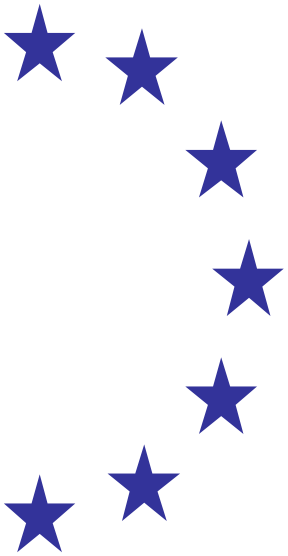
Special Report n° 1/2006

EUROPEAN ECONOMY

EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR
ECONOMIC AND FINANCIAL AFFAIRS



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)

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

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SUMMARY AND MAIN CONCLUSIONS

The challenge in making comparable cross-country age-related expenditure projections

In the coming decades, the size and age-structure of Europe's population will undergo dramatic changes due to low fertility rates, continuous increases in life expectancy and the retirement of baby-boom generation. There has been a growing recognition at national and European level of the profound economic, budgetary and social consequences of ageing populations. Prompted by the launch of the euro, the Economic Policy Committee (EPC) established the Working Group on Ageing Populations (AWG) to examine the economic and budgetary consequences of ageing, which led to the publication of age-related expenditure projections in 2001 and 2003. On the basis of this work, an assessment of the long-term sustainability of public finances was integrated into the surveillance of EU Member States' budgetary positions, and takes place annually on the basis of stability and convergence programmes.

In 2003, the ECOFIN Council gave the Economic Policy Committee (EPC) a mandate to produce a new set of age-related public expenditure projections for all twenty-five Member States covering pensions, health care, long-term care, education, unemployment transfers and, where possible, contributions to pensions/social security systems.[1] This report presents these new budgetary projections. It covers the EU10 Member States which has enriched the exercise, but also increased its complexity and the heterogeneity of the findings. The projections now provide a better scrutinized and more comparable set of information for in-depth analysis of risks to the sustainability of public finances.

The unique value-added of these age-related expenditure projections is that they are produced in a multilateral setting involving national authorities and international organisations. The projections are made on the basis of a common population projection and agreed common underlying economic assumptions that have been endorsed by the EPC.

The projections are generally - and for the reference scenario in particular - made on the basis of "no policy change", i.e. only reflecting enacted legislation but not possible future policy changes (although account is taken of provisions in enacted legislation that enter into force over time). The pension projections are made on the basis of legislation enacted by mid 2005. They are also made on the basis of the current behaviour of economic agents, without assuming any future changes in behaviour over time: for example, this is reflected in the assumptions on participation rates which are based on the most recently observed trends by age and gender. While the underlying assumptions have been made by applying a common methodology uniformly to all Member States, for several countries adjustments have been made to avoid an overly mechanical approach that leads to economically unsound outcomes and to take due account of significant country-specific circumstances.

[1] The projections for the EPC were made by the Ageing Working Group of the EPC chaired by Henri Bogaert and the European Commission's Directorate General for Economic and Financial Affairs.

The pension projections were made using the models of national authorities, and thus reflect the current institutional features of national pension systems. In contrast, the projections for health care, long-term care, education and unemployment transfers were made using common models developed by the European Commission in close co-operation with the EPC and its Working Group on Ageing Populations. While these projections can point to key drivers of public spending, it needs to be noted that they can not completely model the specific institutional arrangements and policies which exist at national level. Caution must be exercised when interpreting the long-run budgetary projections and the degree of uncertainty increases the further into the future the projections go. The projections are not forecasts. Instead, they provide an indication on the potential timing and scale of budgetary challenges that could result from ageing population based on a "no policy change" scenario. The projection methodologies employed can not be completely comprehensive, and there are limitations with the data in several respects.

The age-related expenditure projections presented in this document only portray a partial picture of the economic and budgetary consequences of ageing populations. For example, the projected impact of ageing on the labour market and potential GDP growth rates is based on a partial analysis that does not take account all channels and feedback effects through which an ageing population could impact on real economic activity. Account should also be taken of the positive or negative impact of ageing on other public expenditure and revenue items not covered in this projection exercise. Moreover, and as recognised in the current framework at EU level for assessing the sustainability of public finances, account also needs to be taken of the starting underlying budget positions and outstanding debt levels. In line with the three-pronged strategy, running down public debt can contribute to the sustainability of public finances.

Improvements compared with the 2001 budgetary projection exercise

The 2005 age-related expenditure projections contain many improvements compared with the 2001/2003 projection exercise. Many of the shortcomings listed in the EPC report of 2001 have been addressed, and the following improvements should be highlighted. With the assistance of Eurostat, a much better understanding of the factors driving demographic developments has been acquired and particular attention has been paid to trends in life expectancy. The underlying macroeconomic assumptions were established in a more coherent and transparent manner; they have been published by the EPC and European Commission (2005) with quantitative indications of key assumptions provided wherever possible.[2] A more coherent and relevant set of sensitivity tests have been devised and executed, so that the most important sources of risk to public finances are examined. Enhanced transparency has been achieved through a structured peer review process of the results and the national pension models.

The pension projection exercise is broader, now covering nearly all important public pension schemes, including the old-age provisions for civil servants. To complement their budgetary projections, countries with statutory private pension schemes have provided data for these schemes. Some countries have also provided projections for private occupational pension schemes (with the exception of Denmark and the United Kingdom).

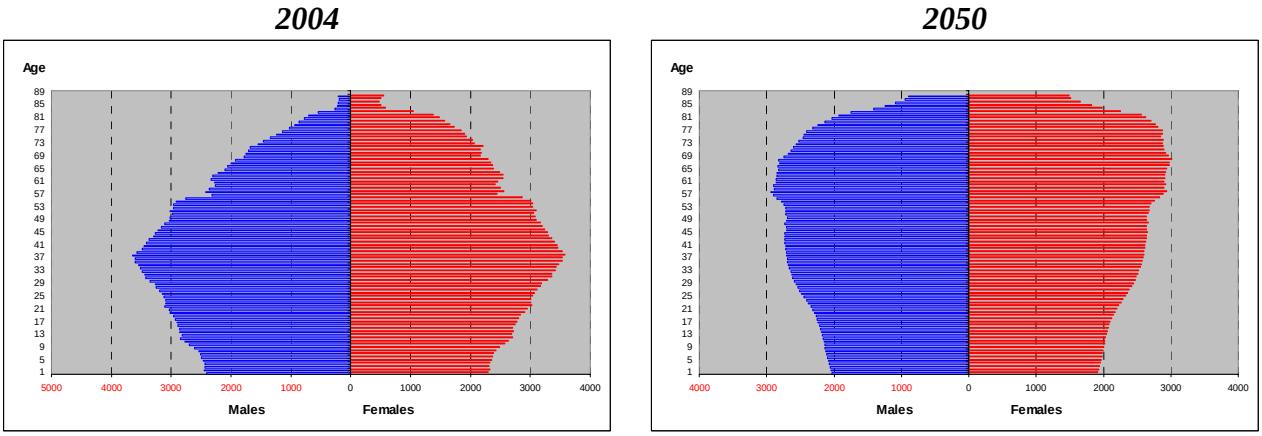
[2] Available under: http://europa.eu.int/comm/economy_finance/publications/european_economy /2005/ eespecialreport0405_en.htm

The inclusion of non-demographic drivers in the projection methodology for health care spending is a significant development. Most progress has been made as regards modelling the potential impact of changes in the health care status of elderly citizens on public spending, and on the role played by death-related costs. While data limitations have been severe, the methodology for projecting public spending on long-term care has also been significantly extended. *Inter alia*, it now looks at age-specific disability rates and enables simulations to be run on future policy changes, such as greater public sector involvement in the provision/financing of long-term care services and changes in the balance between the share of formal care provided in institutions and at home.

Large demographic changes are underway

Europe's population will be slightly smaller, and significantly older, in 2050. Fertility rates in all countries are projected to remain well below the natural replacement rate. Life expectancy at birth, having risen by some 8 years since 1960, is projected to rise by a further 6 years in the next five decades. Inward migration flows will only partially offset these trends. The total population of the EU25 will register a small fall from 457 to 454 million between 2004 and 2050. Of greater economic significance are the dramatic changes in the age structure of the population. Starting already from 2010, the working-age population (15 to 64) is projected to fall by 48 million (or 16%) by 2050. In contrast, the elderly population aged 65+ will rise sharply, by 58 million (or 77%) by 2050. The old-age dependency ratio, that is the number of people aged 65 years and above relative to those between 15 and 64, is projected to double, reaching 51% in 2050. Europe will go from having four people of working age for every elderly citizen currently to a ratio of two to one by 2050.

Age pyramids for EU25 population in 2004 and 2050



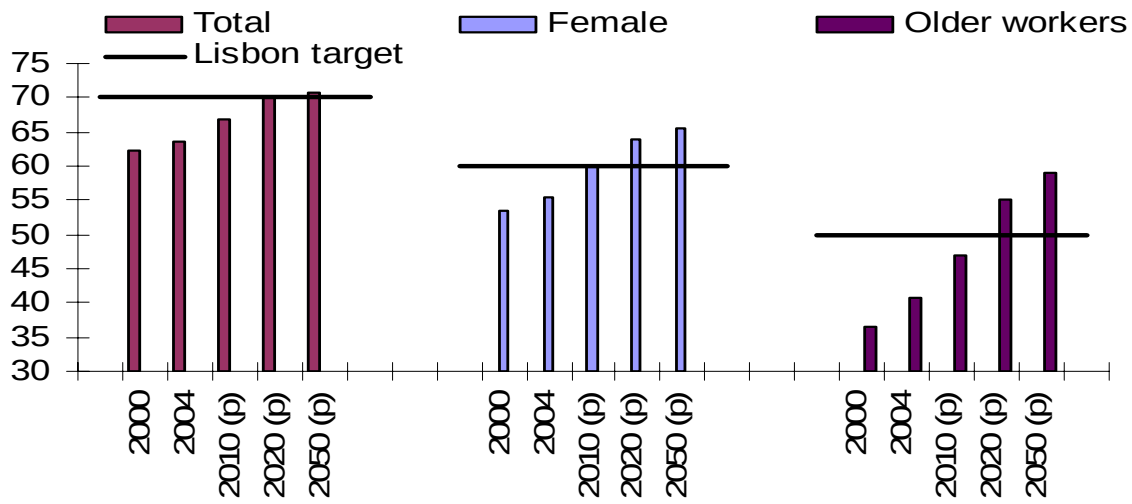
Source: EPC and European Commission (2005)

The change will have major impact on labour market developments

The labour force projection used to make the age-related budgetary projections captures the impact of an ageing population. The overall employment rate is projected to rise from 63% in 2003 to 67% in 2010 and to reach the 70% Lisbon employment rate target in 2020. The projected increase is mainly due to higher female employment rates, which will rise from 55% in 2004 to almost 65% by 2025 as older women with low employment rates retire and are gradually replaced by younger women: the 60% Lisbon employment rate target for females will be reached in 2010. Even sharper is the projected increase in the employment rate of older workers, by 19 percentage points from 40% in 2004 to 59% in 2025. This is well in excess of the 50% Lisbon employment target, which would be reached by 2013. Half of this increase is due to positive effects of already

enacted pension reforms, which is a good illustration of the potential benefits of structural reform.

Projected employment rates and Lisbon targets in the EU25

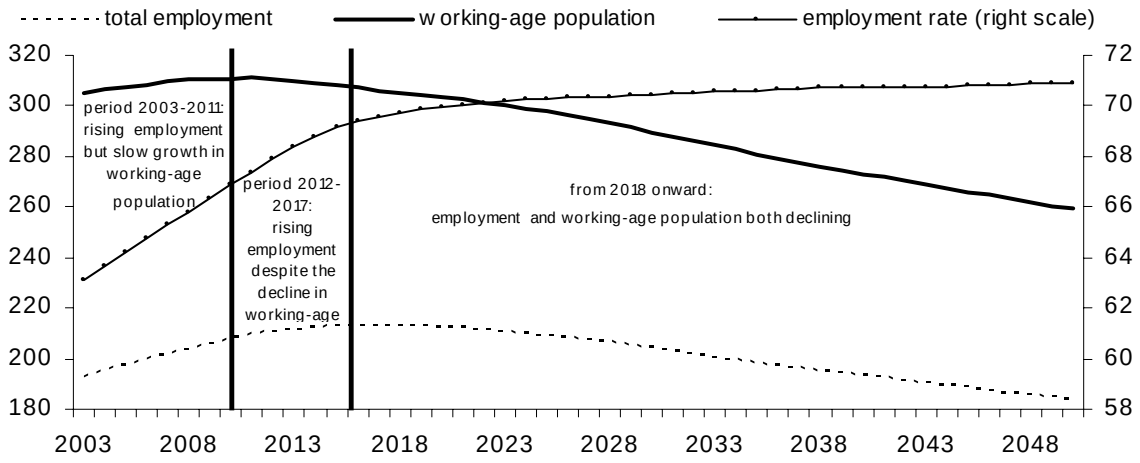


Note: (p) means projected figures; actual figures are given for 2000 and 2004.
Source: EPC and European Commission (2005)

But demographic forces will dominate and the number of persons employed will eventually decline

Meeting the Lisbon employment target, even if not on time, will temporarily cushion the economic effects of ageing. The total number of persons employed is projected to increase up to 2017, but after 2017, the demographic effects of an ageing population outweigh this effect. After increasing by some 20 million between 2004 and 2017, employment will contract by almost 30 million by 2050, i.e. a fall of nearly 10 million over the entire projection period. Three distinct periods can be identified. Between 2004 and 2011, both demographic and employment developments will be supportive of growth: this period can be viewed as a window of opportunity for pursuing structural reforms. Between 2012 and 2017, rising employment rates will offset the decline in the working-age population: during this period, the working-age population will start to decline as the baby-boom generation enters retirement. The ageing effect will dominate as of 2018, and both the size of the working-age population and the number of persons employed will be on a downward trajectory.

Projected working-age population and total employment, EU25



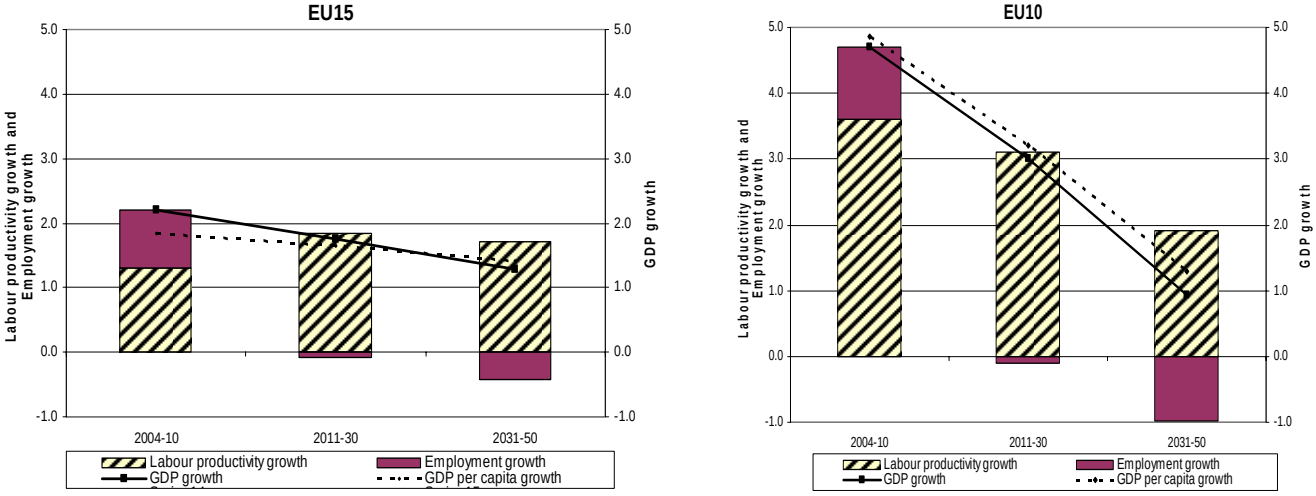
Source: *DG ECFIN*

Potential GDP growth is projected to decline

As a result of these employment trends and the agreed assumptions on productivity, potential GDP growth is projected to decline in the decades to come. For the EU15, the annual average potential GDP growth rate will fall from 2.2% in the period 2004-2010 to 1.8 % in the period 2011-2030 and to 1.3% between 2031 and 2050. An even steeper decline is foreseen in the EU10, from 4.3% in the period 2004-10 to 3% in the period 2011-30 and to 0.9% between 2031 and 2050. This is not only due to unfavourable demographic developments, but also to the underlying assumptions for these countries which assume productivity growth rates coming closer to those of EU15 countries as they complete the convergence process.

In addition, the sources of economic growth will alter dramatically. Employment will make a positive contribution to growth up to 2010, become neutral in the period 2011-2030, and turn significantly negative thereafter. Over time, labour productivity (due to the progress of technology) will become the dominant, and in some countries the only, source of growth. If the projected rise in productivity and in the employment rate will not materialise in the future, the potential growth may fall even more.

Projected (annual average) potential growth rates in the EU15 and EU10 and their determinants (employment/productivity)



Source: *EPC and European Commission (2005)*

Overview of the results of the age-related expenditure projections

The table below provides an overview of the projected change in public spending on all age-related expenditure items between 2004 and 2050. It combines the baseline pension projection, the 'AWG reference scenario' used for health care and long-term care, the baseline projected spending on education and the baseline projection for public spending on unemployment benefits.

Overall, ageing populations is projected to lead to increases in public spending in most Member States by 2050 on the basis of current policies, although there is a wide degree of diversity across countries. The following points should be highlighted:

- for the EU15 and the Euro area as a whole, public spending is projected to increase by about 4 percentage points between 2004 and 2050;

- for the EU10, the increase in the overall age-related spending is projected to rise by only about 1.5 percentage points. This apparently low budgetary impact of ageing is mainly due to the sharp projected drop in public pension spending in Poland, which (in common with several other EU10 countries) is partly the result of the switch from a public pension scheme into a private funded scheme. Excluding Poland, age-related spending in the other EU10 countries would increase by more than 5 percentage points of GDP;

- most of the projected increase in public spending will be on pensions, health care and long-term care. Potential offsetting savings in terms of public spending on education and unemployment benefits are likely to be limited;
- the budgetary impact of ageing in most Member States starts becoming apparent as of 2010. However, the largest increases in spending are projected to take place between 2020 and 2040;

Projected changes in age-related public expenditure between 2004 and 2030/50 (% of GDP)

	Pensions			Health care			Long-term care			Unemployment benefits			Education			Total* (without long term care)		Total* (without education)		Total* of all available items*		
	Level	Change from 2004 to:		Level	Change from 2004 to:		Level	Change from 2004 to:		Level	Change from 2004 to:		Level	Change from 2004 to:		Change from 2004 to:		Change from 2004 to:		Change from 2004 to:		
	2004	2030	2050	2004	2030	2050	2004	2030	2050	2004	2030	2050	2004	2030	2050	2030	2050	2030	2050	2030	2050	
BE	10.4	4.3	5.1	6.2	0.9	1.4	0.9	0.4	1.0	2.3	-0.5	-0.5	5.6	-0.6	-0.7	4.1	5.3	5.1	7.0	4.5	6.3	**BE**
DK	9.5	3.3	3.3	6.9	0.8	1.0	1.1	0.6	1.1	1.5	-0.3	-0.3	7.8	-0.4	-0.3	3.4	3.7	4.4	5.1	4.0	4.8	**DK**
DE	11.4	0.9	1.7	6.0	0.9	1.2	1.0	0.4	1.0	1.3	-0.4	-0.4	4.0	-0.8	-0.9	0.6	1.7	1.8	3.6	1.0	2.7	**DE**
GR				5.1	0.8	1.7				0.3	-0.1	-0.1	3.5	-0.5	-0.4	:	:	:	:	:	:	**GR**
ES	8.6	3.3	7.1	6.1	1.2	2.2	0.5	0.0	0.2	1.1	-0.4	-0.4	3.7	-0.7	-0.6	3.3	8.3	4.0	9.1	3.3	8.5	**ES**
FR	12.8	1.5	2.0	7.7	1.2	1.8				1.2	-0.3	-0.3	5.0	-0.5	-0.5	1.9	2.9	2.4	3.4	1.9	2.9	**FR**
IE	4.7	3.1	6.4	5.3	1.2	2.0	0.6	0.1	0.6	0.7	-0.2	-0.2	4.1	-0.9	-1.0	3.2	7.2	4.3	8.8	3.3	7.8	**IE**
IT	14.2	0.8	0.4	5.8	0.9	1.3	1.5	0.2	0.7	0.4	-0.1	-0.1	4.3	-0.8	-0.6	0.9	1.1	1.8	2.4	1.0	1.7	**IT**
LU	10.0	5.0	7.4	5.1	0.8	1.2	0.9	0.2	0.6	0.3	-0.0	-0.1	3.3	-0.5	-0.9	5.2	7.6	6.0	9.1	5.4	8.2	**LU**
NL	7.7	2.9	3.5	6.1	1.0	1.3	0.5	0.3	0.6	1.8	-0.2	-0.2	4.8	-0.2	-0.2	3.5	4.4	4.0	5.2	3.8	5.0	**NL**
AT	13.4	0.6	-1.2	5.3	1.0	1.6	0.6	0.3	0.9	0.8	-0.1	-0.1	5.1	-0.9	-1.0	0.5	-0.7	1.8	1.2	0.9	0.2	**AT**
PT	11.1	4.9	9.7	6.7	-0.1	0.5				1.0	-0.1	-0.1	5.1	-0.6	-0.4	4.1	9.7	4.7	10.1	4.1	9.7	**PT**
FI	10.7	3.3	3.1	5.6	1.1	1.4	1.7	1.2	1.8	1.5	-0.4	-0.4	6.0	-0.6	-0.7	3.5	3.4	5.3	5.9	4.7	5.2	**FI**
SE	10.6	0.4	0.6	6.7	0.7	1.0	3.8	1.1	1.7	1.1	-0.2	-0.2	7.3	-0.7	-0.9	0.3	0.5	2.0	3.1	1.3	2.2	**SE**
UK	6.6	1.3	2.0	7.0	1.1	1.9	1.0	0.3	0.8	0.4	-0.0	-0.0	4.6	-0.5	-0.6	1.9	3.2	2.7	4.6	2.2	4.0	**UK**
CY	6.9	5.3	12.9	2.9	0.7	1.1				0.4	-0.0	-0.0	6.3	-1.9	-2.2	4.1	11.8	6.0	14.1	4.1	11.8	**CY**
CZ	8.5	1.1	5.6	6.4	1.4	2.0	0.3	0.2	0.4	0.2	-0.0	-0.0	3.8	-0.9	-0.7	1.6	6.8	2.6	7.9	1.8	7.2	**CZ**
EE	6.7	-1.9	-2.5	5.4	0.8	1.1				0.1	-0.0	-0.0	5.0	-1.1	-1.3	-2.3	-2.7	-1.2	-1.4	-2.3	-2.7	**EE**
HU	10.4	3.1	6.7	5.5	0.8	1.0				0.2	-0.0	-0.0	4.5	-1.0	-0.7	2.8	7.0	3.8	7.7	2.8	7.0	**HU**
LT	6.7	1.2	1.8	3.7	0.7	0.9	0.5	0.2	0.4	0.1	-0.1	-0.1	5.0	-1.6	-1.6	0.2	1.0	2.0	3.1	0.3	1.4	**LT**
LV	6.8	-1.2	-1.2	5.1	0.8	1.1	0.4	0.1	0.3	0.3	-0.1	-0.1	4.9	-1.2	-1.4	-1.7	-1.6	-0.4	0.1	-1.5	-1.3	**LV**
MT	7.4	1.7	-0.4	4.2	1.3	1.8	0.9	0.2	0.2	1.2	-0.2	-0.2	4.4	-1.2	-1.2	1.6	0.1	2.9	1.5	1.8	0.3	**MT**
PL	13.9	-4.7	-5.9	4.1	1.0	1.4	0.1	0.0	0.1	0.5	-0.4	-0.4	5.0	-2.0	-1.9	-6.1	-6.8	-4.1	-4.8	-6.1	-6.7	**PL**
SK	7.2	0.5	1.8	4.4	1.3	1.9	0.7	0.2	0.6	0.3	-0.2	-0.2	3.7	-1.5	-1.3	0.1	2.3	1.8	4.1	0.3	2.9	**SK**
SI	11.0	3.4	7.3	6.4	1.2	1.6	0.9	0.5	1.2	0.5	-0.1	-0.1	5.3	-0.7	-0.4	3.9	8.4	5.1	10.1	4.4	9.7	**SI**
EU25	10.6	1.3	2.2	6.4	1.0	1.6	0.9	0.2	0.6	0.9	-0.3	-0.3	4.6	-0.7	-0.6	1.3	2.8	2.2	4.0	1.6	3.4	**EU25**
EU15	10.6	1.5	2.3	6.4	1.0	1.6	0.9	0.3	0.7	0.9	-0.2	-0.2	4.6	-0.6	-0.6	1.6	3.0	2.5	4.3	1.9	3.7	**EU15**
EU12	11.5	1.6	2.6	6.3	1.0	1.5	0.7	0.2	0.5	1.0	-0.3	-0.3	4.4	-0.7	-0.6	1.7	3.2	2.5	4.4	1.9	3.7	**EU12**
EU10	10.9	-1.0	0.3	4.9	0.9	1.3	0.2	0.1	0.2	0.4	-0.2	-0.2	4.7	-1.5	-1.3	-1.8	0.0	-0.3	1.6	-1.8	0.2	**EU10**
EU9 *(EU10-PL)*	8.8	1.6	4.8	5.5	0.9	1.3	0.3	0.2	0.3	0.3	-0.1	-0.1	4.4	-1.1	-0.9	1.4	5.1	2.6	6.4	1.5	5.4	***EU9 (EU10-PL)***

