the average of three best performing countries
Unit costs	GDP per worker	GDP per worker	GDP per worker	GDP per capita	GDP per worker	GDP per worker	GDP per worker

Source: Commission services, EPC.

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 and applies those constant shares to the projected changes in the dependent population. The latter evolves precisely in line with total elderly population, as also the prevalence of ADL-dependency is kept unchanged over the projection horizon, i.e. the rates used in future years are the same as those in the base year. 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 2007 level. While in the above-mentioned elements the scenario is similar to the analogous scenario for health care expenditure, it features a significant difference as far as the main driver of costs is concerned. Given currently predominating deficit of formal care provision and its highly labour-intensive character, public expenditure seems supply- rather than demand-driven. For that reason, GDP per worker (which is assumed to reflect changes in the labour productivity and, at the same time, wage evolution in the care sector), rather than GDP per capita has been chosen as the main driver of unit costs.

8.2.2. High life expectancy scenario

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 (for details see section 5). In terms of methodology, the scenario does not differ from *pure demographic* scenario, apart 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.

8.2.3. Constant disability scenario

This scenario reflects an alternative assumption about trends in age-specific ADL-dependency rates. Being inspired by the *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.

8.2.4. Demand-driven spending scenario

This scenario is identical to the *pure demographic* scenario, except that costs are assumed to evolve in line with GDP per capita instead of GDP per worker. It illustrates a hypothesis according to which changes in the long-term care provision are mainly demand-driven, and the government flexibly responds to the higher social expectations to provide more publicly financed care in line with general increase in the national income.

8.2.5. Scenario assessing the effect of a shift from informal to formal care

This policy-change scenario is run to assess the impact of a given 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% of disabled elderly who have so far received only informal care per year. This extra shift takes place during ten first years of the projection period only, thus it sums up to about 10.5% shift from informal to formal care. Three alternative options are envisaged: (a) all 'new' beneficiaries move into institutional care and nobody into home care; (b) everybody moves into home care and nobody into institutional care; (c) half move to home and half to institutional care.

8.2.6. Labour market / family structure scenario

This scenario is based on the assumption that current demographic, social and educational changes in the structure of society will result in a reduction in the amount of informal care available to elderly dependent people. It uses empirical information on the share of informal care provided by spouses, children and other people; expected changes in the family structure due to demographic developments (narrowing gap between elderly women's and men's life expectancy); and projected labour market developments (growing activity rates of women being currently the main informal care providers, shift from full-time to part-time working pattern). Assuming that the resulting deficit of informal carers will be fully compensated by the increased public provision of formal care, the scenario examines the effect of those changes on public spending.

8.2.7. Scenario assessing the budgetary effect of a convergence in formal care coverage

This scenario assumes that the real convergence across Member States, 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. Given that it is difficult in practical terms to define an optimal level of LTC coverage for a Member State, a number of options can be considered to serve as 'best practice' or a 'target level' of long-term care provision to be reached over the long term in all Member States. Similarly to the scenarios assessing the effect of a shift from informal to formal care, this scenario should be also considered as a policy-change scenario, as it assumes a considerable shift in the current LTC provision policy.

8.3. Data sources

As in the case of health care, in order to assure best possible comparability of data used in the projections, it has been agreed 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. Therefore, most input data comes from the databases established in the framework of the international organisations, such as Eurostat, OECD and WHO.

The data required to successfully perform the projection exercise in the field of long-term care include:

- public expenditure on long-term care;
- split of public long-term care expenditure into spending on LTC services in kind and cash benefits;
- split of public expenditure on LTC services in kind into institutional and home care;
- per capita public spending on long-term care (so-called ‘age profiles of expenditure’) decomposed by gender and age cohorts;
- number of beneficiaries of long-term care services provided at home and in institutions, as well as recipients of LTC-related cash benefits;
- disability/dependency rates.

The data collecting procedure covers the same steps as for health care (see section 7.3 above), with the same questionnaire being used to report the data required for both health and long-term care expenditure projections.

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 were used to pre-fill the questionnaires circulated to the Member States. The remaining items (age profiles of long-term care, number of LTC beneficiaries and cash benefits recipients) were provided directly and exclusively by the Member States, as they do not exist in any commonly agreed databases.

8.3.1. Public expenditure on long-term care

Public expenditure on long-term care is defined, according to the System of Health Accounts classification, as the sum of publicly financed (HF1) 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

- social services of long-term care (HC.R.6.1), which is the part of *'administration and provision of social services in kind to assist living with disease and impairment'* (HC.R.6) that covers *'a range of services of care assistance aimed predominantly at providing help with instrumental activities of daily living (IADL) restrictions to persons with limited ability to perform these tasks on their own'*.

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, 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[70].

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' (for details see section 7.3 above).

[70] For more details, see: OECD (2006), *Costs of Care for Elderly Populations. Guidelines for estimating long-term care expenditure*, DELSA/HEA/DIS(2006)4, 14 February 2006, pp.9-11.

8.3.2. Spending on home vs. institutional care

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[71].

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.

To estimate the share of expenditure devoted to home and institutional care, the SHA classification of health care providers (HP)[72] was used. Following this classification, institutional care was computed as the sum of HP.1 (hospitals) and HP.2 (nursing and residential care facilities), while home care would consist of the sum of HP.3 to HP.9[73].

In case the classification of providers (HP) did not provide satisfactory data, a second option was the analysis of the second level classification of functions of health care (HC), where the 'medical' component of long-term care (HC.3) is disaggregated into three sub-items: *'in-patient long-term nursing care'* (HC.3.1), *'day cases of long-term nursing care'* (HC.3.2), and *'long-term nursing care: home care'* (HC.3.3).

The precise definitions suggest that HC.3.1 and HC.3.2 are types of care that are provided in the institutions or in the community facilities (in any case not at beneficiary's home), while

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71 OECD (2007), *Data collection on long-term care (focussing on recipients). Meeting of OECD Health Data National Correspondents*, DELSA/HEA/HD(2007)7, 28 September 2007, p.12.

72 This classification distinguishes the following types of long-term care providers: hospitals (HP.1); nursing and residential care facilities (HP.2); providers of ambulatory health care (HP.3); retail sale and other providers of medical goods (HP.4); provision and administration of public health programmes (HP.5); general health administration and insurance (HP.6); other industries (HP.7); rest of the world (HP.9).

73 It has therefore been implicitly assumed that ambulatory health care (HP.3) has the characteristics of home care, which may not be the case in some particular cases HP.3 includes the following establishments: offices of physicians (HP.3.1); offices of dentists (HP.3.2); offices of other health practitioners (HP.3.3); out-patient care centres (HP.3.4); medical and diagnostic laboratories (HP.3.5); providers of home health care services (HP.3.6); other providers of ambulatory health care (HP.3.9). Since the specific classification of long-term care provided in ambulatory setting depends on particular institutional structure of each LTC system, the Member States were asked to verify this assumption together with the whole set of figures.

HC.3.3 is provided at home. Therefore, if the second-level disaggregation of HC.3 is available, those figures can be used as proxies for institutional and home care.

Less clear is the issue of the 'social' component of long-term care, as such kind of services can be provided either at home or in special institutions (nursing homes, rehabilitation centres, etc.). In case detailed data were missing on that issue, the same split was applied to both 'medical' and 'social' component of LTC.

8.3.3. Public spending on cash benefits

Public spending on cash benefits is projected separately from expenditure on long-term care services provided 'in kind' at home or in the institutions. The cash benefits include social programmes offering care allowances introduced in a number of countries in order to allow households more choice over care decisions, and to support care provided at home. They are 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.

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.

Given that the System of Health Accounts classification does not provide information on the way the general government finances the social protection expenditure (thus no division between services in kind and cash benefits is available, although the latter component is included in the overall spending), the data from ESSPROS database of general government social protection expenditure have been used instead as a best proxy for cash benefits. Given that ESSPROS and SHA classifications are not compatible, it has been decided not to use directly the ESSPROS estimate of LTC cash benefits, but to calculate the ratio of the two components (services of long-term care supplied directly to the patients as in kind benefits and LTC-related cash benefits) on the basis of the ESSPROS data and apply it to the aggregate public long-term care expenditure as defined according to SHA classification.

The proposed split of ESSPROS items classified within *sickness/health care*, *disability* and *old-age* functions into the SHA items is presented in Table 8. 2.

Table 8. 2 - Suggested correspondence between ESSPROS and SHA items

	ESSPROS	Title of headings	ICHA-HC	Title of headings	HC/LTC*
Sickness/health care function	Cash benefits:	Paid sick leave	HC.R.7	Administration and provision of health-related cash benefits	-
		Other cash benefits	HC.R.7	Administration and provision of health-related cash benefits	-
	Benefits in kind:	In-patient health care	HC.1.1	In-patient curative care	HC
			HC.1.2	Day cases of curative care	HC
			HC.2.1	Inpatient rehabilitative care	HC
			HC.2.2	Day cases of rehabilitative care	HC
			HC.3.1	In-Patient LTC	LTC (h)
			HC.3.2	Day cases of LTC	LTC (h)
		Out-patient health care (including provision of pharmaceutical products)	HC.1.3	Out-patient curative care	HC
			HC.1.4	Services of curative home care	HC
			HC.2.3	Out-patient rehabilitative care	HC
			HC.2.4	Services of rehabilitative home care	HC
			HC.3.3	LTC home care	LTC (h)
			HC.4	Ancillary services to health care	HC
			HC.5	Medical goods dispensed to out-patients	HC
			HC.6	Prevention and public health services	HC
		Other benefits in kind	HC.R.6.1	Social services of LTC (LTC other than HC.3)	LTC (s)
	Cash benefits:	Care allowance	HC.R.7	Administration and provision of health-related cash benefits	LTC (cb)
Disability function	Benefits in kind:	Accommodation	HC.R.6.1	Social services of LTC (LTC other than HC.3)	LTC (s)
		Home help (assistance in carrying out daily tasks)	HC.R.6.1 or HC.3.3	Social services of LTC (LTC other than HC.3) Long-term nursing care: home care	LTC (s) or LTC (h)
		Rehabilitation	HC.R.6.9	All other services classified under HC.R.6	LTC (s)
		Other benefits in kind	HC.R.6.9	All other services classified under HC.R.6	LTC (s)
Old age	Cash benefits:	Care allowance	HC.R.7	Administration and provision of health-related cash benefits	LTC (cb)
	Benefits in kind:	Accommodation	HC.R.6.1	Social services of LTC (LTC other than HC.3)	LTC (s)
		Home help (assistance in carrying out daily tasks)	HC.R.6.1 or HC.3.3	Social services of LTC (LTC other than HC.3) Long-term nursing care: home care	LTC (s) or LTC (h)
		Other benefits in kind	HC.R.6.9	All other services classified under HC.R.6	LTC (s)
Family /children	Cash benefits:	Other cash benefits	HC.R.7	Administration and provision of health-related cash benefits	-
	Benefits in kind:	Other benefits in kind	HC.6.1	Maternal and child health; family planning and counselling	HC
Social exclusion	Benefits in kind:	Rehabilitation of alcohol and drug abusers	HC.R.6.1 or HC.2	Social services of LTC (LTC other than HC.3) Services of rehabilitative care	LTC (s) or HC

Source: Commission services, based on Eurostat (2007), *LTC in SHA Framework. Work progress on delimitation of LTC. Definitions and boundaries*. Presentation provided by D. Kawiorska at the AWG meeting on 18 April 2007.

* the last column reports the correspondence of a given item to health care or long-term care aggregate according to the proposed split between the two types of care. *HC* – health care; *LTC (h)* – 'health' component of long-term care; *LTC (s)* – 'social' component of long-term care; *LTC (cb)* – long-term care-related cash benefits

Drawing from this correspondence, the 'social' part of long-term care missing in the OECD Health Data was calculated as the sum of the following items of ESSPROS classification: *'other benefits in kind'* from sickness/health care function plus *'accommodation'*, *'home help'*, *'rehabilitation'* and *'other benefits in kind'* (which make up the entire category of 'benefits in kind') from disability function, plus *'accommodation'*, *'home help'* and *'other benefits in kind'* (which make up the entire category of 'benefits in kind') from old age function[74].

At the same time the cash benefits related to long-term care is the sum of the following ESSPROS items: *'periodic care allowance'*, *'periodic economic integration of the handicapped'*, *'lump sum care allowance'*, *'lump sum economic integration of the handicapped'* (all being part of *'cash benefits'*) from disability function and *'periodic care allowance'* (being part of *'cash benefits'*) from old-age function.

8.3.4. Disability rate

The data on the disability rates came from the SHARE survey conducted by a consortium of universities and research institutes in 12 countries of the EU (AT, DE, SE, NL, ES, IT, FR, DK, GR, BE, CZ, PL), and from the Survey on Income and Living Conditions (SILC) conducted by the national statistical offices and gathered by Eurostat.

SHARE database includes information on the percentage of people with *'the prevalence of 1+ limitations with activities of daily living among men and women over 50 years of age'*. The data from SILC survey provides for the percentage of people in a given age group who *'are severely restricted in activities they usually do because of health problems for at least the last 6 months'*[75].

In case of the UK, the English Longitudinal Study of Ageing (ELSA) produces figures that are fully comparable with the SHARE methodology. RO and BG not having provided figures to the SILC questionnaire have been assigned different measures of disability. In the case of RO, the data, taken from Health Interview Survey (year 2004), indicates the percentage of people in a given age group who have suffered from severe activity restriction in the past 6 months. In the case of BG the figures, also taken from the Health Interview Survey (year 2004), indicate percentage of people who have had a long-standing illness or health problem.

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74 As the item *'rehabilitation of alcohol and drug abusers'* accounts for a minor part of total social spending and is not provided by many countries, it can be omitted while calculating the aggregate.

75 More detailed information to be found on SHARE http://www.share-roject.org/new_sites/Documentation/variables.pdf and Eurostat http://europa.eu.int/estatref/info/sdds/en/hlth/hlth_index.htm websites.

9. EDUCATION

9.1. Projecting education expenditure

Among budgetary items to be projected, education plays a key role. The total level of public education expenditure represents between 3.3% and 8.4% of GDP (5% on average) among EU 27 countries and may become even more important given its contribution to the Lisbon strategy objectives. The overall assessment of budgetary challenges posed by ageing population warrants a deeper look at the development of those items of public expenditures in which – as in case of education - there is a potential room for some savings due to the demographic developments. Indeed, the number of the youngest will be diminishing due to a number of social factors (falling fertility rates, postponement of childbearing, changes in the family structure, etc.) and in about 20 years time it will be lower than that of the eldest population, which will probably lead to a decrease in aggregate demand for and public expenditure on education.

Projecting education expenditure is not an easy task and there are only few examples available of long-term projections of this budgetary item[76]. In making the projection, several issues warrant attention and need preliminary clarification. First, there is no clear delimitation of what education means and what activities should be covered by the projection exercise. It can encompass only schooling, or include pre-primary, tertiary and even adult education. Second, being a student or pupil is not an exclusive status, in particular for those above the legal compulsory education threshold who can opt for different patterns of time management combining in various proportions education, work and leisure. A final choice from a range of different statuses depends not only on legislative arrangements but also on individual decisions and developments in the labour markets. Third, education expenditures take different forms. Generally, the public sector funds education either by bearing directly the current and capital expenses of educational institutions (direct expenditure for educational institutions) or by supporting students and their families with scholarships and public loans as well as by transferring public subsidies for educational activities to private firms or non-profit organisations (transfers to private households and firms).

The methodology presented in this chapter builds on the previous projection exercise methodology, extended by some minor changes, and taking advantage of a considerable improvement in the availability and quality of the data gathered by Eurostat.

9.2. Delimitation of the projections

The projections will cover public education expenditure for schooling and tertiary education. In particular:

a. Projections will be run for primary (ISCED 1), lower secondary (ISCED 2), upper secondary and post-secondary non-tertiary (ISCED 3 and 4), and tertiary education

[76] A brief overview is included in A. Montanino, B. Przywara and D. Young (2004).

(ISCED 5 and 6)[77]. This classification can be used for a specification of compulsory schooling (ISCED 1 and 2), non-compulsory schooling (ISCED 3 and 4) and tertiary education (ISCED 5 and 6)[78]. It should be considered that ISCED levels 4 and 6 play a marginal role and often they are assimilated respectively to levels 3 and 5. In practice, they will be treated as part of these levels (see Table 9. 1 for the theoretical starting and ending age for each education level).

Table 9. 1 - Theoretical starting and ending age for level education

	ISCED-97 Levels of education				
	Level 1	**Level 2**	**Level 3**	**Level 5**	**Level 6**
BE	6-11	12-13	14-18	19-21	22-23+
BG	7-10	11-14	15-18[79]	19-23	24-26
CZ	6-10	11-14	15-18	19-23	24-26
DK	7-12	13-16	17-19	20-24	28-29
DE	6-10	11-16	17-19	20-25	26-28
EE	7-12	13-15	16-18	19-23	24-26
GR	6-11	12-15	16-17	18-24	24-26
ES	6-11	12-15	16-17	18-23	24-28
FR	6-10	11-14	15-18	19-22	23-26
IE	4-12	13-15	16-18	19-23	24-27
IT	6-10	11-13	14-18	19-23	24-31
CY	6-11	12-14	15-18	19-23	23-28
LV	7-10	11-15	16-18	19-24	25-28
LT	7-10	11-15	16-18	19-24	25-28
LU	6-11	12-15	16-18	19-23	n.a.
HU	6-9	10-13	14-17	18-23	24-30
MT	5-10	11-15	16-18	19-24	25-32
NL	6-11	12-15	16-19	20-22	23-25
AT	6-9	10-13	14-17	18-22	23-24
PL	7-12	13-14	15-18	19-25	26-34
PT	6-11	12-14	15-17	18-22	23-28
SI	7-10	11-14	15-18	19-23	24-27
SK	6-9	10-14	15-18	19-23	24-26
FI	7-12	13-15	16-18	19-24	25-28
SE	7-12	13-15	16-19	20-23	23-26
UK	5-10	11-13	14-17	18-20	21-23

Source: Eurostat, Commission services

Note: the breakdown is based on the theoretical age and on the current distribution of border ages among the different education levels.

[77] The formal definitions of the levels of education covered by the 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 second stage of basic education). The end of this stage is usually after nine years of schooling after the beginning of primary education and often coincides with the end of the 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 and these 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 level 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.

[78] The borders between compulsory and non-compulsory education are not in all cases as clear-cut as the simple rule of thumb above suggests. For an overview of the legal limits of compulsory education and their overlap with the ISCED levels in all EU Member States, see Annex 9.1.

[79] Schooling is mandatory in BG till the age of 16.

b. Projections will include expenditures on educational institutions from public sources (direct public expenditures) and transfers to private households. The former may take two different forms:
    - purchases by the government agency itself of educational resources to be used by educational institutions (e.g. direct payments of teachers' salaries by a central or regional education ministry).
    - payments by the government agency to educational institutions that have responsibility for purchasing educational resources themselves (e.g. a government appropriation or block grant to a university, which the university then uses to compensate staff and to buy other resources).

The pre-primary education is excluded from the exercise. This component represents on average less than 0.5% of GDP. The reason to exclude pre-primary education is that there are serious data problems that make it difficult to run reliable projections. Comparability across countries is also difficult since the institutional settings of pre-primary systems are very different and include a large share of private institutions.

9.3. Projection methodology

The methodology builds on the previous round of projections, and benefits from the extensive Eurostat education database which provides detailed information on all 27 EU Member States on enrolment and expenditures in different education levels. The methodology is built to fit with the kind of available data and a simple two-steps approach can be developed. The first step is to decompose the key variables for public education expenditure projections - education per student and number of students - for the base year. The decomposition would take into account the different underlying variables that affect the total number of students in each education level and the expenditure per student (as wages, number of teaching and non-teaching staff and the existence of other current and capital expenditures). The base year is the calendar year 2006 (for financial data) or school/academic year 2005/2006 (for enrolment and personnel data).

The second step requires assumptions on future developments of the underlying variables that affect the number of students and the expenditure per student. Regarding the latter, Eurostat database considers only direct education expenditure, i.e. expenditures directly carried out by the government (either national or local) to run public institutions. Transfers to private households and firms will be projected using a more mechanistic approach (see below).

In setting the base year and in producing the long term projections, the different education levels will be treated separately, to capture the existing differences within the education system. In particular, differences in the cost structure and in the interrelations with the labour market.

9.3.1. The base year

Number of students and enrolment rates

The number of students (S) in education level x is obtained as:

$$S_x = \sum_{y=1}^{100} S_x^y \qquad [1]$$

i.e. is the sum of the number of students enrolled by age (y) in the specific education level x. In practice there is no maximum age-limit to be enrolled in education, in particular for what concern higher education. Hence, all ages should be added in each education level to see whether someone is enrolled, despite the fact that is beyond the maximum theoretical age. Although the bulk of students enrolled in a given level of education are within the theoretical age for this level, in certain cases there is a substantial number of students enrolled with an age that tend to exceed even the theoretical exit age from the specific education level. In order to take into account these specificities, the enrolment rate is calculated for two dimensions: per age and education level together.

The net enrolment rate by education level x and age y is obtained as:

$$e_x^y = \frac{S_x^y}{POP^y} \qquad [2]$$

where POP^y is population of age y.

Conversely, the enrolment rate by age is the sum of the number of students of the specific age (y) in the different education levels as a share of total population in age y, i.e.:

$$e^y = \left(\sum_{x=1}^{6} S_x^y \right) \Big/ POP^y \qquad [3]$$

The enrolment rate by age together with the enrolment rates by age and education level are needed to project future enrolment and the distribution across education levels of the future cohorts.

There is a basic difference in the value of enrolment rate and its drivers between compulsory and non-compulsory levels of education which – in most cases – coincide with levels 1-2 and 3-6 of ISCED classification respectively. Given the legally compulsory education concerning all citizens in the EU Member States until a certain age (15-16 years of age) or during a given number of years (9-10 years), enrolment rate is supposed to approximate 100% in the age cohorts statutorily corresponding to the compulsory education levels (in most cases primary and lower secondary). The deviations from that principle are minor and due mainly to the frictional movements from school to school and existence of a small number of children not enrolled to any school. However, after that age (thus generally from upper-secondary education onwards) schooling becomes voluntary and as such an alternative to professional work. The unique status of compulsory enrolment is thus replaced by a wider choice of options. In particular, those above 15-16 years old may (i) study full time, (ii) work and study part time, (iii) work full time or (iv) neither work nor study. Unlike in the previous round of

projections, data available in Eurostat database, combining the outcomes of the UOE Data Collection[80] and the Labour Force Survey allow to divide total number of population in a given age into those four groups. In particular, institutional data provided by the UOE data collection includes the number of students in each age and gender (thus also enrolment rates), while LFS provides for participation rates as well as the number of people who split their time between working and studying (part-time students). Based on that information, the number of those who neither study nor work can be calculated as a simple complement of the three previous groups:

$$e^y + p^y - t^y + d^y = 1 \qquad [4]$$

Where:

e^y is enrolment rate in a given age cohort (number of students (both full and part-time) of the age y enrolled in education as a share of the total population of that age cohort);

p^y is participation rate in a given age cohort y (size of labour force (including part-time students who are also working) as a share of the total population of that age cohort);

t^y is 'working students' rate' of a given age cohort y (number of part-time students who are also working as a share of the total population of that age cohort);

d^y is 'leisure rate' in a given age cohort y (number of those who are neither studying nor working as a share of the total population of that age cohort).

Or, by decomposing t^y :

$$e^y + p^y - c^y * e^y + d^y = 1 \qquad [5]$$

c^y is the working students ratio in a given age cohort y (ratio of the number of working students to the total number of enrolled students of that age cohort in a given education level);

It is possible to combine the data available across age cohorts (enrolment, participation, inactivity) with those available across levels of education as the calculations are performed in two dimensions: separately for each level of education and then for the age cohorts inside each of them.

Expenditure per student

Yearly expenditure per student differs widely across education levels and across countries. In 2004, it ranged from just above €500 (in PPPs) for secondary education in Romania to over €17000 (in PPPs) for tertiary education in Denmark[81]. Such a considerable gap reflects different levels of wages for teaching and non-teaching staff, different student-to-staff ratios, as well as different levels of investments and other costs associated with education. In order to give account of these differences and of the role that the underlying variables play in setting the unit (per student) cost of education, education expenditure per student can be written as:

[80] UNESCO-UIS/OECD/EUROSTAT Data Collection on Education Statistics. Manual: concepts, definitions and classifications (2005).

[81] Own calculations based on Eurostat data.

$$ES_x = \frac{T_x}{S_x} * W_x + \frac{K_x}{S_x} \quad [6]$$

where all variables refer to education level *x* and where:

- *T* is the total number of teachers and non teachers staff;
- *W* are the gross wages and social contributions paid for school staff;
- *K* are other costs, current and capital.
- *S* is the number of students enrolled in education level *x,* obtained through equation 1.

The schematic presentation of the implicit decomposition of expenditure per student is presented in Graph 9. 2.

This decomposition of the expenditure per student provides helpful information on the factors behind the observed level of expenses. It should be considered that this decomposition is clearly a simplification of the complexity of the variables that determine the expenditure per student. A key variable seems to be the class size. Costs present discontinuity so that main changes appear when an additional class is created/destroyed. Given the difficulties in having proper information on this variable, a good approximation may be the student-to-staff ratio. It gives an idea of how many resources (teaching and non teaching staff) are provided to the system given a certain number of individuals enrolled in education.

Also, wages differ on the basis of the ratio between teacher and non-teacher staff, so that the higher is the number of teachers relatively to non-teacher staff, the higher may be the average salary. Average wages depend also on the seniority of the staff. Other things being equal, the older is the labour force involved in the education system, the higher is the current average wage but, at the same time, the trends may become more favourable once the older go to pension. Finally, other costs apart from wages may vary according to past levels of investment. A high current level may depend on low levels in the past and may imply low level of spending also in the future.

The proposed decomposition would allow applying different assumptions on the future trends of the single underlying variables and thus addressing the role of the wage setting as well as other institutional factors, such as the capacity of the education system to adapt to demographic changes.

9.3.2. Methodology used in education projections

The main purpose of the projections is the assessment of the impact of demographic developments on public expenditure on education and subsequently on the overall budgetary stance in the EU Member States up to 2060. Apart from the pure demographic effect, projections should also take into consideration the projected trends in the labour market in order to include behavioural aspects and the developments of the economy. It is envisaged to include a baseline scenario and a number of alternative scenarios. The latter will consider the uncertainty behind the development of several variables: enrolment rate, unit cost development, staff-to-student ratio, etc.. In order to undertake those scenarios, students and expenditures per student will be projected for each education level. The aggregation of the results will provide the total expenditure in public education.

The schematic model of the projection methodology is presented in Graph 9.3.

Number of students

Future developments of the number of students enrolled in each level of education depend on individual behaviour, and in particular whether education is an alternative to work. For simplification purposes, education is considered compulsory in levels 1 and 2 of ISCED classification. The baseline projection assumes that net enrolment rates for students in those levels of education remain constant at the base year level. This implies that no behavioural changes are projected for those people. In order to obtain the projected number of students enrolled in those levels of education, a two step approach is used. First, the total number of students in each age is estimated on the basis of demographic developments and the net enrolment rate in the base year (equation 3). Secondly, students in age *x* are distributed into the separate education levels according to the distribution in the base year. The alternative scenario considers that education for all is a key objective in EU policies, in particular for compulsory education. Net enrolment rates in compulsory schooling are then assumed to converge gradually to 100% and then remain constant.

The projection of the number of students for those in non-compulsory levels of education takes into account labour market developments, and net enrolment rates are not constant. An increase in the participation rate in the labour market implies, other things being equal, a decrease of the net enrolment rate. Following this logic, the net enrolment rate per single age *y* is projected separately for each level of education (keeping constant the initial distribution of students in each age cohort between different levels of education) according to the following formula:

$$e^y = \frac{1 - p^y - d^y}{1 - c^y} \qquad [7]$$

Expenditure per student

As shown by equation [6], expenditure per student in each education level depends on three main variables: (i) the staff to student ratio, (ii) the average wage and (iii) the "other-costs" to student ratio. In the baseline scenario, the assumptions for each variable will be the following:

a) the staff-to-student ratio will remain constant over the projection period so that it is explicitly assumed that the number of teaching and non teaching staff adjusts immediately to demographic changes;

b) the average wage is assumed to develop according to the GDP per worker (labour productivity) for the whole economy;

c) the "other-costs" to student ratio remains a constant share of the expenditure per student, so that an increase in the wage component would determine additional increase in other current and capital expenditures.

Alternative scenarios have been discussed by the Ageing Working Group, but no final decision has been taken as to whether these should be carried out within the projection exercise. Subject to agreement by the Ageing Working Group and the EPC, the following scenarios could be considered: (i) a different pattern in the staff to student ratio can be

assumed, so that the staff does not immediately adjust to demographic changes and thus the staff-to-student ratio increases linearly for some time (e.g. by 10% in the next 15 years) and then remain constant, reaching a steady state level that is higher than the current one; (ii) a different assumption from the baseline may regard the average compensation cost, where a stronger increase (e.g. 10% higher than the GDP per worker) can be considered to evaluate possible risks of wage setting in a unionised sector as public education. The "other costs" to student ratio develops as in the baseline; and, (iii) the cost implications of reaching specific benchmarks on educational attainment, if agreed at the EU level within the context of the updated Strategic Framework for European Cooperation in Education and Training.[82]

Transfers to households

Public expenditure in education is carried out mainly directly by governmental institutions. However, part of the expenses comes from transfers to private households. The methodology used to include transfers in the education expenditures is the following: the current share of transfers over total public education expenditure (available from OECD)[83] is applied to the projected direct expenditure, taking the share as constant over time. The sum between direct expenditure and transfers to private households gives the total expenditure in public education.

9.4. Data sources

The projections will be based mainly on available data provided by Eurostat. This has the advantage of avoiding heavy data requests processing and it guarantees the comparability of the information and subsequently of the results of the budgetary projections. Eurostat provides a comprehensive dataset which includes all the variables needed for defining the number of students and the expenditure per student in the base year according to the methodology discussed in the previous section. Hence, no data will be required to be provided by the Member States, unless there are lacks in the Eurostat database that calls for additional information directly from the Member State concerned. The time coverage of the data differs according to the type of information. Enrolment and personnel data is available up to the school year 2005/2006, while the financial data up to the year 2005. The base year will be 2006 or, alternatively, school/academic year 2005/2006. As the financial information is lacking for the most recent year, the values will be extrapolated from the data of the previous years using the same indexation rule as for the projection itself. For countries where data are not available or incomplete, Members of the AWG have provided the relevant information to the Commission.

Macroeconomic variables to be used in the projection exercise, namely: GDP, labour force and GDP per worker will come from the common assumptions of AWG. The list of the variables needed for each of the four different education level in the base year is the following:

- Total expenditure in public wages;
- Number of students per age and education level in public education;

[82] Directorate General for Education and Culture (DG EAC) of the European Commission is in the process of coming to an agreement with the Member States whether such targets should be established.

[83] See OECD, *Education at a glance*.

- Number of working students per age and education level as a share of total number of students;
- Numbers of teaching and non teaching staff per education level;
- Total expenditure for personnel compensation;
- Total expenditure in other current and capital expenditures (except wages);
- Transfers to households as a share of total expenditures in public education;
- Share of publicly funded education.

The education expenditure projections will use the following additional information (which available from the AWG macroeconomic assumptions described in Part I of this report) for each projected year:

- Labour force per single age;
- GDP per worker;
- GDP.

ANNEX 9.1 Organisational structure of secondary education

The End of Lower Secondary Education Often Coincides with the End of Full-Time Compulsory Education[84]

In this context, three different organisational models can be distinguished, depending on whether countries have a single structure, compulsory integrated secondary education corresponding to a 'common core' or distinct types of education. In some new Member States (the Czech Republic, Latvia, Lithuania, Hungary and Slovakia), several combinations of the three models exist alongside each other.

In all countries where the **single structure** is the only form of structure (Denmark, Estonia, Portugal, Slovenia, Finland, Sweden, Iceland, Norway and Bulgaria), the end of (single-structure) education coincides with the end of compulsory education except in Bulgaria where compulsory education ends one year later.

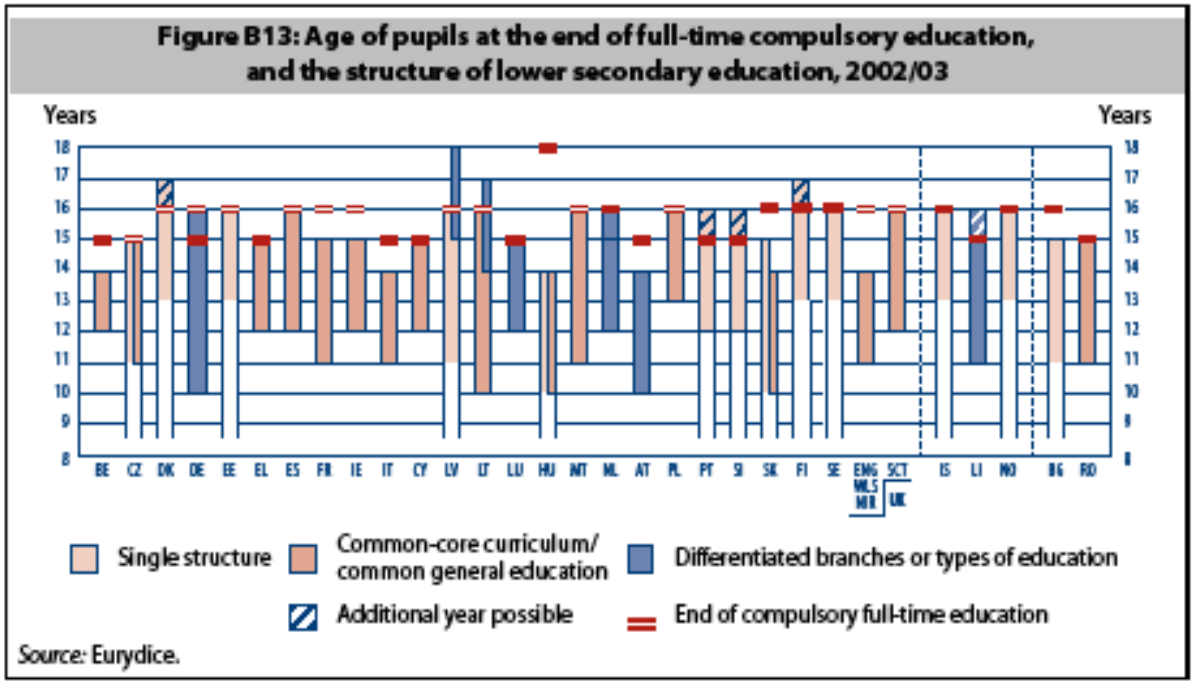
In almost half of all European countries, all pupils follow the same general curriculum (**common core**) during lower secondary education. In seven of these countries, the end of lower secondary education coincides with the end of full-time compulsory education.

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 correspond to the end of lower secondary education. Instead, the 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 Communities of Belgium, 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.

[84] *Source:* Key data on education in Europe 2005, European Commission, Eurydice, Eurostat, 2005.

Graph 9. 1 - Age of pupils at the end of full-time compulsory education, and the structure of lower secondary education, 2002/2003



Source: Commission services.

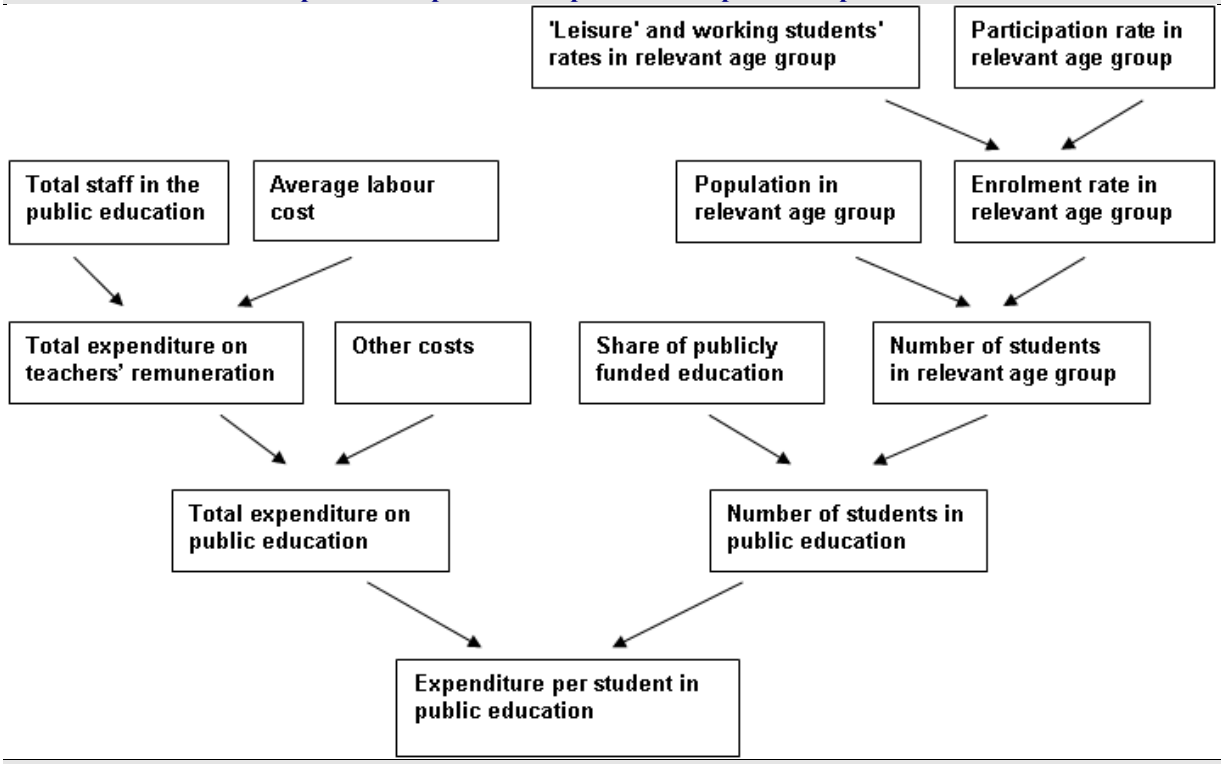
Additional notes:

Belgium: The end of full-time compulsory education is extended to the age of 16 for pupils who have not completed the first stage of lower secondary education. In the French and German-speaking Communities, admission to this level of education can take place at a differentiated stage (1re Band 2e année professionnelle).
Czech Republic, **Hungary** and **Slovakia**: In parallel with the single-structure system that ends at the age of 14 or 15 depending on the country, pupils may be admitted to lower secondary school at the age of 10 or 11.
Germany: Full-time compulsory education lasts between 9 and 10 years, depending on the Länder concerned.
Estonia: Compulsory education continues until pupils have completed basic education (at the age of 16) or reached the age of 17.
Latvia: Pupils without a certificate of basic education by the age of 15 may take the appropriate courses up to the age of 18 within the curriculum for basic vocational education.
Lithuania: Pupils wishing to gain a vocational qualification may attend a vocational school from the age of 14.
Netherlands: Depending on the school attended, lower secondary education ends at the age of 15 (VWO, HAVO) or 16 (MAVO, VBO and VMBO). Compulsory education ends at the end of the school year when pupils turn the age of 16 and have completed 12 years of compulsory education.
Slovenia: The diagram shows the 'post-reform' situation that has applied since 1999/2000.
Romania: With effect from 2003/04, pupils complete both compulsory and lower secondary education at the age of 16.

Explanatory note:

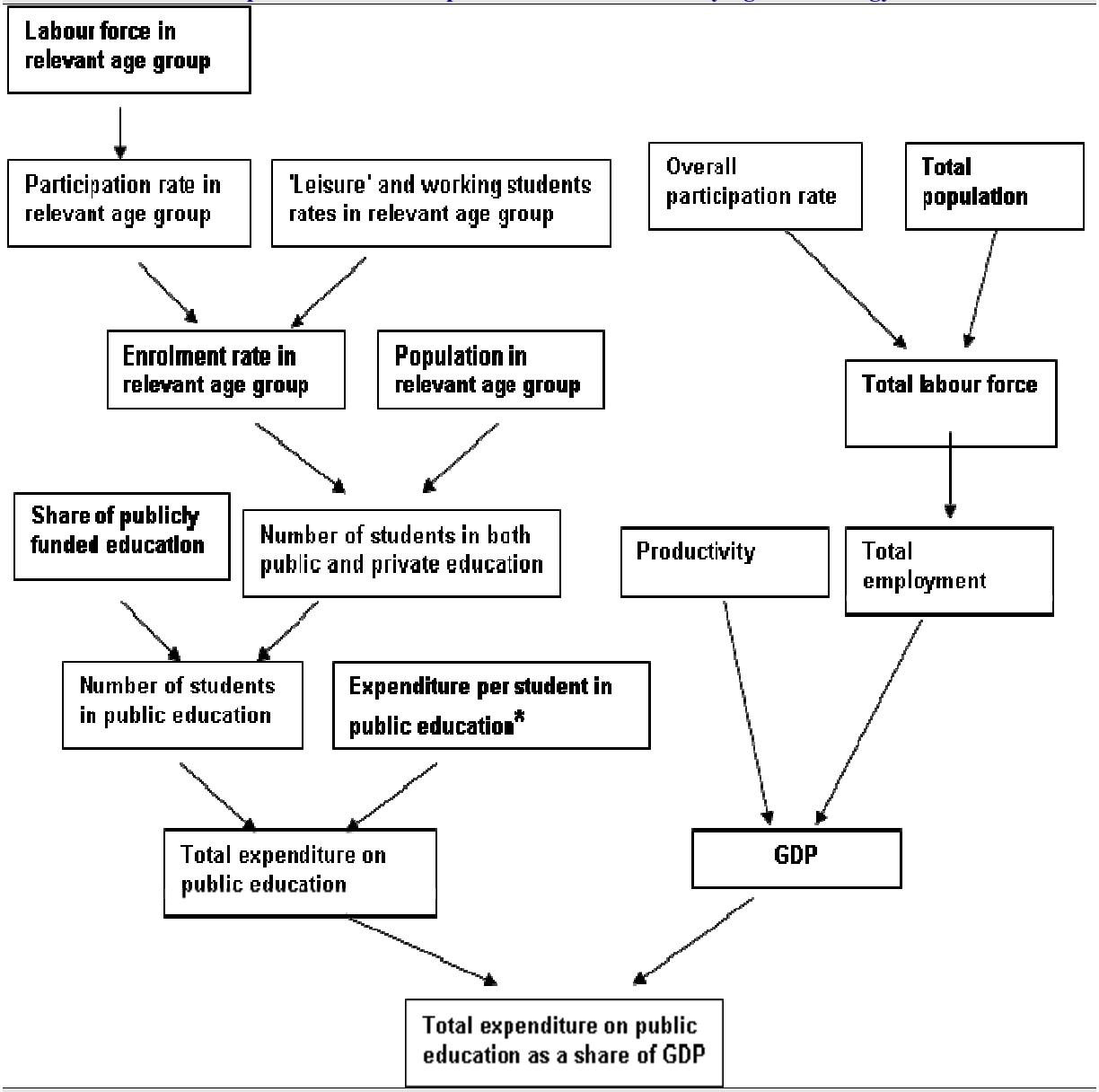
In countries where secondary education is provided within a single continuous structure, only the number of years corresponding to ISCED 2 are coloured in the Graph above.

Graph 9. 2 - Implicit decomposition of expenditure per student



Source: Commission services, EPC.

Graph 9. 3 - Schematic presentation of the underlying methodology



Source: Commission services, EPC.

** see Graph 9. 2.*

10. UNEMPLOYMENT BENEFITS

10.1. Building on the methodology used in the 2006 projection

In order to get a comprehensive assessment of the total impact of ageing on public finances, and to guarantee consistency with the macroeconomic scenario, the AWG has decided to make projections on unemployment benefit spending in the context of the common long-term projection exercise. These projections complement long-term projections on age-related expenditures (pensions, health care, long-term care, education).

In order to assess whether and by how much unemployment benefit (henceforth UB) expenditure would be affected by projected changes in the unemployment situation in Member States, as implied by the macroeconomic and labour market assumptions agreed upon in the AWG, a simple methodology is proposed to be used, as was the case in the previous 2003 and 2006 exercises.

10.2. Projection methodology for unemployment benefits

Projections can be made using the average per-capita unemployment insurance spending in a base year. In order to avoid that the choice of the base year of calculation is overly conditioned by the cyclicality of labour market conditions and/or possible statistical errors, the figures for the base year are equivalent to the average of spending over a number of years, e.g. the last five years. This per capita spending will be combined with the AWG baseline projections on unemployed persons in the future. This straightforward calculation implies assumes, under a no-policy change hypothesis, constant replacement rates, duration of benefit, entitlement conditions, eligibility criteria, take-up rates, and tax structure. Finally, as for the pension projections, it also assumes a constant share of wages in the income distribution over time (that is, the wage per worker grows at the same rate as labour productivity, i.e. GDP per worker).

This set of assumptions can be illustrated by decomposing the total unemployment benefit spending UB, as follows:

$$UB = GRR \times pcw \times \frac{UBr}{U} \times U \qquad (1)$$

where GRR is the gross replacement rate, *pcw* is per capita wage, UBr is the number of recipients (unemployed persons receiving unemployment benefits), and thus the ratio $\frac{UBr}{U}$ is the take-up ratio. Given that per capita wages can also be written as:

$$pcw = \frac{W}{Y} \times \frac{Y}{L}, \qquad \text{(where L is employment, Y is GDP and W is total wages)}$$

then UB can be re-written as:

$$UB = GRR \times \frac{W}{Y} \times \frac{Y}{L} \times \frac{UBr}{U} \times U \qquad (2)$$

where W/Y is the share of wages in the income distribution and Y/L is labour productivity.

Per capita UB is: $UBpc = \frac{UB}{U} = GRR \times \frac{W}{Y} \times \frac{Y}{L} \times \frac{UBr}{U}$ and this can be expressed in terms of GDP per worker (or Ypc=Y/L) as follows:

$$\frac{UBpc}{Ypc} = \frac{UB/U}{Y/L} = GRR \times \frac{W}{Y} \times \frac{Y}{L} \times \frac{UBr}{U} \times \frac{L}{Y} \quad (3)$$

Thus, the total expenditure as percentage of GDP can be expressed as:

$$\frac{UB}{Y} = GRR \times \frac{W}{Y} \times \frac{UBr}{U} \times \frac{U}{L} \quad (4)$$

Given that L = LF (1-*u*), where LF = labour force and *u* = unemployment rate, the ratio (U_t/L_t) can also be re-written as $u_t/(1-u_t)$ and:

$$\frac{UB}{Y} = GRR \times \frac{W}{Y} \times \frac{UBr}{U} \times \frac{u}{(1-u)}. \quad (5)$$

In this formulation under the assumption of no change in both the GRR and the take-up ratio (UBr/U), and a constant share of wages in income distribution (W/Y), as a result of the assumption that wages grow at the same rate as labour productivity, **only changes in the unemployment rate (or the ratio of unemployed to employed persons, U/L) will drive the change over time of unemployment benefit spending.**

With this methodology, projections of UB expenditure, expressed as a share of GDP, can be made, where average expenditure per head grows at the same rate as GDP per worker in each projection year.

Thus, the basic approach applied to run projections for UB expenditure (as percentage of GDP) is the following (a formal illustration of the methodology is presented in the Annex):

Estimate the average amount of UB received by each unemployed person (and as percentage of GDP per worker) in the base year ($Ubpc^b/Ypc^b$). This is done by dividing the average amount of UB expenditures (as % of GDP) over the certain period by the average of the ratio unemployed/employed persons over the same period. In the absence of any alternative and reasonable assumption on the future number of UB beneficiaries (which is the result of entitlement and eligibility rules that affect coverage, take up rates, and so on) and the average duration of unemployment spells, the calculation assumes that all these elements remain unchanged. This approximation is neutral and does not lead to a systematic bias in the projections of benefit spending. In order to guarantee the comparability of projections across countries, standardised figures provided by EUROSTAT –Social protection Expenditure (instead of country-specific figures coming from national databases) are proposed to be used.

For each projection year, the ratio unemployment benefit /GDP per head in the base year (from step 1) is multiplied by the corresponding projected ratio of the future number of unemployed persons and employed persons (U/L) for each country and each of the

year of projection. The projections of employed and unemployed persons are those in the baseline scenario (no-policy change). This generates projections of UB spending, expressed as a share of GDP[85].

[85] The projection does not take into account that unemployment benefits may be subject to income tax, so that after tax UB spending as % of GDP may be lower. This effect is however likely to be relatively constant over time and quite small.

ANNEX 10.1 Methodology for projecting unemployment benefits

Step 1 - Estimation of current per capita expenditure

In order to obtain current per capita spending, total UB expenditure (UB) in the base year can be decomposed according to the following identity:

$$ub_{pc}^{b} = \frac{UB^{b}}{UP^{b}}$$

Where UB^{b} = total expenditure on UB in base year in national currency;

UP^{b} = numbers of unemployed persons in base year;

$ub_{pc}{}^{b}$ = average UB expenditures for each unemployed persons in base year expressed in national currency;

b = base year.

Step 2 - Expressing per capita expenditure in terms of productivity level (GDP per employed person)

Base year UB expenditure for unemployed person ($ub_{pc}{}^{b}$) can be deflated by base-year GDP per worker, such that:

$$yub_{pc}^{b} = \frac{ub_{pc}^{b}}{\left(GDP^{b} / E^{b}\right)}$$

where: yub_{pc}^{b} = average UB expenditure for each unemployed person in the base year *b*, expressed as a share of base year GDP per worker;

E^{b} = total employment in base year; and

GDP^{b} = national GDP in base year.

Step 3 Matching the base-year profiles to the future labour market structure

The "deflated" per capita expenditure for the base year yub_{pc}^{b} is then matched to the unemployment vector UP^{t} for each of the projection year's t (from 2008 to 2060) as follows:

$$yub_{pc}^{b} * UP^{t} = \frac{ub_{pc}^{b}}{\left(GDP^{b} / E^{b}\right)} \times UP^{t} = \frac{\overline{UB^{t}}}{\left(GDP^{t} / E^{t}\right)}$$

where $\overline{UB^t}$ = projected total UB expenditure in projection year t (the bar above the variable denotes that it is projection);

This step generates the projected total UB expenditure expressed as a share of GDP per worker, under the implicit assumption that UB expenditure per head grows at the same rate as GDP per worker. This, in turn, implies (see equation 3 in the main test) unchanged unemployment benefit schemes (mainly gross replacement rates, coverage, take-up ratio) and a constant wage share in income distribution, that is, average wage per capita grows at the same rate as labour productivity (GDP per worker).

Step 4 - Expressing the results as a share of projected national GDP for each projection year

The results can then be expressed in terms of projected national GDP for each of the projection years by dividing by projected employment levels as follows:

$$\frac{\overline{UB^t}}{GDP^t} = \frac{yub_{pc}^{\ b} * UP^t}{E^t}$$

Thus, projections of UB expenditure as a share of GDP can be generated using UB expenditure (per unemployed person) and GDP level (per worker) in the base year, and existing projections for the unemployed and employed persons.