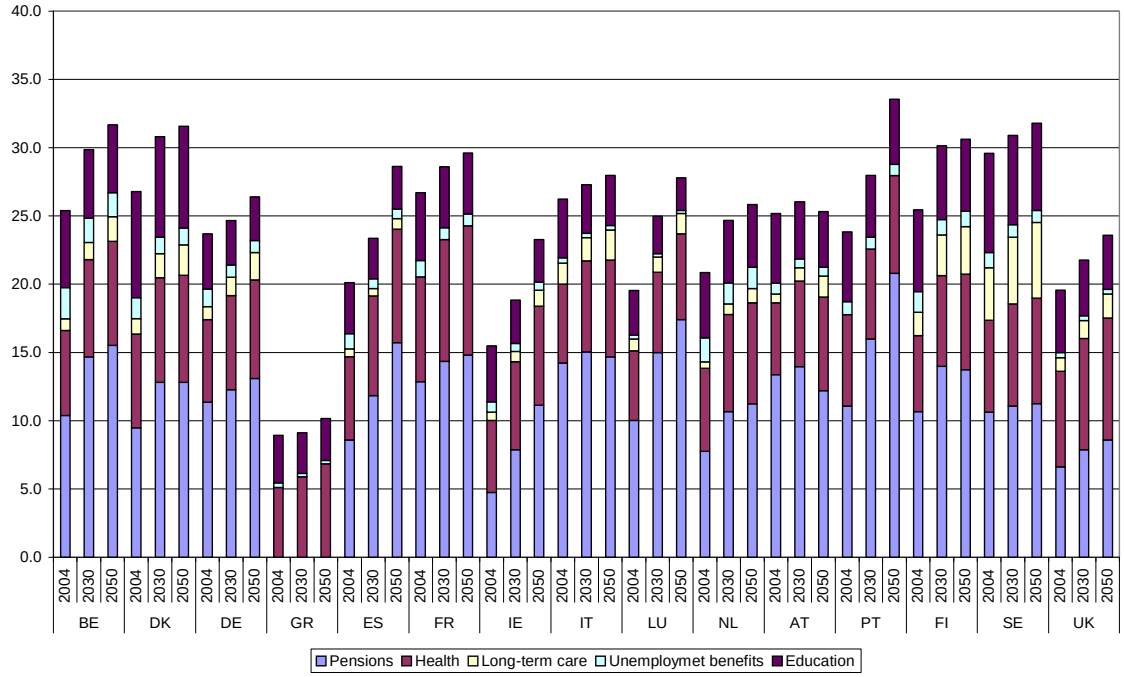
*1) Total expenditure for GR does not include pension expenditure. The Greek authorities have agreed to provide the pension projections in 2006. In the context of the most recent assessment of the sustainability of public finances based on the Greek stability programme, public spending on pensions was projected to increase by 10.3% of GDP between 2004 and 2050.

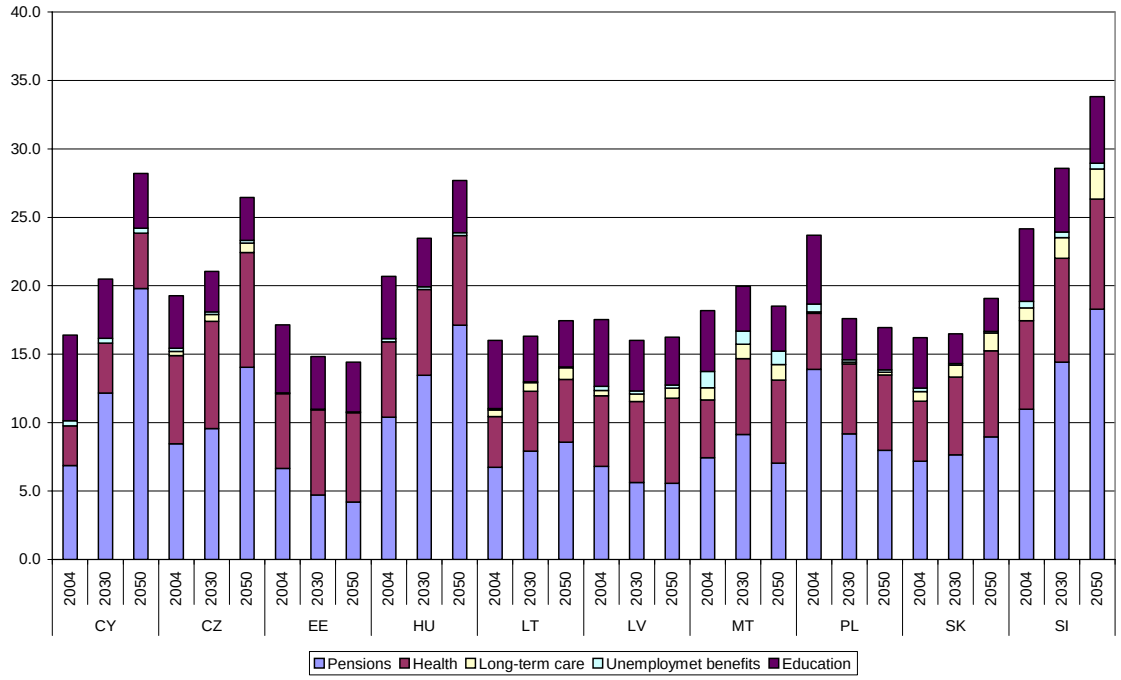
2) Total expenditure for: GR, FR, PT, CY, EE, HU does not include long-term care.

3) The projection results for public spending on long-term care for Germany does not reflect current legislation where benefit levels are fixed. A scenario which comes closer to the current setting of legislation projects that public spending would remain constant as a share of GDP over the projection period.

Note: these figures refer to the baseline projections for social security spending on pensions, education and unemployment transfers. For health care and long-term care, the projections refer to "AWG reference scenarios"

Age-related spending as a % of GDP in EU Member States, 2004, 2030 and 2050





The projection results regarding pensions

For EU15 Member States, public pension spending is projected to increase in all countries, except Austria, on account of its reforms since 2000. Very small increases in spending on pensions are projected in Italy and Sweden due to their notional contribution-defined schemes where pension benefits are based on effective working-life contributions Relatively moderate increases (between 1.5 and 3.5 percentage points of GDP) are projected in most other EU countries, with the largest increases projected for Ireland (6.4 p.p.), Spain (7.1 p.p.),

Luxembourg (7.4 p.p.) and Portugal (9.7 p.p.). Reforms enacted in several EU15 countries, since the last age-related expenditure projection exercise of 2001, appear to have curtailed the projected increase in public spending on pensions significantly in half of all EU15 Member States[3].

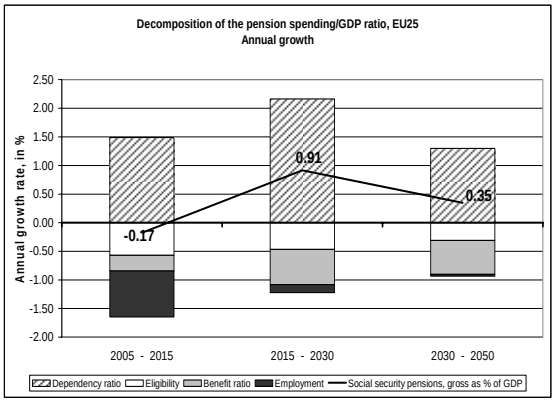
The inclusion of the EU10 Member States increases the diversity of the results. Between 2004 and 2030, public pension expenditure is projected to decrease by 1 p.p. of GDP and thereafter to increase by 1.3 p.p., resulting in an overall increase of 0.3 p.p. of GDP on average between 2004 and 2050. However, the trends are very diverse across countries, ranging from a decrease of 5.9 p.p. of GDP in Poland and to an increase of 6.7 p.p. in Hungary, 7.3 p.p. in Slovenia and 12.9 p.p. in Cyprus. The projected decreases in Poland, Estonia and Latvia, as well as small projected increases in Lithuania and Slovakia, stem partly from pension reforms enacted during the last 10 years which involve a partial switch of the public old-age pension scheme into private funded schemes. Thus, the public provision of pensions will decrease over time while the private part will increase. The challenges faced by Cyprus, Slovenia, Hungary and the Czech Republic are among the biggest in the EU. While Slovenia and the Czech Republic have undertaken parametric reforms in their pension system during the 1990s, the systems remain fully pay-as-you-go public pension schemes.

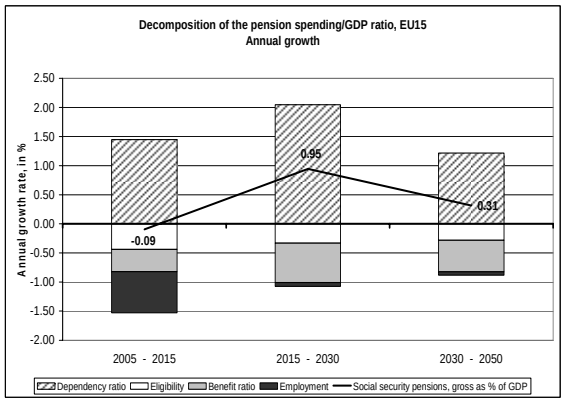
Decomposing the drivers of public pension spending

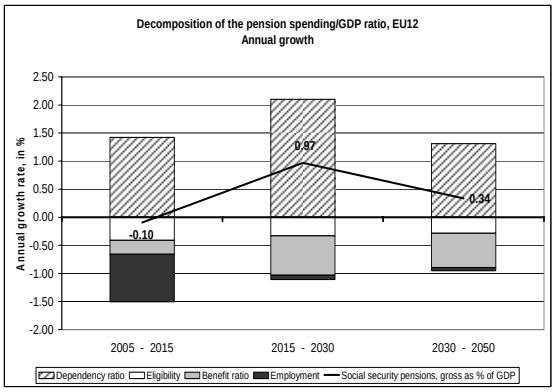
A decomposition clearly shows that the rise in the old-age dependency ratio is the dominant factor pushing up public spending in the coming decades. However, other factors such as employment rate, eligibility rate and relative benefit level will offset part of the demographic pressure. In the EU15, these factors are projected to curtail some 70% of the pressure caused by demographic developments alone, and in the EU10 they would offset almost all the demographic pressure. The strongest effect will come from the benefit ratio, and in the EU10 countries also from the take-up ratio of pensions. An increase in the employment rate is projected to help in particular during the next decade, especially in countries with currently low employment rates.

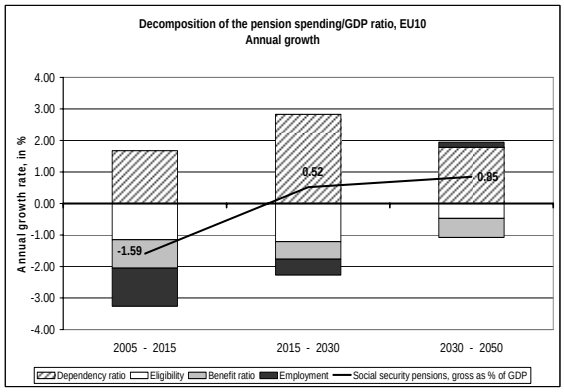
[3] More detailed information about the impacts of enacted reforms are provided in the 'country fiches" published on the web site of the Economic and Policy Committee: *http://europa.eu.int/comm/economy_finance/epc/epc_sustainability_ageing_en.htm*

Decomposition of the annual growth of pension spending (as % of GDP)









One of the most striking results is the projected decline in "benefit ratio" of public pensions relative to wages. It should be noted however, that the benefit ratio, measuring the evolution of average pensions relative to output per worker, only provides an approximate indication on the evolution of the generosity of pension systems and is not an equivalent to the usual replacement rate indicator. The projected fall in the "benefit ratio" is partly due to reforms, which index pension benefits to prices instead of wages thus reducing the generosity of public pensions over time. While resulting in budgetary savings, the adequacy of pensions, including for mixed funded systems, should be kept under review, as it may lead to future pressure for policy changes. The projected fall in the "benefit ratio" is also the result of the partial switch from statutory social security pension provision to private funded schemes. While reducing explicit public finance liabilities and improving the sustainability of public finances, moves towards more private sector pension provision create new challenges and forms of risks for policy makers, and in particular, underline the importance of appropriate regulation of private pension funds and of careful surveillance of their performance for securing adequate retirement income.

Pension spending is especially sensitive to life expectancy, but less so to changes in the employment rate

Sensitivity tests show that public spending on pensions appears to be most sensitive to changes in life expectancy and in some countries to the labour productivity growth rate. However, the projected change in public spending on pensions are relatively robust regarding the changes in employment rates and the changes in interest rates affect only funded schemes. More specifically:

- higher life expectancy leads to increased public spending in countries with defined-benefit schemes, whereas defined-contribution schemes inherently takes into account the length of retirement. As part of recent pension reforms, some Member States have introduced a link between life expectancy at retirement and pension benefits: the projection results indicate that these measures appear to achieve a better sharing of demographic risk.

- a change in the labour productivity assumption only has a significant impact on pension spending in countries where pension benefits are indexed to prices. In this case, pension spending as a percentage of GDP will be lower with a higher productivity growth rate assumption;

- higher employment rates, especially if due to higher employment rates of older workers, reduce the projected increase in pension spending as a share of GDP. However, the effect is limited as higher/longer employment results in the accumulation of greater pension entitlements. Notwithstanding the apparently small impact on public spending, raising the employment rate is welfare enhancing. It leads to an improved economic performance, and on the budgetary side it delays somewhat the onset of increased public spending on pensions. Moreover, higher employment generates increased contributions to pension schemes, and if it is the result of lower unemployment, additional budgetary savings may emerge. Finally, longer working lives enable workers to acquire greater pension entitlements offsetting some of the impact of less generous public pensions.

- interest rates affect the pension spending only in countries where funding is important. Moreover, it also affects the contribution rate and asset accumulation of funded schemes, albeit in opposite directions in defined-benefit and defined-contribution schemes. In defined-benefit schemes, with a higher interest rate, the contribution rate can be lowered to cover the targeted benefit, whereas in a defined-contribution scheme, the contribution rate remains unchanged but results in a higher accumulation of assets.

The projection results for health care spending

To project public spending on health care over the long-run is an extremely complex exercise. There are uncertainties regarding future trends in key drivers of spending, the availability of comparable data is limited, and the projection methodology which is feasible in a cross-country exercise is somewhat mechanical and does not reflect the institutional settings for the provision of health care services in each Member State. A particular challenge has been to include other non-demographic drivers of spending on both the demand and supply side.

According to the "AWG reference scenario" (a prudent scenario which takes account of the combined effects of ageing, the health care status of elderly citizens and the income elasticity of demand), public expenditure on health care is projected to increase by between 1 and 2 percentage points of GDP in most Member States up to 2050**.** While age itself is not the causal factor of health care spending (but rather the health condition of a person), the projections illustrate that the pure effect of an ageing population would put pressure for increased public spending.

The projections, however, also illustrate that non-demographic factors are relevant drivers of spending. In particular, the projections show that changes in the health care status of elderly citizens would have a large effect on health spending. If healthy life expectancy (falling morbidity rates) evolve broadly in line with change in age-specific life expectancy (a development which would be equivalent to the so-called dynamic equilibrium hypothesis),

then the projected increase in spending on health care due to ageing would be approximately halved. Caution should be exercised, however, as there is inconclusive evidence that these 'positive' trends will occur nor of the scale of their likely impact. Some additional evidence emerges from a scenario that incorporates death-related costs, i.e. taking account of the fact that a large share of total spending on health care during a persons lifetime occurs in the final phase of life.

Compared with the effects of the health care status of elderly citizens, less progress has been made in incorporating other important supply side drivers of spending into the projection model. Stylised scenarios indicate that the projected increase in public spending on health care is very sensitive to the assumption on the income elasticity of demand and on the evolution of unit costs. Spending on health as a share of GDP could increase at a fast pace if unit costs (wages, pharmaceutical prices) grow faster than their equivalents in the economy as a whole, on account of public policies to improve access to health or improve quality (reduce waiting lists, increase choice), or if rising per capita income levels and the impact of technology lead to increased demand for health care services. The effective management of technology is of utmost importance: otherwise the expenditure savings resulting from lower unit costs could easily be outstripped by the costs of meeting additional demand for new and better treatments.

The projection results for public spending on long-term care

An ageing population will create a strong upward impact on public spending for long term care. This is because frailty and disability rises sharply at older ages, especially amongst the very old (aged 80+) which will be the fastest growing segment of the population in the decades to come. The projection methodology has been upgraded considerably since the 2001 exercise, and has enabled scenarios to run which examine non-demographic drivers of spending.

According to the "AWG reference scenario" based on current policy settings, public spending on long-term care is projected to increase by between 0.1 percentage points and 1.8 percentage points of GDP between 2004 and 2050. This range reflects very different approaches to the provision/financing of formal care. Countries with very low projected increases in public spending currently have very low levels of formal care. The projections show that with an ageing population, a growing gap may occur between the number of elderly citizens with disability who are in need of care (which will more than double by 2050) and the actual supply of formal care services. On top of an ageing population, this gap could further grow due to less informal care being available within households on account of trends in family size and projected increase in the participation of women in the labour market. In brief, for countries with less developed formal care systems today, the headline projected increase in public spending on long-term care may not fully capture the pressure on public finances, as future policy changes in favour of more formal care provision may be needed.

Public spending is very sensitive to trends in the disability rates of elderly citizens. Compared with a "pure ageing" scenario, projected change in spending would be between 40% and 60% lower if the disability status of elderly citizens improves broadly in line with the projected increase in life expectancy. Policy measures, which can either reduce disability, limit the need for formal care amongst elderly citizens with disabilities, or which favour formal care at home rather than in institutions can have a very large impact on public spending.

The projection results for public spending on education

The ratio of children and young people to the working-age population is expected to fall over the coming decades, pointing to fewer students relative to the working population. The pure consequences of expected demographic changes indicate a potential for a decline in public expenditure on education in all Member States over the next 50 years, but significant savings are only projected for some countries. However, this result could be altered substantially, and public expenditure on education as a share of GDP could even increase if account is taken of potential rises in enrolment rates due to government efforts to raise skill levels. Overall, education expenditure cannot be expected to offset the projected increase in spending on pension and health care expenditures.

The projection results for public spending on unemployment transfers

In order to get a more comprehensive assessment of the total impact of ageing on public finances, and to guarantee consistency with the macroeconomic scenario, projections on unemployment benefit spending were also carried out. Unemployment benefit spending in the EU25 is projected to fall from about 1% of GDP in 2002-2003 to 0.6% in 2025-2050. This primarily reflects the assumed lower proportions of unemployed people over the projection period. In terms of percentage points of GDP, the decrease is very modest (given the relatively low starting levels) and relatively small when compared to projected effects of ageing on pension and health care spending.

The results overall provide a sound basis for assessing risks to the sustainability of public finances at EU level…

Overall, the 2005 age-related expenditure projections provide a much more comparable, transparent and sound basis for the assessment to take place at EU level on the risks to the sustainability of Member States' public finances. In the coming months, further analysis is needed to achieve a fuller understanding of the new projection results, and in particular to get clearer insights of the key driving factors for each Member States.

Consideration also needs to be given on the possibilities which these new projections offer in terms of assessing the sustainability of public finances – the annexes provide an overview on the existing framework. In addressing these issues, the following elements may need to be taken on board:

- a major effort has been made to run comparable sensitivity tests on the key drivers of age-related expenditures. Currently at EU level, a quantitative assessment of fiscal sustainability is only carried out with reference to a baseline/central projection for age-related spending (either based on the existing EPC projections or national projections reported in stability and convergence programmes). The new sensitivity tests offer the possibility of addressing this shortcoming;
- for each age-related expenditure item, the reference scenario is to be used for making a quantitative assessment of the sustainability of public finances. Moreover, national projections may also be taken into account in the assessment where differences with the reference scenario and underlying assumptions are clearly described and explained.