STATISTICAL ANNEX

MAIN DEMOGRAPHIC AND MACROECONOMIC ASSUMPTIONS BY COUNTRY (2007-2060)

Belgium	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.75	1.76	1.76	1.77	1.77	1.77	1.78	1.78	1.78	1.79	1.79
Life expectancy at birth											
males	76.7	77.9	78.7	79.5	80.2	81.0	81.7	82.4	83.1	83.8	84.4
females	82.3	83.3	84.0	84.7	85.4	86.0	86.6	87.2	87.8	88.4	88.9
Life expectancy at 65											
males	16.5	17.2	17.7	18.3	18.8	19.3	19.8	20.3	20.7	21.2	21.7
females	20.1	20.8	21.4	21.9	22.3	22.8	23.3	23.8	24.2	24.7	25.1
Net migration (thousand)	50.7	41.0	36.2	33.6	31.4	28.8	27.1	26.3	25.2	25.0	23.3
Net migration as % of population	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	10.7	11.1	11.3	11.5	11.7	11.9	12.0	12.1	12.2	12.2	12.3
Young population (0-14) as % of total	16.9	16.7	16.7	16.5	16.3	16.0	15.8	15.7	15.7	15.7	15.6
Prime age population (25-54) as % of total	42.0	40.4	39.1	37.9	37.0	36.8	36.4	36.1	35.8	35.7	35.6
Working age population (15-64) as % of total	66.1	65.0	63.8	62.4	60.9	59.8	59.2	59.0	58.6	58.2	57.8
Elderly population (65 and over) as % of total	17.0	18.3	19.5	21.1	22.9	24.2	25.0	25.4	25.7	26.0	26.5
Very elderly population (80 and over) as % of total	4.7	5.4	5.6	5.6	6.5	7.4	8.4	9.4	10.0	10.2	10.2
Elderly population (55 and over) as % of working age pop.15-64	43.8	47.9	51.7	55.1	58.2	60.3	61.9	63.1	64.3	64.9	65.5
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.5	2.3	1.9	1.6	1.6	1.7	1.8	1.7	1.7	1.7	1.7
Employment (growth rate)	1.3	0.6	0.2	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.0
Labour input : hours worked (growth rate)	1.2	0.6	0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	0.0
Labour productivity per hour (growth rate)	1.3	1.7	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.8	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.8	1.8	1.5	1.2	1.3	1.4	1.6	1.6	1.6	1.6	1.6
GDP in 2007 prices (in millions euros)	330.8	400.0	443.1	481.5	521.6	566.7	617.6	672.9	731.4	793.7	863.4
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.0	0.1	0.0	-0.1	-0.2	0.0	0.1	0.0	0.0	-0.1	0.0
Population growth (working age:15-71)	0.7	0.5	0.1	0.1	0.0	-0.1	0.0	0.0	0.1	0.0	0.0
Labour force (thousands)	4717	5049	5103	5081	5055	5048	5059	5069	5066	5053	5053
Participation rate (15-64)	67.3	69.5	69.8	69.4	69.4	69.6	69.7	69.7	69.7	69.6	69.7
Participation rate (15-71)	61.8	63.2	63.1	62.3	61.9	62.1	62.6	62.8	62.6	62.4	62.3
young (15-24)	34.4	36.7	35.9	35.2	35.7	35.5	35.7	35.9	35.8	35.6	35.6
prime-age (25-54)	85.3	86.5	86.6	86.7	86.6	86.6	86.7	86.7	86.7	86.8	86.7
older (55-64)	36.2	46.0	48.9	48.9	48.8	48.8	49.5	49.4	49.4	48.7	49.1
oldest (65-71)	2.9	6.4	7.8	8.9	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Employment rate (15-64)	62.3	64.7	65.4	65.1	65.1	65.3	65.4	65.4	65.4	65.3	65.4
Employment rate (15-71)	57.2	58.9	59.2	58.5	58.1	58.3	58.7	59.0	58.8	58.6	58.5
Unemployment rate (15-64)	7.5	6.8	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	4.3	4.7	4.7	4.7	4.7	4.6	4.7	4.7	4.7	4.7	4.7
share of young (15-24)	8%	9%	8%	8%	9%	9%	9%	9%	9%	9%	9%
share of prime-age (25-54)	82%	78%	77%	76%	76%	77%	77%	77%	77%	77%	77%
share of older (55-64)	10%	13%	15%	15%	15%	14%	14%	15%	15%	15%	14%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.0	19.7	21.1	21.3	20.6	19.8	19.7	20.1	20.5	20.2	19.7
Old-age dependency ratio (2)	26	28	31	34	38	40	42	43	44	45	46
Total dependency ratio (3)	51	54	57	60	64	67	69	70	71	72	73
Total economic dependency ratio (4)	143	137	138	145	150	154	156	158	159	161	162
Economic old-age dependency ratio (15-64) (5)	41	42	45	50	56	60	63	64	65	67	68
Economic old-age dependency ratio (15-71) (6)	41	42	45	49	55	59	62	63	64	65	67

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Bulgaria	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.38	1.41	1.42	1.44	1.46	1.47	1.49	1.51	1.52	1.54	1.55
Life expectancy at birth											
males	69.7	71.6	72.8	74.1	75.3	76.4	77.5	78.6	79.6	80.6	81.6
females	76.7	78.2	79.3	80.3	81.3	82.2	83.1	84.0	84.9	85.7	86.5
Life expectancy at 65											
males	13.1	14.1	14.8	15.4	16.1	16.8	17.5	18.1	18.8	19.4	20.0
females	16.1	17.1	17.8	18.5	19.2	19.9	20.5	21.2	21.8	22.5	23.1
Net migration (thousand)	-1.4	1.7	0.2	-0.4	-0.5	1.4	2.5	2.0	1.6	1.1	-1.2
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population (million)	7.6	7.4	7.2	7.0	6.8	6.5	6.3	6.1	5.9	5.7	5.5
Young population (0-14) as % of total	13.4	14.2	14.3	13.5	12.6	12.0	12.0	12.3	12.3	12.2	12.0
Prime age population (25-54) as % of total	42.8	43.3	42.8	41.2	39.3	37.5	35.9	34.1	33.2	33.5	33.4
Working age population (15-64) as % of total	69.3	67.0	65.4	64.7	64.2	63.2	61.3	58.6	56.4	54.4	53.8
Elderly population (65 and over) as % of total	17.3	18.9	20.3	21.8	23.3	24.7	26.7	29.1	31.3	33.4	34.2
Very elderly population (80 and over) as % of total	3.6	4.4	4.6	4.9	6.1	7.1	8.0	8.7	9.6	11.0	12.8
Elderly population (55 and over) as % of working age pop.15-64	44.4	48.4	51.5	54.5	58.5	63.7	69.4	76.3	81.0	83.3	84.3
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	6.4	3.0	2.4	2.0	1.7	1.5	1.4	0.7	0.3	0.7	0.8
Employment (growth rate)	2.3	-0.5	-0.9	-1.0	-1.0	-1.2	-1.3	-1.4	-1.4	-1.0	-0.9
Labour input : hours worked (growth rate)	2.4	-0.5	-0.9	-1.0	-1.0	-1.2	-1.3	-1.4	-1.4	-1.0	-0.9
Labour productivity per hour (growth rate)	4.0	3.6	3.3	3.0	2.7	2.7	2.7	2.2	1.7	1.7	1.7
TFP (growth rate)	1.2	1.5	1.7	1.7	1.7	1.7	1.7	1.4	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	2.7	2.1	1.6	1.3	1.0	1.0	1.0	0.8	0.6	0.6	0.6
GDP per capita (growth rate)	7.0	3.5	2.9	2.7	2.4	2.2	2.0	1.4	1.0	1.4	1.6
GDP in 2007 prices (in millions euros)	28.9	40.1	45.6	50.6	55.5	60.1	64.5	67.6	69.3	71.1	73.9
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.4	-1.1	-0.9	-0.8	-0.8	-1.2	-1.5	-1.5	-1.4	-1.4	-0.8
Population growth (working age:15-71)	-0.6	-0.7	-0.8	-0.7	-0.8	-0.9	-0.9	-1.1	-1.4	-1.3	-1.3
Labour force (thousands)	3589	3536	3391	3227	3074	2911	2731	2543	2361	2223	2122
Participation rate (15-64)	66.8	69.9	70.3	69.6	69.0	68.4	68.0	68.0	67.9	68.6	69.3
Participation rate (15-71)	61.2	63.7	63.6	63.1	62.5	61.7	60.5	59.7	59.3	59.7	60.9
young (15-24)	32.0	34.9	30.6	30.3	31.7	32.7	33.0	32.5	31.6	31.4	31.7
prime-age (25-54)	84.0	85.1	85.7	86.1	86.0	85.8	85.7	85.9	86.2	86.2	86.1
older (55-64)	46.6	47.4	48.2	48.8	49.8	49.7	49.0	49.4	47.6	47.2	50.2
oldest (65-71)	6.0	13.1	13.9	14.2	14.5	14.7	14.7	14.7	14.8	14.8	14.5
Employment rate (15-64)	62.1	66.6	67.0	66.3	65.7	65.1	64.8	64.8	64.7	65.3	66.0
Employment rate (15-71)	57.0	60.7	60.6	60.1	59.6	58.9	57.7	57.0	56.6	56.9	58.0
Unemployment rate (15-64)	7.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Employment (15-64) (in millions)	3.3	3.3	3.1	3.0	2.8	2.7	2.5	2.3	2.2	2.0	1.9
share of young (15-24)	8%	7%	6%	6%	7%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	78%	79%	80%	79%	77%	75%	74%	74%	75%	78%	77%
share of older (55-64)	13%	14%	14%	15%	16%	18%	19%	19%	18%	15%	15%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	19.4	20.3	20.4	20.7	22.2	24.6	25.9	26.6	25.6	21.9	20.8
Old-age dependency ratio (2)	25	28	31	34	36	39	44	50	55	61	64
Total dependency ratio (3)	44	49	53	55	56	58	63	71	77	84	86
Total economic dependency ratio (4)	128	122	125	130	134	139	147	158	169	176	176
Economic old-age dependency ratio (15-64) (5)	38	40	43	47	52	56	63	72	80	88	91
Economic old-age dependency ratio (15-71) (6)	38	39	42	46	50	54	61	69	77	85	88

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Czech Republic	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.33	1.36	1.38	1.40	1.41	1.43	1.45	1.47	1.49	1.51	1.52
Life expectancy at birth											
males	73.9	75.3	76.3	77.2	78.1	79.0	79.9	80.8	81.6	82.4	83.2
females	80.2	81.3	82.1	82.9	83.7	84.4	85.1	85.9	86.5	87.2	87.8
Life expectancy at 65											
males	14.7	15.6	16.2	16.8	17.4	18.0	18.6	19.1	19.7	20.3	20.8
females	18.1	18.9	19.5	20.1	20.7	21.3	21.9	22.4	23.0	23.5	24.0
Net migration (thousand)	24.0	27.7	24.7	21.3	22.9	23.3	27.3	24.1	21.9	20.4	16.7
Net migration as % of population	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Population (million)	10.3	10.5	10.5	10.5	10.4	10.3	10.2	10.0	9.9	9.7	9.5
Young population (0-14) as % of total	14.3	14.6	14.7	13.8	12.8	12.2	12.1	12.4	12.6	12.5	12.3
Prime age population (25-54) as % of total	44.1	43.6	43.6	42.1	39.7	37.2	36.1	35.0	33.9	34.0	33.9
Working age population (15-64) as % of total	71.1	67.5	65.1	64.5	64.3	63.8	61.6	58.4	56.5	55.1	54.4
Elderly population (65 and over) as % of total	14.6	17.9	20.2	21.8	22.9	24.1	26.3	29.3	30.9	32.4	33.4
Very elderly population (80 and over) as % of total	3.4	3.9	4.1	5.0	6.6	7.9	8.4	8.7	9.3	11.1	13.4
Elderly population (55 and over) as % of working age pop.15-64	40.4	46.3	50.0	52.9	57.5	63.4	68.6	74.8	79.3	80.9	81.9
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	5.2	3.0	2.5	1.6	1.4	1.1	0.9	0.9	0.7	0.9	1.1
Employment (growth rate)	1.1	0.0	-0.4	-0.5	-0.3	-0.6	-0.8	-0.8	-1.0	-0.8	-0.5
Labour input : hours worked (growth rate)	1.0	0.0	-0.4	-0.5	-0.3	-0.6	-0.8	-0.8	-1.0	-0.8	-0.5
Labour productivity per hour (growth rate)	4.1	3.0	2.9	2.2	1.8	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	3.1	1.8	1.8	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.0	1.2	1.2	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	4.8	2.9	2.5	1.8	1.7	1.4	1.1	1.1	1.1	1.3	1.6
GDP in 2007 prices (in millions euros)	128.1	174.5	199.5	219.2	236.2	252.3	264.2	276.3	286.9	299.1	315.3
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	-0.7	-0.5	-0.1	-0.5	-0.5	-1.3	-1.3	-0.9	-0.8	-0.5
Population growth (working age:15-71)	0.6	-0.2	-0.6	-0.4	-0.3	-0.3	-0.4	-0.9	-1.2	-0.8	-0.7
Labour force (thousands)	5177	5331	5262	5117	5016	4923	4734	4549	4340	4155	4023
Participation rate (15-64)	70.0	73.5	73.9	72.9	72.5	72.6	72.3	73.3	73.5	73.2	73.5
Participation rate (15-71)	65.3	66.8	67.5	66.9	66.9	66.3	65.3	64.8	65.7	66.0	66.3
young (15-24)	32.0	35.8	31.6	30.1	32.5	33.0	33.3	33.3	32.3	31.6	31.9
prime-age (25-54)	87.7	87.6	87.4	87.4	87.3	86.8	86.5	86.5	86.7	86.9	86.9
older (55-64)	48.9	56.8	58.1	58.5	60.8	64.9	63.4	66.0	66.8	65.6	67.5
oldest (65-71)	8.5	14.1	20.0	20.0	20.0	18.5	21.1	22.0	23.1	24.6	24.4
Employment rate (15-64)	66.2	70.2	70.6	69.6	69.2	69.4	69.0	70.0	70.2	70.0	70.2
Employment rate (15-71)	61.8	63.9	64.5	64.0	63.9	63.4	62.4	62.0	62.9	63.1	63.4
Unemployment rate (15-64)	5.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Employment (15-64) (in millions)	4.9	5.0	4.8	4.7	4.6	4.5	4.3	4.1	3.9	3.7	3.6
share of young (15-24)	8%	7%	6%	6%	7%	7%	7%	7%	6%	7%	7%
share of prime-age (25-54)	78%	77%	79%	78%	75%	70%	70%	71%	71%	73%	74%
share of older (55-64)	14%	16%	15%	15%	18%	23%	23%	22%	23%	20%	19%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	19.8	19.8	19.0	19.1	21.8	25.6	25.9	24.7	24.5	22.1	20.5
Old-age dependency ratio (2)	21	26	31	34	36	38	43	50	55	59	61
Total dependency ratio (3)	41	48	54	55	56	57	62	71	77	82	84
Total economic dependency ratio (4)	110	109	114	119	121	122	130	138	146	153	155
Economic old-age dependency ratio (15-64) (5)	30	35	40	45	48	51	57	65	72	77	81
Economic old-age dependency ratio (15-71) (6)	29	34	39	43	46	49	54	61	68	73	76

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Denmark	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Life expectancy at birth											
males	76.4	77.6	78.4	79.2	80.0	80.8	81.5	82.2	82.9	83.6	84.3
females	81.0	82.2	83.0	83.7	84.5	85.2	85.9	86.6	87.2	87.8	88.4
Life expectancy at 65											
males	16.1	16.8	17.4	17.9	18.4	19.0	19.5	20.0	20.5	21.0	21.4
females	19.0	19.8	20.4	21.0	21.6	22.1	22.6	23.2	23.7	24.2	24.6
Net migration (thousand)	9.7	8.5	8.1	8.1	8.7	7.0	6.5	6.0	5.7	5.9	6.2
Net migration as % of population	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Population (million)	5.5	5.6	5.7	5.7	5.8	5.9	5.9	5.9	5.9	5.9	5.9
Young population (0-14) as % of total	18.4	17.3	16.7	16.6	16.9	17.1	17.0	16.6	16.3	16.2	16.3
Prime age population (25-54) as % of total	41.0	39.0	38.1	36.9	36.1	36.0	36.4	36.3	35.9	35.7	35.6
Working age population (15-64) as % of total	66.0	64.1	63.1	62.0	60.3	58.7	58.2	58.4	59.2	59.4	58.7
Elderly population (65 and over) as % of total	15.6	18.6	20.1	21.4	22.8	24.1	24.8	24.9	24.5	24.4	25.0
Very elderly population (80 and over) as % of total	4.1	4.2	4.7	5.7	7.1	7.7	8.1	8.9	9.7	10.1	10.0
Elderly population (55 and over) as % of working age pop.15-64	43.8	48.4	52.1	55.9	59.1	61.0	60.7	60.5	60.8	61.6	62.8
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.3	1.7	1.6	1.8	1.5	1.6	1.7	1.9	1.9	1.7	1.6
Employment (growth rate)	0.5	-0.1	-0.2	0.1	-0.2	-0.1	0.0	0.2	0.2	0.0	-0.1
Labour input : hours worked (growth rate)	0.3	-0.2	-0.1	0.1	-0.2	-0.1	0.0	0.2	0.2	0.1	-0.1
Labour productivity per hour (growth rate)	2.0	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.9	1.4	1.4	1.5	1.2	1.5	1.6	1.9	1.9	1.7	1.5
GDP in 2007 prices (in millions euros)	227.7	262.1	283.9	309.8	334.4	363.8	394.7	433.7	476.5	521.2	565.7
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.3	0.0	0.0	-0.1	-0.4	-0.1	0.0	0.2	0.3	-0.1	-0.3
Population growth (working age:15-71)	0.5	0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	0.1	0.2	0.1
Labour force (thousands)	2927	2912	2888	2894	2869	2867	2862	2896	2928	2942	2933
Participation rate (15-64)	80.3	79.8	79.6	79.6	79.6	80.4	80.6	81.1	81.0	80.8	80.8
Participation rate (15-71)	74.3	71.7	71.9	72.3	72.1	72.6	73.5	74.6	75.3	75.0	74.3
young (15-24)	70.8	72.5	72.6	72.5	72.7	72.3	72.1	72.2	72.4	72.5	72.5
prime-age (25-54)	89.0	88.1	87.5	87.3	87.2	87.3	87.3	87.2	87.2	87.2	87.3
older (55-64)	61.3	61.1	62.6	64.4	64.0	66.8	66.6	69.7	70.3	69.6	69.3
oldest (65-71)	11.5	11.2	9.7	13.8	17.4	19.9	22.3	23.8	25.2	26.7	26.5
Employment rate (15-64)	77.2	77.2	77.0	77.0	77.0	77.8	78.0	78.5	78.3	78.1	78.2
Employment rate (15-71)	71.5	69.4	69.6	69.9	69.8	70.3	71.2	72.2	72.9	72.6	72.0
Unemployment rate (15-64)	3.9	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Employment (15-64) (in millions)	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
share of young (15-24)	15%	17%	17%	17%	17%	16%	17%	17%	17%	17%	17%
share of prime-age (25-54)	70%	68%	67%	66%	66%	67%	68%	67%	66%	65%	66%
share of older (55-64)	15%	15%	16%	17%	17%	17%	15%	15%	17%	18%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	20.2	19.3	20.3	21.4	21.3	19.9	18.0	17.8	19.5	20.5	20.2
Old-age dependency ratio (2)	24	29	32	34	38	41	43	43	41	41	43
Total dependency ratio (3)	52	56	58	61	66	70	72	71	69	68	70
Total economic dependency ratio (4)	94	100	104	107	112	115	117	114	112	111	113
Economic old-age dependency ratio (15-64) (5)	29	35	40	42	46	49	51	50	49	49	50
Economic old-age dependency ratio (15-71) (6)	28	35	39	42	45	47	49	49	47	47	48

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Germany	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.34	1.36	1.38	1.40	1.42	1.44	1.45	1.47	1.49	1.51	1.53
Life expectancy at birth											
males	77.3	78.5	79.3	80.1	80.8	81.6	82.3	83.0	83.6	84.3	84.9
females	82.6	83.6	84.3	84.9	85.6	86.2	86.8	87.4	88.0	88.6	89.1
Life expectancy at 65											
males	16.8	17.6	18.1	18.6	19.1	19.7	20.1	20.6	21.1	21.6	22.0
females	20.1	20.8	21.4	21.9	22.4	22.9	23.3	23.8	24.3	24.7	25.1
Net migration (thousand)	159.8	166.3	173.1	186.6	187.0	159.6	131.6	140.5	135.7	137.9	115.9
Net migration as % of population	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	82.2	81.9	81.5	80.9	80.2	79.1	77.8	76.2	74.5	72.6	70.8
Young population (0-14) as % of total	13.7	12.8	12.6	12.7	12.7	12.5	12.2	12.1	12.1	12.3	12.6
Prime age population (25-54) as % of total	43.1	41.8	39.4	36.9	36.2	35.9	35.1	34.1	33.7	33.5	33.5
Working age population (15-64) as % of total	66.2	65.9	64.6	62.6	59.7	57.3	56.7	56.7	56.2	55.4	55.0
Elderly population (65 and over) as % of total	20.1	21.2	22.8	24.7	27.6	30.2	31.1	31.3	31.7	32.3	32.5
Very elderly population (80 and over) as % of total	4.7	5.7	7.1	7.9	8.0	8.9	10.3	12.4	14.0	13.8	13.2
Elderly population (55 and over) as % of working age pop.15-64	47.8	53.0	59.1	65.7	70.4	74.1	76.4	78.5	80.1	81.3	81.5
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	1.4	1.9	1.5	0.9	1.3	1.1	1.1	1.2	1.0	1.0	1.0
Employment (growth rate)	0.2	0.3	-0.2	-0.9	-0.4	-0.6	-0.6	-0.5	-0.7	-0.7	-0.7
Labour input : hours worked (growth rate)	-0.1	0.2	-0.2	-0.9	-0.4	-0.6	-0.6	-0.5	-0.7	-0.7	-0.7
Labour productivity per hour (growth rate)	1.5	1.6	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.6	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.6	1.9	1.6	1.0	1.5	1.4	1.5	1.6	1.5	1.5	1.5
GDP in 2007 prices (in millions euros)	2423.8	2808.1	3047.6	3209.7	3369.8	3539.4	3720.8	3940.8	4161.6	4374.7	4596.7
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.6	-0.4	-0.6	-0.9	-1.2	-0.9	-0.3	-0.5	-0.6	-0.8	-0.5
Population growth (working age:15-71)	-0.3	-0.2	-0.2	-0.5	-0.6	-1.0	-1.0	-0.5	-0.4	-0.6	-0.8
Labour force (thousands)	42065	43063	42614	41107	39597	38231	36964	35994	34924	33718	32546
Participation rate (15-64)	76.2	78.7	79.1	78.8	79.3	80.1	80.2	79.9	79.7	79.7	79.8
Participation rate (15-71)	68.0	72.0	71.7	70.8	70.2	70.7	72.1	73.0	72.2	71.7	71.6
young (15-24)	51.5	52.7	52.9	52.8	52.1	51.9	52.2	52.5	52.5	52.5	52.2
prime-age (25-54)	87.9	88.9	89.2	89.4	89.6	89.6	89.6	89.5	89.4	89.4	89.5
older (55-64)	57.3	67.6	69.9	69.6	70.5	73.3	74.7	74.4	73.9	73.7	73.9
oldest (65-71)	6.5	10.1	14.5	16.0	19.1	21.8	21.9	24.0	23.8	24.0	22.9
Employment rate (15-64)	69.6	73.1	74.2	73.9	74.4	75.1	75.2	74.9	74.8	74.8	74.9
Employment rate (15-71)	62.1	67.0	67.3	66.5	66.0	66.5	67.8	68.6	67.9	67.4	67.3
Unemployment rate (15-64)	8.7	7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	38.0	39.5	39.0	37.4	35.6	34.1	33.2	32.4	31.3	30.1	29.1
share of young (15-24)	11%	10%	10%	10%	10%	10%	10%	11%	11%	11%	11%
share of prime-age (25-54)	76%	72%	69%	67%	69%	71%	70%	68%	68%	68%	69%
share of older (55-64)	13%	18%	21%	23%	21%	19%	20%	22%	22%	21%	21%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.5	20.7	23.9	26.2	24.1	21.3	21.7	23.3	23.6	23.0	22.5
Old-age dependency ratio (2)	30	32	35	40	46	53	55	55	56	58	59
Total dependency ratio (3)	51	52	55	60	67	75	76	76	78	80	82
Total economic dependency ratio (4)	113	106	106	113	120	126	129	130	132	135	137
Economic old-age dependency ratio (15-64) (5)	42	42	45	50	57	64	67	68	70	72	73
Economic old-age dependency ratio (15-71) (6)	41	42	44	48	54	61	64	65	67	68	69

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Estonia	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.55	1.56	1.57	1.59	1.60	1.61	1.62	1.63	1.64	1.65	1.66
Life expectancy at birth											
males	68.0	70.0	71.4	72.7	74.0	75.3	76.5	77.6	78.8	79.8	80.8
females	78.7	80.1	81.1	82.0	82.9	83.7	84.5	85.3	86.1	86.8	87.5
Life expectancy at 65											
males	13.0	14.0	14.7	15.3	16.0	16.7	17.3	18.0	18.6	19.3	19.9
females	18.1	19.0	19.6	20.2	20.8	21.4	22.0	22.6	23.1	23.7	24.2
Net migration (thousand)	-0.6	0.0	-0.1	-0.1	-0.3	-0.1	0.1	0.2	0.3	0.2	-0.3
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.1
Young population (0-14) as % of total	14.8	16.3	16.9	16.3	15.1	14.0	13.8	14.1	14.5	14.4	14.0
Prime age population (25-54) as % of total	41.6	42.6	41.8	40.3	38.8	38.2	37.0	35.0	34.4	34.8	34.9
Working age population (15-64) as % of total	68.0	66.1	64.3	63.5	63.2	63.2	62.1	60.4	58.1	55.7	55.3
Elderly population (65 and over) as % of total	17.2	17.7	18.8	20.2	21.7	22.8	24.2	25.5	27.4	29.9	30.7
Very elderly population (80 and over) as % of total	3.6	4.5	5.2	5.4	5.9	6.8	7.8	8.6	9.0	9.8	10.7
Elderly population (55 and over) as % of working age pop.15-64	41.7	45.9	49.1	51.3	54.1	56.8	61.5	67.5	71.6	73.5	73.9
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	7.8	3.2	2.6	2.3	2.2	1.3	1.0	0.7	0.6	0.8	1.2
Employment (growth rate)	1.5	-0.7	-0.7	-0.7	-0.5	-0.5	-0.7	-0.9	-1.1	-0.9	-0.5
Labour input : hours worked (growth rate)	1.6	-0.7	-0.7	-0.7	-0.5	-0.5	-0.7	-1.0	-1.1	-0.9	-0.5
Labour productivity per hour (growth rate)	6.0	3.9	3.3	3.0	2.7	1.9	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	2.7	1.8	1.8	1.8	1.8	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	3.3	2.1	1.6	1.2	0.9	0.7	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	8.0	3.4	2.8	2.6	2.6	1.7	1.4	1.1	1.0	1.2	1.7
GDP in 2007 prices (in millions euros)	15.5	22.5	25.8	29.0	32.4	35.1	37.1	38.8	40.0	41.4	43.6
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.4	-0.9	-0.7	-0.6	-0.4	-0.6	-0.7	-0.9	-1.2	-1.2	-0.2
Population growth (working age:15-71)	-0.1	-0.6	-0.5	-0.4	-0.4	-0.5	-0.5	-0.8	-0.7	-0.9	-1.1
Labour force (thousands)	689	675	651	628	611	596	579	555	525	499	483
Participation rate (15-64)	72.9	75.4	75.4	74.6	74.3	73.9	74.1	74.0	73.7	74.1	74.5
Participation rate (15-71)	68.0	70.2	69.0	68.0	67.6	67.6	67.2	66.9	65.7	64.9	66.1
young (15-24)	38.5	45.0	39.5	38.1	40.1	41.1	42.3	42.2	40.8	39.8	40.0
prime-age (25-54)	88.4	87.5	87.6	87.8	87.8	87.6	87.3	87.4	87.8	87.9	87.8
older (55-64)	62.4	60.6	62.8	63.7	64.6	63.8	64.5	64.4	61.9	61.0	64.1
oldest (65-71)	23.1	17.6	15.3	15.7	16.1	16.3	16.5	16.6	17.1	16.8	15.3
Employment rate (15-64)	69.4	72.8	72.8	72.0	71.7	71.4	71.5	71.5	71.2	71.5	72.0
Employment rate (15-71)	64.8	67.9	66.7	65.7	65.3	65.3	65.0	64.6	63.5	62.7	63.8
Unemployment rate (15-64)	4.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Employment (15-64) (in millions)	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
share of young (15-24)	11%	9%	8%	8%	10%	10%	10%	9%	9%	9%	10%
share of prime-age (25-54)	75%	75%	76%	75%	73%	72%	70%	69%	71%	74%	74%
share of older (55-64)	14%	15%	17%	17%	17%	18%	20%	22%	21%	16%	16%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	16.5	19.1	20.0	19.4	19.7	20.7	22.5	25.4	24.4	19.9	18.4
Old-age dependency ratio (2)	25	27	29	32	34	36	39	42	47	54	56
Total dependency ratio (3)	47	51	55	58	58	58	61	66	72	80	81
Total economic dependency ratio (4)	106	105	111	115	117	119	122	128	137	146	147
Economic old-age dependency ratio (15-64) (5)	32	34	37	41	45	47	51	55	62	70	73
Economic old-age dependency ratio (15-71) (6)	31	33	36	40	43	46	49	53	59	67	70

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Ireland	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.90	1.90	1.90	1.89	1.89	1.89	1.89	1.89	1.88	1.88	1.88
Life expectancy at birth											
males	77.5	78.7	79.5	80.3	81.1	81.8	82.5	83.2	83.9	84.6	85.2
females	81.9	83.0	83.8	84.6	85.3	86.0	86.7	87.4	88.0	88.6	89.2
Life expectancy at 65											
males	16.8	17.5	18.1	18.7	19.2	19.7	20.3	20.8	21.3	21.7	22.2
females	19.7	20.6	21.2	21.7	22.3	22.8	23.4	23.9	24.4	24.9	25.4
Net migration (thousand)	63.1	34.5	21.7	13.5	8.7	6.5	6.0	8.0	7.4	7.9	8.6
Net migration as % of population	1.4	0.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Population (million)	4.4	5.1	5.4	5.7	5.9	6.1	6.2	6.4	6.5	6.7	6.8
Young population (0-14) as % of total	20.4	21.1	21.1	20.2	18.9	17.8	17.4	17.4	17.5	17.3	17.0
Prime age population (25-54) as % of total	44.3	44.1	42.8	41.5	40.2	38.6	37.1	36.5	36.3	36.0	35.8
Working age population (15-64) as % of total	68.4	66.6	65.6	65.2	65.1	64.6	63.3	61.1	58.8	57.8	57.8
Elderly population (65 and over) as % of total	11.2	12.2	13.3	14.5	16.0	17.6	19.4	21.5	23.7	24.8	25.2
Very elderly population (80 and over) as % of total	2.8	2.9	3.1	3.5	4.3	5.0	5.7	6.5	7.3	8.3	9.6
Elderly population (55 and over) as % of working age pop.15-64	30.6	33.3	35.9	38.7	42.1	46.6	51.9	56.1	59.4	60.9	61.6
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	5.2	3.4	2.9	2.6	2.3	2.1	1.8	1.5	1.6	1.8	2.0
Employment (growth rate)	3.3	1.5	1.1	0.8	0.7	0.4	0.1	-0.2	-0.1	0.1	0.3
Labour input : hours worked (growth rate)	2.9	1.5	1.0	0.8	0.7	0.4	0.1	-0.1	-0.1	0.1	0.3
Labour productivity per hour (growth rate)	2.2	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.6	1.7	1.7	1.7	1.7	1.5	1.3	1.0	1.1	1.4	1.7
GDP in 2007 prices (in millions euros)	185.6	249.0	289.6	331.0	373.5	416.6	458.0	496.7	536.4	582.5	640.0
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	2.8	1.2	1.0	0.8	0.6	0.3	0.0	-0.4	-0.2	0.2	0.4
Population growth (working age:15-71)	2.7	1.4	1.0	0.9	0.7	0.5	0.2	0.1	-0.1	-0.2	0.2
Labour force (thousands)	2176	2582	2745	2874	2981	3061	3095	3084	3060	3056	3089
Participation rate (15-64)	72.5	75.2	75.7	75.7	75.7	75.9	76.0	76.0	76.3	76.3	76.3
Participation rate (15-71)	68.9	70.9	71.2	71.2	71.0	70.8	70.5	69.8	69.3	70.0	70.5
young (15-24)	55.4	54.5	53.4	53.1	53.5	54.5	55.3	55.0	54.3	53.9	53.9
prime-age (25-54)	82.0	84.0	84.6	85.1	85.3	85.5	85.7	85.7	85.7	85.7	85.7
older (55-64)	55.1	62.3	65.6	66.6	68.1	69.0	68.6	67.7	68.3	68.6	69.1
oldest (65-71)	16.3	18.8	19.9	21.7	22.4	22.7	23.2	23.6	22.9	22.9	23.0
Employment rate (15-64)	69.1	71.4	71.8	71.9	71.9	72.0	72.1	72.2	72.5	72.5	72.4
Employment rate (15-71)	65.8	67.4	67.7	67.7	67.5	67.3	67.0	66.4	65.9	66.5	67.1
Unemployment rate (15-64)	4.7	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Employment (15-64) (in millions)	2.0	2.4	2.5	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8
share of young (15-24)	16%	13%	13%	13%	14%	14%	14%	13%	13%	13%	13%
share of prime-age (25-54)	73%	74%	73%	72%	70%	68%	67%	68%	70%	70%	70%
share of older (55-64)	11%	13%	14%	15%	16%	18%	20%	19%	17%	17%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	14.3	14.9	15.6	16.4	17.5	19.4	21.3	20.9	19.0	18.0	18.0
Old-age dependency ratio (2)	16	18	20	22	25	27	31	35	40	43	44
Total dependency ratio (3)	46	50	52	53	54	55	58	64	70	73	73
Total economic dependency ratio (4)	108	108	109	110	110	111	115	121	129	133	134
Economic old-age dependency ratio (15-64) (5)	21	23	25	28	30	34	38	43	50	53	55
Economic old-age dependency ratio (15-71) (6)	21	23	25	27	30	33	36	42	47	51	53

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Greece	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.41	1.43	1.45	1.46	1.48	1.49	1.51	1.52	1.54	1.55	1.57
Life expectancy at birth											
males	77.4	78.6	79.4	80.1	80.9	81.6	82.3	82.9	83.6	84.2	84.8
females	82.6	83.5	84.1	84.7	85.3	85.9	86.5	87.1	87.6	88.2	88.7
Life expectancy at 65											
males	17.2	17.9	18.4	18.8	19.3	19.8	20.2	20.7	21.1	21.6	22.0
females	19.6	20.3	20.8	21.3	21.8	22.3	22.7	23.2	23.7	24.1	24.5
Net migration (thousand)	39.7	39.9	38.2	38.1	37.2	38.0	36.6	35.5	31.0	28.6	26.8
Net migration as % of population	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Population (million)	11.2	11.5	11.6	11.6	11.6	11.6	11.6	11.5	11.4	11.3	11.1
Young population (0-14) as % of total	14.3	14.5	14.4	13.7	13.0	12.7	12.7	13.0	13.1	13.1	12.9
Prime age population (25-54) as % of total	44.2	42.9	41.5	39.5	37.5	36.0	34.9	34.5	34.2	34.2	34.1
Working age population (15-64) as % of total	67.1	65.5	64.5	63.8	62.8	61.0	58.9	56.8	55.3	55.2	55.4
Elderly population (65 and over) as % of total	18.6	20.0	21.1	22.6	24.2	26.3	28.4	30.2	31.5	31.8	31.7
Very elderly population (80 and over) as % of total	4.1	5.8	6.5	6.5	7.1	7.9	8.9	9.9	11.2	12.4	13.5
Elderly population (55 and over) as % of working age pop.15-64	45.2	49.8	53.2	57.4	62.0	67.6	72.8	76.3	78.6	78.6	78.1
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	3.8	2.7	2.9	1.8	1.3	1.1	1.0	1.1	1.2	1.3	1.4
Employment (growth rate)	1.1	0.3	0.0	-0.4	-0.4	-0.6	-0.7	-0.6	-0.5	-0.4	-0.3
Labour input : hours worked (growth rate)	1.3	0.3	0.0	-0.4	-0.5	-0.6	-0.7	-0.6	-0.5	-0.4	-0.3
Labour productivity per hour (growth rate)	2.5	2.4	2.9	2.2	1.8	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.3	1.3	1.7	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.2	1.1	1.1	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	3.4	2.5	2.8	1.8	1.3	1.1	1.1	1.1	1.4	1.6	1.8
GDP in 2007 prices (in millions euros)	228.9	291.2	331.1	368.2	396.8	421.5	444.2	467.6	494.7	527.2	565.0
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	0.0	-0.2	-0.2	-0.4	-0.6	-0.8	-0.7	-0.5	-0.2	-0.2
Population growth (working age:15-71)	-0.1	0.2	-0.1	0.0	-0.2	-0.3	-0.7	-0.6	-0.7	-0.6	-0.2
Labour force (thousands)	5109	5280	5257	5174	5064	4932	4774	4617	4488	4398	4333
Participation rate (15-64)	67.1	69.3	69.4	68.8	68.3	68.3	68.4	68.7	69.1	69.0	68.8
Participation rate (15-71)	61.4	63.3	63.0	62.0	61.1	60.4	60.0	59.9	60.3	61.0	61.3
young (15-24)	32.8	33.7	32.7	31.8	33.0	33.7	33.6	33.2	32.8	32.5	32.7
prime-age (25-54)	82.1	84.1	84.7	85.0	85.0	84.8	84.9	85.0	85.1	85.0	84.9
older (55-64)	44.3	47.1	48.7	50.4	50.9	51.8	51.5	50.7	51.3	51.3	51.7
oldest (65-71)	8.8	8.7	9.3	9.6	9.8	10.2	10.2	10.3	10.1	10.0	10.2
Employment rate (15-64)	61.4	64.4	65.1	64.6	64.0	64.0	64.1	64.4	64.8	64.7	64.6
Employment rate (15-71)	56.2	58.8	59.2	58.2	57.3	56.7	56.3	56.3	56.6	57.3	57.5
Unemployment rate (15-64)	8.5	7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	4.6	4.8	4.9	4.8	4.7	4.5	4.4	4.2	4.1	4.0	4.0
share of young (15-24)	7%	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	81%	80%	79%	77%	75%	74%	74%	75%	76%	77%	76%
share of older (55-64)	12%	14%	15%	17%	18%	19%	19%	18%	17%	16%	16%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.4	19.2	20.4	22.0	23.5	24.4	24.6	23.1	21.6	21.0	21.0
Old-age dependency ratio (2)	28	31	33	35	38	43	48	53	57	58	57
Total dependency ratio (3)	49	53	55	57	59	64	70	76	81	81	80
Total economic dependency ratio (4)	140	136	136	141	146	153	162	170	176	177	177
Economic old-age dependency ratio (15-64) (5)	43	46	48	53	58	65	72	79	85	86	86
Economic old-age dependency ratio (15-71) (6)	43	45	48	52	56	63	70	77	82	84	84

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Spain	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.39	1.41	1.43	1.44	1.46	1.47	1.49	1.51	1.52	1.54	1.56
Life expectancy at birth											
males	77.4	78.6	79.4	80.1	80.9	81.6	82.3	83.0	83.7	84.3	84.9
females	83.9	84.7	85.4	85.9	86.5	87.1	87.6	88.1	88.6	89.1	89.6
Life expectancy at 65											
males	17.1	17.8	18.3	18.8	19.3	19.8	20.3	20.8	21.2	21.7	22.1
females	21.0	21.6	22.1	22.5	23.0	23.4	23.9	24.3	24.7	25.1	25.5
Net migration (thousand)	623.4	375.8	263.1	190.4	160.8	149.3	150.5	146.1	135.2	131.8	129.9
Net migration as % of population	1.4	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Population (million)	45.3	49.4	51.1	52.1	52.7	53.0	53.3	53.4	53.2	52.7	51.9
Young population (0-14) as % of total	14.6	15.7	15.5	14.5	13.4	12.8	12.7	13.0	13.2	13.1	12.9
Prime age population (25-54) as % of total	46.9	45.5	43.4	40.9	38.4	36.1	34.8	34.2	33.9	33.9	33.7
Working age population (15-64) as % of total	68.8	67.0	66.3	65.7	64.5	62.4	59.6	56.6	54.7	54.3	54.7
Elderly population (65 and over) as % of total	16.6	17.3	18.2	19.8	22.1	24.8	27.7	30.5	32.1	32.6	32.3
Very elderly population (80 and over) as % of total	4.6	5.3	5.4	5.7	6.4	7.2	8.3	9.7	11.3	12.9	14.5
Elderly population (55 and over) as % of working age pop.15-64	39.7	42.9	46.6	51.3	57.4	64.8	71.5	77.0	80.1	80.3	79.6
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	3.7	3.1	3.4	2.5	1.8	1.3	0.9	0.8	1.1	1.4	1.6
Employment (growth rate)	3.3	1.2	0.8	0.1	-0.1	-0.4	-0.8	-0.9	-0.6	-0.3	-0.1
Labour input : hours worked (growth rate)	2.7	1.2	0.8	0.1	-0.1	-0.4	-0.8	-0.9	-0.6	-0.3	-0.1
Labour productivity per hour (growth rate)	1.0	1.9	2.7	2.4	1.9	1.8	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.3	1.1	1.7	1.5	1.3	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.8	0.7	0.9	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.1	2.1	2.9	2.2	1.7	1.2	0.8	0.8	1.2	1.6	1.9
GDP in 2007 prices (in millions euros)	1049.8	1323.8	1546.8	1774.3	1969.4	2126.3	2242.3	2337.3	2453.6	2610.5	2810.3
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.7	0.6	0.4	0.1	-0.3	-0.6	-0.9	-1.0	-0.5	-0.2	-0.1
Population growth (working age:15-71)	1.4	0.7	0.5	0.4	0.0	-0.3	-0.6	-0.8	-0.9	-0.6	-0.3
Labour force (thousands)	22032	25099	25941	26303	26395	26024	25139	24040	23179	22671	22443
Participation rate (15-64)	71.6	75.2	75.7	75.8	76.4	77.0	77.2	77.4	77.6	77.4	77.3
Participation rate (15-71)	66.3	69.2	69.4	68.9	68.6	68.3	67.7	67.0	67.5	68.4	69.0
young (15-24)	48.2	47.6	45.7	45.6	46.9	48.0	48.0	47.4	46.8	46.4	46.6
prime-age (25-54)	82.9	85.5	86.2	86.9	87.1	87.2	87.4	87.4	87.5	87.4	87.4
older (55-64)	47.5	58.4	63.5	66.8	70.9	73.1	72.7	72.5	73.1	73.3	74.0
oldest (65-71)	4.5	7.6	8.5	9.5	10.2	10.8	11.5	11.5	11.1	11.2	11.3
Employment rate (15-64)	65.6	69.5	71.0	71.1	71.6	72.2	72.4	72.6	72.8	72.6	72.5
Employment rate (15-71)	60.8	64.0	65.2	64.7	64.4	64.2	63.6	62.9	63.4	64.3	64.8
Unemployment rate (15-64)	8.3	7.5	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	20.1	23.0	24.1	24.3	24.3	23.9	23.0	21.9	21.2	20.8	20.6
share of young (15-24)	10%	9%	8%	9%	10%	10%	9%	9%	9%	10%	10%
share of prime-age (25-54)	79%	78%	75%	72%	68%	66%	67%	69%	70%	71%	70%
share of older (55-64)	11%	14%	16%	19%	22%	24%	24%	22%	20%	20%	20%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.5	17.1	19.2	21.2	23.1	25.1	25.1	23.2	21.4	20.3	20.5
Old-age dependency ratio (2)	24	26	27	30	34	40	46	54	59	60	59
Total dependency ratio (3)	45	49	51	52	55	60	68	77	83	84	83
Total economic dependency ratio (4)	120	114	111	112	114	119	129	140	148	151	149
Economic old-age dependency ratio (15-64) (5)	36	36	37	41	46	52	61	71	77	80	79
Economic old-age dependency ratio (15-71) (6)	36	36	37	40	45	51	59	69	75	78	77

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

France	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.98	1.98	1.97	1.97	1.96	1.96	1.95	1.95	1.94	1.94	1.93
Life expectancy at birth											
males	77.5	78.7	79.5	80.3	81.0	81.8	82.5	83.2	83.9	84.5	85.1
females	84.3	85.2	85.8	86.4	87.0	87.6	88.1	88.6	89.1	89.6	90.1
Life expectancy at 65											
males	17.7	18.4	18.9	19.4	19.9	20.3	20.8	21.2	21.7	22.1	22.5
females	22.0	22.7	23.1	23.5	23.9	24.3	24.7	25.1	25.5	25.8	26.2
Net migration (thousand)	99.3	97.4	92.5	88.9	86.5	82.6	76.9	73.9	69.9	66.4	62.9
Net migration as % of population	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Population (million)	61.9	64.2	65.6	66.8	68.0	69.0	69.9	70.6	71.0	71.4	71.8
Young population (0-14) as % of total	18.3	18.4	18.2	17.8	17.4	17.1	17.0	17.1	17.0	16.9	16.7
Prime age population (25-54) as % of total	40.6	38.8	37.4	36.2	35.3	35.3	35.2	35.0	35.0	35.0	34.9
Working age population (15-64) as % of total	65.2	63.1	61.6	60.5	59.4	58.5	57.6	57.5	57.3	57.3	57.4
Elderly population (65 and over) as % of total	16.5	18.5	20.2	21.7	23.2	24.4	25.3	25.4	25.6	25.9	25.9
Very elderly population (80 and over) as % of total	5.0	5.9	6.0	6.1	7.3	8.5	9.3	10.0	10.5	10.9	10.8
Elderly population (55 and over) as % of working age pop.15-64	43.7	49.1	52.9	56.2	59.4	61.1	62.9	63.6	63.9	64.0	64.3
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.1	2.0	1.9	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.8
Employment (growth rate)	1.0	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1
Labour input : hours worked (growth rate)	0.6	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1
Labour productivity per hour (growth rate)	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.5	1.5	1.5	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.7
GDP in 2007 prices (in millions euros)	1892.2	2212.8	2437.9	2663.0	2900.1	3165.0	3463.3	3781.2	4129.6	4516.2	4944.9
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.7	-0.1	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.1	0.2
Population growth (working age:15-71)	0.4	0.5	0.0	0.0	0.0	0.0	0.0	-0.1	0.2	0.1	0.1
Labour force (thousands)	28335	28926	29011	29077	29098	29188	29368	29481	29601	29767	29975
Participation rate (15-64)	70.3	70.6	70.8	70.7	70.9	71.1	71.7	71.5	71.5	71.6	71.6
Participation rate (15-71)	65.0	64.1	63.5	63.6	63.5	63.6	64.2	64.6	64.5	64.5	64.5
young (15-24)	39.4	40.5	39.7	39.9	40.2	40.4	40.4	40.3	40.1	40.0	40.2
prime-age (25-54)	88.3	88.6	88.8	88.9	88.9	88.9	88.9	88.9	89.0	88.9	88.9
older (55-64)	41.0	42.9	46.1	47.7	48.8	47.6	49.4	48.9	48.4	48.7	49.3
oldest (65-71)	3.2	7.5	7.5	8.6	8.3	8.9	9.1	8.9	9.1	9.1	9.0
Employment rate (15-64)	64.7	65.6	66.4	66.4	66.5	66.7	67.3	67.1	67.1	67.2	67.2
Employment rate (15-71)	59.8	59.6	59.6	59.7	59.6	59.7	60.3	60.6	60.5	60.5	60.6
Unemployment rate (15-64)	8.0	7.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	26.0	26.6	26.8	26.8	26.9	26.9	27.1	27.2	27.3	27.5	27.7
share of young (15-24)	10%	10%	10%	10%	10%	11%	10%	10%	10%	10%	10%
share of prime-age (25-54)	80%	78%	77%	76%	75%	76%	76%	76%	77%	77%	76%
share of older (55-64)	11%	12%	13%	14%	14%	13%	13%	14%	13%	13%	13%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.4	19.8	20.1	20.4	20.4	19.4	18.9	19.4	19.2	18.8	19.1
Old-age dependency ratio (2)	25	29	33	36	39	42	44	44	45	45	45
Total dependency ratio (3)	53	59	62	65	68	71	74	74	74	75	74
Total economic dependency ratio (4)	137	140	143	147	151	155	156	157	158	158	158
Economic old-age dependency ratio (15-64) (5)	39	43	48	52	57	61	64	64	65	66	66
Economic old-age dependency ratio (15-71) (6)	39	43	47	51	56	60	62	63	64	64	65

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Italy	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.38	1.41	1.42	1.44	1.46	1.47	1.49	1.51	1.52	1.54	1.55
Life expectancy at birth											
males	78.5	79.6	80.3	81.0	81.7	82.4	83.1	83.7	84.3	84.9	85.5
females	84.2	85.1	85.7	86.3	86.9	87.5	88.0	88.5	89.0	89.5	90.0
Life expectancy at 65											
males	17.5	18.2	18.7	19.2	19.7	20.2	20.6	21.1	21.5	22.0	22.4
females	21.4	22.1	22.5	23.0	23.4	23.9	24.3	24.7	25.1	25.5	25.9
Net migration (thousand)	259.5	248.6	240.8	240.8	248.7	239.9	229.5	206.9	193.4	185.8	174.3
Net migration as % of population	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Population (million)	59.5	60.9	61.4	61.7	61.9	62.0	62.0	61.8	61.2	60.4	59.4
Young population (0-14) as % of total	14.0	13.9	13.4	12.7	12.2	12.1	12.2	12.3	12.3	12.2	12.1
Prime age population (25-54) as % of total	43.7	42.3	40.5	38.2	36.3	35.3	34.9	34.6	34.1	34.0	33.7
Working age population (15-64) as % of total	65.9	64.5	63.9	63.3	61.6	59.3	57.0	55.5	55.1	55.1	55.1
Elderly population (65 and over) as % of total	20.1	21.7	22.7	24.0	26.2	28.6	30.8	32.2	32.6	32.7	32.7
Very elderly population (80 and over) as % of total	5.5	6.6	7.3	7.7	8.5	9.1	10.0	11.5	13.1	14.4	14.9
Elderly population (55 and over) as % of working age pop.15-64	48.8	52.9	57.1	62.0	67.8	73.2	77.3	80.0	81.4	81.6	81.7
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	1.5	2.1	1.9	1.7	1.4	1.1	1.0	1.2	1.3	1.4	1.4
Employment (growth rate)	1.3	0.5	0.2	0.0	-0.3	-0.7	-0.7	-0.5	-0.4	-0.3	-0.3
Labour input : hours worked (growth rate)	1.2	0.5	0.2	0.0	-0.3	-0.6	-0.6	-0.5	-0.4	-0.3	-0.3
Labour productivity per hour (growth rate)	0.3	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.2	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	0.9	1.8	1.7	1.6	1.3	1.0	1.1	1.3	1.5	1.7	1.8
GDP in 2007 prices (in millions euros)	1535.5	1751.6	1925.5	2102.5	2264.6	2399.5	2525.0	2671.7	2846.9	3042.9	3258.6
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	-0.1	0.0	-0.2	-0.7	-0.8	-0.8	-0.4	-0.3	-0.3	-0.3
Population growth (working age:15-71)	0.4	0.2	-0.1	0.1	-0.2	-0.5	-0.7	-0.7	-0.5	-0.3	-0.3
Labour force (thousands)	24729	26162	26560	26688	26403	25688	24825	24135	23636	23218	22853
Participation rate (15-64)	62.6	65.7	66.4	66.9	67.4	67.6	67.7	68.0	67.9	67.7	67.7
Participation rate (15-71)	56.8	59.5	60.1	60.4	60.0	59.5	59.4	59.8	60.5	60.6	60.4
young (15-24)	31.2	32.7	31.9	31.9	32.7	33.0	32.7	32.3	32.1	32.1	32.3
prime-age (25-54)	77.6	78.4	78.8	79.1	78.9	78.7	78.8	78.9	78.9	78.9	78.8
older (55-64)	34.7	48.7	54.0	58.8	62.3	62.6	61.9	62.4	62.8	62.6	63.1
oldest (65-71)	6.5	7.2	9.9	11.2	12.2	13.2	13.8	13.6	13.6	13.8	13.7
Employment rate (15-64)	58.7	62.0	62.6	63.1	63.5	63.7	63.8	64.0	64.0	63.8	63.8
Employment rate (15-71)	53.3	56.1	56.7	57.0	56.7	56.1	56.1	56.5	57.1	57.2	57.0
Unemployment rate (15-64)	6.2	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Employment (15-64) (in millions)	22.9	24.3	24.6	24.6	24.2	23.4	22.6	22.0	21.6	21.2	20.9
share of young (15-24)	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	7%
share of prime-age (25-54)	83%	79%	76%	72%	69%	70%	72%	73%	72%	72%	72%
share of older (55-64)	10%	15%	18%	22%	24%	24%	22%	21%	21%	21%	22%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.3	19.3	21.6	24.1	25.3	24.9	23.3	22.2	22.1	22.1	22.4
Old-age dependency ratio (2)	30	34	35	38	42	48	54	58	59	59	59
Total dependency ratio (3)	52	55	56	58	62	69	75	80	82	82	81
Total economic dependency ratio (4)	156	149	148	148	152	161	171	177	180	181	181
Economic old-age dependency ratio (15-64) (5)	50	53	55	58	64	72	80	86	89	89	89
Economic old-age dependency ratio (15-71) (6)	50	52	54	56	62	69	77	83	86	87	86