…but there is scope for further refinements and analysis

While this new set of common ageing-related expenditure projections represent a substantial advance compared with earlier exercises, there is scope for further improvements in the following areas:

- there is a great deal of uncertainty as regards future trends in life expectancies, and how these should be handled in a population projection that is used as a basis for making budgetary projections. The population projection underlying these age-related expenditure projections embodies considerable differences in projected changes in life expectancies across countries, which invariably influences the results of the budgetary projection exercise;

- migration is also a topic where further analysis is required. Comparable data is very limited, and there appears to be scope to examine more systematically at EU level the economic determinants of migration;

- as regards the macroeconomic assumptions, there appears to be some scope for improving the approach used regarding productivity, in particular some specific assumptions and important feedback channels may usefully be further investigated on the basis of empirical analysis;

- consideration could be given to projecting an increase in the educational attainment levels and modelling not only ensuing budgetary effects but also its potential impact on overall labour productivity;

- for health care and long-term care, a key challenge is to get to grips with supply side factors, including the effects of technological changes in health care costs, as well as to get a better understanding on institutional settings and the incentive effects that they provide to medical professionals and patients to consume health care services in a rational manner. An additional element is that the projections only cover public sector spending, and the interaction with private sector spending on health care would be a useful extension.

- regarding the coverage of the exercise, an open question remains to whether additional age-related expenditure items should be covered, and also on the merits of projecting the impact of an ageing population on different tax bases and revenues.

- an area where transparency could be further improved concerns the models used by Member States to project public spending on pensions. National models are used given their capacity to capture important institutional characteristics of national pension systems. This is certainly an important element that is not present in the other expenditure projections, which can not capture important and specific institutional features of different national systems. The different approaches to modelling pension spending have been looked at in a series of peer review, even though the necessarily high complexity of national models presents some difficulty. Overall, transparency can be further enhanced by examining in more detail key features of pension models, not only their general design, but also assumptions regarding the evolution of thresholds over time, how the transition from work to retirement is modelled and assumptions on transitions from old to reformed pension schemes.

- Finally, the age-related expenditure projections provide valuable insights on the budgetary impact of structural reforms, and their use in the context of the Stability and Growth Pact will be explored further, in time for the assessment of next round of Stability and Convergence Programmes.

1. INTRODUCTION

The mandate

In the coming decades, the size and age-structure of Europe's population will undergo dramatic changes due to low fertility rates, continuous increases in life expectancy and the retirement of the baby-boom generation. Recently, there has been a growing recognition at national and European level of the profound economic, budgetary and social consequences of ageing populations. Prompted by the launch of the euro, the Economic Policy Committee (EPC) established the Ageing Working Group (AWG) to examine the economic and budgetary consequences of ageing, which led to the publication of age-related expenditure projections in 2001 and 2003. [4]

In 2003, the ECOFIN Council gave the Economic Policy Committee (EPC) a mandate to produce a new set of age-related public expenditure projections for all twenty-five Member States covering pensions, health care, long-term care, education, unemployment transfers and, where possible, contributions to pensions/social security systems. [5] This report presents these new budgetary projections. It now covers the EU10 Member States which has enriched the exercise, but also increased its complexity and the heterogeneity of the findings.

This report presents the results of the age-related expenditure projection exercise. The projections for the EPC were made by the Ageing Working Group of the EPC Chaired by Henri Bogaert and the European Commission's Directorate General for Economic and Financial Affairs. The AWG members[6] are experts from national authorities of all 25 Member States, the European Commission (represented by the Directorate General for Economic and Financial Affairs) and the European Central Bank. Eurostat have played a central role by preparing a population projection.[7] Other Commission services are also associated with this work, especially the Directorate General for Employment, Social Affairs and Equal Opportunities and the Health and Consumer Protection Directorate General. In addition, several international organisations have also participated in the AWG's work on the budgetary projections, notably the OECD and IMF.[8] The EPC has moreover coordinated its work with other Council formations, especially the Social Protection Committee.[9]

Overview of the entire age-related expenditure projection exercise

The unique value-added of these age-related expenditure projections is that they are produced in a multilateral setting involving national authorities and international organisations. The projections are made on the basis of a common population projection and common underlying

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4 Economic Policy Committee (2001) and Economic Policy Committee (2003).

5 Member States can also submit projections for additional expenditure and revenue items, for example family allowances provided they are based on the agreed underlying assumptions.

6 A list of AWG members can be found in Annex 16.

7 In preparing the population projection, Eurostat has closely involved national statistical institutes via the "Population Projection" Interest Group on CIRCA, and through meetings of Eurostat's Working Group on Population Projections.

8 The work of the AWG does not reflect the positions of these international organisations.

9 Its Indicators Sub-Group Chaired by David Stanton.

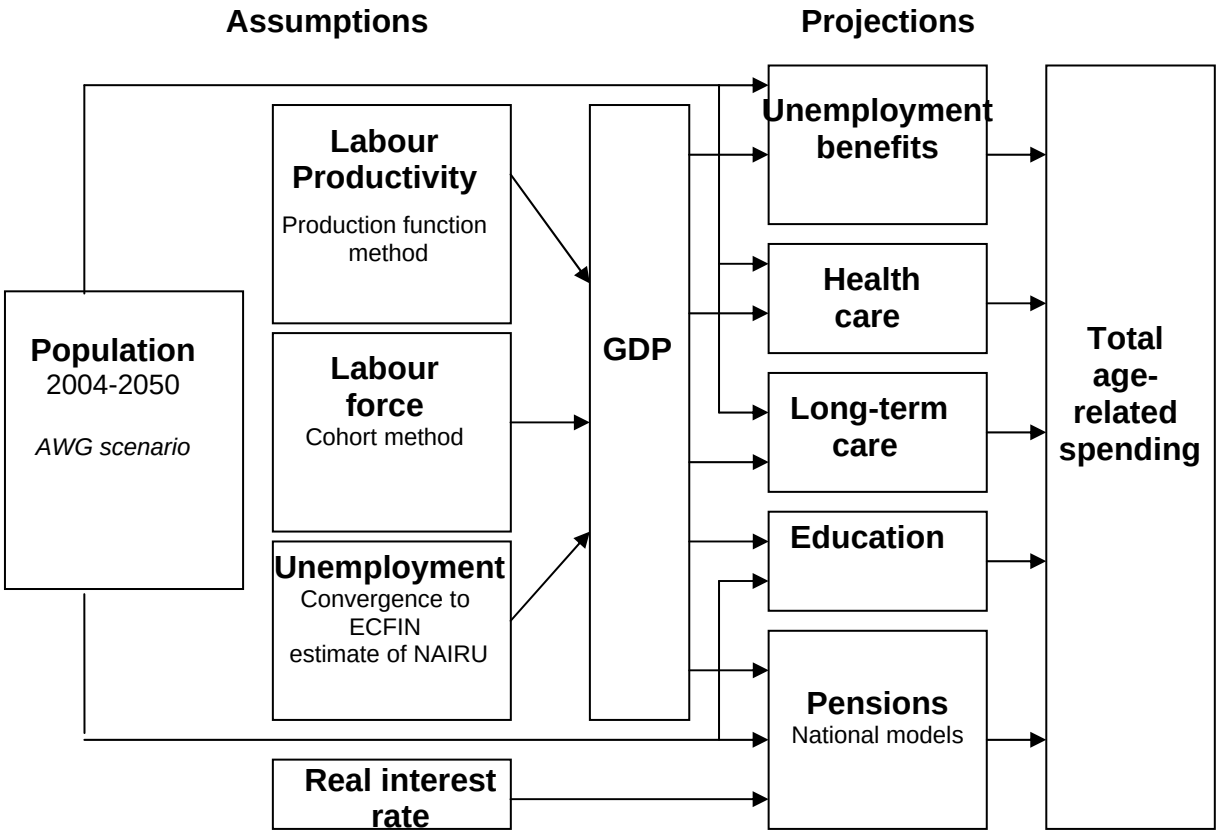
economic assumptions that have been endorsed by the EPC and forwarded to the ECOFIN Council. The projections are made on the basis of "no policy change", i.e. only reflecting enacted legislation but not possible future policy changes (although account would be taken of provisions in enacted legislation that will enter into force). They are also made on the basis of the current behaviour of economic agents, i.e. without assuming any future changes in behaviour over time: for example, this is reflected in the assumptions on participation rates which is based on the most recently observed participation rates by age and gender (for details see section 2.2). Every effort has been made to maximise the comparability of the projection exercise across countries. While the underlying assumptions have been made by applying a common methodology uniformly to all Member States, for several countries adjustments have been made to avoid an overly mechanical approach that would lead to economically unsound outcomes and to take account of significant relevant country-specific circumstances.

Caution must be exercised when interpreting the long-run budgetary projections and the degree of uncertainty increases the further into the future the projections go. The projections are not forecasts. There are limitations with the data in several respects and the projection methodologies employed are not fully comprehensive. Instead, they provide an indication on the potential timing and scale of budgetary changes that could result from an ageing population based on a "no policy change" scenario.

It should be emphasised that the budgetary projections presented in this document show only a partial picture of the economic and budgetary consequences of ageing populations. For example, the projected impact of ageing on the labour market and on potential GDP growth rates is based on a partial analysis that does not take into account some channels and feedback effects through which an ageing population could affect real economic activity. Further the age-related expenditure projections covered in this exercise may not provide a fully comprehensive picture of the pressure which demographic change may have on public finances. For example, the impact of ageing on other public expenditure and revenue items are not covered in this projection exercise. Moreover, and as recognised in the current framework at EU level for assessing the sustainability of public finances, account also needs to be taken of the starting underlying budget positions and outstanding debt levels.

Graph 1-1 below presents an overview of the entire age-related expenditure projection exercise. The starting point is a common "AWG scenario" population projection for the period 2004 to 2050. Next, a common set of exogenous macroeconomic assumptions were agreed, covering the labour force (participation, employment and unemployment rates), labour productivity and the real interest rate. These combined assumptions enable the computation of GDP for all Member States up to 2050. On the basis of these assumptions, separate projections are 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. The results of the set of projections are aggregated to provide an overall projection of age-related public expenditures.

Graph 1-1 Overview of the 2005 projection of age-related expenditure



Underlying assumptions endorsed by the ECOFIN Council of November 2005

The population and macroeconomic assumptions to be used for making all the age-related expenditure projections were endorsed by the EPC and forwarded to the ECOFIN Council in November 2005. Full details of the underlying assumptions can be found in EPC and European Commission (2005b). The input data used to calculate the underlying assumptions, as well as a more detailed description of the projection methodologies can be found in EPC and European Commission (2005a).

In arriving at the underlying assumptions, the following approach was adopted:

- a review of the economic literature was carried out to identify best practices amongst international organisations and national authorities in making long-run budgetary projections;

- on issues where specific expertise was required, a series of workshops were organised at which external academics and experts were invited;[10]

[10] A list of the conferences can be found in annex 2 of EPC and European Commission (2005 a). The papers and presentations delivered at the conference on *Trends in the health care status and disabilities of elderly citizens* held on 21/22 February 2005 can be downloaded from http://europa.eu.int/comm/economy_finance/events/2005/events_brussels_0205_en.htm . DG ECFIN and the AWG would like to express their gratitude to Adelina Comas-Herrera and Ilija Batljan who provided advice on projection methodologies to be used to project health care and long-term care spending during their periods as Visiting Research Fellows in DG ECFIN. The work of the AWG does not reflect the positions of these individuals, nor of any of the contributors to the workshops/conferences.

- the EPC endorsed the underlying assumptions and projection methodologies for the budgetary projections. Thus, underlying assumptions have been made by applying a common methodology uniformly to all Member States. To avoid an overly mechanical approach that can lead to economically unsound outcomes, and to take account of significant relevant country-specific circumstances, several adjustments were made to the common approach for several countries. Table 1-1 below provides a summary of these adjustments which have improved the basis for making the budgetary projections. To ensure full transparency, the common underlying assumptions and the adjustments are explained in detail in EPC and European Commission (2005a);

- The AWG invited a number of external experts to provide comments on the robustness of the underlying assumptions and feasibility of the sensitivity tests. The feedback received were broadly taken on board;[11]

Table 1-1 Overview of underlying assumptions and adjustments for certain Member States

	Population AWG scenario (differences compared with EUROPOP2004)		**Labour force projections**			**Productivity**		
	Convergence in life-expectancy across EU15	**Data adjustment for migration**	**Data adjustment for pension reforms**	**Data adjustment for conversion into national account equivalent**	**Special convergence rule on NAIRU**	**Data adjustment for conversion into national account equivalent**	**TFP adjustment to speed the catch up with EU15 countries**	**Real convergence of EU10**
BE								
CZ								
DK								
DE								
EE								
EL								
ES								
FR								
IE								
IT								
CY								
LV								
LT								
LU								
HU								
MT								
NL								
AT								
PT								
PO								
SI								
SK								
FI								
SE								
UK								

source: EPC and European Commission (2005a)
Note: The grey areas indicate the adjustments that have been made.

[11] For a summary of the comments and suggestions of the external experts, see annex 11 of EPC and European Commission (2005a).

Outline of this report

The remainder of this report presents the results of the age-related expenditure projections. Section 2 recalls the underlying population and macroeconomic assumptions, and draws some conclusions on the economic impact of ageing populations[12]. Section 3 portrays the results for the projections on pension expenditure. Section 4 presents the budgetary projection results for health care spending and section 5 describes for public spending on long-term care. Lastly, sections 6 and 7 show the projection results for public spending on education and unemployment transfers respectively.

This report is complemented with individual country fiches prepared by the authorities of each Member State. These country fiches are issued under the responsibility of each national authority. The content of the country fiches is somewhat heterogeneous, but *inter alia* they contain a description of the national pension system, a description of the model(s) used to make the pension projections and an analysis of the main factors driving the results of the pension projections. Some country fiches contain additional information on the results of the other age-related expenditure projections as well as information on national strategies to meet the economic and budgetary impact of ageing.

2. UNDERLYING ASSUMPTIONS

2.1. Demographic projections

2.1.1. The AWG population scenario

The population projection used to make the age-related expenditure projection was prepared by Eurostat. It is based on, but is not identical to, the EUROPOP2004 projection released by Eurostat in May 2005,[13] and hereafter it is referred to as the "AWG scenario". In particular:

- the fertility rate assumptions are the same as those in the baseline of EUROPOP2004 for all 25 Member States;

- for the EU10, the assumptions on life expectancy at birth are the same as those in the baseline of EUROPOP2004. For the EU15, the assumptions on life expectancy at birth are based on an AWG scenario produced by Eurostat;

- the migration assumptions are the same as those in the baseline of EUROPOP2004 for all Member States, except Germany, Italy and Spain, where specific adjustments were made to the level and/ or age structure of migrants in the AWG scenario.[14]

[12] For a more detailed analysis of the impact of ageing on the real economy and, in particular, on EU labour markets and potential growth rates, see Carone G., D.Costello, N. Diez Guardia, G. Mourre, B. Przywara, A. Salomäki (2005).

[13] '*EU25 population rises until 2025, then falls*', Eurostat press release 448/2005 of 8 April 2005. For simplicity, the baseline variant of the trend scenario of EUROPOP2004 is referred to as EUROPOP2004 baseline in the text.

[14] The migration projections used by the AWG can differ substantially from the migration projections of national authorities. For example, the Maltese authorities consider that their national projections provide a more reasonable picture of likely future trends and, therefore, have expressed reservation on the common migration projections.

2.1.2. Fertility rates well below replacement levels

The fertility rate assumptions in the AWG scenario are the same as those used in the baseline of EUROPOP2004 for all 25 Member States. For the EU15 Member States, fertility is derived from an analysis of postponement of childbearing and recuperation of fertility rates at a later age.[15] The fertility assumptions for the EU10 Member States have been prepared on the basis of a study made for Eurostat by the Netherlands Interdisciplinary Demographic Institute (NIDI). Fertility is postponed as a consequence of modernisation and westernisation; at the end of the projection period, fertility rates in most EU10 countries are assumed to converge to an EU average median age at childbearing of 30 years.

Table 2-1 and Graph 2-1 present the fertility assumptions used in the AWG population scenario. Total fertility rates increase over the projection period in all Member States, except France, Ireland and Malta, where small declines are projected. In all cases, fertility rates will remain well below the natural replacement rate of 2.1 needed to stabilise the population size and age structure. For the EU25,[16] fertility rates are projected to rise from 1.48 in 2004 to 1.60 by 2030 and to stay constant around that level until 2050.

[15] For an overview of the methodology used, see Eurostat (2004 a).

[16] Note that all EU averages are weighted by the population size.

Graph 2-1 Past and projected fertility rates for the EU25

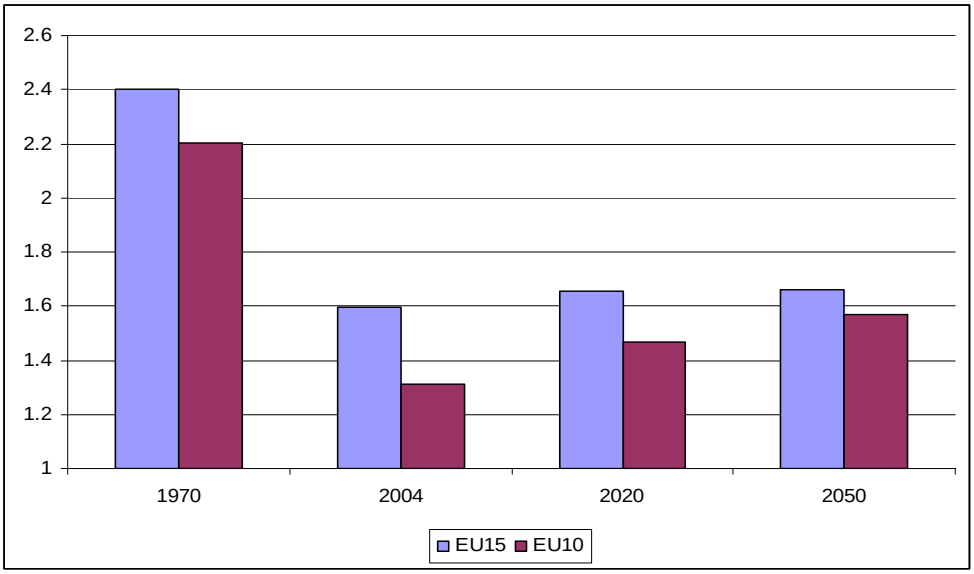


Table 2-1 Baseline assumptions on fertility rates in EU Member states

	2004	2010	2020	2030	2040	2050	*change*
BE	1.62	1.66	1.69	1.70	1.70	1.70	*0.08*
DK	1.76	1.78	1.79	1.79	1.80	1.80	*0.04*
DE	1.35	1.41	1.44	1.45	1.45	1.45	*0.10*
GR	1.29	1.41	1.49	1.50	1.50	1.50	*0.21*
ES	1.30	1.36	1.40	1.40	1.40	1.40	*0.10*
FR	1.89	1.87	1.86	1.85	1.85	1.85	*-0.04*
IE	1.97	1.89	1.81	1.80	1.80	1.80	*-0.17*
IT	1.31	1.38	1.40	1.40	1.40	1.40	*0.09*
LU	1.65	1.73	1.78	1.79	1.80	1.80	*0.15*
NL	1.75	1.76	1.75	1.75	1.75	1.75	*0.00*
AT	1.40	1.42	1.44	1.45	1.45	1.45	*0.05*
PT	1.45	1.52	1.59	1.60	1.60	1.60	*0.15*
FI	1.76	1.78	1.79	1.80	1.80	1.80	*0.04*
SE	1.74	1.84	1.85	1.85	1.85	1.85	*0.11*
UK	1.72	1.74	1.75	1.75	1.75	1.75	*0.03*
CY	1.47	1.43	1.49	1.50	1.50	1.50	*0.03*
CZ	1.15	1.24	1.44	1.50	1.50	1.50	*0.35*
EE	1.39	1.45	1.54	1.60	1.60	1.60	*0.21*
HU	1.30	1.33	1.51	1.59	1.60	1.60	*0.30*
LT	1.29	1.30	1.41	1.55	1.60	1.60	*0.31*
LV	1.30	1.42	1.53	1.59	1.60	1.60	*0.30*
MT	1.66	1.49	1.54	1.60	1.60	1.60	*-0.06*
PL	1.21	1.19	1.42	1.58	1.60	1.60	*0.39*
SK	1.19	1.18	1.33	1.52	1.59	1.60	*0.41*
SI	1.18	1.27	1.46	1.50	1.50	1.50	*0.32*
EU25	*1.48*	*1.52*	*1.57*	*1.59*	*1.60*	*1.60*	*0.12*
EU15	*1.53*	*1.57*	*1.60*	*1.60*	*1.60*	*1.61*	*0.07*
Euro area	*1.49*	*1.53*	*1.55*	*1.56*	*1.56*	*1.56*	*0.08*
EU10	*1.23*	*1.24*	*1.44*	*1.56*	*1.58*	*1.58*	*0.36*

Source: EPC and European Commission (2005a)

These projected increases are modest as compared with fertility rates observed in other developed countries such as the US, and point to the prospect of a sustained fall in the size of the European population. There is substantial divergence in fertility rates between neighbouring EU countries with similar levels of economic development (e.g. 1.9 children per woman in FR compared with 1.3 in DE and IT). If sustained over the very long run, these gaps would lead to very different population prospects. While many countries have public policies to support families, the majority have not considered explicit strategies targeting fertility. However, the interaction of a variety of public policies (labour market, education, and housing) may be inadvertently constrains choices on childbearing, and there is an emerging interest at EU level as to whether public interventions (e.g. childcare availability, flexible working-time and leave arrangements) can in practice affect fertility patterns.[17]

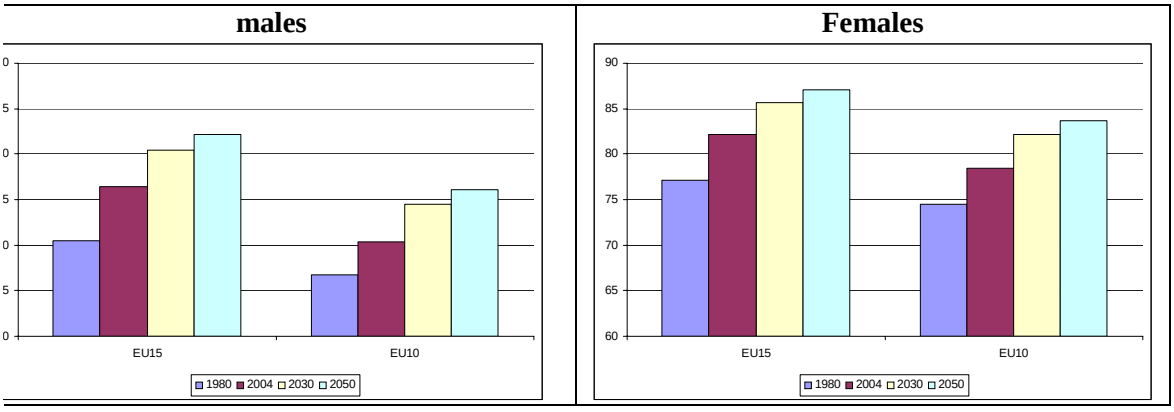
2.1.3. Continuous increases in life expectancy of more than one year per decade

Life expectancy at birth increased by some 8 years in EU countries between 1960 and 2000, equivalent to a gain of some 3 months per annum. Eurostat projects these increases to continue in the decades to come, albeit at a somewhat slower pace.