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Cyprus	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.45	1.47	1.49	1.50	1.52	1.53	1.54	1.56	1.57	1.59	1.60
Life expectancy at birth											
males	78.2	79.3	80.0	80.8	81.5	82.1	82.8	83.4	84.0	84.6	85.2
females	81.7	82.8	83.5	84.2	84.9	85.6	86.2	86.9	87.5	88.1	88.7
Life expectancy at 65											
males	17.1	17.8	18.3	18.8	19.3	19.7	20.2	20.6	21.1	21.5	22.0
females	19.0	19.8	20.3	20.9	21.5	22.0	22.5	23.1	23.6	24.1	24.6
Net migration (thousand)	9.3	8.8	8.5	8.2	7.8	7.5	7.2	6.9	6.6	6.2	5.9
Net migration as % of population	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4
Population (million)	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.3
Young population (0-14) as % of total	17.5	16.9	17.4	17.4	16.6	15.7	15.1	14.9	15.1	15.1	15.0
Prime age population (25-54) as % of total	43.9	44.7	44.3	43.7	42.6	41.5	40.0	38.9	37.8	37.2	37.0
Working age population (15-64) as % of total	70.1	69.3	67.5	66.1	65.4	65.3	64.9	63.8	61.7	60.0	58.8
Elderly population (65 and over) as % of total	12.4	13.8	15.0	16.5	17.9	19.0	20.0	21.3	23.2	24.8	26.2
Very elderly population (80 and over) as % of total	2.8	3.0	3.4	3.9	4.6	5.3	6.1	6.8	7.3	7.8	8.6
Elderly population (55 and over) as % of working age pop.15-64	32.9	36.3	39.6	42.2	44.5	47.1	51.1	54.9	59.1	62.0	63.8
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	3.6	3.8	3.9	3.2	2.9	2.6	2.3	2.0	1.8	1.8	1.8
Employment (growth rate)	2.1	1.7	1.2	0.9	0.9	0.8	0.6	0.3	0.1	0.1	0.2
Labour input : hours worked (growth rate)	1.9	1.7	1.1	0.9	0.8	0.8	0.6	0.3	0.1	0.1	0.2
Labour productivity per hour (growth rate)	1.7	2.1	2.7	2.3	2.0	1.9	1.8	1.7	1.7	1.7	1.7
TFP (growth rate)	0.7	1.3	1.7	1.5	1.3	1.2	1.2	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.0	0.8	1.0	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.0	2.2	2.4	2.0	1.8	1.7	1.6	1.3	1.2	1.2	1.4
GDP in 2007 prices (in millions euros)	15.6	20.9	25.2	29.9	34.6	39.5	44.6	49.7	54.5	59.5	65.0
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.9	1.0	0.9	0.8	0.9	0.9	0.6	0.2	-0.1	0.1	0.1
Population growth (working age:15-71)	2.0	1.3	1.0	1.0	0.9	0.8	0.7	0.5	0.3	0.1	0.1
Labour force (thousands)	403	485	520	544	567	591	611	623	628	630	633
Participation rate (15-64)	72.9	76.9	78.5	78.6	78.4	78.2	78.0	77.8	78.0	78.0	78.0
Participation rate (15-71)	68.9	72.5	73.5	73.4	72.9	72.9	72.7	72.0	71.3	71.1	71.2
young (15-24)	44.2	46.3	46.0	43.0	42.7	43.7	44.4	44.8	44.6	43.8	43.4
prime-age (25-54)	86.7	90.1	91.1	91.6	91.7	91.7	91.7	91.7	91.7	91.8	91.8
older (55-64)	57.6	61.1	62.7	63.1	64.6	65.9	66.6	65.4	65.4	65.0	65.1
oldest (65-71)	17.5	21.4	21.9	22.9	23.1	23.2	23.8	24.1	24.2	23.9	24.1
Employment rate (15-64)	69.7	74.3	75.8	75.9	75.7	75.5	75.3	75.1	75.3	75.3	75.3
Employment rate (15-71)	65.9	70.1	71.1	70.9	70.4	70.5	70.3	69.6	68.9	68.7	68.9
Unemployment rate (15-64)	4.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Employment (15-64) (in millions)	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
share of young (15-24)	13%	11%	9%	9%	9%	10%	10%	10%	9%	9%	9%
share of prime-age (25-54)	75%	76%	77%	77%	77%	75%	73%	72%	73%	73%	74%
share of older (55-64)	12%	13%	14%	14%	14%	15%	17%	18%	18%	17%	16%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.2	16.4	17.4	17.2	17.1	18.1	20.3	21.6	21.5	20.7	19.4
Old-age dependency ratio (2)	18	20	22	25	27	29	31	33	38	41	44
Total dependency ratio (3)	43	44	48	51	53	53	54	57	62	67	70
Total economic dependency ratio (4)	99	91	92	95	98	99	100	104	110	115	120
Economic old-age dependency ratio (15-64) (5)	23	24	26	29	32	34	37	40	44	49	53
Economic old-age dependency ratio (15-71) (6)	22	23	25	28	31	33	35	38	43	47	51

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Latvia	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.36	1.38	1.40	1.41	1.43	1.45	1.47	1.48	1.50	1.52	1.54
Life expectancy at birth											
males	66.0	68.2	69.8	71.3	72.8	74.2	75.6	76.9	78.1	79.3	80.5
females	76.7	78.3	79.4	80.5	81.5	82.5	83.4	84.3	85.2	86.0	86.8
Life expectancy at 65											
males	12.7	13.7	14.5	15.2	16.0	16.7	17.4	18.1	18.8	19.5	20.1
females	17.1	18.1	18.8	19.5	20.1	20.8	21.4	22.0	22.6	23.2	23.8
Net migration (thousand)	-1.0	-0.3	-0.3	-0.2	-0.6	-0.2	0.1	0.3	0.7	0.5	-0.6
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population (million)	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.8	1.7	1.7
Young population (0-14) as % of total	13.7	14.7	15.3	14.8	13.6	12.6	12.1	12.3	12.6	12.6	12.3
Prime age population (25-54) as % of total	42.4	44.1	43.5	41.7	40.0	39.1	37.3	34.7	33.3	33.8	33.8
Working age population (15-64) as % of total	69.0	67.6	66.1	65.0	64.2	63.8	62.4	60.6	57.8	54.6	53.3
Elderly population (65 and over) as % of total	17.3	17.7	18.6	20.2	22.2	23.7	25.4	27.1	29.6	32.8	34.4
Very elderly population (80 and over) as % of total	3.6	4.5	5.2	5.6	5.9	6.7	7.9	9.2	9.9	10.9	11.9
Elderly population (55 and over) as % of working age pop.15-64	41.0	44.9	48.5	51.4	55.0	58.5	64.4	72.1	78.5	82.0	83.9
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	8.6	3.0	2.1	2.0	1.8	1.0	0.7	0.2	-0.1	0.4	1.1
Employment (growth rate)	2.1	-1.0	-1.2	-1.0	-0.9	-0.9	-1.0	-1.5	-1.9	-1.3	-0.6
Labour input : hours worked (growth rate)	2.0	-1.0	-1.2	-1.0	-0.9	-0.9	-1.0	-1.5	-1.9	-1.3	-0.6
Labour productivity per hour (growth rate)	6.4	3.9	3.3	3.0	2.7	1.9	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	3.1	1.9	1.8	1.8	1.8	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	3.3	2.0	1.6	1.2	1.0	0.7	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	9.2	3.4	2.6	2.5	2.5	1.6	1.3	0.8	0.5	1.1	1.9
GDP in 2007 prices (in millions euros)	19.9	28.8	32.5	35.8	39.3	41.8	43.6	44.5	44.3	44.6	46.7
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.5	-1.0	-0.9	-0.9	-0.7	-0.8	-1.1	-1.2	-1.7	-1.7	-0.7
Population growth (working age:15-71)	-0.2	-0.9	-0.7	-0.6	-0.7	-0.9	-0.9	-1.1	-1.0	-1.3	-1.7
Labour force (thousands)	1184	1150	1085	1024	980	937	895	841	768	708	681
Participation rate (15-64)	72.9	76.1	75.3	74.0	73.9	73.4	73.7	73.3	72.0	72.3	74.2
Participation rate (15-71)	67.8	70.6	68.7	66.8	66.1	65.9	65.7	64.9	62.5	61.1	63.5
young (15-24)	43.4	50.9	43.4	42.4	43.9	45.2	46.5	46.5	45.2	44.0	44.1
prime-age (25-54)	87.1	86.9	87.1	87.3	87.1	87.0	87.1	87.3	87.5	87.4	87.3
older (55-64)	60.4	60.0	58.5	56.2	58.6	57.1	58.8	59.1	54.4	50.6	58.1
oldest (65-71)	21.8	13.1	9.0	9.4	9.2	9.1	9.2	9.1	9.2	9.1	8.9
Employment rate (15-64)	68.5	72.4	71.6	70.4	70.3	69.8	70.1	69.8	68.5	68.8	70.6
Employment rate (15-71)	63.8	67.2	65.4	63.6	62.9	62.7	62.5	61.8	59.5	58.2	60.5
Unemployment rate (15-64)	6.1	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Employment (15-64) (in millions)	1.1	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6
share of young (15-24)	13%	10%	8%	9%	10%	10%	10%	9%	9%	9%	10%
share of prime-age (25-54)	74%	75%	76%	76%	74%	73%	71%	68%	70%	75%	75%
share of older (55-64)	14%	15%	16%	16%	16%	17%	19%	22%	21%	16%	15%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	16.0	18.6	20.4	20.3	20.5	21.4	23.7	27.4	27.3	22.0	19.4
Old-age dependency ratio (2)	25	26	28	31	35	37	41	45	51	60	64
Total dependency ratio (3)	45	48	51	54	56	57	60	65	73	83	87
Total economic dependency ratio (4)	106	102	110	117	120	123	126	134	150	163	163
Economic old-age dependency ratio (15-64) (5)	32	34	38	42	47	51	56	62	72	84	88
Economic old-age dependency ratio (15-71) (6)	31	33	37	42	46	50	55	61	70	82	86

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Lithuania	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49	1.51	1.52	1.54
Life expectancy at birth											
males	65.9	68.2	69.8	71.3	72.8	74.2	75.6	76.9	78.1	79.3	80.4
females	77.4	78.9	80.0	80.9	81.9	82.8	83.7	84.5	85.3	86.1	86.9
Life expectancy at 65											
males	13.1	14.1	14.9	15.6	16.3	17.0	17.7	18.3	19.0	19.6	20.3
females	17.5	18.4	19.0	19.7	20.3	20.9	21.5	22.1	22.6	23.2	23.7
Net migration (thousand)	-2.2	-0.7	-0.2	0.2	-0.3	-0.1	-0.2	0.3	1.2	1.0	-0.1
Net migration as % of population	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population (million)	3.4	3.3	3.2	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5
Young population (0-14) as % of total	15.3	14.3	14.8	14.8	14.1	13.0	12.1	12.0	12.2	12.5	12.4
Prime age population (25-54) as % of total	42.5	44.0	43.5	42.1	40.1	38.9	37.4	35.0	33.1	32.5	32.6
Working age population (15-64) as % of total	68.8	69.1	67.6	65.7	63.8	62.7	61.5	60.3	58.1	55.0	52.9
Elderly population (65 and over) as % of total	15.8	16.6	17.6	19.5	22.1	24.3	26.3	27.7	29.7	32.5	34.7
Very elderly population (80 and over) as % of total	3.3	4.4	4.9	5.3	5.6	6.4	7.8	9.6	10.7	11.5	12.0
Elderly population (55 and over) as % of working age pop.15-64	38.1	41.7	46.5	51.2	56.0	59.8	65.2	72.0	79.1	84.5	87.4
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	8.0	3.6	2.5	1.8	1.5	0.8	0.8	0.5	0.2	0.2	0.4
Employment (growth rate)	1.8	-0.1	-0.9	-1.2	-1.2	-1.1	-0.9	-1.2	-1.5	-1.5	-1.3
Labour input : hours worked (growth rate)	2.4	-0.1	-0.9	-1.2	-1.2	-1.1	-0.9	-1.2	-1.5	-1.5	-1.3
Labour productivity per hour (growth rate)	5.4	3.7	3.3	3.0	2.7	1.9	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	2.8	1.8	1.8	1.8	1.8	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	2.6	1.9	1.6	1.3	1.0	0.7	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	8.6	3.9	2.8	2.2	2.0	1.4	1.4	1.1	0.9	0.9	1.2
GDP in 2007 prices (in millions euros)	28.0	41.0	47.4	52.4	56.7	59.5	61.9	63.8	64.7	65.3	66.4
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.1	-0.6	-0.8	-1.1	-1.0	-0.9	-0.9	-1.1	-1.6	-1.7	-1.1
Population growth (working age:15-71)	0.0	-0.6	-0.5	-0.6	-0.7	-1.0	-1.0	-1.1	-1.0	-1.2	-1.6
Labour force (thousands)	1604	1635	1592	1506	1417	1337	1275	1207	1125	1042	971
Participation rate (15-64)	68.1	70.6	71.0	70.1	69.1	68.3	68.3	68.1	67.6	67.6	68.2
Participation rate (15-71)	63.0	66.4	66.3	64.8	62.9	62.1	62.0	62.0	60.7	59.3	59.6
young (15-24)	28.3	33.4	31.8	29.0	28.2	29.0	30.3	31.2	30.8	29.6	29.1
prime-age (25-54)	86.0	84.4	84.0	84.0	83.8	83.4	83.1	83.3	83.7	83.8	83.7
older (55-64)	55.5	59.9	59.4	56.3	56.0	55.3	56.9	56.9	54.8	53.1	54.1
oldest (65-71)	10.7	18.7	20.0	20.9	20.2	19.5	19.4	19.2	19.2	19.0	18.8
Employment rate (15-64)	65.1	68.1	68.5	67.6	66.7	65.9	65.9	65.7	65.2	65.2	65.8
Employment rate (15-71)	60.3	64.1	64.1	62.6	60.7	60.0	59.9	59.9	58.6	57.3	57.6
Unemployment rate (15-64)	4.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Employment (15-64) (in millions)	1.5	1.5	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.9	0.9
share of young (15-24)	9%	9%	7%	6%	6%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	78%	76%	76%	77%	76%	76%	74%	71%	71%	73%	76%
share of older (55-64)	12%	15%	17%	17%	17%	17%	19%	22%	23%	20%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.1	17.7	20.5	21.5	21.3	21.0	22.3	26.1	27.9	25.5	21.8
Old-age dependency ratio (2)	23	24	26	30	35	39	43	46	51	59	66
Total dependency ratio (3)	45	45	48	52	57	59	63	66	72	82	89
Total economic dependency ratio (4)	120	110	112	121	130	137	141	147	158	171	180
Economic old-age dependency ratio (15-64) (5)	33	32	34	39	47	53	60	65	72	83	92
Economic old-age dependency ratio (15-71) (6)	33	32	33	38	45	51	57	62	69	78	87

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Luxembourg	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.65	1.66	1.67	1.67	1.68	1.69	1.70	1.70	1.71	1.72	1.72
Life expectancy at birth											
males	76.3	77.6	78.5	79.4	80.2	81.0	81.7	82.5	83.2	83.8	84.5
females	81.2	82.4	83.2	83.9	84.6	85.3	86.0	86.7	87.3	87.9	88.5
Life expectancy at 65											
males	16.8	17.5	18.0	18.6	19.1	19.6	20.1	20.5	21.0	21.5	21.9
females	19.7	20.5	21.0	21.5	22.0	22.5	23.0	23.4	23.9	24.3	24.8
Net migration (thousand)	4.4	4.1	4.0	3.8	3.7	3.5	3.4	3.2	3.1	2.9	2.8
Net migration as % of population	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4
Population (million)	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
Young population (0-14) as % of total	18.2	17.3	16.9	16.9	16.9	16.9	16.7	16.4	16.2	16.1	16.2
Prime age population (25-54) as % of total	45.3	43.2	41.6	40.2	39.5	38.9	38.5	38.2	37.9	37.5	37.3
Working age population (15-64) as % of total	67.7	67.6	66.9	65.4	63.5	61.9	61.1	60.9	60.8	60.7	60.3
Elderly population (65 and over) as % of total	14.2	15.1	16.2	17.7	19.6	21.3	22.2	22.7	23.0	23.1	23.6
Very elderly population (80 and over) as % of total	3.5	4.1	4.3	4.4	5.0	5.8	6.7	7.8	8.6	8.9	8.9
Elderly population (55 and over) as % of working age pop.15-64	36.6	40.0	43.6	47.5	50.6	53.1	54.7	55.5	56.5	57.5	58.6
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	4.5	4.0	2.7	2.3	2.1	2.2	2.2	2.2	2.2	2.0	2.0
Employment (growth rate)	3.1	2.1	0.7	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3
Labour input : hours worked (growth rate)	2.7	2.1	0.7	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3
Labour productivity per hour (growth rate)	1.7	1.9	2.0	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.8	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.9	0.8	0.9	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.9	2.9	1.6	1.3	1.2	1.3	1.5	1.6	1.6	1.6	1.5
GDP in 2007 prices (in millions euros)	36.1	51.4	60.0	67.7	75.3	83.7	93.2	104.0	115.8	128.5	141.9
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.7	1.0	0.7	0.5	0.2	0.4	0.6	0.6	0.5	0.4	0.3
Population growth (working age:15-71)	1.6	1.2	0.9	0.7	0.5	0.4	0.3	0.5	0.5	0.4	0.4
Labour force (thousands)	214	238	247	254	259	265	271	278	285	291	296
Participation rate (15-64)	66.4	67.1	66.9	66.8	66.9	67.3	67.3	67.1	67.1	66.8	66.8
Participation rate (15-71)	61.5	61.7	60.9	60.2	59.6	59.6	60.1	60.3	60.3	60.1	59.7
young (15-24)	27.4	29.0	29.6	29.8	29.3	29.3	29.2	29.2	29.4	29.5	29.5
prime-age (25-54)	84.2	85.9	86.1	86.2	86.2	86.0	86.1	86.0	86.0	86.0	86.1
older (55-64)	33.0	39.0	40.6	40.9	40.4	41.7	41.9	41.6	42.3	41.8	41.3
oldest (65-71)	0.7	1.6	1.8	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0
Employment rate (15-64)	63.6	64.0	63.8	63.7	63.8	64.2	64.2	64.0	64.0	63.7	63.7
Employment rate (15-71)	58.9	58.9	58.1	57.4	56.9	56.9	57.3	57.6	57.5	57.3	56.9
Unemployment rate (15-64)	4.2	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Employment (15-64) (in millions)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
share of young (15-24)	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	86%	82%	81%	80%	81%	81%	81%	81%	81%	80%	80%
share of older (55-64)	8%	11%	12%	13%	12%	12%	12%	12%	12%	12%	12%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.7	17.7	19.3	20.4	19.8	18.7	18.4	18.3	18.7	19.4	19.5
Old-age dependency ratio (2)	21	22	24	27	31	34	36	37	38	38	39
Total dependency ratio (3)	48	48	50	53	57	62	64	64	64	65	66
Total economic dependency ratio (4)	132	131	134	140	146	151	154	156	157	158	160
Economic old-age dependency ratio (15-64) (5)	33	35	38	42	48	53	56	58	59	59	61
Economic old-age dependency ratio (15-71) (6)	33	35	38	42	48	53	56	58	59	59	61

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Hungary	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.35	1.37	1.39	1.41	1.42	1.44	1.46	1.48	1.50	1.51	1.53
Life expectancy at birth											
males	69.7	71.6	72.9	74.2	75.4	76.6	77.7	78.8	79.9	80.9	81.9
females	78.1	79.5	80.5	81.5	82.4	83.3	84.2	85.0	85.8	86.6	87.3
Life expectancy at 65											
males	13.6	14.6	15.3	16.0	16.7	17.4	18.1	18.7	19.4	20.0	20.6
females	17.5	18.4	19.1	19.8	20.4	21.1	21.7	22.3	22.9	23.5	24.0
Net migration (thousand)	19.6	22.1	22.4	18.0	17.3	19.3	22.3	19.6	17.9	16.6	14.9
Net migration as % of population	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	10.0	10.0	9.9	9.8	9.7	9.5	9.4	9.2	9.1	8.9	8.7
Young population (0-14) as % of total	15.0	14.8	14.8	14.3	13.6	13.0	12.8	12.8	12.9	12.9	12.7
Prime age population (25-54) as % of total	43.6	42.4	43.0	42.2	40.4	38.0	36.9	35.9	34.9	34.5	34.1
Working age population (15-64) as % of total	68.8	67.4	65.4	64.3	64.5	63.8	62.2	59.4	57.7	56.4	55.4
Elderly population (65 and over) as % of total	16.2	17.7	19.8	21.4	22.0	23.1	25.0	27.7	29.3	30.7	31.9
Very elderly population (80 and over) as % of total	3.7	4.4	4.8	5.4	6.2	7.6	8.4	8.5	9.1	10.5	12.6
Elderly population (55 and over) as % of working age pop.15-64	41.8	46.6	48.8	51.6	54.8	60.3	64.8	70.2	74.5	77.1	79.1
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.9	2.8	2.4	2.1	2.1	1.5	1.1	1.0	0.8	0.9	1.0
Employment (growth rate)	-0.1	0.3	-0.2	-0.5	-0.6	-0.8	-1.0	-1.0	-0.9	-0.8	-0.7
Labour input : hours worked (growth rate)	-0.3	0.3	-0.2	-0.5	-0.6	-0.8	-1.0	-0.9	-0.9	-0.8	-0.7
Labour productivity per hour (growth rate)	3.2	2.6	2.6	2.6	2.7	2.3	2.1	1.9	1.7	1.7	1.7
TFP (growth rate)	1.5	1.4	1.5	1.6	1.7	1.5	1.3	1.2	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.8	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.6
GDP per capita (growth rate)	4.0	2.9	2.6	2.4	2.4	1.8	1.4	1.3	1.1	1.3	1.5
GDP in 2007 prices (in millions euros)	101.1	127.8	145.0	161.2	178.4	194.5	206.6	217.1	226.7	236.5	248.4
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.0	-0.7	-1.0	-0.3	-0.3	-0.7	-1.2	-1.1	-0.8	-0.8	-0.7
Population growth (working age:15-71)	0.0	-0.4	-0.4	-0.5	-0.4	-0.2	-0.5	-0.7	-1.1	-0.8	-0.7
Labour force (thousands)	4305	4445	4395	4292	4175	4032	3845	3663	3493	3346	3228
Participation rate (15-64)	61.7	65.4	66.6	66.8	65.9	65.0	64.3	64.8	64.9	64.8	65.0
Participation rate (15-71)	56.7	59.7	60.1	60.1	60.3	59.2	57.5	56.7	57.1	57.3	57.3
young (15-24)	26.1	28.3	27.0	25.7	26.2	26.9	27.0	27.0	26.7	26.2	26.2
prime-age (25-54)	80.0	81.5	81.5	81.5	81.3	81.0	80.9	80.9	81.1	81.1	81.1
older (55-64)	34.1	46.4	47.2	50.4	50.8	51.5	48.8	49.3	49.4	48.5	49.3
oldest (65-71)	3.9	6.9	10.3	10.1	10.9	11.8	11.7	11.6	11.0	11.3	11.2
Employment rate (15-64)	57.2	60.9	62.5	62.7	61.8	61.0	60.3	60.8	60.9	60.8	61.0
Employment rate (15-71)	52.5	55.6	56.4	56.4	56.7	55.6	54.1	53.3	53.6	53.8	53.8
Unemployment rate (15-64)	7.4	7.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	4.0	4.1	4.0	3.9	3.8	3.7	3.5	3.3	3.2	3.1	2.9
share of young (15-24)	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
share of prime-age (25-54)	83%	79%	81%	80%	78%	74%	75%	76%	76%	77%	77%
share of older (55-64)	10%	15%	14%	14%	17%	20%	19%	18%	19%	17%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.3	20.3	18.5	18.3	20.7	24.1	24.6	23.5	23.7	22.6	21.5
Old-age dependency ratio (2)	24	26	30	33	34	36	40	47	51	54	58
Total dependency ratio (3)	45	48	53	55	55	57	61	68	73	77	81
Total economic dependency ratio (4)	152	142	143	146	149	154	163	173	181	188	193
Economic old-age dependency ratio (15-64) (5)	40	42	46	51	53	57	64	73	80	86	91
Economic old-age dependency ratio (15-71) (6)	40	41	45	50	52	56	62	71	78	84	89

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Malta	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.38	1.41	1.42	1.44	1.46	1.47	1.49	1.50	1.52	1.54	1.55
Life expectancy at birth											
males	76.0	77.3	78.2	79.1	79.9	80.7	81.5	82.2	83.0	83.7	84.3
females	81.1	82.3	83.1	83.9	84.6	85.4	86.1	86.7	87.4	88.0	88.6
Life expectancy at 65											
males	15.9	16.7	17.2	17.8	18.3	18.9	19.4	19.9	20.4	20.9	21.4
females	19.1	20.0	20.5	21.1	21.7	22.2	22.8	23.3	23.8	24.3	24.8
Net migration (thousand)	1.0	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8
Net migration as % of population	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Young population (0-14) as % of total	16.3	14.6	14.6	14.4	14.0	13.3	12.7	12.5	12.6	12.7	12.7
Prime age population (25-54) as % of total	41.8	41.1	40.9	41.0	40.1	38.5	37.0	35.8	34.6	33.8	33.6
Working age population (15-64) as % of total	69.9	67.4	65.1	63.0	61.8	61.9	61.6	60.2	58.4	56.5	54.9
Elderly population (65 and over) as % of total	13.8	18.0	20.3	22.6	24.2	24.8	25.7	27.3	29.1	30.8	32.4
Very elderly population (80 and over) as % of total	3.2	3.9	4.5	5.2	7.1	8.3	9.3	9.9	9.9	10.4	11.8
Elderly population (55 and over) as % of working age pop.15-64	39.9	47.0	51.8	55.0	58.2	61.4	65.1	69.6	74.5	78.6	81.4
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.9	2.7	2.7	1.9	1.7	1.4	1.2	1.0	0.8	0.8	1.0
Employment (growth rate)	2.0	0.2	0.0	-0.3	-0.1	-0.3	-0.5	-0.7	-0.9	-0.9	-0.7
Labour input : hours worked (growth rate)	1.4	0.2	0.0	-0.2	-0.1	-0.3	-0.5	-0.7	-0.9	-0.9	-0.7
Labour productivity per hour (growth rate)	1.5	2.5	2.7	2.1	1.8	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.0	1.6	1.7	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.5	0.9	0.9	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.2	2.4	2.4	1.7	1.7	1.6	1.4	1.2	1.1	1.0	1.3
GDP in 2007 prices (in millions euros)	5.4	6.6	7.6	8.5	9.3	10.0	10.7	11.3	11.8	12.3	12.9
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.3	-0.4	-0.4	-0.5	-0.2	-0.1	-0.5	-0.8	-0.9	-1.0	-0.7
Population growth (working age:15-71)	1.2	0.5	-0.6	-0.3	-0.4	-0.3	-0.1	-0.4	-0.7	-0.8	-0.7
Labour force (thousands)	169	174	176	175	176	174	171	165	159	152	146
Participation rate (15-64)	59.5	61.2	63.0	64.1	65.1	64.8	64.4	64.4	64.4	64.3	64.4
Participation rate (15-71)	55.1	54.3	55.7	56.7	57.9	58.4	57.8	56.7	56.1	55.7	55.6
young (15-24)	55.4	58.0	58.2	56.1	55.7	55.9	56.5	57.0	57.0	56.4	56.0
prime-age (25-54)	69.9	71.9	72.4	72.1	71.7	71.5	71.6	71.7	71.9	71.9	71.8
older (55-64)	31.6	32.0	38.1	43.4	50.6	52.2	51.6	51.2	51.1	50.5	50.3
oldest (65-71)	3.0	1.7	1.4	3.2	5.6	6.9	7.5	7.4	7.3	7.3	7.1
Employment rate (15-64)	55.8	57.4	59.1	60.2	61.1	60.8	60.4	60.4	60.4	60.3	60.4
Employment rate (15-71)	51.7	50.9	52.2	53.2	54.3	54.9	54.3	53.2	52.7	52.3	52.2
Unemployment rate (15-64)	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
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	0.1
share of young (15-24)	18%	16%	14%	13%	13%	13%	13%	13%	13%	13%	13%
share of prime-age (25-54)	72%	73%	73%	74%	72%	69%	68%	67%	67%	68%	69%
share of older (55-64)	11%	11%	13%	13%	15%	18%	19%	20%	20%	19%	18%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	20.1	20.3	20.5	19.1	19.0	21.4	23.4	24.2	24.8	24.2	22.3
Old-age dependency ratio (2)	20	27	31	36	39	40	42	45	50	54	59
Total dependency ratio (3)	43	48	54	59	62	61	62	66	71	77	82
Total economic dependency ratio (4)	158	158	160	163	163	164	167	173	181	191	199
Economic old-age dependency ratio (15-64) (5)	35	46	53	59	63	64	67	73	80	88	95
Economic old-age dependency ratio (15-71) (6)	35	46	52	58	62	63	66	72	79	86	93

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Netherlands	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.72	1.73	1.73	1.74	1.74	1.75	1.75	1.75	1.76	1.76	1.77
Life expectancy at birth											
males	77.9	79.0	79.7	80.4	81.1	81.8	82.5	83.1	83.7	84.3	84.9
females	82.2	83.2	83.9	84.6	85.3	85.9	86.6	87.2	87.8	88.3	88.9
Life expectancy at 65											
males	16.5	17.3	17.8	18.3	18.8	19.3	19.8	20.3	20.8	21.2	21.7
females	19.9	20.7	21.2	21.7	22.2	22.7	23.2	23.7	24.1	24.6	25.0
Net migration (thousand)	7.8	8.2	10.6	13.1	13.7	12.6	6.5	6.7	7.2	9.3	8.4
Net migration as % of population	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Population (million)	16.4	16.7	16.9	17.1	17.2	17.3	17.2	17.1	16.9	16.7	16.6
Young population (0-14) as % of total	17.9	16.6	15.7	15.5	15.7	15.7	15.6	15.3	14.9	14.8	15.0
Prime age population (25-54) as % of total	42.6	40.4	38.8	37.1	36.4	36.4	36.2	35.8	35.5	35.3	34.9
Working age population (15-64) as % of total	67.4	65.6	64.5	62.6	60.2	58.3	57.5	58.0	58.4	58.3	57.8
Elderly population (65 and over) as % of total	14.7	17.8	19.8	21.9	24.1	25.9	26.9	26.8	26.6	26.8	27.3
Very elderly population (80 and over) as % of total	3.8	4.3	4.7	5.4	6.9	8.0	9.0	10.1	11.1	11.4	10.9
Elderly population (55 and over) as % of working age pop.15-64	40.7	47.0	52.1	57.5	62.1	64.4	65.5	65.7	66.2	67.0	68.5
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.1	1.7	1.5	1.3	1.2	1.4	1.5	1.6	1.5	1.4	1.3
Employment (growth rate)	0.8	0.1	-0.2	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.3	-0.4
Labour input : hours worked (growth rate)	0.5	0.0	-0.3	-0.4	-0.5	-0.3	-0.2	-0.1	-0.2	-0.3	-0.4
Labour productivity per hour (growth rate)	1.6	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.0	1.5	1.3	1.1	1.1	1.4	1.6	1.8	1.7	1.6	1.5
GDP in 2007 prices (in millions euros)	559.5	649.2	702.9	752.3	800.9	854.8	920.8	994.0	1072.9	1153.3	1235.2
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.1	-0.1	-0.2	-0.5	-0.7	-0.6	-0.1	0.0	-0.1	-0.3	-0.4
Population growth (working age:15-71)	0.2	0.3	-0.3	-0.3	-0.4	-0.5	-0.4	-0.3	0.0	-0.1	-0.3
Labour force (thousands)	8766	8907	8863	8705	8498	8326	8246	8192	8134	8035	7906
Participation rate (15-64)	78.7	79.4	79.5	79.5	79.7	80.3	81.0	80.8	80.4	80.2	80.2
Participation rate (15-71)	73.1	72.4	72.2	71.8	71.3	71.4	72.4	73.5	73.2	72.6	72.1
young (15-24)	72.7	73.6	73.5	74.1	73.8	73.5	73.3	73.5	73.6	73.8	73.8
prime-age (25-54)	87.7	89.0	89.6	90.0	90.1	90.1	90.2	90.2	90.1	90.1	90.2
older (55-64)	53.3	55.3	56.1	56.2	55.8	55.4	57.5	58.0	57.8	57.2	57.6
oldest (65-71)	9.3	14.4	14.6	15.0	15.1	15.2	15.2	15.4	15.5	15.6	15.6
Employment rate (15-64)	76.1	77.0	77.1	77.1	77.3	77.9	78.5	78.3	78.0	77.8	77.8
Employment rate (15-71)	70.8	70.3	70.0	69.7	69.2	69.3	70.3	71.3	71.0	70.4	70.0
Unemployment rate (15-64)	3.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Employment (15-64) (in millions)	8.4	8.5	8.4	8.2	8.0	7.8	7.8	7.8	7.7	7.6	7.5
share of young (15-24)	16%	17%	17%	17%	16%	16%	16%	17%	17%	17%	16%
share of prime-age (25-54)	72%	69%	68%	68%	69%	71%	71%	69%	69%	68%	68%
share of older (55-64)	12%	14%	15%	16%	15%	14%	13%	14%	15%	15%	15%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.9	19.9	21.4	22.6	22.1	19.9	18.7	19.5	20.6	21.0	21.3
Old-age dependency ratio (2)	22	27	31	35	40	45	47	46	46	46	47
Total dependency ratio (3)	48	52	55	60	66	72	74	72	71	71	73
Total economic dependency ratio (4)	93	95	98	104	111	116	118	117	116	117	119
Economic old-age dependency ratio (15-64) (5)	27	33	37	42	48	53	56	55	55	56	57
Economic old-age dependency ratio (15-71) (6)	27	32	36	41	47	52	54	54	54	54	55

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Austria	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.41	1.43	1.45	1.46	1.48	1.49	1.51	1.53	1.54	1.56	1.57
Life expectancy at birth											
males	77.4	78.6	79.4	80.1	80.9	81.6	82.3	83.0	83.6	84.3	84.9
females	82.9	83.9	84.6	85.2	85.8	86.4	87.0	87.6	88.1	88.7	89.2
Life expectancy at 65											
males	17.1	17.8	18.3	18.8	19.3	19.8	20.2	20.7	21.2	21.6	22.0
females	20.3	21.0	21.5	22.0	22.5	23.0	23.4	23.9	24.3	24.8	25.2
Net migration (thousand)	33.1	31.4	30.5	31.5	31.2	28.7	26.0	25.6	24.7	23.9	22.3
Net migration as % of population	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Population (million)	8.3	8.6	8.7	8.9	9.0	9.1	9.1	9.1	9.1	9.1	9.0
Young population (0-14) as % of total	15.3	14.4	14.3	14.3	14.1	13.9	13.6	13.5	13.5	13.7	13.8
Prime age population (25-54) as % of total	44.1	43.0	41.2	39.0	37.8	37.5	36.7	36.1	35.5	35.3	35.2
Working age population (15-64) as % of total	67.5	67.2	66.3	64.6	62.2	60.1	59.2	58.9	58.3	57.8	57.2
Elderly population (65 and over) as % of total	17.2	18.4	19.4	21.1	23.7	26.1	27.2	27.6	28.2	28.5	29.0
Very elderly population (80 and over) as % of total	4.6	4.9	5.2	6.2	6.7	7.2	8.4	10.1	11.5	11.7	11.4
Elderly population (55 and over) as % of working age pop.15-64	42.0	45.8	50.7	56.2	60.6	63.8	66.4	68.0	70.1	71.0	71.5
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.2	1.9	1.9	1.6	1.5	1.6	1.5	1.5	1.5	1.4	1.5
Employment (growth rate)	0.7	0.2	0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2
Labour input : hours worked (growth rate)	0.6	0.2	0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2
Labour productivity per hour (growth rate)	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.8	1.6	1.6	1.3	1.2	1.4	1.5	1.5	1.5	1.5	1.6
GDP in 2007 prices (in millions euros)	272.7	322.7	354.9	386.1	415.5	449.1	485.6	523.1	563.4	605.1	650.9
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.2	0.1	0.1	-0.3	-0.6	-0.5	-0.1	-0.1	-0.2	-0.3	-0.3
Population growth (working age:15-71)	0.7	0.2	0.0	0.1	-0.1	-0.4	-0.5	-0.2	0.0	-0.3	-0.2
Labour force (thousands)	4235	4420	4471	4463	4413	4387	4363	4320	4278	4223	4175
Participation rate (15-64)	74.8	75.8	75.9	75.7	76.4	77.5	77.9	77.6	77.5	77.4	77.6
Participation rate (15-71)	68.6	69.6	69.6	69.2	68.5	69.1	70.3	70.9	70.5	70.1	70.1
young (15-24)	61.5	64.1	63.7	63.4	63.2	63.2	63.3	63.4	63.5	63.4	63.3
prime-age (25-54)	87.4	87.7	88.2	88.6	89.0	89.2	89.2	89.2	89.2	89.3	89.3
older (55-64)	40.0	45.7	49.6	51.1	52.1	53.7	56.1	55.6	56.0	55.2	55.4
oldest (65-71)	7.5	9.4	12.2	17.3	16.7	18.2	19.6	20.1	20.5	20.5	20.5
Employment rate (15-64)	71.5	72.6	72.7	72.5	73.1	74.2	74.6	74.2	74.2	74.1	74.3
Employment rate (15-71)	65.6	66.6	66.7	66.3	65.6	66.2	67.4	67.9	67.6	67.2	67.2
Unemployment rate (15-64)	4.5	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Employment (15-64) (in millions)	4.0	4.2	4.2	4.2	4.1	4.0	4.0	4.0	3.9	3.9	3.8
share of young (15-24)	14%	14%	13%	13%	13%	13%	14%	14%	14%	14%	14%
share of prime-age (25-54)	77%	75%	73%	71%	71%	72%	71%	71%	70%	71%	71%
share of older (55-64)	9%	11%	14%	16%	16%	14%	15%	16%	16%	16%	15%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	16.6	18.4	21.5	23.5	22.6	20.4	20.4	21.3	21.8	21.7	20.9
Old-age dependency ratio (2)	25	27	29	33	38	43	46	47	48	49	51
Total dependency ratio (3)	48	49	51	55	61	66	69	70	72	73	75
Total economic dependency ratio (4)	105	104	106	110	116	120	122	124	127	129	130
Economic old-age dependency ratio (15-64) (5)	34	36	38	42	48	54	57	59	61	62	63
Economic old-age dependency ratio (15-71) (6)	34	36	38	41	47	52	55	57	58	60	61

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Poland	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.27	1.30	1.32	1.34	1.36	1.38	1.40	1.42	1.44	1.47	1.49
Life expectancy at birth											
males	71.4	73.1	74.3	75.5	76.6	77.7	78.8	79.8	80.7	81.6	82.5
females	79.9	81.2	82.1	82.9	83.7	84.5	85.3	86.0	86.7	87.4	88.0
Life expectancy at 65											
males	14.5	15.4	16.0	16.7	17.3	18.0	18.6	19.2	19.8	20.4	20.9
females	18.6	19.4	20.0	20.6	21.2	21.8	22.3	22.9	23.4	23.9	24.4
Net migration (thousand)	-15.5	8.5	14.0	4.9	-1.3	4.4	17.1	24.4	26.4	17.2	8.2
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Population (million)	38.1	38.1	38.0	37.6	37.0	36.1	35.2	34.3	33.3	32.2	31.1
Young population (0-14) as % of total	15.5	14.6	14.8	14.2	13.1	12.0	11.4	11.4	11.6	11.6	11.4
Prime age population (25-54) as % of total	43.9	43.5	43.5	43.0	41.4	39.2	36.6	34.6	33.2	32.6	32.4
Working age population (15-64) as % of total	71.1	70.0	67.0	64.6	63.9	63.8	62.7	60.2	56.8	54.1	52.5
Elderly population (65 and over) as % of total	13.5	15.3	18.2	21.2	23.0	24.2	25.9	28.4	31.6	34.3	36.2
Very elderly population (80 and over) as % of total	3.0	4.0	4.4	4.5	5.7	7.7	9.4	10.0	10.1	11.0	13.1
Elderly population (55 and over) as % of working age pop.15-64	35.3	42.6	47.2	51.1	55.1	60.2	67.3	74.8	82.5	87.9	91.1
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	5.9	3.1	2.5	2.5	2.0	1.0	0.5	0.3	0.3	0.3	0.5
Employment (growth rate)	2.8	-0.3	-0.6	-0.3	-0.6	-0.8	-1.1	-1.4	-1.5	-1.5	-1.2
Labour input : hours worked (growth rate)	2.8	-0.3	-0.6	-0.4	-0.7	-0.9	-1.2	-1.4	-1.4	-1.4	-1.2
Labour productivity per hour (growth rate)	3.0	3.4	3.1	2.8	2.7	1.9	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.7	1.6	1.7	1.7	1.7	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.3	1.8	1.4	1.1	0.9	0.7	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	6.0	3.1	2.6	2.7	2.4	1.5	1.1	0.9	0.9	0.9	1.3
GDP in 2007 prices (in millions euros)	307.3	427.0	488.0	551.9	613.9	655.5	678.7	693.1	702.6	712.1	727.6
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	-0.7	-1.0	-0.8	-0.5	-0.6	-1.1	-1.5	-1.9	-1.5	-1.1
Population growth (working age:15-71)	0.2	0.0	-0.6	-0.7	-0.8	-0.6	-0.6	-0.9	-1.3	-1.6	-1.4
Labour force (thousands)	17257	17577	17124	16761	16303	15709	14928	13997	13013	12093	11335
Participation rate (15-64)	63.3	65.1	66.1	67.6	67.6	66.3	65.4	65.1	65.5	66.0	66.3
Participation rate (15-71)	59.3	60.4	59.6	60.3	61.1	60.9	59.5	58.0	57.2	57.1	58.0
young (15-24)	33.9	36.0	34.9	32.3	32.5	33.6	34.6	34.9	34.2	33.2	32.9
prime-age (25-54)	81.8	83.0	83.0	82.7	82.0	81.4	81.4	81.7	82.2	82.4	82.1
older (55-64)	32.1	35.5	34.9	41.8	48.1	48.4	47.9	46.6	46.2	45.9	46.5
oldest (65-71)	8.2	9.0	9.1	10.0	11.2	15.4	16.5	16.4	16.3	15.7	15.8
Employment rate (15-64)	57.1	61.3	62.2	63.6	63.6	62.4	61.5	61.2	61.7	62.1	62.4
Employment rate (15-71)	53.6	56.9	56.1	56.8	57.5	57.4	56.1	54.7	53.9	53.9	54.7
Unemployment rate (15-64)	9.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Employment (15-64) (in millions)	15.4	16.3	15.8	15.4	15.0	14.4	13.6	12.6	11.7	10.8	10.2
share of young (15-24)	11%	9%	7%	7%	7%	8%	8%	7%	7%	7%	7%
share of prime-age (25-54)	81%	80%	82%	82%	79%	76%	73%	73%	74%	76%	77%
share of older (55-64)	8%	11%	11%	11%	14%	17%	19%	20%	19%	17%	16%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	16.4	20.7	20.0	18.2	19.1	22.3	26.0	27.6	26.8	24.5	22.2
Old-age dependency ratio (2)	19	22	27	33	36	38	41	47	56	63	69
Total dependency ratio (3)	41	43	49	55	57	57	59	66	76	85	91
Total economic dependency ratio (4)	141	132	138	141	144	148	156	167	180	192	201
Economic old-age dependency ratio (15-64) (5)	31	34	42	49	54	58	64	73	85	97	106
Economic old-age dependency ratio (15-71) (6)	31	34	41	48	53	56	61	69	81	92	101

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Portugal	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.36	1.39	1.40	1.42	1.44	1.45	1.47	1.49	1.51	1.52	1.54
Life expectancy at birth											
males	75.8	77.1	78.0	78.8	79.7	80.5	81.2	82.0	82.7	83.4	84.1
females	82.4	83.4	84.1	84.7	85.4	86.0	86.6	87.1	87.7	88.3	88.8
Life expectancy at 65											
males	16.3	17.1	17.6	18.1	18.7	19.2	19.7	20.2	20.7	21.1	21.6
females	19.9	20.6	21.1	21.6	22.1	22.5	23.0	23.5	23.9	24.4	24.8
Net migration (thousand)	51.8	49.2	47.6	46.9	46.1	45.2	45.3	42.5	38.8	36.6	34.5
Net migration as % of population	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Population (million)	10.6	10.9	11.1	11.2	11.3	11.4	11.5	11.5	11.4	11.4	11.3
Young population (0-14) as % of total	15.3	15.1	14.5	13.8	13.3	13.0	13.0	13.0	13.0	12.9	12.8
Prime age population (25-54) as % of total	43.9	43.1	41.7	40.5	39.1	37.4	36.2	35.7	35.2	34.9	34.4
Working age population (15-64) as % of total	67.2	66.1	65.5	64.7	63.5	62.1	60.2	58.2	56.9	56.5	56.3
Elderly population (65 and over) as % of total	17.4	18.9	20.1	21.5	23.3	24.9	26.8	28.8	30.1	30.6	30.9
Very elderly population (80 and over) as % of total	4.2	5.2	5.8	6.1	6.8	7.6	8.4	9.5	10.5	11.6	12.8
Elderly population (55 and over) as % of working age pop.15-64	43.3	47.2	50.6	54.1	58.6	63.7	68.5	72.1	74.5	75.7	76.7
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	1.3	2.1	2.1	2.1	2.5	2.2	1.8	1.5	1.2	1.3	1.4
Employment (growth rate)	0.3	0.6	0.3	0.1	-0.1	-0.3	-0.4	-0.5	-0.5	-0.4	-0.3
Labour input : hours worked (growth rate)	0.2	0.6	0.3	0.1	-0.1	-0.3	-0.4	-0.5	-0.5	-0.4	-0.3
Labour productivity per hour (growth rate)	1.1	1.5	1.8	2.0	2.7	2.5	2.2	2.0	1.7	1.7	1.7
TFP (growth rate)	0.5	1.0	1.2	1.3	1.7	1.6	1.4	1.3	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.6	0.5	0.6	0.7	0.9	0.9	0.8	0.7	0.6	0.6	0.6
GDP per capita (growth rate)	1.0	1.7	1.8	1.9	2.4	2.1	1.7	1.5	1.3	1.5	1.6
GDP in 2007 prices (in millions euros)	162.8	189.1	209.3	231.6	258.3	290.4	319.7	346.8	370.8	395.1	423.0
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.2	0.2	0.1	-0.1	-0.3	-0.4	-0.6	-0.6	-0.4	-0.3	-0.2
Population growth (working age:15-71)	0.1	0.4	0.2	0.1	-0.1	-0.3	-0.3	-0.5	-0.6	-0.5	-0.3
Labour force (thousands)	5465	5729	5803	5843	5841	5786	5680	5547	5403	5291	5208
Participation rate (15-64)	74.1	76.1	76.1	76.3	76.4	76.5	76.4	76.5	76.6	76.4	76.3
Participation rate (15-71)	69.6	71.4	71.4	71.6	71.5	71.5	71.3	71.0	71.2	71.4	71.4
young (15-24)	42.3	41.7	40.8	41.7	41.7	42.2	42.1	41.7	41.4	41.4	41.6
prime-age (25-54)	87.8	88.9	89.1	89.2	89.0	89.0	89.1	89.1	89.1	89.0	89.0
older (55-64)	54.5	61.1	63.5	65.0	67.0	68.0	67.4	67.2	67.5	67.6	67.8
oldest (65-71)	25.2	28.7	31.1	33.8	36.1	37.4	38.8	38.9	38.6	38.6	38.7
Employment rate (15-64)	67.8	70.8	71.4	71.5	71.6	71.7	71.7	71.8	71.8	71.7	71.6
Employment rate (15-71)	63.8	66.7	67.2	67.4	67.4	67.4	67.2	67.0	67.1	67.3	67.3
Unemployment rate (15-64)	8.5	6.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	4.8	5.1	5.2	5.2	5.1	5.1	4.9	4.8	4.7	4.6	4.5
share of young (15-24)	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	9%
share of prime-age (25-54)	78%	77%	75%	74%	72%	70%	70%	72%	72%	72%	72%
share of older (55-64)	13%	15%	17%	18%	20%	21%	21%	20%	19%	19%	20%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.4	18.7	19.9	20.9	22.0	23.6	23.9	22.6	21.6	21.4	22.0
Old-age dependency ratio (2)	26	29	31	33	37	40	45	49	53	54	55
Total dependency ratio (3)	49	51	53	55	58	61	66	72	76	77	77
Total economic dependency ratio (4)	112	109	108	109	112	116	122	129	134	137	139
Economic old-age dependency ratio (15-64) (5)	33	35	37	40	43	47	53	58	63	66	67
Economic old-age dependency ratio (15-71) (6)	32	34	35	38	40	44	48	53	58	61	62