Table 2-2 and Graph 2-2 present the agreed baseline assumptions on life expectancy at birth for males and females respectively. Life expectancy at birth for males is projected to increase by 6.3 years and by 5.1 years for females in the EU25. While this results in some convergence female life expectancy is nonetheless projected to be 5 years higher than for males in 2050, at 86.6 years for the EU25 as a whole.

There are significant differences in the life expectancy improvements projected across Member States. They range from 4.6 years in Sweden to 9.6 in Hungary for males, and from 3.9 years in Spain to 6.6 in Hungary for females. The largest gains in life expectancy are projected to take place in the EU10, where levels are currently lower than in the EU15 (except for Cyprus and Malta). Despite this, life expectancy at birth in the EU10 will remain below the EU15 average according to the projection. This is especially the case for men, with a projected life expectancy of 78.7 years in 2050 as compared to 82.1 years for the EU15 on average.

Graph 2-2 Baseline assumptions for life expectancy at birth, EU 15 and EU10



Source: EPC and European Commission (2005a)

[17] In June 2005, the Commission adopted a Green paper *Faced with demographic change, a new solidarity between the generations* (COM(2005) 94).

These cross-country differences in part reflect the separate approaches used to project life expectancy at birth between the EU15 and the EU10 countries:

- for the EU10, the assumptions are the same as in the baseline of EUROPOP2004.[18] The method is based on age-specific mortality rates (ASMR) and other mortality indicators resulting from life tables. Eurostat assumes that the trend of decreasing mortality rates observed over the period of 1985 to 2002 will continue at the same speed until 2019, and slow down thereafter. This assumption results in bigger improvements in life expectancy at birth until 2019 than during the period of 2019 to 2050. Additional assumptions were made whereby in the medium and long-run, the speed of improvements in mortality reduction will converge gradually towards the pattern of average improvements in the EU15.

- For the EU15 Member States, the assumptions are based on an AWG scenario produced by Eurostat on request, for the purpose of making the 2005 budgetary projections. In brief, the AWG scenario introduces a convergence factor in life expectancy at birth towards the average outcome of EU15 Member States emerging from the baseline scenario of EUROPOP2004[19].

Table 2-2 Baseline assumptions on life expectancy at birth for males and females

	Males							Females						
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***change***	**2004**	**2010**	**2020**	**2030**	**2040**	**2050**	***change***
BE	75.5	76.9	78.9	80.3	81.4	82.1	*6.6*	81.6	82.9	84.8	86.1	87.0	87.5	*5.9*
DK	75.2	76.4	78.1	79.5	80.6	81.4	*6.2*	79.6	80.5	82.1	83.3	84.3	85.2	*5.6*
DE	76.1	77.2	78.9	80.2	81.2	82.0	*5.9*	81.7	82.7	84.2	85.4	86.2	86.8	*5.1*
GR	76.4	77.1	78.2	79.3	80.2	81.1	*4.6*	81.4	82.1	83.3	84.4	85.2	85.9	*4.5*
ES	76.6	77.6	79.1	80.2	81.0	81.7	*5.1*	83.4	84.3	85.6	86.5	87.0	87.3	*3.9*
FR	76.2	77.4	79.3	80.6	81.6	82.3	*6.1*	83.4	84.4	85.8	86.8	87.5	87.9	*4.5*
IE	75.5	76.8	78.7	80.2	81.3	82.2	*6.6*	80.7	81.8	83.6	85.0	86.0	86.8	*6.2*
IT	77.3	78.3	79.9	81.1	82.1	82.8	*5.5*	83.2	84.0	85.3	86.4	87.2	87.8	*4.6*
LU	75.0	76.4	78.4	79.9	81.0	81.8	*6.8*	81.4	82.4	83.9	85.1	86.0	86.7	*5.3*
NL	76.2	77.0	78.3	79.4	80.3	81.1	*4.8*	80.8	81.4	82.5	83.5	84.4	85.2	*4.3*
AT	76.2	77.4	79.3	80.8	81.9	82.8	*6.6*	82.1	83.2	84.7	85.9	86.7	87.2	*5.2*
PT	74.2	75.5	77.4	79.0	80.2	81.2	*6.9*	81.0	82.2	83.9	85.2	86.0	86.7	*5.7*
FI	75.3	76.7	78.7	80.2	81.2	81.9	*6.6*	81.9	82.8	84.2	85.3	86.0	86.6	*4.8*
SE	78.1	79.0	80.4	81.4	82.1	82.6	*4.6*	82.4	83.2	84.4	85.4	86.1	86.6	*4.3*
UK	76.4	77.6	79.4	80.7	81.7	82.4	*6.0*	80.9	82.1	83.8	85.1	86.0	86.7	*5.7*
CY	76.3	77.5	79.0	80.2	81.1	81.9	*5.6*	80.8	81.6	82.8	83.7	84.5	85.1	*4.3*
CZ	72.4	73.7	75.9	77.8	78.8	79.7	*7.4*	78.8	79.8	81.3	82.7	83.5	84.1	*5.3*
EE	65.5	66.5	68.9	71.6	73.5	74.9	*9.4*	76.9	77.8	79.5	81.2	82.3	83.1	*6.3*
HU	68.5	70.1	72.8	75.2	77.0	78.1	*9.6*	76.8	78.0	79.8	81.5	82.6	83.4	*6.6*
LT	66.5	67.4	69.6	72.3	74.3	75.5	*9.0*	77.6	78.5	80.1	81.8	82.9	83.7	*6.1*
LV	64.9	65.8	68.0	70.9	72.9	74.3	*9.3*	76.2	76.9	78.6	80.4	81.6	82.5	*6.3*
MT	76.2	77.4	79.0	80.1	81.0	81.8	*5.6*	80.7	81.7	82.9	83.7	84.4	85.0	*4.3*
PL	70.5	72.0	74.6	76.8	78.2	79.1	*8.7*	78.5	79.6	81.3	82.8	83.7	84.4	*5.9*
SK	69.7	70.9	73.1	75.3	76.7	77.7	*8.0*	77.8	78.7	80.3	81.8	82.7	83.4	*5.6*
SI	72.6	73.9	76.1	77.9	78.9	79.8	*7.3*	80.2	81.2	82.8	83.8	84.6	85.1	*5.0*
EU25	*75.3*	*76.5*	*78.3*	*79.8*	*80.8*	*81.6*	*6.3*	*81.5*	*82.5*	*84.1*	*85.2*	*86.0*	*86.6*	*5.1*
EU15	*76.4*	*77.5*	*79.1*	*80.4*	*81.4*	*82.1*	*5.8*	*82.2*	*83.2*	*84.6*	*85.7*	*86.5*	*87.0*	*4.9*
Euro area	*76.3*	*77.4*	*79.1*	*80.3*	*81.3*	*82.1*	*5.7*	*82.5*	*83.4*	*84.8*	*85.9*	*86.6*	*87.2*	*4.7*
EU10	*70.1*	*71.6*	*74.0*	*76.3*	*77.7*	*78.7*	*8.6*	*78.2*	*79.2*	*80.9*	*82.4*	*83.4*	*84.1*	*5.9*

[18] Eurostat (2004 b)

[19] This change was made as the assumptions on life expectancy at birth in EUROPOP2004 are based on an extrapolation until 2050 of the trends observed during the past 17 years (20 years in some cases), which leads to some divergences across Member States, including neighbouring countries. The AWG considered that the life expectancy assumptions in the EUROPOP2004 baseline may not be fully suitable as a starting point for making long-run budgetary projections whose primary use is to help assess the sustainability of Member States' public finances. Projected changes in age-related public expenditures would be heavily determined by the projected (diverging) changes in life expectancy at birth: this would make it difficult for policy-makers to disentangle the changes in age-related expenditures due to projected increases in life expectancy from those which are due to the institutional characteristics of national pensions and health care systems.

Source: EPC and European Commission (2005a)

From an economic policy perspective, the following factors regarding life expectancy warrant special emphasis:

- much of the projected gains in life expectancy will result from lower mortality rates at older ages. Life expectancy at 65 for the EU 25 will increase by about 4 years until 2050. This is especially relevant when considering pension policy as it influences the duration of retirement relative to work;

- although life expectancy at birth is expected to increase, what is not so clear is whether future gains in life expectancy will be spent in broadly good health and free of disability, i.e. whether the overall share of life spent in good health will alter. It is a highly significant question, not only for the general well-being of older persons, but also because of its repercussions for health care policy, and is examined in more depth in section 4;

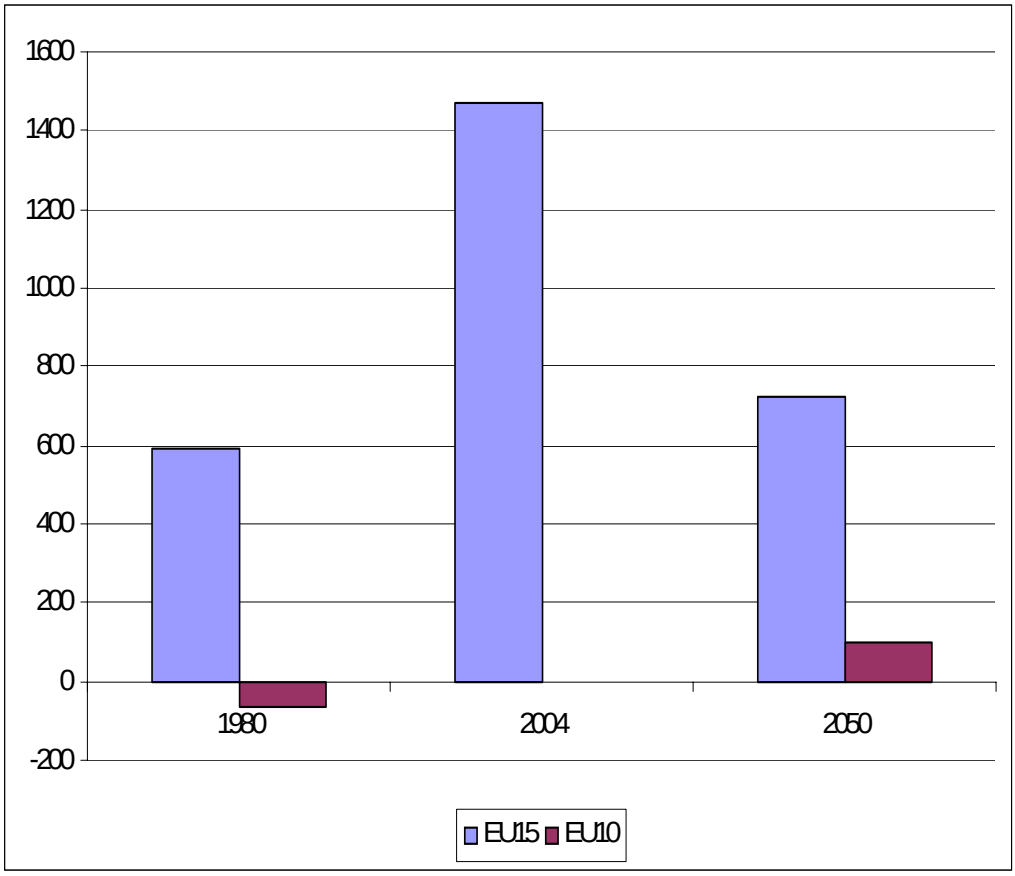
- life expectancy projections are subject to uncertainty. Past projections from official sources have regularly underestimated the gains in life expectancy, and consultations with external demographic experts suggest that this could also be a risk for current population projections. Until recently, the so-called 'demographic risk' of larger-than-expected gains in life expectancy has been borne by governments, adding extra costs to pension systems. Uncertainty has led to a number of technical and policy responses. To begin with, demographers are trying to improve the understanding of trend developments and create stochastic population projections attaching probabilities to future possible outcomes. In addition, some Member States have (through different means) linked pension benefits to life expectancy at retirement age, thus sharing the demographic risk between government and pension beneficiary.

2.1.4. Net inward migration to the EU projected to continue

Annual net migration inflows to the EU25 currently amount to 1.3 million people or 0.35% of the population. The majority of these inflows goes to EU15 countries whereas some EU10 Member States currently experience net outward migration. The assumptions on net migration in the AWG population scenario are presented on Table 2-3 and

Graph **2-3**. These are the same as those used in the baseline of EUROPOP2004 for all Member States, except for Germany[20], Italy and Spain. For the latter two specific adjustments were made to the level and age structure of migrants (for Spain, changes were only made to the age structure of migrants). This was done to enable more recent information on migration flows to be taken on board. The AWG population scenario involves large net flows into the EU25 over the projection period. For the EU25 as a whole, annual net inflows are projected to fall from an estimated 1.3 million people in 2004, equivalent to 0.3% of the EU25 population, to inflows of some 800,000 people by 2015 and thereafter hovering around 850,000 people, or 0.2% of the population.

Graph 2-3 Baseline assumptions on net migration flows, EU 15 and EU10



Source: EPC and European Commission (2005a)

[20] The assumptions on net migration in Germany were changed to take into account that the age-structure of migration was significantly influenced by the reunification and the immigration of German resettlers (Aussiedler) from Eastern Europe. In addition, the level of net migration was adjusted with a constant net migration of 200,000 "foreigners" p.a. and a decreasing net migration of German resettlers.

Table 2-3 Baseline assumptions on net migration flows for EU Member States

	in thousands							as % of total population	
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***cumulated***	**2004**	**2050**
BE	24	20	19	19	19	19	*897*	*0.2*	*0.2*
DK	8	7	7	7	7	7	*323*	*0.1*	*0.1*
DE	270	230	215	205	200	200	*10180*	*0.3*	*0.3*
GR	43	40	39	35	35	35	*1743*	*0.4*	*0.3*
ES	508	112	110	105	104	102	*6235*	*1.2*	*0.2*
FR	64	62	60	59	59	59	*2823*	*0.1*	*0.1*
IE	16	15	14	13	13	12	*645*	*0.4*	*0.2*
IT	150	150	150	150	150	150	*7050*	*0.3*	*0.3*
LU	3	3	3	3	3	3	*132*	*0.6*	*0.4*
NL	21	33	33	32	31	31	*1480*	*0.1*	*0.2*
AT	25	24	21	19	20	20	*985*	*0.3*	*0.2*
PT	42	18	16	15	15	15	*808*	*0.4*	*0.1*
FI	6	6	6	6	6	6	*288*	*0.1*	*0.1*
SE	28	24	23	22	22	21	*1069*	*0.3*	*0.2*
UK	139	116	103	99	99	98	*4939*	*0.2*	*0.2*
CY	6	6	5	5	5	5	*238*	*0.0*	*0.2*
CZ	4	3	10	22	21	20	*647*	*0.1*	*0.2*
EE	1	-2	0	2	2	2	*19*	*0.8*	*0.5*
HU	15	13	14	21	21	20	*795*	*-0.1*	*0.1*
LT	-6	-6	-1	5	4	4	*28*	*-0.2*	*0.2*
LV	-2	-3	-1	3	3	3	*30*	*0.1*	*0.2*
MT	3	2	2	2	2	3	*113*	*0.6*	*0.5*
PL	-28	-35	-11	36	35	34	*318*	*-0.1*	*0.1*
SK	-2	-2	1	5	5	5	*109*	*0.3*	*0.4*
SI	6	6	5	7	7	7	*287*	*0.0*	*0.1*
EU25	*1343*	*841*	*841*	*895*	*886*	*879*	*42182*	*0.3*	*0.2*
EU15	*1347*	*859*	*817*	*788*	*781*	*778*	*39596*	*0.4*	*0.2*
Euro area	*1171*	*712*	*685*	*660*	*654*	*651*	*33264*	*0.4*	*0.2*
EU10	*-3*	*-18*	*24*	*107*	*105*	*101*	*2586*	*0.0*	*0.1*

Source: EPC and European Commission (2005a)

These net inflows cumulate to close to 40 million people between 2004 and 2050. Migration is high on the political agenda due to its potential to offset some of the economic effects of ageing. From an economic policy perspective, the following factors require special emphasis:

- The data on migration flows are sketchy and it is extremely difficult to project migration flows.[21] The static snapshot of net inflows of the AWG population scenario fails to capture the complexity of the situation, not least because gross flows (both inwards and outwards) are neglected. Moreover, migration has a dynamic impact on the population of the host country, and account needs to be taken of factors such as the extent to which migrants return to their home country, family reunification and whether the fertility and mortality patterns of migrants' offspring and subsequent generations converge to that of the host country. Migration flows are also uncertain due to the influence of a variety of push and pull factors in both host and home countries (over which the EU have little or no influence). Natural disasters, war and political instability play a role, but these are too uncertain to project. Relative income disparities and public policy towards migrants are the major determining factors of migration over the long-run, and these can be analysed more

[21] Eurostat (2004 c).

systematically. From an analytical point of view, it is striking to note the very large diversity in approaches to modelling migration flows across official agencies.[22] This suggests that there may be scope for developing better collaboration at EU level on analysing migration flows, and in particular to quantify the repercussions of relevant policy decisions. In addition, for the EU, another important policy determinant is the accession of new Member States, given the Treaty provisions on the free movement of workers.

- Indeed, several European countries already rely on migrants to fill shortages for certain skilled and unskilled tasks (e.g. in health care sector). It has been argued that migration could bolster the financial sustainability of public pay-as-you-go pension schemes. For these benefits to materialise fully, however, it is necessary for migrants to be employed in the formal economy (contributing to the tax and social security systems), for pension schemes to be broadly in actuarial balance (otherwise the contributions of migrants will be insufficient to cover their future pension entitlements, making the funding of pension systems potentially not sustainable), and for the skill structure of migrants to match labour market needs.[23] However, in practice however, these conditions are often not met: immigrants tend to have lower employment rates than EU nationals in many countries, and their unemployment rates are roughly three times higher than average. Therefore, a key the challenge is to better integrate immigrants in the society.

2.1.5. The size and age structure of the population in the baseline scenario

According to the AWG scenario, the population in the EU25 will be both smaller and older in 2050. Table 2-4 provides an overview of these changes. The EU25 population is projected to rise from 457 million in 2004 to a peak of 470 million in 2025, and thereafter decline to 454 million in 2050. This aggregate picture hides a sharply diverged representation at country level. Whereas, the total population is projected to increase in some Member States (e.g. BE +4%, FR +9%, IE +36%, SE +13%, UK +8%), this contrasts with large projected falls in other countries (DE –6%, IT –7% PL –12%).

[22] Howe and Jackson (2005).

[23] European Commission Green Paper of January 2005 on managing economic migration (COM (2004) 811 final).

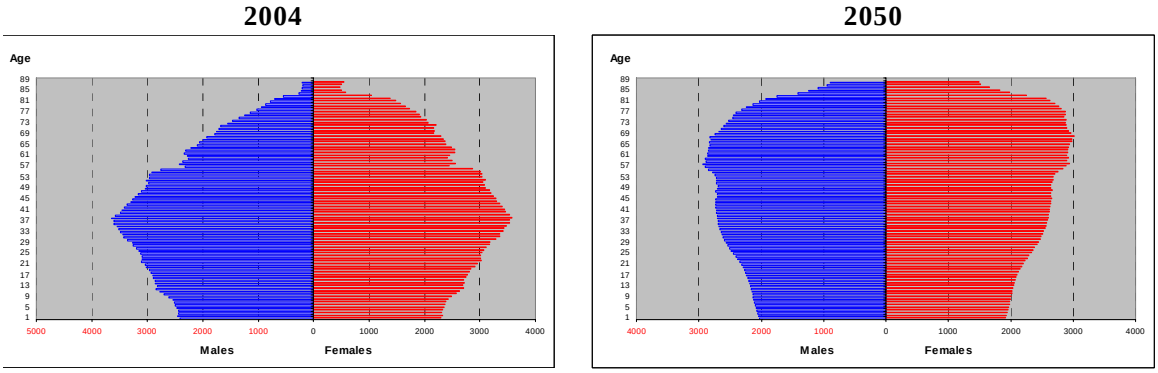
Table 2-4 Overview of the projected changes in the size and age structure of the population, in millions

	Total population			Young population (0-14)			Working-age population (15-64)			Elderly population (65+)			Very old population (80+)		
	2004	2050	% change	2004	2050	% change	2004	2050	% change	2004	2050	% change	2004	2050	% change
BE	10.4	10.8	*4*	1.8	1.6	*-11*	6.8	6.3	*-8*	1.8	3.0	*15*	0.4	1.2	*173*
DK	5.4	5.5	*2*	1.0	0.9	*-16*	3.6	3.3	*-8*	0.8	1.4	*7*	0.2	0.5	*140*
DE	82.5	77.7	*-6*	12.2	9.5	*-22*	55.5	45.0	*-19*	14.9	23.3	*105*	3.4	9.9	*187*
GR	11.0	10.7	*-3*	1.6	1.3	*-18*	7.5	5.9	*-21*	2.0	3.6	*20*	0.4	1.2	*227*
ES	42.3	43.0	*1*	6.2	5.0	*-19*	29.1	22.9	*-21*	7.1	15.0	*99*	1.8	5.3	*199*
FR	59.9	65.1	*9*	11.1	10.4	*-7*	39.0	37.4	*-4*	9.8	17.4	*94*	2.6	6.9	*163*
IE	4.0	5.5	*36*	0.8	0.9	*4*	2.7	3.2	*16*	0.4	1.4	*12*	0.1	0.4	*313*
IT	57.9	53.8	*-7*	8.2	6.2	*-25*	38.5	29.3	*-24*	11.1	18.2	*89*	2.8	7.2	*158*
LU	0.5	0.6	*42*	0.1	0.1	*26*	0.3	0.4	*30*	0.1	0.1	*1*	0.0	0.1	*279*
NL	16.3	17.6	*8*	3.0	2.8	*-9*	11.0	10.6	*-4*	2.3	4.3	*26*	0.6	1.6	*191*
AT	8.1	8.2	*1*	1.3	1.0	*-24*	5.5	4.7	*-15*	1.3	2.5	*15*	0.3	1.0	*204*
PT	10.5	10.1	*-4*	1.6	1.3	*-21*	7.1	5.5	*-22*	1.8	3.2	*18*	0.4	1.1	*181*
FI	5.2	5.2	*0*	0.9	0.8	*-13*	3.5	3.0	*-14*	0.8	1.4	*7*	0.2	0.5	*174*
SE	9.0	10.2	*13*	1.6	1.7	*4*	5.8	6.0	*4*	1.5	2.5	*12*	0.5	0.9	*95*
UK	59.7	64.2	*8*	10.9	9.4	*-13*	39.2	37.8	*-4*	9.5	17.0	*93*	2.6	6.5	*150*
CY	0.7	1.0	*34*	0.1	0.1	*-11*	0.5	0.6	*19*	0.1	0.3	*2*	0.0	0.1	*319*
CZ	10.2	8.9	*-13*	1.6	1.1	*-28*	7.2	5.0	*-31*	1.4	2.8	*17*	0.3	0.8	*164*
EE	1.4	1.1	*-17*	0.2	0.2	*-23*	0.9	0.7	*-27*	0.2	0.3	*1*	0.0	0.1	*124*
HU	10.1	8.9	*-12*	1.6	1.2	*-24*	6.9	5.2	*-25*	1.6	2.5	*12*	0.3	0.8	*131*
LT	3.4	2.9	*-16*	0.6	0.4	*-35*	2.3	1.7	*-26*	0.5	0.8	*3*	0.1	0.3	*171*
LV	2.3	1.9	*-19*	0.4	0.3	*-22*	1.6	1.1	*-30*	0.4	0.5	*1*	0.1	0.2	*131*
MT	0.4	0.5	*27*	0.1	0.1	*1*	0.3	0.3	*12*	0.1	0.1	*1*	0.0	0.0	*254*
PL	38.2	33.7	*-12*	6.6	4.4	*-33*	26.7	19.4	*-27*	5.0	9.9	*62*	0.9	3.0	*226*
SK	5.4	4.7	*-12*	0.9	0.6	*-36*	3.8	2.7	*-28*	0.6	1.4	*10*	0.1	0.4	*210*
SI	2.0	1.9	*-5*	0.3	0.2	*-16*	1.4	1.1	*-24*	0.3	0.6	*4*	0.1	0.2	*252*
EU25	*456.8*	*453.8*	*-1*	74.8	61.4	*-18*	306.8	259.1	*-16*	75.3	133.3	*725*	18.2	49.9	*174*
EU15	*382.7*	*388.3*	*1*	62.4	52.7	*-15*	255.1	221.3	*-13*	65.2	114.2	*613*	16.3	44.2	*172*
Euro area	*308.6*	*308.4*	*0*	48.9	40.8	*-17*	206.5	174.2	*-16*	53.3	93.4	*501*	13.0	36.3	*180*
EU10	*74.1*	*65.5*	*-12*	12.4	8.6	*-30*	51.7	37.8	*-27*	10.1	19.1	*112*	1.9	5.7	*193*

Source: EPC and European Commission (2005a)

Even more dramatic changes will occur at the age structure of the population. Population pyramids on Graph 2-4 provide a snapshot contrast of the EU25 population in 2004 and 2050. In 2004, the large bulges are persons of working age, with 39 being the most numerous age cohorts. By 2050, an inverted cone shape is evident, reflecting the passage of baby-boomers into retirement years, increasing life expectancy and the effects of prolonged low fertility rates.