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Romania	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.32	1.35	1.37	1.39	1.41	1.42	1.44	1.46	1.48	1.50	1.52
Life expectancy at birth											
males	69.8	71.7	73.0	74.3	75.5	76.7	77.8	78.9	79.9	80.9	81.9
females	76.6	78.2	79.3	80.3	81.3	82.3	83.2	84.1	85.0	85.8	86.6
Life expectancy at 65											
males	13.6	14.5	15.2	15.9	16.6	17.2	17.9	18.5	19.2	19.8	20.4
females	16.3	17.3	18.0	18.7	19.4	20.0	20.7	21.4	22.0	22.6	23.2
Net migration (thousand)	-5.6	4.0	6.3	1.8	-0.8	11.4	12.9	14.1	12.7	9.4	3.9
Net migration as % of population	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Population (million)	21.4	21.1	20.8	20.5	20.0	19.6	19.2	18.7	18.1	17.6	16.9
Young population (0-14) as % of total	15.2	14.9	14.7	13.9	13.0	12.2	11.8	11.8	11.8	11.7	11.5
Prime age population (25-54) as % of total	44.2	45.1	45.6	43.5	41.4	39.0	37.2	34.5	33.6	33.2	32.8
Working age population (15-64) as % of total	69.9	69.4	67.9	66.7	66.8	64.9	62.6	59.7	57.3	54.3	53.6
Elderly population (65 and over) as % of total	14.9	15.6	17.4	19.4	20.3	22.9	25.5	28.5	30.9	34.0	35.0
Very elderly population (80 and over) as % of total	2.8	3.6	4.2	4.3	4.9	6.2	7.4	7.7	9.4	11.1	13.1
Elderly population (55 and over) as % of working age pop.15-64	37.2	41.4	43.3	48.3	52.6	59.5	66.0	75.0	80.3	85.7	87.7
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	6.4	3.9	2.9	2.2	1.6	1.8	1.1	0.6	0.3	0.6	0.3
Employment (growth rate)	0.2	-0.1	-0.5	-0.9	-1.1	-0.9	-1.6	-1.3	-1.4	-1.1	-1.4
Labour input : hours worked (growth rate)	1.0	-0.1	-0.5	-0.9	-1.1	-0.9	-1.6	-1.3	-1.4	-1.1	-1.4
Labour productivity per hour (growth rate)	5.4	4.0	3.4	3.0	2.7	2.7	2.7	2.0	1.7	1.7	1.7
TFP (growth rate)	2.5	1.9	1.8	1.8	1.8	1.8	1.8	1.3	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	2.9	2.1	1.6	1.3	1.0	1.0	1.0	0.7	0.6	0.6	0.6
GDP per capita (growth rate)	7.5	4.1	3.2	2.5	2.1	2.2	1.6	1.2	0.9	1.3	1.2
GDP in 2007 prices (in millions euros)	121.3	178.6	209.5	235.9	257.5	280.4	303.2	315.1	321.2	328.6	335.8
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	-0.1	-0.7	-0.8	-0.5	-0.3	-1.3	-1.4	-1.5	-1.4	-1.7	-0.9
Population growth (working age:15-71)	-0.2	-0.1	-0.3	-0.6	-0.7	-0.4	-1.5	-1.1	-1.4	-1.2	-1.6
Labour force (thousands)	9875	9833	9650	9288	8811	8386	7918	7375	6868	6446	6051
Participation rate (15-64)	63.0	64.7	64.8	64.2	62.4	61.4	60.8	60.7	60.5	61.3	61.3
Participation rate (15-71)	60.0	61.5	61.1	60.4	59.3	57.9	56.5	56.1	55.7	55.8	56.3
young (15-24)	30.6	32.4	31.3	30.9	31.2	31.8	32.1	32.0	31.5	31.2	31.3
prime-age (25-54)	78.9	78.1	77.1	76.0	75.3	74.9	74.7	75.0	75.2	75.2	75.1
older (55-64)	42.4	46.3	47.1	50.9	48.2	47.1	45.6	45.8	44.2	45.0	45.4
oldest (65-71)	27.8	26.2	28.9	30.4	31.6	32.5	30.8	30.6	29.8	29.9	29.4
Employment rate (15-64)	58.7	60.9	61.0	60.4	58.6	57.8	57.2	57.0	56.9	57.6	57.6
Employment rate (15-71)	56.1	58.0	57.6	57.0	56.0	54.7	53.4	53.0	52.6	52.8	53.2
Unemployment rate (15-64)	6.8	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Employment (15-64) (in millions)	8.8	8.9	8.6	8.2	7.9	7.4	6.9	6.4	5.9	5.5	5.2
share of young (15-24)	9%	7%	6%	6%	7%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	80%	79%	80%	78%	75%	74%	73%	72%	73%	75%	76%
share of older (55-64)	11%	14%	13%	16%	18%	19%	20%	21%	20%	18%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.9	18.9	17.7	19.2	22.3	24.1	25.3	27.2	26.3	23.0	22.5
Old-age dependency ratio (2)	21	23	26	29	30	35	41	48	54	63	65
Total dependency ratio (3)	43	44	47	50	50	54	60	68	75	84	87
Total economic dependency ratio (4)	135	131	135	140	147	157	167	180	193	205	210
Economic old-age dependency ratio (15-64) (5)	30	32	35	40	43	51	59	70	81	94	99
Economic old-age dependency ratio (15-71) (6)	29	31	33	37	41	47	54	64	74	84	91

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Slovenia	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.32	1.35	1.37	1.39	1.40	1.42	1.44	1.46	1.48	1.50	1.52
Life expectancy at birth											
males	74.7	76.1	77.1	78.0	78.9	79.8	80.6	81.4	82.2	83.0	83.7
females	81.9	83.0	83.7	84.4	85.1	85.8	86.4	87.0	87.6	88.2	88.8
Life expectancy at 65											
males	15.7	16.5	17.1	17.7	18.2	18.8	19.3	19.9	20.4	20.9	21.4
females	19.6	20.4	20.9	21.5	22.0	22.5	23.0	23.5	24.0	24.5	24.9
Net migration (thousand)	5.9	5.0	4.4	3.6	3.4	3.1	3.3	3.4	3.0	2.6	2.3
Net migration as % of population	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Population (million)	2.0	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.8
Young population (0-14) as % of total	13.9	14.0	14.2	13.6	12.8	12.2	12.1	12.4	12.8	12.9	12.8
Prime age population (25-54) as % of total	45.7	43.7	41.7	39.5	37.7	35.8	34.3	33.3	33.0	33.1	33.2
Working age population (15-64) as % of total	70.0	68.1	65.4	63.5	61.9	60.4	58.9	56.7	54.7	53.7	53.8
Elderly population (65 and over) as % of total	16.1	17.9	20.4	22.9	25.3	27.4	29.1	31.0	32.5	33.4	33.4
Very elderly population (80 and over) as % of total	3.5	4.8	5.4	6.0	6.7	8.4	9.9	11.0	12.0	12.7	13.9
Elderly population (55 and over) as % of working age pop.15-64	40.0	47.3	53.1	58.6	63.5	69.3	74.8	79.8	82.9	83.8	82.8
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	4.9	3.2	2.6	1.4	0.8	0.7	0.7	0.7	0.8	1.0	1.1
Employment (growth rate)	1.2	0.0	-0.5	-0.9	-0.9	-0.9	-1.0	-1.0	-0.9	-0.7	-0.6
Labour input : hours worked (growth rate)	1.2	0.0	-0.5	-0.9	-0.9	-1.0	-1.0	-1.0	-0.9	-0.7	-0.6
Labour productivity per hour (growth rate)	3.6	3.2	3.1	2.3	1.8	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.5	1.6	1.7	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	2.1	1.5	1.4	1.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	4.5	3.0	2.6	1.6	1.1	1.1	1.1	1.1	1.3	1.5	1.7
GDP in 2007 prices (in millions euros)	33.5	44.5	51.0	55.8	58.8	61.2	63.4	65.7	68.3	71.3	75.1
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.2	-0.5	-0.8	-0.7	-0.7	-0.7	-0.9	-1.2	-1.0	-0.7	-0.4
Population growth (working age:15-71)	0.2	-0.3	-0.4	-0.6	-0.7	-0.8	-0.9	-0.9	-1.0	-1.0	-0.8
Labour force (thousands)	1022	1024	1008	972	929	887	845	805	766	735	712
Participation rate (15-64)	71.4	72.5	73.4	72.6	71.7	71.2	70.8	71.0	71.6	72.0	71.9
Participation rate (15-71)	66.3	66.5	66.1	65.2	64.4	63.7	63.3	62.8	62.8	63.4	64.1
young (15-24)	40.9	41.9	40.8	39.2	40.1	41.0	41.4	41.3	40.6	40.0	40.1
prime-age (25-54)	89.3	89.2	89.1	89.1	88.5	88.2	88.4	88.7	89.0	89.0	88.7
older (55-64)	34.5	42.9	48.8	49.5	49.5	50.2	49.3	48.7	48.3	48.6	49.1
oldest (65-71)	12.4	7.3	11.6	15.2	16.2	16.0	16.3	16.3	15.8	15.7	15.3
Employment rate (15-64)	67.8	69.1	69.9	69.2	68.3	67.9	67.5	67.7	68.3	68.6	68.6
Employment rate (15-71)	63.1	63.4	63.1	62.2	61.5	60.8	60.5	60.0	60.0	60.6	61.2
Unemployment rate (15-64)	4.9	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Employment (15-64) (in millions)	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7
share of young (15-24)	10%	8%	8%	8%	9%	9%	9%	9%	9%	9%	9%
share of prime-age (25-54)	82%	79%	78%	77%	75%	74%	73%	74%	75%	76%	76%
share of older (55-64)	8%	13%	15%	16%	16%	17%	18%	18%	16%	15%	14%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.1	21.0	21.9	22.4	22.7	23.9	25.4	25.2	23.5	21.5	20.6
Old-age dependency ratio (2)	23	26	31	36	41	45	49	55	59	62	62
Total dependency ratio (3)	43	47	53	58	61	66	70	77	83	86	86
Total economic dependency ratio (4)	107	111	116	125	133	140	148	156	163	167	168
Economic old-age dependency ratio (15-64) (5)	32	37	42	49	56	63	69	76	83	87	87
Economic old-age dependency ratio (15-71) (6)	31	37	42	47	54	61	67	73	79	83	84

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Slovak Republic — Main demographic and macroeconomic assumptions

(BASELINE SCENARIO)

Budgetary Projection AWG - Population EUROPOP2008

Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.25	1.28	1.30	1.32	1.34	1.36	1.38	1.40	1.43	1.45	1.47
Life expectancy at birth											
males	70.9	72.6	73.8	74.9	76.0	77.1	78.2	79.2	80.2	81.1	82.0
females	78.7	80.0	81.0	81.8	82.7	83.5	84.4	85.2	85.9	86.7	87.4
Life expectancy at 65											
males	13.3	14.3	15.0	15.6	16.3	17.0	17.7	18.3	19.0	19.6	20.2
females	17.1	18.1	18.8	19.4	20.1	20.7	21.3	22.0	22.6	23.2	23.7
Net migration (thousand)	3.6	5.0	5.0	4.0	3.9	4.1	6.1	6.4	6.1	5.2	3.7
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	0.1
Population (million)	5.4	5.4	5.4	5.4	5.3	5.2	5.1	5.0	4.9	4.7	4.5
Young population (0-14) as % of total	15.8	14.7	14.6	13.9	12.9	11.9	11.3	11.2	11.3	11.3	11.1
Prime age population (25-54) as % of total	45.6	45.7	45.4	44.4	42.3	39.4	37.0	34.9	33.3	32.7	32.4
Working age population (15-64) as % of total	72.3	71.5	69.0	67.0	65.9	65.2	63.4	60.2	57.0	54.4	52.7
Elderly population (65 and over) as % of total	12.0	13.8	16.4	19.1	21.3	23.0	25.3	28.6	31.6	34.3	36.1
Very elderly population (80 and over) as % of total	2.6	3.0	3.2	3.7	4.7	6.4	7.8	8.7	9.3	10.8	13.2
Elderly population (55 and over) as % of working age pop.15-64	32.3	38.3	43.1	47.4	52.6	59.3	66.5	74.9	82.6	87.9	91.3
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	6.5	4.2	3.4	2.3	2.0	0.8	0.5	0.3	0.2	0.3	0.5
Employment (growth rate)	0.8	0.7	0.3	-0.7	-0.6	-1.1	-1.2	-1.4	-1.5	-1.4	-1.2
Labour input : hours worked (growth rate)	1.0	0.7	0.3	-0.7	-0.7	-1.1	-1.2	-1.4	-1.5	-1.4	-1.2
Labour productivity per hour (growth rate)	5.3	3.5	3.1	2.9	2.7	1.9	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	3.5	2.0	1.8	1.8	1.8	1.2	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.8	1.5	1.3	1.2	0.9	0.7	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	6.5	4.1	3.4	2.4	2.3	1.2	1.0	0.8	0.8	1.0	1.3
GDP in 2007 prices (in millions euros)	54.8	83.2	99.8	112.7	125.1	132.8	136.7	139.5	140.9	142.7	146.1
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.5	-0.4	-0.7	-0.6	-0.7	-0.7	-1.3	-1.6	-1.6	-1.4	-1.1
Population growth (working age:15-71)	0.6	0.0	-0.3	-0.6	-0.6	-0.6	-0.6	-1.0	-1.4	-1.5	-1.4
Labour force (thousands)	2679	2831	2830	2750	2659	2543	2399	2246	2082	1935	1818
Participation rate (15-64)	68.8	71.8	72.9	73.4	72.8	71.6	70.5	70.4	70.4	70.7	71.2
Participation rate (15-71)	64.5	67.0	67.7	67.4	67.2	66.2	64.6	63.1	62.5	62.5	63.1
young (15-24)	34.8	37.7	35.9	33.8	34.3	35.2	35.9	36.1	35.4	34.6	34.5
prime-age (25-54)	87.5	87.6	87.9	87.9	87.8	87.4	87.1	87.1	87.3	87.5	87.5
older (55-64)	39.4	49.6	50.3	53.4	55.1	55.4	53.8	53.1	52.6	51.8	52.8
oldest (65-71)	2.2	12.6	22.7	20.4	22.7	23.6	24.1	23.8	23.3	23.1	22.9
Employment rate (15-64)	61.2	65.6	68.4	68.8	68.3	67.2	66.2	66.0	66.0	66.3	66.8
Employment rate (15-71)	57.3	61.3	63.6	63.3	63.1	62.2	60.8	59.3	58.8	58.8	59.4
Unemployment rate (15-64)	11.1	8.6	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Employment (15-64) (in millions)	2.4	2.5	2.6	2.5	2.4	2.3	2.1	2.0	1.8	1.7	1.6
share of young (15-24)	10%	8%	7%	6%	7%	7%	7%	7%	7%	7%	7%
share of prime-age (25-54)	81%	78%	80%	80%	78%	74%	72%	72%	73%	75%	76%
share of older (55-64)	9%	13%	14%	14%	16%	19%	21%	21%	21%	19%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	15.7	19.1	19.3	18.9	20.3	24.0	26.5	27.3	27.1	25.0	22.8
Old-age dependency ratio (2)	17	19	24	28	32	35	40	48	55	63	68
Total dependency ratio (3)	38	40	45	49	52	53	58	66	75	84	90
Total economic dependency ratio (4)	126	111	108	113	118	124	133	145	158	170	177
Economic old-age dependency ratio (15-64) (5)	27	28	31	38	43	48	55	65	77	88	96
Economic old-age dependency ratio (15-71) (6)	27	27	30	36	41	46	52	61	72	82	90

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Finland	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Life expectancy at birth											
males	76.1	77.4	78.3	79.1	79.9	80.7	81.5	82.2	83.0	83.7	84.3
females	83.0	84.0	84.7	85.3	85.9	86.5	87.1	87.7	88.2	88.8	89.3
Life expectancy at 65											
males	16.6	17.4	17.9	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.8
females	20.7	21.3	21.8	22.3	22.8	23.2	23.7	24.1	24.5	25.0	25.4
Net migration (thousand)	9.7	9.5	7.8	6.6	5.8	4.6	4.8	4.9	4.9	5.0	4.5
Net migration as % of population	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Population (million)	5.3	5.4	5.5	5.5	5.6	5.6	5.5	5.5	5.4	5.4	5.4
Young population (0-14) as % of total	16.9	16.4	16.6	16.6	16.3	15.9	15.6	15.6	15.7	15.8	15.7
Prime age population (25-54) as % of total	40.0	37.9	36.9	35.9	35.6	35.3	34.9	34.9	34.6	34.6	34.6
Working age population (15-64) as % of total	66.6	63.4	61.0	59.3	58.2	57.7	58.2	58.0	57.5	57.1	56.4
Elderly population (65 and over) as % of total	16.5	20.1	22.4	24.1	25.5	26.4	26.2	26.4	26.8	27.1	27.8
Very elderly population (80 and over) as % of total	4.3	5.1	5.6	6.2	8.2	9.4	10.1	10.6	10.8	10.5	10.8
Elderly population (55 and over) as % of working age pop.15-64	46.1	53.3	58.3	61.9	63.5	65.1	65.6	66.2	67.7	68.3	69.0
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	3.4	1.9	1.7	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.5
Employment (growth rate)	1.2	-0.1	-0.1	-0.3	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2
Labour input : hours worked (growth rate)	0.8	-0.1	-0.1	-0.3	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2
Labour productivity per hour (growth rate)	2.5	2.0	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	2.0	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.5	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	3.0	1.6	1.5	1.3	1.4	1.7	1.7	1.7	1.6	1.5	1.6
GDP in 2007 prices (in millions euros)	178.8	217.5	238.1	256.9	276.0	298.1	322.8	349.2	375.8	403.4	433.8
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.0	-0.6	-0.5	-0.3	-0.3	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3
Population growth (working age:15-71)	0.5	0.3	-0.6	-0.4	-0.3	-0.3	-0.2	0.0	-0.2	-0.3	-0.1
Labour force (thousands)	2690	2697	2691	2658	2621	2605	2595	2580	2552	2516	2487
Participation rate (15-64)	75.8	77.0	78.4	78.5	78.6	78.9	78.8	78.9	79.1	79.0	79.1
Participation rate (15-71)	69.8	68.7	69.7	70.5	70.7	71.1	71.8	71.6	71.3	71.2	71.0
young (15-24)	54.4	56.8	56.0	55.1	55.3	55.5	55.7	56.0	56.0	55.7	55.5
prime-age (25-54)	88.1	88.8	89.2	89.5	89.8	89.9	90.1	90.0	90.1	90.1	90.1
older (55-64)	59.4	61.9	66.5	67.0	66.1	67.9	67.8	67.8	68.5	67.5	67.7
oldest (65-71)	8.6	9.5	12.6	15.6	16.4	15.9	15.9	16.6	16.5	16.3	16.5
Employment rate (15-64)	70.5	72.5	73.8	73.9	74.0	74.4	74.2	74.3	74.5	74.4	74.6
Employment rate (15-71)	65.0	64.8	65.8	66.5	66.7	67.1	67.7	67.6	67.3	67.1	67.1
Unemployment rate (15-64)	7.0	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Employment (15-64) (in millions)	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3
share of young (15-24)	12%	13%	12%	12%	12%	13%	13%	12%	12%	12%	12%
share of prime-age (25-54)	72%	70%	70%	70%	71%	71%	70%	70%	69%	70%	71%
share of older (55-64)	16%	18%	18%	18%	17%	17%	18%	18%	18%	18%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	21.3	21.6	21.5	21.3	19.7	19.4	20.6	20.7	21.1	20.8	19.7
Old-age dependency ratio (2)	25	32	37	41	44	46	45	46	47	48	49
Total dependency ratio (3)	50	58	64	69	72	73	72	72	74	75	77
Total economic dependency ratio (4)	110	115	120	125	129	130	129	129	130	132	134
Economic old-age dependency ratio (15-64) (5)	34	42	47	52	56	58	58	58	59	61	63
Economic old-age dependency ratio (15-71) (6)	33	41	46	50	54	57	56	57	58	59	61

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Sweden	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85
Life expectancy at birth											
males	79.0	79.9	80.6	81.3	81.9	82.5	83.1	83.7	84.3	84.9	85.4
females	83.1	84.1	84.7	85.4	86.0	86.6	87.2	87.7	88.3	88.8	89.3
Life expectancy at 65											
males	17.4	18.1	18.6	19.0	19.5	20.0	20.4	20.9	21.3	21.7	22.2
females	20.5	21.2	21.7	22.2	22.6	23.1	23.6	24.0	24.4	24.9	25.3
Net migration (thousand)	46.8	33.3	26.9	22.6	20.2	18.1	17.2	16.7	16.7	18.2	15.8
Net migration as % of population	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Population (million)	9.2	9.6	9.9	10.1	10.3	10.4	10.5	10.6	10.7	10.8	10.9
Young population (0-14) as % of total	16.8	17.0	17.4	17.5	17.3	16.8	16.2	16.1	16.3	16.5	16.5
Prime age population (25-54) as % of total	39.4	39.1	39.2	37.6	36.5	36.5	36.5	36.0	35.2	35.5	35.6
Working age population (15-64) as % of total	65.7	63.1	61.8	60.9	60.2	59.6	59.5	59.5	59.0	58.0	56.9
Elderly population (65 and over) as % of total	17.5	19.9	20.8	21.6	22.5	23.6	24.3	24.4	24.7	25.5	26.6
Very elderly population (80 and over) as % of total	5.3	5.2	5.4	6.3	7.6	8.1	8.4	8.8	9.5	10.0	10.0
Elderly population (55 and over) as % of working age pop.15-64	46.9	50.2	52.8	55.5	57.7	58.8	59.5	61.0	63.4	64.1	65.0
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	3.5	2.2	1.9	1.9	1.7	1.8	1.9	1.8	1.7	1.6	1.7
Employment (growth rate)	1.7	0.4	0.1	0.2	0.1	0.1	0.2	0.2	0.0	-0.1	0.0
Labour input : hours worked (growth rate)	1.6	0.4	0.1	0.2	0.0	0.1	0.2	0.1	0.0	-0.1	0.0
Labour productivity per hour (growth rate)	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.6	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.3	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.8	1.6	1.4	1.4	1.4	1.6	1.7	1.6	1.5	1.4	1.5
GDP in 2007 prices (in millions euros)	332.0	403.3	445.4	489.1	534.9	584.2	639.4	701.8	765.9	830.3	899.7
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.0	-0.1	0.2	0.2	-0.1	0.2	0.1	0.1	0.0	-0.2	0.0
Population growth (working age:15-71)	1.2	0.1	0.0	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.0
Labour force (thousands)	4811	5121	5163	5203	5232	5254	5290	5342	5361	5338	5317
Participation rate (15-64)	79.2	81.9	82.2	82.0	81.9	81.9	82.0	82.3	82.4	82.2	82.5
Participation rate (15-71)	73.3	74.5	75.4	75.5	75.2	74.7	75.1	75.6	75.8	75.1	74.6
young (15-24)	51.8	60.1	56.3	55.7	56.6	56.3	56.7	57.5	57.4	56.7	56.5
prime-age (25-54)	90.0	90.7	91.3	91.7	91.9	92.0	92.1	92.1	92.2	92.2	92.2
older (55-64)	73.2	75.0	75.5	75.9	75.5	75.7	76.0	76.8	77.1	75.5	76.6
oldest (65-71)	12.9	20.0	21.3	22.0	22.3	22.0	22.2	22.0	22.3	22.8	22.2
Employment rate (15-64)	74.3	77.0	77.3	77.1	77.0	77.0	77.1	77.4	77.5	77.4	77.6
Employment rate (15-71)	68.8	70.2	71.1	71.1	70.9	70.4	70.7	71.2	71.4	70.7	70.3
Unemployment rate (15-64)	6.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Employment (15-64) (in millions)	4.4	4.7	4.7	4.7	4.8	4.8	4.8	4.9	4.9	4.8	4.8
share of young (15-24)	11%	13%	10%	11%	12%	12%	12%	12%	11%	11%	12%
share of prime-age (25-54)	70%	70%	72%	70%	69%	70%	70%	69%	68%	70%	71%
share of older (55-64)	19%	18%	18%	19%	19%	18%	18%	19%	21%	19%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	20.2	18.7	19.1	20.1	20.2	19.2	18.7	19.9	21.5	20.1	18.3
Old-age dependency ratio (2)	27	32	34	35	37	40	41	41	42	44	47
Total dependency ratio (3)	52	58	62	64	66	68	68	68	70	72	76
Total economic dependency ratio (4)	102	102	106	109	112	114	114	114	115	119	122
Economic old-age dependency ratio (15-64) (5)	34	37	40	42	45	47	49	49	50	53	56
Economic old-age dependency ratio (15-71) (6)	33	36	39	41	43	46	47	48	49	51	53

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

United-Kingdom	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Life expectancy at birth											
males	77.4	78.6	79.4	80.2	80.9	81.7	82.4	83.1	83.8	84.4	85.0
females	81.5	82.7	83.5	84.2	85.0	85.7	86.4	87.0	87.7	88.3	88.9
Life expectancy at 65											
males	16.9	17.6	18.2	18.7	19.2	19.7	20.3	20.7	21.2	21.7	22.1
females	19.5	20.3	20.9	21.5	22.1	22.6	23.1	23.6	24.1	24.6	25.1
Net migration (thousand)	188.2	174.3	165.7	158.0	150.9	144.3	138.0	131.8	126.3	122.2	113.6
Net migration as % of population	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Population (million)	61.3	63.8	65.7	67.5	69.2	70.7	72.0	73.3	74.5	75.6	76.7
Young population (0-14) as % of total	17.5	17.3	17.7	17.8	17.6	17.2	16.8	16.6	16.6	16.6	16.6
Prime age population (25-54) as % of total	41.1	41.2	40.4	39.1	38.2	38.5	38.1	37.4	36.8	36.7	36.7
Working age population (15-64) as % of total	66.4	65.1	64.0	63.1	61.8	60.9	60.8	61.0	60.5	59.5	58.7
Elderly population (65 and over) as % of total	16.1	17.6	18.3	19.2	20.5	21.9	22.4	22.4	23.0	23.9	24.7
Very elderly population (80 and over) as % of total	4.5	4.8	5.0	5.3	6.3	6.7	7.3	8.1	8.9	9.1	9.0
Elderly population (55 and over) as % of working age pop.15-64	42.1	44.6	47.6	50.4	52.5	53.4	54.6	56.2	58.2	59.8	60.6
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.7	2.4	2.0	2.0	2.1	2.1	2.1	2.1	1.9	1.8	1.8
Employment (growth rate)	0.7	0.5	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.1	0.1
Labour input : hours worked (growth rate)	0.2	0.5	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.1	0.1
Labour productivity per hour (growth rate)	2.5	1.9	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	1.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	1.1	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.2	1.8	1.4	1.5	1.6	1.7	1.8	1.8	1.6	1.5	1.5
GDP in 2007 prices (in millions euros)	2018.8	2461.5	2738.2	3030.0	3351.7	3710.6	4121.4	4584.2	5056.1	5526.5	6028.1
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.1	0.2	0.3	0.2	0.0	0.2	0.4	0.3	0.0	0.0	0.1
Population growth (working age:15-71)	1.0	0.4	0.0	0.4	0.3	0.2	0.1	0.2	0.4	0.2	0.0
Labour force (thousands)	31044	32639	33138	33641	34241	34841	35614	36472	36993	37153	37235
Participation rate (15-64)	75.6	76.9	77.2	77.0	77.5	78.0	78.5	78.6	78.6	78.6	78.7
Participation rate (15-71)	70.4	70.7	71.1	71.1	71.1	71.5	72.6	73.7	73.4	72.9	72.8
young (15-24)	62.0	63.8	63.1	62.1	62.4	62.3	62.6	62.9	62.8	62.5	62.4
prime-age (25-54)	84.5	84.9	85.1	85.4	85.7	85.8	85.8	85.8	85.8	85.9	85.9
older (55-64)	59.7	62.6	64.1	64.7	65.8	67.6	70.3	71.3	71.3	71.0	71.1
oldest (65-71)	13.8	15.1	15.5	17.3	20.2	21.7	23.7	28.0	30.1	30.4	29.9
Employment rate (15-64)	71.5	72.7	73.0	72.9	73.2	73.8	74.2	74.3	74.3	74.3	74.4
Employment rate (15-71)	66.6	66.9	67.3	67.3	67.3	67.7	68.8	69.8	69.5	69.1	69.0
Unemployment rate (15-64)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Employment (15-64) (in millions)	28.9	30.2	30.7	31.0	31.4	31.8	32.5	33.2	33.5	33.4	33.5
share of young (15-24)	15%	14%	13%	13%	14%	14%	14%	14%	14%	13%	14%
share of prime-age (25-54)	71%	71%	71%	70%	69%	70%	70%	68%	68%	68%	69%
share of older (55-64)	14%	15%	16%	17%	17%	16%	16%	18%	19%	18%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.9	17.5	19.0	20.1	19.3	17.5	17.7	19.5	20.2	19.6	18.5
Old-age dependency ratio (2)	24	27	29	30	33	36	37	37	38	40	42
Total dependency ratio (3)	51	54	56	59	62	64	64	64	65	68	70
Total economic dependency ratio (4)	108	109	112	115	117	118	118	116	118	121	123
Economic old-age dependency ratio (15-64) (5)	32	35	36	39	42	45	46	45	46	48	51
Economic old-age dependency ratio (15-71) (6)	31	34	36	38	40	43	44	43	44	46	48

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Norway	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.90	1.90	1.90	1.90	1.89	1.89	1.89	1.89	1.89	1.89	1.88
Life expectancy at birth											
males	78.4	79.4	80.1	80.8	81.5	82.2	82.8	83.5	84.1	84.7	85.2
females	82.9	83.8	84.5	85.2	85.8	86.4	87.0	87.6	88.1	88.7	89.2
Life expectancy at 65											
males	17.3	18.0	18.5	19.0	19.5	19.9	20.4	20.8	21.3	21.7	22.1
females	20.4	21.1	21.6	22.1	22.6	23.0	23.5	23.9	24.4	24.8	25.2
Net migration (thousand)	22.4	17.5	15.2	13.5	12.4	11.6	11.0	10.6	10.3	10.1	9.6
Net migration as % of population	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	4.7	5.0	5.2	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.0
Young population (0-14) as % of total	19.2	18.2	18.0	17.9	17.8	17.5	17.2	16.9	16.7	16.7	16.7
Prime age population (25-54) as % of total	41.5	40.2	39.6	38.3	37.0	36.6	36.4	36.1	35.7	35.4	35.4
Working age population (15-64) as % of total	66.2	65.1	63.9	62.5	61.2	59.9	59.0	59.0	58.9	58.5	57.9
Elderly population (65 and over) as % of total	14.6	16.7	18.1	19.6	21.0	22.6	23.8	24.1	24.4	24.8	25.4
Very elderly population (80 and over) as % of total	4.6	4.4	4.4	5.0	6.3	7.1	7.8	8.4	9.3	9.9	10.0
Elderly population (55 and over) as % of working age pop.15-64	40.3	44.0	47.3	51.4	55.0	57.4	58.9	59.9	61.3	62.6	63.5
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	6.0	2.1	2.0	1.9	1.7	1.7	1.9	1.9	1.9	1.8	1.8
Employment (growth rate)	3.8	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1
Labour input : hours worked (growth rate)	3.9	0.4	0.3	0.2	0.0	0.0	0.2	0.2	0.2	0.1	0.1
Labour productivity per hour (growth rate)	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	2.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
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)	5.1	1.3	1.3	1.2	1.2	1.3	1.5	1.6	1.6	1.5	1.5
GDP in 2007 prices (in millions euros)	214.1	253.9	280.4	308.0	336.4	366.4	400.6	440.1	483.8	529.4	577.5
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	1.3	0.4	0.3	0.2	0.1	0.0	0.1	0.3	0.2	0.0	0.0
Population growth (working age:15-71)	1.3	0.7	0.2	0.3	0.2	0.2	0.1	0.1	0.3	0.2	0.1
Labour force (thousands)	2481	2616	2658	2685	2699	2704	2720	2751	2782	2798	2806
Participation rate (15-64)	78.8	78.3	78.3	78.2	77.9	77.8	78.0	78.0	78.0	77.9	78.0
Participation rate (15-71)	74.5	72.2	72.1	71.7	71.2	70.6	70.6	71.2	71.4	71.1	70.7
young (15-24)	58.8	60.8	61.0	60.3	60.5	60.2	60.2	60.5	60.7	60.6	60.5
prime-age (25-54)	87.4	87.4	87.3	87.2	87.3	87.4	87.4	87.4	87.4	87.4	87.5
older (55-64)	69.9	66.7	66.4	67.2	66.3	65.0	65.6	66.2	66.5	65.8	65.6
oldest (65-71)	18.9	18.3	17.6	17.4	17.5	17.7	17.0	16.9	17.1	17.5	17.1
Employment rate (15-64)	76.8	75.1	75.1	74.9	74.7	74.6	74.8	74.8	74.8	74.7	74.8
Employment rate (15-71)	72.6	69.2	69.1	68.8	68.3	67.8	67.8	68.3	68.5	68.2	67.8
Unemployment rate (15-64)	2.5	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Employment (15-64) (in millions)	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6
share of young (15-24)	13%	14%	14%	13%	13%	14%	14%	14%	14%	14%	14%
share of prime-age (25-54)	70%	70%	70%	69%	68%	69%	70%	69%	69%	69%	69%
share of older (55-64)	16%	16%	17%	18%	18%	17%	16%	17%	17%	18%	17%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	18.2	18.4	19.0	20.0	20.7	19.6	18.7	19.0	19.9	20.2	19.6
Old-age dependency ratio (2)	22	26	28	31	34	38	40	41	41	42	44
Total dependency ratio (3)	51	54	56	60	63	67	69	70	70	71	73
Total economic dependency ratio (4)	98	102	105	110	115	120	123	123	124	126	128
Economic old-age dependency ratio (15-64) (5)	27	31	35	39	43	47	50	51	52	53	55
Economic old-age dependency ratio (15-71) (6)	26	30	34	38	41	45	49	50	51	52	53

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

European Union	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.52	1.53	1.55	1.56	1.57	1.58	1.59	1.61	1.62	1.63	1.64
Life expectancy at birth											
males	76.0	77.4	78.3	79.2	80.0	80.8	81.6	82.4	83.1	83.8	84.5
females	82.1	83.2	83.9	84.6	85.3	86.0	86.7	87.3	87.9	88.4	89.0
Life expectancy at 65											
males	16.5	17.3	17.8	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.8
females	20.0	20.7	21.2	21.8	22.3	22.8	23.3	23.8	24.3	24.7	25.1
Net migration (thousand)	1683.9	1404.8	1252.8	1144.7	1093.1	1043.8	1005.5	977.3	924.3	888.8	803.5
Net migration as % of population	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	495.4	507.7	513.8	517.8	519.9	520.7	520.1	518.4	515.3	511.0	505.7
Young population (0-14) as % of total	15.7	15.5	15.4	15.0	14.5	14.1	14.0	14.0	14.1	14.1	14.0
Prime age population (25-54) as % of total	43.0	42.1	40.8	39.0	37.7	36.8	36.0	35.2	34.7	34.5	34.4
Working age population (15-64) as % of total	67.3	65.9	64.6	63.3	61.9	60.4	59.2	58.1	57.1	56.4	56.0
Elderly population (65 and over) as % of total	17.1	18.6	20.1	21.7	23.6	25.4	26.8	27.9	28.8	29.6	30.0
Very elderly population (80 and over) as % of total	4.4	5.2	5.7	6.1	6.9	7.9	8.9	10.0	11.0	11.7	12.1
Elderly population (55 and over) as % of working age pop.15-64	43.0	47.5	51.6	55.9	59.9	63.7	67.2	70.2	72.4	73.6	74.1
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.7	2.3	2.1	1.8	1.7	1.5	1.4	1.4	1.3	1.4	1.4
Employment (growth rate)	1.2	0.4	0.0	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3
Labour input : hours worked (growth rate)	1.0	0.3	0.0	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3
Labour productivity per hour (growth rate)	1.7	2.0	2.1	2.0	1.9	1.8	1.8	1.7	1.7	1.7	1.7
TFP (growth rate)	1.0	1.2	1.3	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.7	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	2.2	2.0	1.9	1.6	1.6	1.5	1.4	1.5	1.5	1.6	1.7
GDP in 2007 prices (in millions euros)	12294.8	14891.5	16561.9	18150.7	19692.0	21194.2	22678.1	24223.2	25837.0	27575.0	29524.6
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4	-0.5	-0.4	-0.4	-0.2
Population growth (working age:15-71)	0.4	0.2	-0.1	-0.1	-0.2	-0.3	-0.5	-0.4	-0.4	-0.4	-0.4
Labour force (thousands)	237271	247518	248181	246248	243286	239527	235076	230616	226017	221634	218053
Participation rate (15-64)	70.6	72.7	73.2	73.2	73.4	73.6	73.7	73.9	73.9	74.0	74.1
Participation rate (15-71)	65.0	66.7	66.7	66.5	66.3	66.2	66.4	66.6	66.6	66.7	66.8
young (15-24)	44.6	46.9	46.0	45.4	45.7	46.3	46.8	47.1	46.9	46.6	46.6
prime-age (25-54)	84.5	85.3	85.5	85.7	85.7	85.7	85.8	85.9	86.0	86.0	86.0
older (55-64)	47.5	53.9	56.9	59.3	60.8	61.5	61.8	61.9	62.0	62.0	62.5
oldest (65-71)	8.7	11.2	13.0	14.3	15.6	17.0	17.4	18.1	18.5	19.0	18.7
Employment rate (15-64)	65.5	68.2	69.0	69.1	69.2	69.4	69.5	69.6	69.7	69.8	69.9
Employment rate (15-71)	60.3	62.6	62.9	62.8	62.6	62.5	62.7	63.0	62.9	63.0	63.1
Unemployment rate (15-64)	7.2	6.2	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Employment (15-64) (in millions)	217.4	228.4	229.1	226.5	222.7	218.3	214.1	209.8	205.3	201.0	198.0
share of young (15-24)	11%	10%	9%	10%	10%	10%	10%	10%	10%	10%	10%
share of prime-age (25-54)	77%	75%	74%	73%	72%	71%	71%	71%	71%	72%	72%
share of older (55-64)	12%	14%	16%	18%	18%	18%	19%	19%	19%	18%	18%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.6	19.2	20.5	21.6	21.9	21.7	21.8	22.2	22.0	21.1	20.6
Old-age dependency ratio (2)	25	28	31	34	38	42	45	48	50	52	53
Total dependency ratio (3)	49	52	55	58	62	65	69	72	75	77	79
Total economic dependency ratio (4)	124	120	122	126	130	135	139	143	146	149	151
Economic old-age dependency ratio (15-64) (5)	37	39	42	47	51	57	61	65	68	70	72
Economic old-age dependency ratio (15-71) (6)	36	39	42	45	50	55	59	62	65	68	69

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

Euro Area	Main demographic and macroeconomic assumptions										
	(BASELINE SCENARIO)										
	Budgetary Projection AWG - Population EUROPOP2008										
Demographic assumptions	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Fertility rate	1.55	1.57	1.58	1.59	1.60	1.61	1.62	1.63	1.64	1.65	1.66
Life expectancy at birth											
males	77.0	78.2	79.0	79.8	80.6	81.3	82.1	82.8	83.4	84.1	84.7
females	82.5	83.6	84.3	84.9	85.6	86.2	86.8	87.4	88.0	88.6	89.1
Life expectancy at 65											
males	16.8	17.5	18.0	18.6	19.1	19.6	20.1	20.5	21.0	21.5	21.9
females	20.1	20.9	21.4	21.9	22.4	22.9	23.3	23.8	24.3	24.7	25.1
Net migration (thousand)	1418.3	1120.9	980.1	906.6	873.0	810.9	755.7	731.4	686.9	670.9	623.0
Net migration as % of population	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Population (million)	319.5	329.5	334.1	337.1	339.1	340.2	340.4	339.4	337.3	334.2	330.6
Young population (0-14) as % of total	15.4	15.3	15.0	14.6	14.2	13.9	13.8	13.9	13.9	13.9	13.9
Prime age population (25-54) as % of total	43.3	41.8	40.0	38.0	36.7	35.9	35.3	34.8	34.4	34.4	34.2
Working age population (15-64) as % of total	66.5	65.2	64.2	63.0	61.2	59.4	58.0	57.0	56.3	56.0	56.0
Elderly population (65 and over) as % of total	18.1	19.5	20.8	22.5	24.6	26.7	28.2	29.1	29.7	30.1	30.1
Very elderly population (80 and over) as % of total	4.8	5.7	6.3	6.7	7.4	8.3	9.3	10.7	11.9	12.5	12.8
Elderly population (55 and over) as % of working age pop.15-64	44.7	49.3	53.7	58.5	63.0	67.1	70.5	72.8	74.2	74.7	74.8
Macroeconomic assumptions*	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Potential GDP (growth rate)	2.2	2.2	2.0	1.6	1.5	1.4	1.3	1.3	1.4	1.4	1.5
Employment (growth rate)	1.2	0.5	0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2
Labour input : hours worked (growth rate)	0.9	0.5	0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4	-0.3	-0.2
Labour productivity per hour (growth rate)	1.3	1.7	1.9	1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.7
TFP (growth rate)	0.7	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Capital deepening (contribution to labour productivity growth)	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
GDP per capita (growth rate)	1.6	1.8	1.8	1.5	1.4	1.3	1.3	1.4	1.5	1.6	1.7
GDP in 2007 prices (in millions euros)	8911.2	10554.4	11710.1	12784.4	13803.7	14796.1	15783.1	16832.3	17980.2	19248.5	20673.1
Labour force assumptions	2007	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Population growth (working age:15-64)	0.4	0.0	-0.1	-0.3	-0.5	-0.5	-0.4	-0.4	-0.3	-0.3	-0.2
Population growth (working age:15-71)	0.4	0.3	0.0	0.0	-0.2	-0.4	-0.5	-0.4	-0.3	-0.3	-0.3
Labour force (thousands)	152129	159834	161011	159916	157896	155191	152006	148930	146160	143753	141853
Participation rate (15-64)	70.8	73.3	73.8	73.9	74.3	74.7	74.9	74.9	74.7	74.6	74.5
Participation rate (15-71)	64.8	66.8	66.9	66.6	66.3	66.5	66.9	67.1	67.0	67.0	67.0
young (15-24)	45.3	46.2	45.0	44.8	45.0	45.6	45.7	45.6	45.2	44.9	44.9
prime-age (25-54)	84.5	86.2	87.1	87.2	87.1	87.1	87.0	87.2	87.0	87.1	87.1
older (55-64)	45.4	54.1	57.6	60.3	62.9	63.6	64.1	63.7	63.7	63.3	63.1
oldest (65-71)	6.7	9.2	11.4	12.7	13.9	15.4	15.6	15.7	15.9	16.1	15.9
Employment rate (15-64)	65.5	68.6	69.5	69.6	70.0	70.3	70.5	70.5	70.4	70.3	70.1
Employment rate (15-71)	59.9	62.5	63.1	62.8	62.5	62.7	63.1	63.3	63.2	63.2	63.2
Unemployment rate (15-64)	7.5	6.5	5.9	5.9	5.9	5.8	5.8	5.8	5.8	5.8	5.8
Employment (15-64) (in millions)	139.4	147.3	148.8	147.2	144.5	141.4	138.6	135.9	133.3	131.1	129.5
share of young (15-24)	10%	10%	9%	9%	10%	10%	10%	10%	10%	10%	10%
share of prime-age (25-54)	78%	76%	74%	72%	71%	71%	71%	71%	72%	72%	72%
share of older (55-64)	11%	15%	17%	19%	19%	19%	19%	19%	18%	18%	18%
Dependency ratios:	2008	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Share of older population (55-64) (1)	17.6	19.4	21.3	22.8	22.8	22.1	21.9	21.8	21.4	21.0	20.9
Old-age dependency ratio (2)	27	30	32	36	40	45	49	51	53	54	54
Total dependency ratio (3)	50	53	56	59	63	68	72	75	77	79	79
Total economic dependency ratio (4)	126	122	122	126	131	137	142	146	149	151	151
Economic old-age dependency ratio (15-64) (5)	40	42	45	49	54	60	65	69	71	73	73
Economic old-age dependency ratio (15-71) (6)	39	41	44	48	53	58	63	67	69	70	71

LEGENDA:

*** The potential GDP and its components is used to estimate the rate of potential output growth, net off 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 15-64

(5) Economic old-age dependency ratio (15-64) = Inactive population aged 65+ as % of employed population 15-64

(6) Economic old-age dependency ratio (15-71) = Inactive population aged 65+ as % of employed population 15-71

Source : Eurostat (EUROPOP2008), Commission Services (DG ECFIN), EPC (AWG).

REFERENCES

Australian Productivity Commission (2005), '*Economic Implications of an Ageing Australia',* Research Report, Canberra, Australia.

Baldacci E. and D. Tuzi, (2003), '*Demographic trends and pension system in Italy: an assessment of 1990s reforms'*, in Labour, No. 17, vol.17, special issue.

Barro, R.J. and X. Sala-i-Martin (1995), '*Economic Growth'.* McGraw-Hill, USA.

Booth H., Maindonald J. and Smith L. (2002), *"Applying Lee-Carter under conditions of variable mortality decline",* Population Studies, 56:325-336.

Brugiavini A. and F. Peracchi (2005), *"Fiscal implications of pension reforms in Italy"*, in Gruber J; and D; A. Wise (editors)(2005), *"Social Security Programs and Retirement around the World: Fiscal Implications"*, NBER Website. 26 July 2005.

Brugiavini A. and F. Peracchi (2003), "*Wealth and Retirement decisions*", Labour, Volume 17, Special Issue, Blackwell Publishing.

Burniaux J., M., R. Duval and F. Jaumotte (2003), '*Coping with ageing: a dynamic approach to quantify the impact of alternative policy options on future labour supply in OECD countries'*, OECD Economic Department WP. N. 371.

Börsch-Supan A. (2003), '*Labor market effects of population aging'*, Labour, Volume 17, Special Issue, Blackwell Publishing.

Carone G. (2005): *'Long-term labour force projections for the EU25 Member States: a set of data for assessing the impact of ageing'*, DG ECFIN, European Economy, *Economic Papers No. 235*.

Carone G., D. Costello, N. Diez Guardia, G. Mourre, B. Przywara, A. Salomaki (2005), *'The economic impact of ageing populations in the EU25 Member States'*, DG ECFIN, European Economy, *Economic Papers No. 236*.

Carone G., Denis C., McMorrow K., Mourre G. and W. Röger (2006), "*Long-term labour productivity and GDP projections for the EU25 Member States: a production function framework"*, DG ECFIN, European Economy, *Economic Papers, No. 253.*

Denis C., D. Grenouilleau, K. Mc Morrow and W. Röger (2006): *'Calculating potential growth rates and output gaps – A revised production function approach'*, DG ECFIN, European Economy, *Economic Papers No. 247*.

Downes, J., A. Drew and P. Ollivaud (2003), *'The OECD medium-term reference scenario: economic outlook'*, OECD Economics Department Working Papers, No. 372, Paris.

Duval R. (2003), *'The retirement effects of old-age pension and early retirement schemes in OECD countries'*, OECD Economic Department WP. N. 370.

Economic Policy Committee (2001), '*Budgetary challenges posed by ageing populations*', EPC/ECFIN/655/01-EN of 24 October 2001.

Economic Policy Committee (2003a), '*The impact of ageing populations on public finances: overview of analysis carried out at EU level and proposals for a future work programme*', EPC/ECFIN/407/04-rev.3-EN of 22 October 2003.

Economic Policy Committee (2003b), '*Budgetary challenges posed by ageing population: the impact on public spending on education*', EPC/ECFIN/435 or 22 October 2003.

Economic Policy Committee (2008), *'The 2009 budgetary projection exercise of the Ageing Working Group: Second progress report to the EPC'*, ECFIN/CEFCPE(2008)REP/ 52951 rev, Brussels, 23/06/2008.

Economic Policy Committee and European Commission (2005), *"The 2005 EPC projections of age-related expenditure (2004-2050) for the EU25 Member States: underlying assumptions and projection methodologies"* in European Economy Reports and Studies, No. 4.

Economic Policy Committee and European Commission (2006*), 'The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)'*, European Economy, Special report, No. 1/2006.

Economic Policy Committee and European Commission (2007) *"Pensions Schemes and Projection Models in EU-25 Member States"*, European Economy, Occasional papers No. 35, November 2007.

European Commission (2006), *'The long-term sustainability of public finances in the European Union'*, European Economy, No. 4/2006.

European Commission (2008a)*, 'Economic forecast – Spring 2008'*, European Economy, No.1/2008.

European Commission (2008b), *'Public finances in EMU in 2008'*, European Economy, No. 4/2008.

Eurostat (2004), 'Classification of funded pension schemes in case of government responsibility or guarantee', News release 30/2004, 2 March.

Eurostat (2005a) '*EU25 population rises until 2025, then falls*', Eurostat press release 448/2005 of 8 April 2005.

Eurostat (2005b), *'AWG ad hoc scenario'*, presentation to the AWG meeting of 16 June 2006.

Eurostat (2008a), *"Ageing characterises the demographic perspectives of the European societies"*, Statistics in Focus, No. 72/2008.

Eurostat (2008b), *"Population projections 2008-2060. From 2015, deaths projected to outnumber births in the EU27"*, News release No. 119/2008, 26/8/2008. EUROPOP2008 convergence scenario is available at: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/data/popul/populat/proj/proj_08c&language=en&product=EU_MAIN_TREE&root=EU_MAIN_TREE&scrollto=263

Eurostat (2009), *"Methodology and main results of the Eurostat Population Projections 2008-based (EUROPOP2008)"*, Eurostat, Methodologies and Working Papers series, Luxembourg, forthcoming.

Gruber J. and D.A. Wise (2002), *'Social Security Programs and Retirement Around the World: Micro Estimation'*, NBER Working Paper No. W9407.

Gruber J. and D.A. Wise (2005a), *'Social security programs and retirement around the world: fiscal implications-Introduction and summary*', NBER Working Paper No. 11290.

Gruber J and D.A. Wise (editors) (2005b), '*Social Security Programs and Retirement around the World: Fiscal Implications*', NBER Website. 26 July 2005. http://www.nber.com/books/intlSS-p3/index.html.

Hatton, T. J. and J. G. Williamson (2003), *"What fundamentals drive world migration?"* Discussion Paper No. 2003/23, United Nations University/World Institute for Development Economics Research, March.

Latulippe D. (1996) *"Effective retirement age and duration of retirement in the industrial countries between 1950 and 1990"*, ILO, Issues in Social Protection DP No. 2.

Montanino A., B. Przywara and D. Young (2004), *"Investment in Education: the Implications for Economic Growth and Public Finances"*, European Economy, *Economic Papers, No.217*.

OECD (2003), '*Labour force participation of groups at the margin of the labour market: past and future trends and policy challenges*', Working Party N° 1 on Macroeconomic and Structural Policy Analysis, ECO/CPE/WP1(2003)8.

OECD (2006), *Costs of Care for Elderly Populations.* Guidelines for estimating long-term care expenditure, DELSA/HEA/DIS(2006)4, 14 February 2006.

OECD (2007), Data collection on long-term care (focussing on recipients), Meeting of OECD Health Data National Correspondents, DELSA/HEA/HD(2007)7, 28 September 2007.

Raitano M. (2006), *"The Impact of Death-Related Costs on Health-Care Expenditure: A Survey",* ENEPRI Research Report No. 17.

Rogers A. and Castro L.J. (1981), *"Model Migration Schedules",* IIASA Research Report RR-81-03, Laxenburg (AT).

Scherer P. (2002), '*Age of withdrawal from the labour force in the OECD countries*', Labour Market and Social policy Occasional Papers, No.49-DELSA.

Schmertmann C. (2003), *"A system of model fertility schedules with graphically intuitive parameters",* Demographic Research, 9:81-110.

Schmertmann C. (2005): *"Quadratic spline fits by nonlinear least squares",* Demographic Research, 12:105-106.

Siegel J.S. and Swanson D.A. eds. (2004), *"The Methods and Materials of Demography"*, 2nd ed. Elsevier Academic Press, San Diego (USA).

Solow, R. M. (1956), *"A Contribution to the Theory of Economic Growth",* Quarterly Journal of Economics, No.70, pp. 65-94.

United Nations (2004), *"World Population Prospects – The 2002 Revision"*, volume III: Analytical Report.

United Nations (2008), *"World Population Prospects: The 2006 Revision"*, Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.