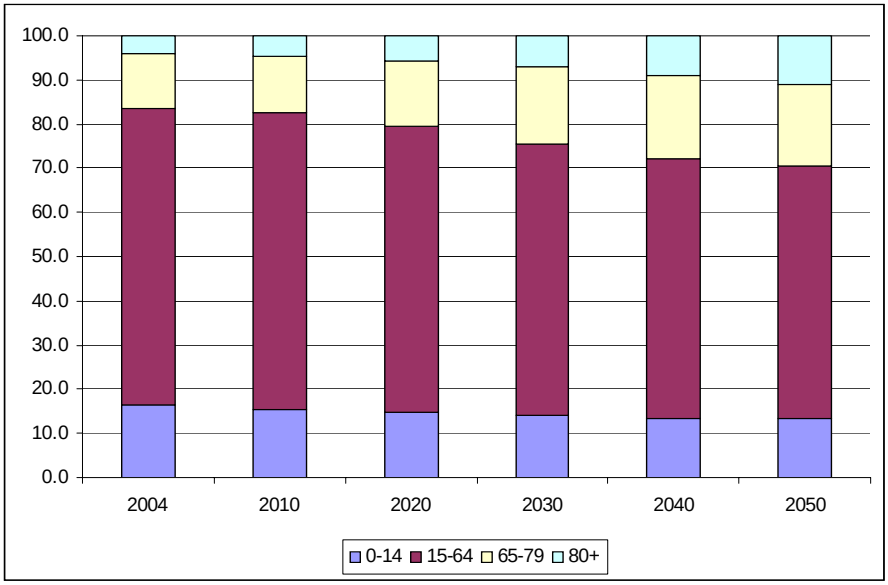
Graph 2-4 Age pyramids for the EU25 population in 2004 and 2050



Source: EPC and European Commission (2005a)

As illustrated on Graph 2-5, the share of young persons aged 0-14 in the total population is projected to decline, and their overall numbers in the EU25 will drop by 19% (-30% in EU10). From an economic perspective, the most interesting change concerns the working-age population (15-64). This group will start to fall as of 2010 in the EU25 (sooner in some countries), and drop by 48 million or 16% by 2050. Here Member State divergences are wide, with declines of more than 20 percentage points projected in 13 countries (DE, GR, ES, IT, PT, CZ, EE, HU, LT, LV, PL, SK, SI). In contrast, the elderly population aged 65+ will rise sharply, by 58 million (or 77%), by 2050. The fastest growing segment of the population will be the very old (80+) and rise by almost 32 million or 174%.

Graph 2-5 Projected changes in the age structure of the EU25 population



Source: EPC and European Commission (2005a)

2.2. Labour force projections

2.2.1. The cohort component methodology

"No policy change" assumption in baseline scenario

The labour force projection is based on an age-cohort methodology developed by the OECD[24] and refined by DG ECFIN[25] and the AWG. The methodology takes into account explicitly the evolution of lifetime profiles of participation. It is based on the calculation of the probability of labour market entry and labour market exit for each of the latest cohorts available (based on the average rates between 1998 and 2003). These probabilities are kept constant and, in the baseline scenario, reflect a working assumption of "no policy change". In essence:

- the cohort methodology reflects the tendency for women belonging to any given cohort or generation to have their own specific level of participation, which is usually higher at all ages than the corresponding level of participation of older cohorts. Thus, the simulation produces an autonomous increase of female participation – referred to as a "cohort effect" – as older women are gradually replaced by younger cohorts;

- captures the effects of demographic change on the labour force. Besides the reduction in the size of the working-age population (aged 15-64), an ageing population also increases the share of older workers (aged 55-64) in the total labour force, whose participation rate is significantly lower than that of younger age groups.

Projections on the future size and structure of the labour force are obtained by combing projections of activity rates (of each single year of age and gender of people in the labour market) with the baseline working-age population projection described in section 2.1. The employment projections only refer to the number of persons, and it is assumed that over the projection period, there will be no changes in the hours worked, the breakdown between private and public sector, the share of self-employed and employees, or the share of part-time work.

Some additional assumptions on participation rates

The following additional adjustments were also included in making the labour force projections:

- a correction mechanism for young cohorts: a floor at the rate observed in 2003 was applied to the participation rates of young cohorts (aged 15-19) in some countries. This is to avoid extrapolating over the next 50 years the recently observed drop in the participation rates of young cohorts as a result of the extended duration of full-time education;

- the potential effects of recently enacted pension reforms that will be phased-in in 17 EU Member States are considered. These include reforms to increase statutory retirement ages, to curtail access to early retirement schemes and to remove financial incentives that have

[24] Burniaux J., M., R. Duval and F. Jaumotte (2003).

[25] A more detailed description of the projection methodology and results can be found in Carone (2005).

encouraged workers to leave the labour force[26]. The effects of these pension reforms have been modelled using a probabilistic model already used within the European Commission for the calculation of the "average exit age" from the labour force;

- for a number of Member States, the conversion of labour force projections is based on Labour Force Surveys that have been converted into national account equivalents.[27]

2.2.2. Projection results for labour force participation and labour supply

Projected increases in overall participation rates

Table 2-5 presents the participation rates by age group and gender in the EU25 Member States in 2003, and Table 2-6 shows the projected change up to 2050 used in the baseline scenario. Overall participation rates (for the age group 15-64) in the EU25 are projected to increase by about 6 percentage points over the period 2003-2050 (from 69.4% in 2003 to 74.6% in 2025 and to 75.2% in 2050).

[26] Detailed information on pension reforms enacted in the EU Member States (also migration policy) can be found in a new database on labour market reforms (LABREF) recently launched by the European Commission-Directorate General for Economic and Financial Affairs together with Labour Market Working Group attached to the EPC. LABREF can be found at: http://europa.eu.int/comm/economy_finance/indicators/labref_en.htm. A description of the database can be found in Arpaia A, D. Costello, G. Mourre and F. Pierini (2005), and the economic rationale for tracking changes in labour market institutions can be found in Arpaia and Mourre (2005).

[27] In many countries, employment data from Labour Force Surveys differ significantly from data from National Accounts due to different statistical methodologies. For some countries, where e.g. pension models are based on National Accounts, a conversion was implemented to avoid inconsistencies.

Table 2-5 Participation rates by gender and age group in 2003 in EU Member States

	Total				Male				Female			
	Total (15-64)	Young (15-24)	Prime age (25-54)	Older (55-64)	Total (15-64)	Young (15-24)	Prime age (25-54)	Older (55-64)	Total (15-64)	Young (15-24)	Prime age (25-54)	Older (55-64)
BE	65.0	35.2	82.3	28.9	72.9	38.6	90.9	38.8	56.9	31.6	73.6	19.3
DK	79.3	65.2	87.8	62.8	83.7	67.8	91.7	70.4	74.8	62.4	83.8	55.2
DE	72.6	50.1	86.2	45.2	79.5	52.9	93.3	54.7	65.4	47.1	78.8	35.9
GR	65.3	35.8	80.0	43.5	78.1	39.3	94.4	61.4	52.4	32.0	65.4	27.1
ES	67.5	44.7	79.6	43.6	79.9	49.8	92.5	62.8	55.1	39.3	66.5	25.6
FR	69.3	38.5	86.3	38.3	75.4	42.7	93.4	42.7	63.3	34.2	79.2	34.0
IE	68.8	52.4	79.1	50.1	79.2	56.1	91.0	66.2	58.3	48.6	67.2	33.6
IT	62.9	37.8	77.9	30.5	74.9	41.6	91.6	43.1	50.9	34.0	64.1	18.8
LU	65.0	29.0	81.4	30.7	75.5	29.9	94.5	40.2	54.3	28.2	68.0	21.3
NL	76.4	72.7	85.2	45.6	84.0	73.3	93.3	58.3	68.7	72.1	76.9	32.7
AT	72.2	55.6	87.4	31.9	79.9	60.9	94.7	42.9	64.4	50.1	80.1	21.5
PT	72.7	45.2	86.0	53.7	79.3	49.2	92.3	64.9	66.3	41.2	79.7	43.8
FI	74.5	51.2	87.5	53.4	76.7	52.0	90.1	55.1	72.3	50.3	84.8	51.8
SE	77.5	48.0	87.7	72.1	79.4	47.6	89.9	75.1	75.6	48.5	85.4	69.1
UK	75.3	63.3	83.8	57.2	82.4	66.4	91.3	67.4	68.3	60.0	76.4	47.2
CY	70.8	42.0	85.7	52.6	79.6	43.8	95.2	72.7	62.3	40.1	76.7	33.5
CZ	70.3	37.6	87.8	44.5	77.9	40.6	94.4	60.3	62.8	34.6	81.1	30.2
EE	70.1	36.9	85.8	56.8	74.7	42.5	89.5	64.7	65.9	31.1	82.3	50.8
HU	60.5	31.6	77.9	29.5	67.5	35.5	84.9	38.8	53.7	27.5	71.0	22.0
LT	70.0	30.4	88.8	51.3	73.6	34.6	90.6	63.6	66.6	26.0	87.2	42.0
LV	69.3	39.0	86.3	47.8	74.3	45.3	89.7	56.6	64.7	32.4	83.0	41.2
MT	58.6	56.8	66.0	32.9	79.9	59.1	93.8	54.2	36.8	54.4	37.5	12.9
PL	63.8	36.2	81.5	29.9	69.8	40.4	87.2	39.3	57.9	31.9	75.8	21.8
SK	70.1	41.5	89.4	29.1	76.8	45.4	94.1	48.9	63.4	37.5	84.6	12.7
SI	67.3	34.0	87.6	24.2	72.0	38.5	90.7	34.0	62.5	29.1	84.4	15.1
EU25	*69.6*	*45.8*	*83.4*	*42.7*	*77.5*	*49.4*	*91.9*	*53.5*	*61.6*	*42.1*	*74.9*	*32.6*
EU15	*70.4*	*48.2*	*83.5*	*44.2*	*78.7*	*51.7*	*92.5*	*54.8*	*62.1*	*44.7*	*74.4*	*34.0*
Euro area	*69.1*	*44.9*	*83.2*	*40.4*	*77.8*	*48.6*	*92.8*	*51.3*	*60.3*	*41.2*	*73.6*	*29.9*
EU10	*65.4*	*36.2*	*83.1*	*34.5*	*71.7*	*40.2*	*88.9*	*45.9*	*59.2*	*32.0*	*77.4*	*24.8*

Source: EPC and European Commission (2005a)

Table 2-6 Projected changes in participation rates up to 2050 used in the baseline scenario

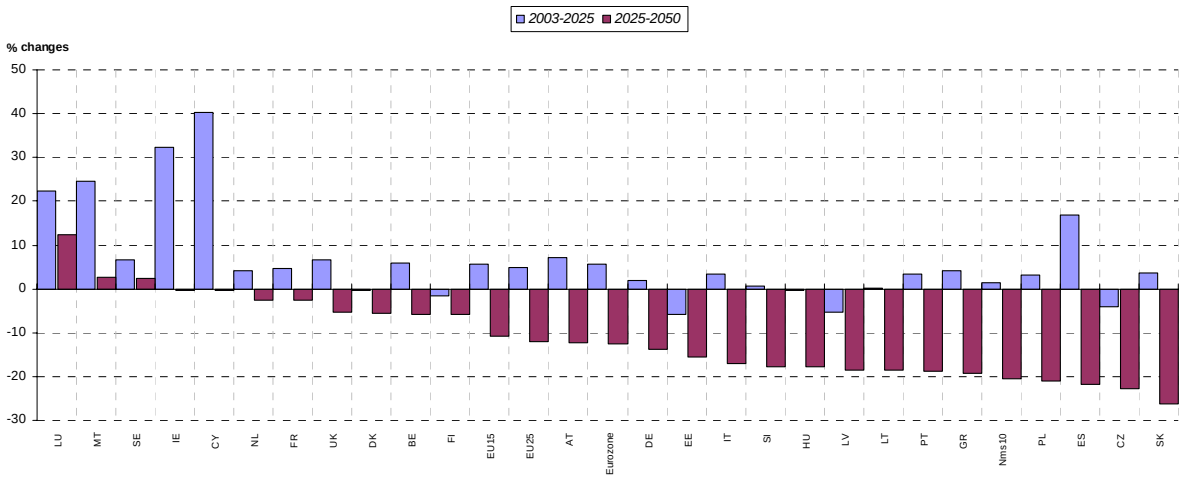
Country	Total				Male				Female			
	Total (15-64)	***Young*** (15-24)	***Prime age*** (25-54)	***Older*** (55-64)	***Total*** (15-64)	***Young*** (15-24)	***Prime age*** (25-54)	***Older*** (55-64)	***Total*** (15-64)	***Young*** (15-24)	***Prime age*** (25-54)	***Older*** (55-64)
BE	5.0	1.7	6.3	16.0	1.6	1.7	3.3	7.9	8.5	1.5	9.3	23.8
DK	2.1	3.0	1.9	6.2	1.8	4.5	1.7	4.0	2.2	1.3	2.0	8.3
DE	6.4	2.0	3.6	24.0	5.4	2.6	2.3	22.8	7.5	1.3	5.1	25.2
GR	4.6	-1.4	5.3	10.2	-0.1	-1.8	0.4	0.0	9.2	-1.0	10.2	18.8
ES	9.2	-2.6	10.3	20.3	3.1	-2.1	3.6	7.2	15.3	-3.1	16.9	32.2
FR	3.8	0.9	3.8	15.8	2.0	0.5	1.6	14.1	5.3	1.3	5.7	17.5
IE	8.4	-0.3	7.7	19.4	3.9	-0.4	3.5	6.1	12.8	-0.3	11.8	33.1
IT	7.4	-0.8	6.3	24.8	4.3	-0.7	2.5	21.9	10.2	-0.9	9.7	26.8
LU	3.4	0.0	6.7	11.4	-0.7	0.8	2.1	6.6	7.5	-0.8	11.4	16.3
NL	4.0	1.0	5.3	10.5	-0.8	0.7	-0.2	2.7	9.0	1.3	10.9	18.4
AT	6.9	1.6	5.1	27.3	3.9	1.0	1.4	24.0	9.8	2.3	8.7	30.1
PT	5.0	-1.2	5.1	12.5	1.9	-0.5	1.7	5.6	7.8	-1.9	8.2	18.2
FI	5.1	1.3	4.7	14.1	4.8	0.9	4.4	14.4	5.3	1.8	5.0	13.7
SE	3.6	3.7	3.5	6.9	3.3	3.0	2.9	7.4	3.9	4.4	4.0	6.3
UK	3.0	1.9	3.2	8.1	0.1	1.7	0.5	1.1	5.7	2.1	5.5	14.7
CY	9.9	5.1	8.6	18.0	6.5	5.8	2.0	11.8	13.0	4.3	14.6	22.8
CZ	4.2	-0.8	2.8	15.6	1.9	-1.1	0.6	9.1	6.4	-0.5	5.2	20.8
EE	6.0	2.0	5.5	7.0	5.2	2.4	5.3	1.4	6.5	1.6	5.3	10.9
HU	5.9	0.1	4.6	20.6	4.0	0.2	3.3	15.8	7.5	0.1	5.8	23.9
LT	7.1	2.3	4.6	17.1	6.4	-0.2	4.2	12.8	7.6	4.8	4.9	19.3
LV	7.4	3.5	6.6	12.7	7.5	3.6	7.3	10.0	7.2	3.3	5.7	14.1
MT	7.4	2.6	13.9	0.9	0.2	0.4	2.9	-2.2	15.0	4.8	25.7	2.9
PL	7.2	3.0	8.2	19.4	6.6	2.8	5.6	20.6	7.8	3.2	10.6	17.2
SK	3.8	0.7	3.4	22.9	1.9	-0.1	1.8	12.2	5.6	1.4	4.9	30.8
SI	6.1	-2.6	4.7	28.8	4.4	-3.8	4.0	23.8	7.9	-1.2	5.5	33.2
EU25	***5.9***	***2.2***	***5.3***	***17.7***	***3.3***	***2.0***	***2.3***	***13.2***	***8.4***	***2.3***	***8.1***	***21.6***
EU15	***5.7***	***1.4***	***5.1***	***17.8***	***2.8***	***1.3***	***1.9***	***12.9***	***8.5***	***1.4***	***8.2***	***22.2***
Euro area	***6.2***	***0.7***	***5.6***	***20.1***	***3.2***	***0.7***	***2.2***	***15.5***	***9.1***	***0.6***	***8.9***	***24.3***
EU10	***6.4***	***1.7***	***6.2***	***18.3***	***5.1***	***1.3***	***4.2***	***16.0***	***7.4***	***2.1***	***8.1***	***19.3***

Source: EPC and European Commission (2005a

… but labour supply will decline because of population trends

The size of the overall labour force (age 15-64) in the EU25 is estimated to increase by 5% from 2003 to 2025 (see Graph 2-6). This is a result of combining the projected population and rates of participation in each gender/age group. This translates into an increase in the labour force of roughly 10.5 million persons. The increase is mainly due to the rise in female labour supply, while the male labour force is projected to remain largely unchanged (only about 2 million additional people). However, this positive trend in female labour supply is projected to reverse during the period 2025-2050 and along with the drop in male supply, the overall labour force is expected to decrease by as much as 12% (equivalent to around 27.5 million people, 16.5 million if compared with the level in 2003) although there are wide differences across countries.

Graph 2-6 Baseline labour force projection (change in % of people aged 15-64 between 2003 and 2050)



Source: EPC and European Commission (2005a)

2.2.3. Assumptions on unemployment

To move from labour force projections to employment projections, one should look at the rate of unemployment. It was agreed that unemployment rates converge to their structural level, or NAIRU (Commission estimates for the NAIRU as agreed upon in the Output Gap Working Group of the EPC) by 2008 and that they remain constant thereafter. The following adjustments are made to this general rule:

- countries with a NAIRU rate in 2008 higher than the average rate of the EU15 had their unemployment rates further reduced so as to converge to the 2008 EU15 average (7%) by 2015;

- the EU10 countries with a NAIRU above the EU15 average (i.e. PL and SK) have 20 years for their unemployment rates to converge to the EU15 average;

- to avoid significant changes in the rankings across countries, the structural unemployment rate is reduced by an additional 0.5 percentage points (to reach 6.5%in 2015) for Belgium, the Czech Republic and Italy.

The outcome of these assumptions is presented in Table 2-7. In aggregate terms, unemployment rates in the EU25 are assumed to fall from 9.3% in 2003 to 7.8% in 2010 and to 6.1% by 2025. A much bigger fall is projected for the EU10 countries, from 14.8% in 2003 to 12% in 2010. The approach to making assumptions results in large projected falls in countries with the highest unemployment rates in the base year of 2003, i.e. a fall of over 10 percentage points in Poland and Slovakia, and of 4.6 percentage points in Spain.

Table 2-7 Assumptions on unemployment rates

	2003	*2010*	*2015*	*2025*	*2050*	*Change 2003-2025*
BE	8.2	7.0	6.5	6.5	6.5	-1.7
DK	5.5	4.3	4.3	4.3	4.3	-1.2
DE	9.9	8.5	7.0	7.0	7.0	-2.9
GR	9.8	8.6	7.0	7.0	7.0	-2.8
ES	11.6	8.7	7.0	7.0	7.0	-4.6
FR	9.0	8.3	7.0	7.0	7.0	-2.0
IE	4.8	3.4	3.4	3.4	3.4	-1.4
IT	8.9	7.3	6.5	6.5	6.5	-2.4
LU	3.7	4.2	4.2	4.2	4.2	0.6
NL	3.7	3.2	3.2	3.2	3.2	-0.5
AT	4.3	3.4	3.4	3.4	3.4	-0.9
PT	6.7	5.6	5.6	5.6	5.6	-1.1
FI	9.2	6.8	6.5	6.5	6.5	-2.7
SE	5.7	4.3	4.3	4.3	4.3	-1.4
UK	5.1	4.6	4.6	4.6	4.6	-0.5
CY	4.4	4.2	4.2	4.2	4.2	-0.2
CZ	7.9	7.3	6.5	6.5	6.5	-1.4
EE	10.3	7.8	7.0	7.0	7.0	-3.3
HU	5.9	4.8	4.8	4.8	4.8	-1.2
LT	12.5	8.9	7.0	7.0	7.0	-5.5
LV	10.7	7.6	7.0	7.0	7.0	-3.7
MT	7.6	8.3	7.0	7.0	7.0	-0.6
PL	20.1	15.8	12.9	7.0	7.0	-13.1
SK	17.6	15.2	12.5	7.0	7.0	-10.6
SI	6.8	5.5	5.5	5.5	5.5	-1.2
EU25	**9.3**	**7.8**	**6.7**	**6.1**	**6.1**	**-3.1**
EU15	**8.2**	**7.0**	**6.1**	**6.1**	**6.0**	**-2.2**
Euro area	**9.0**	**7.6**	**6.5**	**6.5**	**6.4**	**-2.5**
EU10	**14.8**	**12.0**	**10.0**	**6.6**	**6.6**	**-8.3**

Source: EPC and European Commission (2005a)

2.2.4. Employment rate projections

A breakdown of employment rates by age and gender

Graph 2-7 shows the projected employment rates relative to the various Lisbon employment targets. [28] The projected change in employment rates is due to the following developments:[29]

- *young persons (15-24):* the projections were made by extrapolating forward the trends observed in the past 5 years. Whilst in many countries (especially EU10) employment rates of young persons have been falling, it has risen in some EU15 countries. This is linked to more persons completing secondary education and higher enrolment in tertiary studies;

- *women*: the projections show female employment rates rising from just over 55% in 2004 to almost 65% by 2025 and remaining stable thereafter. This increase, which would imply that the 60% Lisbon employment target is reached in 2010, is attributable to the gradual replacement of older women with low participation rates by younger women who have a much stronger attachment to the labour force. A trend of rising employment rates of women has been observed for several decades, and is largely explained by higher educational attainment and socio-cultural factors on the role of women in the society. Whether the projected increases in female employment rates materialise in practice may in part depend on supportive public policies or collective agreements being put in place. For example, policies to promote access to affordable childcare, the reconciliation between professional and private lives and to better achieve gender equality could be important in this regard.[30] Moreover, a rise in female participation may have an impact on fertility rates and working hours, although the magnitude of such effects and the sense of causality remain very uncertain;

- *older workers (55-64):* the employment rate of older workers is projected to increase sharply by 19 p.p. from 40% in 2004 for the EU25 to 47% by 2010 and 59% in 2025: this is well in excess of the 50% Lisbon target that is projected to be reached by 2013. The projection reflects the observed increase in employment rates of older workers in recent years (up by 4.4 p.p. since 2000). It also incorporates the expected (albeit uncertain) positive effects of enacted pension reforms. These reforms have, *inter alia*, curtailed access to early retirement schemes, raised statutory retirement ages (including minimum ages when pension income can be drawn) and strengthened financial incentives to remain in the labour force. Note, the increase in the employment rates for males (by 15 p.p. from 50% to 65%) is less than the projected increase for females (23 p.p. from 30% to 53%). The difference arises due to a stronger cohort effect for females. The increase in the participation rate due to pensions is some 10 p.p. for both male and females, whereas the cohort effect for females is almost 13 p.p. compared with 6 p.p. for males.

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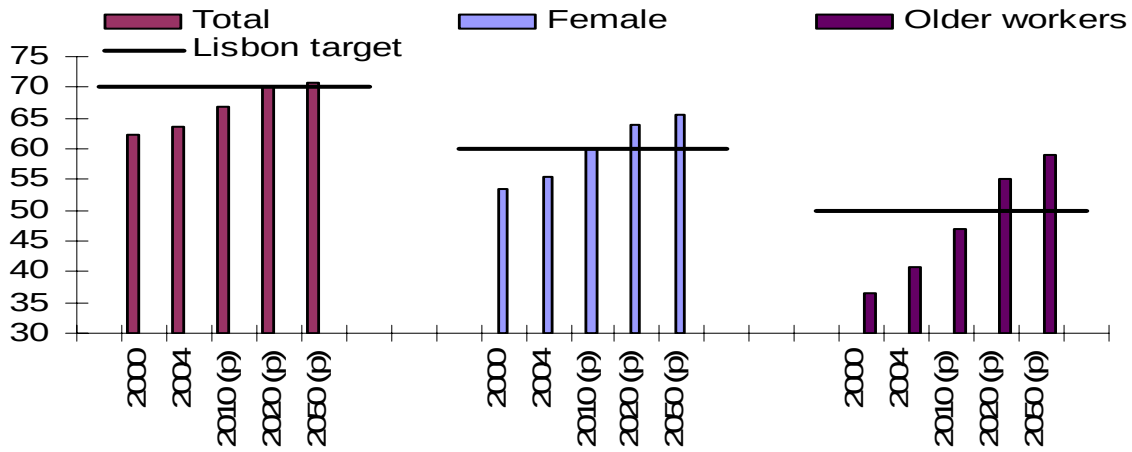
[28] The Lisbon European Council (March 2000) Heads of State and Government set targets of raising the overall EU15 employment rate at 70% and 60% for women. The Stockholm European Council (March 2001) added two intermediate and one additional target: the employment rate should be raised to 67% overall by 2005, 57% for women by 2005 and 50% for older workers by 2010.

[29] The analysis below is based on Carone (2005).

[30] See chapter 3 in European Commission (2004a).

Graph 2-7 Projected employment rates and Lisbon targets in the EU25



Note: *(p) means projected figures, while 2000 and 2004 figures are the actual ones.*
Source: ECFIN calculations based on EPC and European Commission (2005a).

Given the population projections, the unemployment rate assumptions and the labour force projections, the overall employment rate (age 15-64) in the EU25 is projected to increase from 63% in 2003 to 70% in 2025, and to stabilise at 70.7% at the end of the projection period, see Table 2-7. The female employment rate is projected to increase by some 10 percentage points to 65.5% by 2050, above the Lisbon employment target of 60%. The employment rate of older workers is projected to increase by some 18 percentage points over the projection period to 60.4% in 2050, and the Lisbon employment target of 50% is projected to be reached by 2013.

Table 2-8 Projected employments rates used in the 2005 EPC budgetary projection exercise

	Total (15-64)				*Females (15-64)*				*Older workers(55-64)*			
	2003	2010	2025	2050	2003	2010	2025	2050	2003	2010	2025	2050
BE	59.6	62.1	64.7	65.5	51.8	56.0	60.3	61.0	28.1	33.2	42.8	44.4
DK	74.9	76.4	77.3	77.9	70.2	72.0	72.7	73.3	59.8	61.5	65.6	66.7
DE	65.4	70.9	73.2	73.5	59.3	65.8	67.8	68.3	39.5	56.4	65.8	65.7
GR	58.9	62.7	64.9	65.1	44.6	50.0	54.6	55.6	42.1	44.4	51.9	52.9
ES	59.7	66.4	70.3	71.4	46.2	55.6	62.5	64.2	40.6	45.6	59.6	62.5
FR	63.1	64.4	66.7	68.0	57.0	58.9	61.8	63.4	36.3	42.3	49.4	52.9
IE	65.5	70.9	73.6	74.6	55.7	62.7	67.7	69.1	48.8	55.5	66.8	68.9
IT	57.2	61.0	63.6	65.7	44.9	50.0	53.9	56.1	29.4	35.9	49.4	54.6
LU	62.6	64.4	64.9	65.4	51.7	55.6	58.1	58.7	30.3	35.3	40.2	41.8
NL	73.6	75.3	76.5	77.9	66.0	70.1	73.4	75.2	44.4	48.1	53.5	55.2
AT	69.1	73.5	75.1	76.4	61.7	67.8	70.5	71.8	30.1	40.1	54.2	58.0
PT	67.8	71.9	72.9	73.4	61.2	66.4	68.7	69.5	51.4	56.5	63.0	64.7
FI	67.7	70.2	73.8	74.4	65.8	67.9	71.9	72.7	49.4	54.1	62.3	64.9
SE	73.1	74.9	77.4	77.6	71.6	73.5	76.1	76.4	68.8	70.9	75.1	76.6
UK	71.5	72.9	74.2	74.7	65.3	67.3	70.0	71.1	55.4	56.9	62.5	63.9
CY	67.7	73.6	78.2	77.3	59.3	67.0	72.8	72.0	50.2	60.7	65.2	69.1
CZ	64.8	66.8	72.1	69.7	56.6	59.8	66.5	63.8	42.5	48.1	59.8	58.9
EE	62.9	68.4	71.9	70.8	59.3	64.7	68.9	67.4	52.7	55.3	61.7	61.7
HU	56.9	60.8	65.3	63.2	50.7	54.2	60.3	58.6	28.7	39.6	49.8	49.5
LT	61.2	67.3	73.4	71.7	58.4	64.6	71.3	69.0	45.3	53.1	65.1	66.2
LV	61.9	69.9	73.1	71.4	57.8	65.3	69.1	66.7	44.1	53.4	59.2	58.7
MT	54.1	56.7	62.4	61.3	33.7	39.6	49.0	48.6	32.0	29.3	30.3	33.1
PL	51.0	57.0	68.4	66.1	45.8	51.8	64.3	60.9	26.7	35.2	42.7	48.7
SK	57.8	62.1	72.7	68.7	52.2	56.9	68.9	64.3	25.2	38.5	51.7	51.2
SI	62.8	67.7	69.9	69.3	58.0	62.5	65.9	66.4	23.5	40.4	50.0	52.6
EU25	***63.1***	***66.9***	***70.3***	***70.9***	***55.4***	***60.2***	***64.7***	***65.5***	***39.9***	***47.1***	***56.8***	***58.9***
EU15	***64.6***	***68.1***	***70.5***	***71.5***	***56.5***	***61.2***	***64.6***	***66.1***	***41.4***	***48.6***	***58.0***	***60.2***
Euro area	***62.9***	***66.9***	***69.4***	***70.5***	***54.1***	***59.4***	***63.1***	***64.6***	***37.4***	***46.0***	***56.5***	***58.8***
EU10	***55.7***	***60.7***	***69.4***	***67.1***	***50.0***	***55.2***	***65.0***	***62.1***	***31.7***	***39.8***	***49.2***	***51.9***

Source: EPC and European Commission (2005a)

As shown on Table 2-9 the number of persons employed (according to the European Labour Force Survey definition) is expected to record a positive annual growth rate of only 0.4% over the period 2003-2025, and then reverse to a larger negative annual growth rate of about -0.5% in the subsequent period (2025-2050). As a result, the overall number of people employed in the EU25 in 2050 is projected to be about 9 million below the level recorded in 2003 (a drop of 600,000 women and 8.2 million of men).

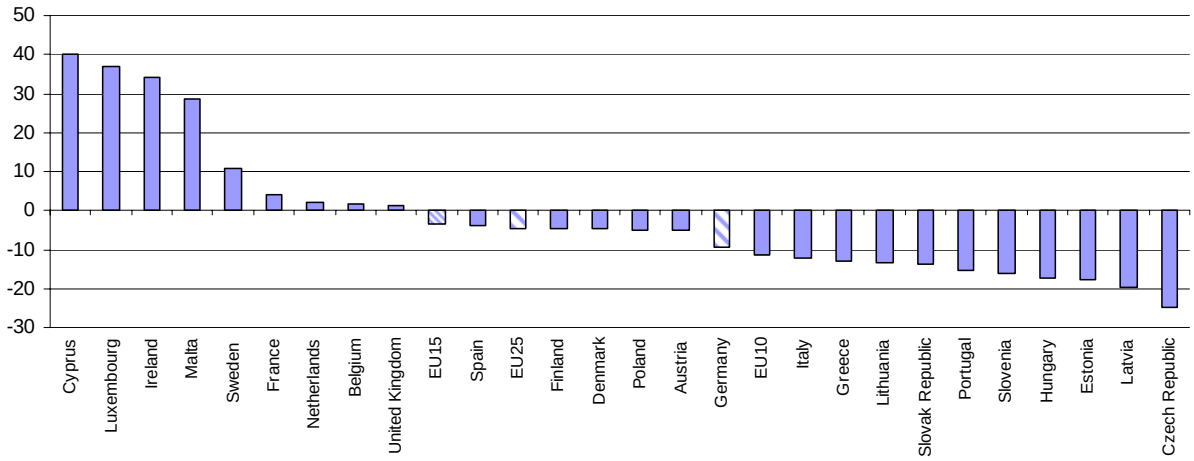
Table 2-9 Projected changes in employment (aged 15-64)

	Changes						Annual Growth rate	
	(thousands)			(as %)				
	2003-2025	*2025-2050*	*2003-2050*	*2003-2025*	*2025-2050*	*2003-2050*	*2003-2025*	*2025-2050*
BE	315	-249	66	7.8	-5.7	1.6	0.3	-0.2
DK	23	-151	-129	0.8	-5.6	-4.8	0.0	-0.2
DE	1887	-5260	-3373	5.2	-13.7	-9.3	0.2	-0.6
GR	331	-908	-577	7.5	-19.2	-13.1	0.3	-0.8
ES	3906	-4552	-646	22.9	-21.7	-3.8	0.9	-1.0
FR	1664	-694	969	6.8	-2.7	4.0	0.3	-0.1
IE	604	-5	599	34.3	-0.2	34.0	1.3	0.0
IT	1348	-3985	-2637	6.2	-17.1	-12.0	0.3	-0.7
LU	41	28	69	21.7	12.4	36.8	0.9	0.5
NL	381	-212	168	4.7	-2.5	2.1	0.2	-0.1
AT	304	-502	-198	8.0	-12.3	-5.2	0.4	-0.5
PT	218	-940	-722	4.6	-18.9	-15.2	0.2	-0.8
FI	28	-141	-112	1.2	-5.9	-4.8	0.1	-0.2
SE	353	107	460	8.3	2.3	10.9	0.4	0.1
UK	1972	-1625	347	7.1	-5.4	1.2	0.3	-0.2
CY	132	-1	131	40.5	-0.3	40.1	1.6	0.0
CZ	-126	-1034	-1160	-2.7	-22.8	-24.9	-0.1	-1.0
EE	-14	-87	-101	-2.4	-15.6	-17.6	-0.1	-0.7
HU	35	-713	-678	0.9	-17.9	-17.1	0.0	-0.8
LT	92	-281	-189	6.5	-18.6	-13.3	0.3	-0.8
LV	-14	-179	-193	-1.5	-18.5	-19.7	-0.1	-0.8
MT	37	5	42	25.3	2.7	28.7	1.0	0.1
PL	2698	-3404	-705	20.0	-21.0	-5.2	0.8	-0.9
SK	369	-672	-303	16.9	-26.3	-13.9	0.7	-1.2
SI	18	-159	-141	2.1	-17.8	-16.1	0.1	-0.8
EU25	**16603**	**-25615**	**-9012**	**8.6**	**-12.2**	**-4.7**	**0.4**	**-0.5**
EU15	**13376**	**-19090**	**-5714**	**8.2**	**-10.8**	**-3.5**	**0.4**	**-0.5**
Euro area	**11028**	**-17420**	**-6392**	**8.5**	**-12.4**	**-4.9**	**0.4**	**-0.5**
EU10	**3227**	**-6525**	**-3298**	**11.3**	**-20.5**	**-11.5**	**0.5**	**-0.9**

Source: EPC and European Commission (2005a).

The broad trends described above are common to many countries, but they are not uniform and the geographical patterns are striking. As shown in Graph 2-8, five smaller Member States (CY, IE, LU, SE, MT) are projected to experience a pronounced rise in employment between 2003 and 2050, while the change in employment in four EU15 Member States (FR, NL, BE and UK) is projected to be slightly positive or stable. Eleven Member States are projected to see falls in employment that are well above the average for the EU25 of -4.6% (DE, GR, IT, PT, CZ, EE, HU, LT, LV, SK, SI).

Graph 2-8 Projected changes in employment (% change of employed people aged 15-64 between 2003 and 2050)



Source: EPC and European Commission (2005a)

2.2.5. A closer look at the impact of ageing on labour supply and employment

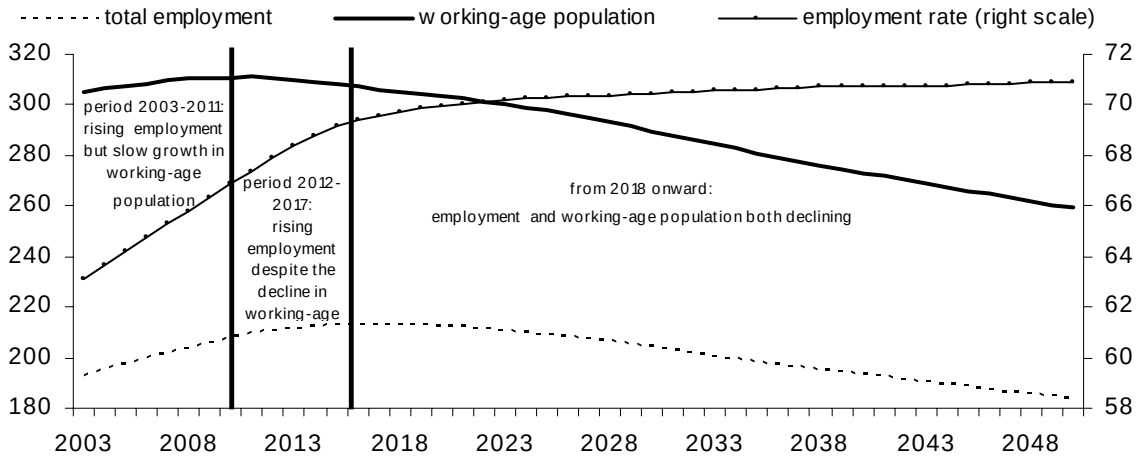
The projected increases in the employment rates of women and older workers will, as illustrated in Graph 2-9, temporarily cushion the effects of ageing on the labour force. Three distinct time periods can be observed (with Table 2-10 below providing more information on the peaks and troughs as regards the size of the working age population and the numbers of persons employed per Member State):

- *2004-2011 – window of opportunity when both demographic and employment developments are supportive of growth:* both the working-age population and the number of persons employed increase during this period. However, the rate of increase slows down, as the effects of an ageing population take hold even if not yet visible in aggregate terms. This period can be viewed as a window of opportunity, since both demographics and labour force trends are supportive of growth. Conditions for pursuing structural reforms may be relatively more favourable than in subsequent years;

- *2012-2017 – rising employment rates offset the decline in the working-age population:* during this period, the working-age population will start to decline as the baby-boom generation enter retirement. However, the continued projected increase in the employment rates of women and older worker will cushion the demographic factors, and the overall number of persons employed will continue to increase albeit at a slower pace. This period could be characterised by tightening labour market conditions with potentially growing mismatches and the risk of heightened wage pressures. The window of opportunity will be closing rapidly;

- *the ageing effect dominates from 2018:* the trend increase in female employment rates will broadly have worked itself through by 2017. In the absence of further pension reforms, the employment rate of older workers is also projected to reach a steady state. Consequently, there is no counter-balancing factor to ageing, and thus both the size of the working-age population and the number of persons employed both enter a downward trajectory.

Graph 2-9 Projected working-age population and total employment, EU25



Source: DG ECFIN and the EPC

Table 2-10-Peaks and troughs for the size of the working-age population and the total number of persons employed (aged 15-64)

	Working-age population (15-64)			Employment (15-64)		
	peak year	% change 2003-peak	% change peak-trough	peak year	% change 2003-peak	% change peak-trough
BE	2011	2.9	-10.0	2017	10.3	-7.8
DK	2008	0.7	-9.8	2009	2.4	-8.1
DE	2003	0.0	-19.2	2015	10.7	-18.0
GR	2010	1.2	-22.2	2015	10.8	-21.6
ES	2010	6.3	-24.3	2020	24.1	-22.5
FR	2011	3.3	-6.6	2015	7.3	-3.1
IE	2035	23.1	-4.4	2035	39.8	-4.1
IT	2004	0.7	-23.9	2018	8.6	-19.0
LU	2050	30.9		2050	36.8	
NL	2011	2.5	-7.2	2019	6.0	-4.8
AT	2012	2.3	-16.2	2019	11.1	-14.7
PT	2008	1.6	-22.7	2013	7.9	-21.4
FI	2010	1.3	-14.5	2011	5.3	-9.6
SE	2050	4.3		2050	10.9	
UK	2011	3.8	-6.7	2018	7.8	-6.1
CY	2043	26.3	-2.9	2041	44.2	-2.8
CZ	2007	0.8	-30.7	2013	3.4	-27.3
EE	2006	0.2	-26.9	2011	7.2	-23.1
HU	2003	0.0	-25.4	2011	5.5	-21.5
LT	2006	0.1	-26.1	2016	12.7	-23.1
LV	2003	0.0	-30.3	2012	10.5	-27.3
MT	2041	14.5	-0.8	2037	29.8	-0.9
PL	2011	2.4	-28.6	2025	20.0	-21.0
SK	2010	2.7	-29.5	2020	17.4	-26.6
SI	2011	0.9	-24.7	2012	9.0	-23.0
EU25	*2011*	*1.9*	-16.7	*2017*	*10.6*	-13.8
EU15	*2011*	*2.1*	-14.6	*2017*	*10.2*	-12.4
Euro area	*2011*	*1.7*	-16.6	*2016*	*11.0*	-14.3
EU10	*2009*	*1.3*	-27.5	*2015*	*13.1*	-21.8

Note: *The trough for the size of the working-age population is 2050 for all countries except DK (2044) and NL (2039). Trough for number of persons employed is 2050 for all countries except DK (2041) and NL (2041).*
Source**:** DG ECFIN calculations based on EPC and European Commission (2005a).

2.3. Labour productivity and potential growth rates[31]

Assumptions on productivity based on a 'production function approach'

It has been agreed to use a 'production function approach' to estimate labour productivity growth. Labour productivity (output per worker) is derived from the calculations based on the labour input projections, the assumptions concerning Total Factor Productivity (TFP) and the investment scenario. This approach aims at shedding light on the reasons behind productivity developments and obtaining a richer medium-term dynamic including the effect of population growth on labour productivity in the medium run through the change in capital intensity.

As explained in EPC and European Commission (2005a), the following assumptions have been agreed:

- to take the scenario of the Output Gap Working Group (OGWG) over the medium run (2007-2009) while sorting out the level differences between the OGWG and (cohort-approach-based) AWG labour input series;

- for the EU15 countries, the growth rate of Total Factor Productivity (TFP) will converge to 1.1% (i.e. the US trend labour productivity growth) by 2030, with different speeds of convergence across Member States[32]. For the EU10, TFP will converge to 1.75% by 2030 and thereafter converge at the same pace so as to reach 1.1% in 2050;

- in order to allow for a faster convergence across the EU10 Member States, three quarters of the convergence towards 1.75% and 1.1% is achieved in 2015 and 2035, respectively. Indeed, while a longer period of convergence (by 2050) is necessary for the EU10 Member States, there is a clear need for countries to converge to the same growth of output per worker at the end of the projection horizon;

- as regards the capital deepening assumptions, the EPC agreed to hold the investment/ GDP ratio constant until 2010 in the baseline scenario. A transition to a constant capital/ labour[33] ratio assumption is introduced gradually (in a linear manner) over the period 2010 to 2030. Finally, the capital/labour ratio expressed in efficiency units (capital per effective worker) is held constant from 2030 to 2050. This implies that both the capital stock per worker and labour productivity grows at the same pace, which coincides with labour-augmenting technical progress (i.e. TFP growth - equal to 1.1- divided by the labour share, set equal to 0.65).

Projection results for potential GDP growth in the baseline scenario

By combining the employment and productivity projections, a projection for potential GDP growth rates up to 2050 is obtained. Table 2-11 presents the outcome of these assumptions in

[31] A more detailed description of the approach used to make the assumptions and projections on labour productivity and GDP growth can be found in Carone G., C.Denis, K. Mc Morrow, G. Mourre, W. Röger (2006), forthcoming.

[32] Some countries underwent specific adjustments in their TFP profile in the period 2010-2030 such as GR, IT, PT and ES, in order to allow for stronger real convergence in productivity level.

[33] Labour here refers to technical-progress-augmented labour (i.e. labour measured by efficiency unit).

terms of the projections for potential growth rates up to 2050 as well as its determinants. For the EU25, the annual average potential GDP growth rate in the period 2004 to 2010 is projected to decline from 2.4% to 1.2% in the period 2031-2050. The projected fall in potential growth rates is much higher in the EU10. For the EU10, potential GDP growth rates of 4.5% between 2004 and 2010 are projected to fall to 0.9% between 2031 and 2050. This occurs in part because the productivity growth rates between the EU10 and EU15 are assumed to have converged by then, but especially because of their less favourable demographic projections.

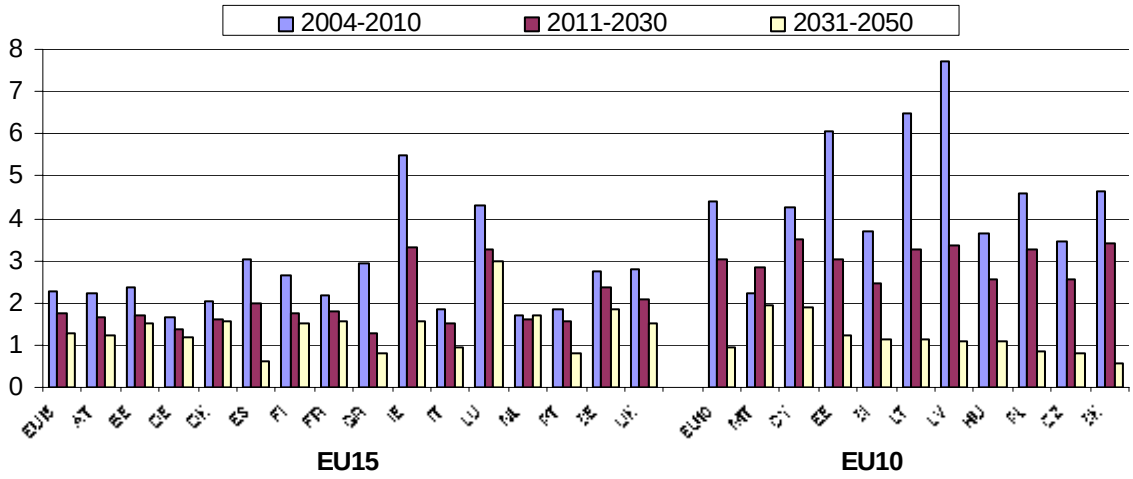
Table 2-11 Projected potential growth rates and determinants

	Potential Growth			Labour productivity			Employment		
	2004-2010	2011-30	2031-50	2004-2010	2011-30	2031-50	2004-2010	2011-30	2031-50
BE	2.4	1.8	1.5	1.5	1.8	1.7	0.9	0.0	-0.2
DK	2.0	1.6	1.6	1.9	1.8	1.7	0.1	-0.2	-0.1
DE	1.7	1.4	1.2	0.9	1.6	1.7	0.8	-0.3	-0.5
GR	2.9	1.6	0.8	2.1	1.8	1.7	0.9	-0.2	-0.9
ES	3.0	2.0	0.6	1.1	1.9	1.7	1.9	0.1	-1.1
FR	2.2	1.8	1.6	1.4	1.7	1.7	0.8	0.1	-0.1
IE	5.5	3.3	1.6	3.4	2.5	1.7	2.0	0.8	-0.1
IT	1.9	1.5	0.9	0.7	1.7	1.7	1.1	-0.2	-0.8
LU	4.0	3.0	3.0	1.8	1.9	1.7	2.2	1.0	1.3
NL	1.7	1.6	1.7	1.1	1.7	1.7	0.6	-0.1	0.0
AT	2.2	1.6	1.2	1.5	1.8	1.7	0.7	-0.2	-0.5
PT	1.9	2.1	0.8	1.2	2.4	1.7	0.7	-0.3	-0.9
FI	2.7	1.7	1.5	2.1	2.0	1.7	0.6	-0.3	-0.2
SE	2.7	2.4	1.8	2.2	2.3	1.7	0.6	0.1	0.1
UK	2.8	2.1	1.5	2.1	2.1	1.7	0.7	0.0	-0.2
CY	4.3	3.5	1.9	2.4	2.9	1.9	1.9	0.6	0.0
CZ	3.5	2.6	0.8	3.4	3.0	1.9	0.1	-0.4	-1.1
EE	6.1	3.0	1.2	5.3	3.6	1.9	0.7	-0.6	-0.7
HU	3.7	2.6	1.1	3.2	2.9	1.9	0.5	-0.3	-0.9
LT	6.5	3.3	1.1	5.7	3.6	1.9	0.8	-0.4	-0.8
LV	7.7	3.4	1.1	6.5	4.1	1.9	1.2	-0.7	-0.8
MT	2.2	2.8	2.0	1.0	2.2	1.9	1.2	0.6	0.0
PL	4.6	3.2	0.9	3.8	3.1	1.9	0.7	0.1	-1.1
SK	4.6	3.4	0.6	3.9	3.3	1.9	0.7	0.1	-1.3
SI	3.7	2.5	1.1	3.3	3.0	1.9	0.4	-0.5	-0.8
EU25	2.4	1.9	1.2	1.5	2.0	1.7	0.9	-0.1	-0.5
EU15	2.2	1.8	1.3	1.3	1.8	1.7	0.9	-0.1	-0.4
Euro area	2.1	1.7	1.2	1.1	1.8	1.7	1.0	-0.1	-0.5
EU10	4.5	3.0	0.9	3.6	3.1	1.9	0.9	-0.1	-1.0

Source: EPC and European Commission (2005a)

The projected potential GDP growth rates for all countries are shown in Graph 2-10. Almost all countries are projected to experience a steady decline. It will become apparent as of 2010, and will be most significant in countries with the highest starting point, notably the EU10. In many countries, potential annual growth rates will have dropped to close to, or below, 1% during the period 2030 to 2050. Only a few small countries (LU, LV, CY, IE, LT, and EE) are projected to enjoy an average growth rate higher than 2.5%, while a few larger countries (DE, GR, IT and PT) are expected to grow at a rate lower than 1.5% over the whole period.

Graph 2-10 Projected potential GDP growth (annual average) in the EU25 Member States

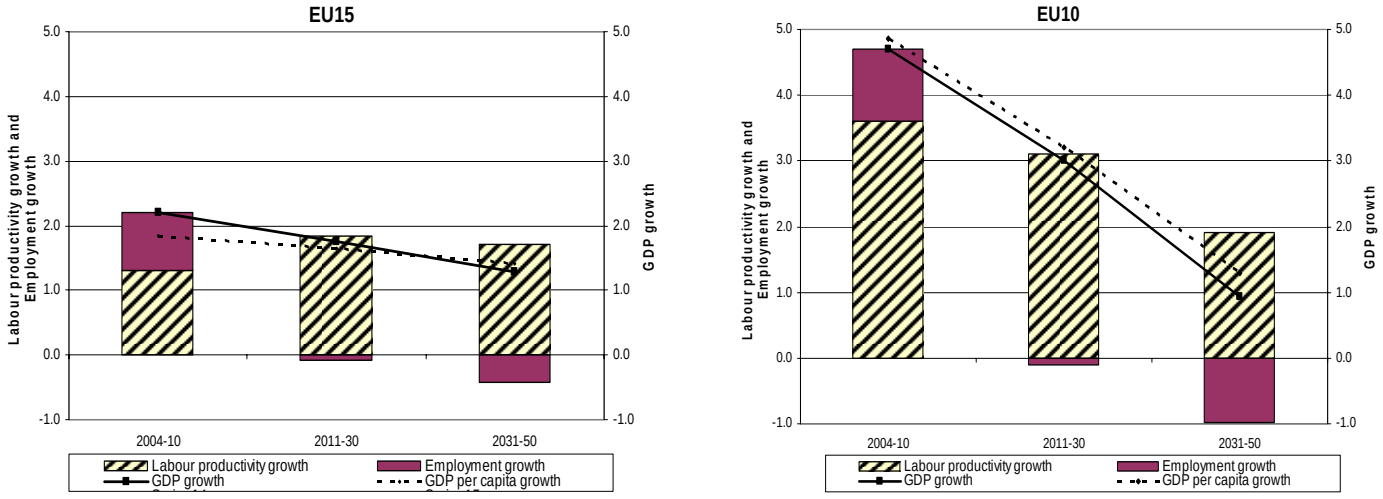


Source: EPC and European Commission (2005a)

The sources of economic growth are also projected to change

In addition to falling potential GDP growth rates, the sources of growth will alter dramatically. Employment will make a positive contribution to growth in both the EU15 and the EU10 up to 2010, but becomes neutral in the period 2011-2030 and turn significantly negative thereafter. Over time, productivity will become the dominant source of growth.

Graph 2-11 Projected (annual average) potential growth rates in the EU15 and EU10 and their determinants (employment/productivity)



Source: EPC and European Commission (2005a)

In order to assess the relative contribution to GDP growth of its two main components, labour productivity and labour utilisation, Table 2-12 uses the standard accounting framework. One can see the compensating effects of an increasing employment rate (which on average contributes 0.2 percentage points to average GDP growth over the projection period) and 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).

Table 2-12 GDP growth and its sources, 2004-2050

	AVERAGE 2004-2050			
	EU25	**EU15**	**Euro area**	**EU10**
GDP growth	1.7	1.6	1.5	2.4
due to % change in:				
Productivity (GDP/per employee)	1.8	1.7	1.6	2.7
of which:				
Total factor productivity	1.2	1.1	1.1	1.6
Capital deepening	0.6	0.6	0.6	1.1
Labour utilisation	-0.1	-0.1	-0.1	-0.3
of which:				
Employment rate	0.2	0.2	0.3	0.4
Share of working age population	-0.3	-0.3	-0.4	-0.4
Population	0.00	0.04	0.01	-0.27

Note: *The level of GDP is given by the product of labour productivity (GDP per hour worked) by the different components of labour utilisation (average hours worked per person, the employment rate and the share of working-age population) and the population. GDP growth is (roughly) equivalent to the sum of the growth rates of these variables.*

Source: DG ECFIN calculations based on EPC and European Commission (2005a).

Developments in terms of GDP per capita

Table 2-13 presents the projections for GDP per capita growth rates and provides an indication of GDP per capita and productivity levels relative to the average for the EU15. The effects of an ageing population on living standards can more closely be observed by looking at growth rates in terms of GDP per capita. As expected, the projected decline in GDP per capita growth rates in both the EU15 and the EU10 is less than the projected fall in potential output growth rates, since total population growth rates should drop over the period 2004-2050. Hence, living standards should hold up better than what is suggested by the trend in headline GDP growth rate.[34] It is also interesting to note from Table 2-13 that per capita income levels in EU10 are projected to increase from 50% of EU15 average in 2004 to 78% in 2050**.**

[34] A further distinction worth noting is that the retirement of the baby-boom generation will lead to some slowdown in GDP per capita growth in comparison with GDP per worker. To the extent that wages over the long-run reflect developments in GDP per worker, a shift could occur in the relative income position of different age cohorts.

Table 2-13 GDP per capita growth: growth rates and levels relative to EU15 average

	GDP per capita growth rates (%)			GDP per capita (EU15=100)			Productivity levels (EU15=100)		
	2004-10	2011-30	2031-50	2004	2030	2050	2004	2030	2050
BE	2.1	1.6	1.6	108	107	109	122	115	115
DK	1.8	1.5	1.7	110	107	111	98	100	100
DE	1.6	1.4	1.5	101	94	95	94	88	88
GR	2.6	1.6	1.1	72	72	68	84	79	79
ES	2.0	1.9	0.9	85	90	81	91	88	88
FR	1.7	1.5	1.6	105	101	103	113	110	110
IE	4.2	2.5	1.2	132	177	167	128	161	161
IT	1.6	1.6	1.3	100	97	94	116	108	108
LU	3.1	2.1	2.4	194	226	270	129	135	135
NL	1.3	1.3	1.7	108	98	103	93	92	92
AT	1.9	1.5	1.4	116	113	112	109	106	106
PT	1.5	2.1	1.1	68	73	68	60	71	71
FI	2.4	1.6	1.7	108	110	115	104	112	112
SE	2.3	2.0	1.7	112	123	129	104	116	116
UK	2.4	1.8	1.5	104	111	113	95	107	107
CY	2.9	2.7	1.6	81	107	110	77	94	97
CZ	3.6	2.8	1.3	64	89	86	59	87	90
EE	6.6	3.5	1.6	46	86	87	46	82	86
HU	3.9	2.8	1.4	54	76	75	61	81	85
LT	7.0	3.7	1.5	43	86	87	46	80	84
LV	8.3	3.9	1.5	42	93	94	42	88	92
MT	1.3	2.2	1.7	68	73	76	80	81	84
PL	4.7	3.4	1.3	45	75	73	54	76	79
SK	4.7	3.6	1.0	48	83	77	52	76	80
SI	3.6	2.5	1.4	73	94	94	71	96	100
EU25	2.2	1.8	1.4	92	97	97	93	97	98
EU15	1.9	1.7	1.4	100	100	100	100	100	100
Euro area	1.8	1.6	1.4	99	97	96	101	98	98
EU10	4.6	3.2	1.3	50	80	78	56	80	83

Source: EPC and European Commission (2005a)

2.4. Other macroeconomic assumptions

Real interest rates: the EPC agreed to assume a real interest rate of 3%.

Inflation: projections will be reported in 2004 prices. However, for technical reasons, some countries may need to introduce an assumption on inflation into their models, and in this event, the EPC agreed that it should be 2% for all countries.

Growth of real wages: it is assumed that real wages grow in line with labour productivity. As a result, the wage share will remain constant over the projection period. The rule is applied to all Member States uniformly.[35]

2.5. Some overall conclusions on economic impact of ageing

Significant policy challenges lie ahead

The projection results described above suggest that ageing populations will have a significant impact on Europe's economies in the decades ahead. From an economic perspective, potential

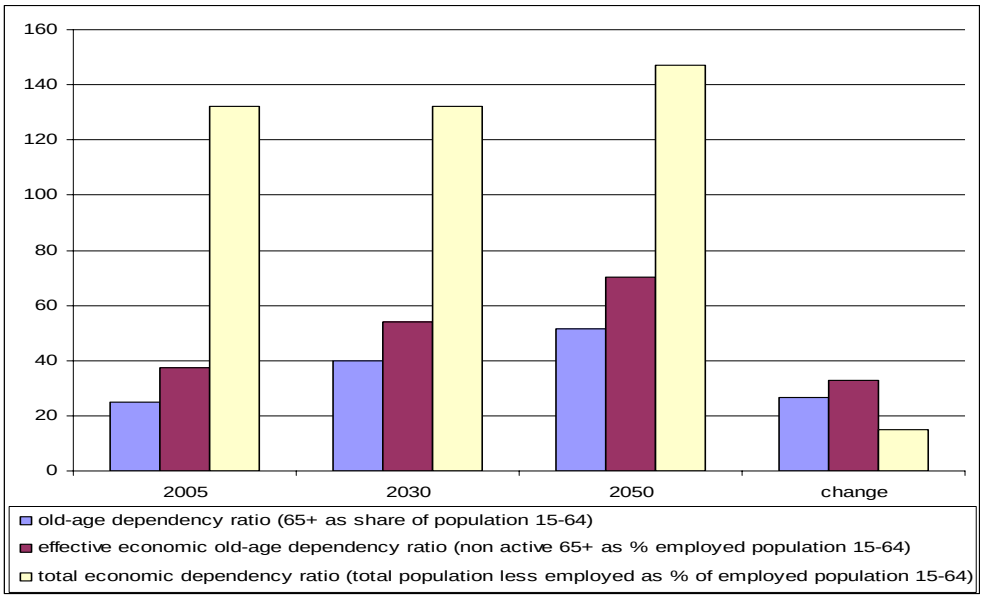
[35] The assumption is well-founded in economic theory. If the real wage is equal to the marginal productivity of labour, it follows that under the standard features of the production function, real wage growth is equal to labour productivity growth and real unit labour costs remain constant.

growth rates will fall to levels below those observed in recent decades: however, living standards as measured by GDP per capita should hold up better than what is suggested by the trend in headline GDP growth rate. Pressure for increased public spending will result from having a higher share of the total population in older age cohorts that receive larger public transfers (e.g. pensions) and services (health care, long-term care). The financing side may also be affected, with a decline in the support ratio of contributors to beneficiaries.

These developments can best be viewed by comparing the projected demographic dependency ratios (that emerge from the AWG population scenario) with the economic dependency ratios (that result from the employment and GDP projections), see Graph 2-12 and Table 2-14.

Over the next decades the old-age dependency ratio, that is the number of people aged 65 years and above, relative to those between 15 and 64, is projected to double, reaching 51% in 2050. This means in the EU, the current situation of having four people of working-age for every elderly citizen change into a ratio of 2 to 1 (even higher in some countries). The effective economic old-age dependency is also shown on Table 2-14, which is the number of non-active persons aged 65 and above as a percentage of employed persons aged 15 to 64. As expected, this ratio is higher than the old age-dependency ratio, and projected to rise sharply for the EU25 from 37% in 2003 to 48% in 2025 and 70% in 2050, raising complex issues on the role of public transfers in achieving an appropriate distribution of resources between a smaller active population and a larger inactive retired population.

Graph 2-12 Projected demographic and economic dependency ratios for the EU 25



Source: EPC and European Commission (2005a)

The total economic dependency ratio measures the total inactive population (total population less persons employed) as a percentage of persons employed (aged 15 to 64). It gives an indication of the average number of people which each economically active person 'supports', and thus is relevant when considering the prospects for potential GDP per capita growth. For the EU 25, this ratio actually falls from 136% in 2003 to 125% in 2025, but thereafter increases to 147% by 2050. The overall economic dependency is projected to decline up to 2025 mostly due to a better labour market performance (especially the projected trend increase in female employment rates), but also due to low fertility (as smaller numbers of

young people imply a decline in the youth dependency ratio). However, these effects taper off after 2025, and the increase in the total economic dependency ratio between 2025 and 2050 is noticeably steeper.

Table 2-14 Projected changes in demographic and economic dependency ratios

	Old-age dependency ratio (population aged 65 and above as a percentage of the population aged 15-64*)				Effective economic old-age dependency ratio (non active population aged 65 and above as a percentage of employed population aged 15-64)				Total economic dependency ratio (total population less employed as a percentage of employed population aged 15-64)			
	2003	**2025**	**2050**	***change 2003-50***	**2003**	**2025**	**2050**	***change 2003-50***	**2003**	**2025**	**2050**	***change 2003-50***
BE	26	36	47	*21*	43	55	71	*28*	156	150	164	*8*
DK	22	34	42	*20*	28	42	52	*24*	101	106	116	*14*
DE	26	38	52	*26*	39	50	69	*30*	127	117	135	*9*
GR	26	36	60	*35*	41	52	88	*47*	150	141	181	*31*
ES	25	33	66	*41*	40	45	88	*48*	144	118	162	*18*
FR	25	37	46	*21*	39	53	66	*27*	144	146	156	*12*
IE	16	25	45	*29*	23	31	56	*33*	125	108	132	*7*
IT	28	39	62	*34*	49	60	93	*44*	162	149	179	*17*
LU	21	28	36	*15*	33	42	55	*22*	138	137	149	*11*
NL	20	33	41	*20*	27	41	51	*24*	101	107	114	*13*
AT	23	34	52	*30*	33	45	67	*35*	113	108	128	*15*
PT	23	35	59	*36*	30	43	73	*43*	118	116	149	*30*
FI	23	41	47	*24*	33	54	60	*27*	121	128	133	*12*
SE	26	36	41	*14*	35	45	50	*15*	111	113	117	*6*
UK	24	33	45	*21*	32	42	57	*25*	113	114	128	*14*
CY	14	29	43	*30*	18	35	52	*33*	120	96	114	*-6*
CZ	20	35	55	*35*	29	47	76	*46*	119	116	154	*35*
EE	23	31	43	*20*	35	41	57	*22*	135	118	137	*2*
HU	22	34	48	*26*	39	51	74	*35*	156	140	172	*16*
LT	22	29	45	*23*	35	38	60	*25*	144	107	134	*-10*
LV	23	31	44	*21*	35	39	58	*23*	137	113	137	*0*
MT	19	34	41	*22*	34	54	66	*32*	170	154	168	*-2*
PL	18	33	51	*33*	35	46	74	*40*	183	127	163	*-20*
SK	16	28	51	*34*	28	38	73	*45*	146	105	151	*6*
SI	21	36	56	*35*	32	49	77	*44*	127	124	157	*31*
EU25	*24*	*35*	*51*	*27*	*37*	*48*	*70*	*33*	*136*	*125*	*147*	*11*
EU15	*25*	*36*	*52*	*26*	*38*	*49*	*70*	*32*	*132*	*126*	*145*	*13*
EU10	*19*	*33*	*50*	*31*	*34*	*45*	*73*	*39*	*159*	*124*	*158*	*-1*

Source: EPC and European Commission (2005a)

Some positive developments are underway, in part due to reforms already carried out.

There are some positive indications which emerge from the analysis:

- first, employment rates and levels are projected to continue rising for at least a decade, which will offset somewhat the projected decline in the size of the working-age populations and provides a window of opportunity to undertake necessary reform measures;

- second, the projections confirm the validity of the Lisbon strategy. They already embody the achievement of the overall Lisbon employment targets (although only reached in 2020 for the EU25), but also confirm the importance of policies to raise

productivity potential. Higher levels of investment in physical and human capital could yield substantial productivity gains over the long run, especially against a background of a knowledge-based society. There is strong evidence that higher educational attainment leads to enhanced labour productivity and adaptability to a knowledge-based economy. The higher enrolment rates in second and third level education observed in many countries, coupled with a greater focus on quality and efficiency, may contribute to improved productivity in the future, albeit with a lag of several years even decades. The interaction between labour- and product market reforms is worth highlighting in this context, as more flexibility in these markets facilitates resource re-allocation to more innovative and productive activities.

- the projections illustrate the effects of successful structural reforms, and that policy action can have a substantial impact on our capacity to meet the challenge of ageing. The projections indicate that pension reforms already enacted by Member States, could lead to a 10 percentage point increase in the employment rate of older workers, thus reaching levels above the Lisbon employment targets.

3. PENSIONS

3.1. Introduction

This chapter presents the projection results for spending on pensions. It builds upon the 2001 projection exercise of the EPC, which in addition to being used in the assessment at EU level of the sustainability of public finances, also fed into the open method of co-ordination on pensions[36]. Considerable efforts have been made to improve upon the 2001 exercise in two important respects:

- the coverage of pension schemes included in the exercise is more complete and comparable. In the 2001 projection exercise, the coverage of early retirement and disability pension schemes, as well as some specific schemes such as those covering public sector employees, was incomplete;

- the decomposition of projection results has been improved. The 2001 projection results lacked clarity and were not disaggregated, e.g. no breakdown of pension expenditure was presented and old-age pensions could not be analysed separately.

The remainder of the chapter is structured as follows. The next section deals with the coverage of the exercise. After briefly summarising the very different pension schemes that exist in the EU Member States, a detailed description is provided of those pension schemes included in this projection exercise. Section 3.3 presents the results for the baseline scenario. Section 3.4 presents the results of the sensitivity tests.

3.2. Pension schemes and their coverage in the projections

3.2.1. Overview of the pension systems

Pension systems are very diverse in the EU Member States. However, all countries have a strong public sector involvement in the pension system through their social security systems, while the importance of occupational and private pension provisions varies. In most countries, the core of the social security pension system is a statutory earnings-related old-age pension scheme, either a common scheme for all employees or several parallel schemes in different sectors or occupational groups. In addition, the social security pension system often provides a minimum guaranteed pension to those who have not qualified for the earnings-related scheme or have accrued only a small earnings-related pension. Usually, such minimum guarantee pensions are means-tested and provided either by a specific minimum pension scheme or through a general social assistance scheme. In a few Member States, notably in Denmark, the Netherlands, Ireland and the United Kingdom, however, the social security pension system provides in the first instance a flat-rate pension, which is supplemented by earnings-related private occupational pension schemes (in the UK, also by a public earnings-related pension scheme (State Second Pension) and in Ireland by an earnings-related pension scheme for public sector employees). In these countries, the occupational pension provision is

[36] Council of the European Union (2003), 'Adequate and sustainable pensions. Joint Report by the Commission and the Council', 7165/03.

equivalent to the earnings-related social security pension schemes in most of the EU countries.

A further source of diversity relates to the fact that a number of Member States, including Sweden and a number of new Member States such as Estonia, Latvia, Lithuania, Hungary, Poland and Slovakia, have switched a part of their social security pension schemes into private funded schemes. Usually, this provision is statutory but the insurance policy is made between the individual and the pension fund. Participation in a funded scheme is conditional on participation in the public pension scheme and is mandatory for new entrants to the labour market (in Sweden for all employees), while it is voluntary for older workers (in Lithuania it is voluntary for all people).

According to the decision of EUROSTAT[37], these schemes should be included in the private sector in national accounts because the transactions are between the individual and the pension fund. Thus, they are not recorded as government revenues or expenditure, and consequently, they do not have an impact on the government surplus or deficit. In addition, the insured persons have the ownership of the assets of the fund and, thus, they bear the risks and enjoy the rewards regarding the value of the assets. Furthermore, the EUROSTAT decision specifies that a possible government guarantee for such a fund is not an adequate condition to classify such schemes as social security (public) schemes, because such a guarantee is a contingent liability and these are not considered as economic transactions until they materialise.

Social security pension systems diverge from each other as regards the type of benefits provided by the pension system. Most pension schemes provide not only old-age pensions but also early retirement pensions, disability and survivors' pensions. Some countries, however, have specific schemes for some of these benefit types, in particular, some countries do not consider disability benefits as pensions, despite the fact that they are granted for long periods, and may be covered by the sickness insurance scheme.

Furthermore, pension systems differ across countries regarding the financing method of the schemes. Most social security schemes are financed on a pay-as-you-go (PAYG) basis, indicating that the contribution revenues are used for the payments of current pensions. In addition, there is a considerable variation between countries regarding the extent to which the contribution revenues cover all pension expenditure. In most countries, minimum guarantee pensions are covered by general taxes. However, it is also common that earnings-related schemes are subsidised to varying degrees from general government funds or some specific schemes (notably public sector employees' pensions) do not constitute a clear scheme but, instead, pensions appear directly as expenditure in the government budget. On the other hand, some predominantly PAYG pension schemes (FI, LU, SE) have statutory requirements for partial pre-funding and, in view of the increasing pension expenditure, many governments have started to collect reserve funds for their public pension schemes. Occupational and private pension schemes are usually funded. However, the degree of funding relative to the pension promises may differ due to the fact that benefits can be defined either on the basis of benefit rights linked to the salary and career length (defined-benefit principle) or of paid contributions (defined-contribution principle).

[37] Classification of funded pension schemes in the case of government responsibility and guarantee, EUROSTAT 20/2004, 2 March 2004

Table 3-1 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); Disability pension schemes for private sector employees and self-employed. Early retirement ("pre-pension") through an unemployment benefit and a supplement from the employer	Legal framework has been established. The provision of occupational pensions is minor (pensions accounted for 1.3% of GDP in 2004).	Voluntary private schemes exist only to a minor extent
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, also providing a flat-rate pension to economically inactive persons; covering old-age, disability and survivors' pensions; Public security personnel (armed forces, police, custom officers, firemen) pensions paid from the state budget.	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 (subject to the time lived in DK), means-tested supplements to those without occupational pensions, tax-financed; Disability pensions to those below 65. *Earnings-related social security pensions:* Voluntary early retirement pensions (requires 25 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 sectorcovering 90% of the employees), Labour market supplementary pensions (ATP), Special pension savings plan (SP), Labour market supplementary pensions for recipients of anticipatory pensions (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 1.3% of GDP; supported by SSC exemptions up to 4% of SSC ceiling, equal to 2472€ in 2004, and by tax exemption up to 4300€. In 2003, about 30% of newly retired received occupational pensions. In 2005, about 60% contribute to such schemes (including private funded schemes, about 70% of employees contribute to supplementary schemes).	Individual funded pensions of growing importance since the 2001 reform (supported by tax exemptions and direct allowances; contribution rate 2% of wages in 2004, to be increased to 4% by 2008). Currently, about 4.7 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. *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 through? *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) *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 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	Voluntary enterprise pension schemes for private sector employees (funded DC schemes); 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);
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.	Do not exist	Legal framework has been established and some schemes have been introduced but they are not yet operational)
IE	*Minimum guarantee pensions:* Means-tested minimum flat-rate pensions and age-related benefits (old-age, widows, disability 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, retirement, and widow(er)'s pensions, invalidity and disability benefits) Public service occupational pension scheme (benefits 1.1% of GDP in 2004).	Voluntary occupational schemes for private sector employees. 33% of current pensioners receive also occupational pensions, amounting to 25% of total pension income. Contributor coverage to occupational schemes is just over half the employees.	Voluntary individual schemes also play a role in the Irish pension system. In recent years, a series of significant tax incentives have been introduced for the purpose of promoting pension provision amongst self-employed, employers in non-pensionable employment and proprietary directors.

IT	*Minimum guarantee pensions:* Means-tested social assistance pensions to those not qualifying for or not having accrued the minimum level of earnings-related scheme *Earnings-related social security pensions:* One main social security pension scheme covering the whole population, providing old-age, early retirement (seniority), disability and survivors' pensions; NDC scheme fully applied to persons entering the labour market as of 1996, transition schemes for workers already in the labour market in 1995; old DB scheme applied to the workers with at least 18 years of contributions at the end of 1995.	Voluntary supplementary funds exist. The 2004 reform increased the provisions for occupational pensions through the possibility to transform TFR (end-of-service allowance) into an occupational pension scheme.	Voluntary private pension scheme; 0.1% of total pension expenditure
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 2006 and 2010. 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 (meritorious persons, scientists, judges, casualties, officers and servicemen)	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:* General flat-rate old-age pensions (AOW) to all citizens; Separate disability benefits (WAO) and survivors' pensions (ANW); flat-rate or earnings-related benefits.	A high number of funds (industry-wide, company-specific and professional group specific) for the provision of occupational old-age pensions and early retirement schemes (VUT), covering over 90% of employees	Exists to some degree
AT	*Minimum guarantee pensions:* Means-tested minimum pensions through social assistance scheme *Earnings-related social security pensions:* Harmonised social security pension schemes covering all employees 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 *Earnings-related social security pensions:* A general social security pension scheme covering all employees and the self-employed in the private sector, providing old-age, disability and survivors' pensions (apart from short-term benefits). A separate pension scheme (CGA) for public sector employees (incl. police and military forces), benefits paid from the state budget.	Exists mainly for banking, insurance and telecommunication sectors as a substitute for the general social security scheme.	Exists only to a very minor extent
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 Flat-rate pensions to farmers, military personnel of the Yugoslav army and for retirees from other republics of the former SFRY	Mandatory supplementary insurance for some high-risk professions (about 26000 workers, minor importance), voluntary collective supplementary pensions (covering half the employees)	voluntary individual supplementary pensions (of minor importance in 2003)
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 social security pension scheme covering all employees and the self-employed, providing old-age, disability and survivors' pensions.	Do not exist	Statutory private schemes for the switched part of the social security pension scheme as of 2005 (mandatory for new entrants and voluntary for current employees). Contribution rate is 9% of wages.
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

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. *Earnings-related social security pensions:* One general social security (NDC) pension scheme covering all employees and the self-employed, providing old-age pensions. The old earnings-related ATP schemes for local and central government employees work 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% of wages. (Note: reported as social security pension until 2007)
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.

3.2.2. Coverage of the pension expenditure projections

These projections cover social security and other public pensions as well as mandatory private pensions. Projections have been made both for gross and net pensions. As far as the projections of occupational pensions are concerned, some Member States where these pensions are of major importance have provided also these projections.

Social security and other public pensions are broken down into two categories:

- old-age and early retirement pensions (including minimum and earnings-related pensions), with a preference to include also disability and widow's pensions paid out to persons over the standard retirement age;

- other pensions (disability, survivors', partial pensions without any lower age limit, including minimum and earnings-related pensions).

Occupational and mandatory private pensions are not broken down into sub-groups.

In general, in the 2005 projections, the coverage of public pension schemes is very good. They include social security schemes, which are statutory and involve a contribution to the scheme, and other public pensions which do not constitute a scheme but are paid out directly as government expenditure (such as government sector employees or armed forces' pensions) or which are equivalent benefits to pensions such as minimum guaranteed benefits from general social assistance scheme. For a couple of countries, the coverage has been improved compared with the 2001 projection exercise by including also public sector employees' pensions in the projections (Luxembourg and the United Kingdom) as well as disability pensions or benefits (in Sweden). In the case of Denmark, the coverage has been made consistent with the new definition of the general government sector by moving supplementary occupational pensions (ATP) from public pensions into occupational pensions. Greece was not able to provide projections covering all pension funds; partial results for the main fund have not been included in this report.

Regarding private mandatory pensions, their inclusion in the projections is of great importance as it concerns pension provision that has been switched from social security schemes to private funds. In all of the new Member States, where these private mandatory schemes exist, they are recorded under the private sector pensions. Such a scheme also exists in the Swedish pension system. However, this scheme will be included in the general government sector in the national accounts up to 2007. Accordingly, the Swedish private mandatory scheme is included in the public sector schemes in these projections (additional information on its importance is provided in Table 3-16). All voluntary private schemes (except the part in Lithuania that can be voluntarily switched from the social security scheme into a private scheme) are excluded from these projections.

Regarding the coverage of occupational pension schemes, only the Netherlands and Sweden provided a full coverage of occupational pensions. However, occupational pensions form a significant proportion of total pensions also in Denmark, Ireland and the United Kingdom and can be considered being equivalent to earnings-related social security pensions in most Member States. Their absence in these projections is a major caveat in the coverage of total pensions. For Denmark, occupational pensions currently amount to over 3 per cent of GDP. In the United Kingdom, spending on funded defined benefit private pensions and private money purchase schemes (occupational and personal) in 2005 is estimated to have been around 4

percent of GDP[38]. Furthermore, a growing number of Member States are increasing the provision of complementary occupational pensions, for instance Belgium, Germany, Spain, Italy, Austria and Poland. Currently, their importance is at most in the order of 1-2 per cent of GDP. All countries (except Slovenia and Sweden) have excluded such complementary occupational pensions in the projections.

Table 3-2 Coverage of pension schemes in the 2004 projections

	Schemes covered in the projections and their desegregation [1)]	**Schemes <u>not</u> covered**
BE	***Social security pensions: old age and early pensions*** Minimum benefits w63/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 Early pensions (pre-pensions) 58+, private sector Early retirement pensions (pre-pension) for labour market reasons 50-57, private sector ***Social security pensions: other*** Disability pensions -64, private sector Disability pensions -64, self-employed	Pre-pensions include only the part paid from unemployment benefit scheme, not the complement paid by the employer. ***Occupational pension schemes*** (pensions 1.3% of GDP in 2004)
CZ	***Social security pensions: old age and early pensions*** Minimum and e-r old-age pensions, 61+ (63+ as of 2013), all sectors Proportional old-age pensions, 65+, all sectors Widows and disability pensions, 55+ Early pensions (with temporary or 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 (e-r old-age, disability and spouse's pensions), private sector (ATP) Labour market pensions (e-r old-age, disability and spouse's pensions), new public sector schemes (ATP) Labour market supplementary pensions (SP) Special pension savings plan (SAP) Labour market supplementary pensions for recipients of anticipatory pension
DE	***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 labour market reasons Early pensions for women Early pensions for severely handicapped ***Social security pensions: other*** (covered above; not shown separately)	*Social security* Minimum benefits to elderly (social assistance); 0.3% of GDP Farmers and miners pensions (0.8% of GDP) *Occupational pensions*, of growing importance (1.3% of GDP in 2004). 30% of newly retired persons receive also occupational pensions and 60% of employees contribute to such schemes. *Individual funded pensions*, schemes at an early

[38] UK: This estimate is from the second report of the UK Pensions Commission (*A New Pension Settlement for the Twenty-First Century*, November 2005), which also includes projections of future private pension spending. The projections are not produced on the same basis (in terms of the underlying assumptions and the modelling and projection methodologies used) as the UK projections of state and public service pensions included in public pensions in this report and are therefore not directly comparable. Further details can be found at http://www.pensionscommission.org.uk/publications/2005/annrep/annrep-index.asp.

		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 59.5+w and 63+m in 2005, 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*** Individual funded pensions, mandatory for young persons born 1983 -	
GR	***Social security pensions: old age and early pensions (<u>planned coverage</u>, projections not yet completed)*** Minimum pensions (State budget and EKAS (Pensioners Social solidarity Fund) Old-age flat-rate? pensions, farmers aged? (OGA) Old-age pensions, other self-employed (TEVE) E-r old-age and supplementary old-age pensions, private sector (IKA and merged funds) E-r old-age pensions, public sector (civil servants, army, public power corporation), aged? E-r supplementary pensions, public sector (auxiliary funds) Disability pensions, all ages? Widows pensions, all ages? Early pensions, aged ? ***Social security pensions: other*** Orphans pensions	
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 Flat-rate old-age and early retirement pensions for central government employees. ***Social security pensions: other*** Disability and survivors' pensions for private sector employees, self-employed, regional, local and central government War pensions	
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, 57.5+ (60+ as of 2008), 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), ORGANIC (tradesmen), CNBF (lawyers), CNAVPL (independent professions)) Disability and widows pensions, 60+, all sectors (FSV) Anticipated old-age and early retirement pension (UNEDIC)	Small anticipatory pension schemes The new disability scheme (within health insurance), established in 2004.

IE	***Social security pensions: old age and early pensions*** Minimum flat-rate old-age **non-contributory** pensions, 66+ (dependant adults only), all sectors [39] Widow(er)s non-contributory pensions, 66+ , all sectors [3] Blind persons, carers and lone parents, 66+, all sectors [3] Flat-rate **contributory** and retirement pensions, 65+ (dependant adults only), private sector, self-employed and some civil servants [40] Invalidity pensions, 65+, private sector, self-employed, Widow(er)s contributory pensions, 66+, all sectors [3] ***Social security pensions: others*** Widow(er)s non-contributory and non-contributory pensions, -65, all sectors [3] Blind persons, carers, -65, all sectors [3] Disability pensions, -66, and invalidity pensions -64, private sector, self-employed, some civil servants [4] Pre-retirement allowance, 55-64, all sectors [3] Public sector (occupational) pensions (Civil service, defence, Gardai, education, health and local authorities, non-commercial state bodies)	*Occupational pensions:* Private sector schemes
IT	***Social security pensions: old age and early pensions*** Social assistance pensions (State budget) E-r old-age, disability and widows pensions, w60+/m65+, all sectors (AGO, general social insur. scheme) Early retirement, disability and widows pensions, w55-59/m55-64, all sectors (AGO) Early (seniority) pensions, all sectors (AGO) ***Social security pensions: other*** Disability and widows pensions, -54, all sectors	*Occupational pensions;* of minor importance
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*** State (social security) benefits (those with less than 10 years insurance records), 67+ , (State budget) 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 survivors pensions, 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,	

[39] IE: while all sectors of the economy are eligible to apply for these pensions, some sectors may not be eligible to receive them given the means-tested nature of the schemes.

[40] IE: Civil and Public Servants recruited after 6 April 1995 are in the full Pay Related Social Insurance class and will therefore receive an integrated Social Security contributory and occupational pension upon retirement. Those recruited before 6 April 1995 pay a lower rate of Pay Related Social Insurance and are not entitled to all benefits.

	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, selected professions (State budget) ***Social security pensions: other*** Social assistance pensions, -w59/-m62.4 Disability and widows pensions, -w59/-m62.4, all sectors (Soc. Insurance scheme) Officials and military personnel disability and widows pensions, -w59/-m62.4, public sector (State budget) Length of service pensions, selected professions, public sector (Soc. sec. scheme) Early retirement unemployment benefit (Unemployment fund), changed into early retirement pension as of mid 2004 (Social insurance scheme as of mid 2004) ***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 Survivors pensions, 62+, all sectors Disability pensions, 62+, all sectors ***Social security pensions: other*** Disability pensions, -61, all sectors Survivors pensions, -61, all sectors Pension-like regular social allowances, -61 ***Private mandatory pensions*** Individual funded pensions, mandatory to persons entering the labour market	Handicap support, political compensation allowances
MT	***Social security pensions: old age and early pensions*** National minimum pensions and increased national minimum pensions E-r old-age (two-thirds) pensions, w60+/m61+; s-e 65+ ***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, disability and early retirement pensions, w60+/m65+, private sector (ASVG, gen. soc. ins. Scheme) E-r old-age, disability and early retirement pensions, w60+/m65+, public sector E-r old-age, disability and early retirement pensions, w60+/m65+, farmers and self-amployed ***Social security pensions: other*** Survivors' pensions, all ages, all sectors	***Social security pensions: old age and early pensions:*** Minimum pensions (Ausgleichszulagen), financed by taxes
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	***Social security pensions: old age and early pensions:*** Minimum means-tested pensions

	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	Occupational pensions (of minor importance)
PT	***Social security pensions: old age and early pensions*** Social pensions (minimum, means-tested and non-Contributory, State budget): old-age, 65+, disability pensions, 65+ General Contributory (social insurance) scheme: e-r old-age 55+; disability pensions, 65+; employees and self-employed of the private sector RESSAA, (Spec. soc. sec. scheme for agriculture workers), e-r old-age, 65+, disability pensions, 65+ CGA (Civil servants' pension scheme), e-r old-age, 55+, disability pensions, all ages ***Social security pensions: other*** Social pensions (means-tested non-contributory), disability pensions, -64, widows and orphans pensions, all ages General contributory scheme & RESSAA, disability pensions, -64, widows and orphans pensions, all ages Civil servants scheme, widows and orphans pensions, all ages	*Occupational pensions:* Supplementary schemes for some sectors (banking and insurance)
SI	***Social security pensions: old age and early pensions*** National (state) minimum pensions (State budget) 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 Flat-rate pensions for farmers, 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*** Social pensions, 65+, all sectors (State budget) E-r old-age, w53-57+/m60+ (w62+ 2016 and m62+ 2006), disability and widows pensions, w55-56/ m55-64, all sectors (Social insurance scheme) ***Social security pensions: other*** Disability and widows pensions, -54, orphans pensions ***Private mandatory pensions*** Individual funded old-age pension, mandatory to persons entering labour market 2005+	
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: (TEL, private sector employees, most industries), (LEL, private sector industries with short-time contracts), (YEL, self-employed), (MYEL,farmers), (TaEL , artists); and the public sector: (VEL (central government employees), KVTEL (municipal sector employees), KiEL (church empl.), unemployment pensions, 60-62, ***Social security pensions: other*** National (minimum) disability and survivors' pensions, -64;	

	E-r disability and survivors pensions, -62, all sectors (early pensions changed 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 (State budget) E-r NDC old-age and anticipated pensions, flexible age, all sectors (Social insurance scheme) Individual mandatory funded old-age pensions, premium pensions, (Note: reported as part of social security scheme for the whole projection period but should be included in the private insurance sector as of 2007) ***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)	
UK	***Social security (and other public) pensions: old age and early pensions*** Basic state (minimum) pensions + their additions (winter fuel allowance), 66+, 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), w60+/m65+ (w65+ 2020), all sectors (National insurance scheme) Widows benefits + their additions, 55+, all sectors E-r old-age pensions, 60+, public sector employees (State budget) ***Social security pensions: other*** Widows benefits, -54, all sectors	***Public pensions*** Disability benefits ***Occupational pensions*** Supplementary funded old-age pensions, private sector; important part of the pension system

[1] E-r = earnings-related

Pension contributions and asset accumulation in pension funds have been included in these projections on a voluntary basis. Most Member States were able to provide these projections. However, some Member States (Belgium, Spain) indicated that they had difficulties projecting contributions as the pension contribution is not defined separately but is included in the overall social security contribution covering all social security benefits. Portugal and Malta have provided projections for the total social security contribution (including also the part of the contribution which is used for benefits other than pensions). Further, it should be noted that, in Denmark, social security pensions are financed by general taxes and virtually no contributions (except a minor contribution to voluntary early retirement schemes) are paid by the employers or employees.

The projections on assets in pension funds (with the exception concerning the coverage of occupational pensions) have been provided by all countries where these assets are important.

3.2.3. The concepts of pensions, contributions and assets

The following concepts have been used in the projection exercise:

Pensions 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 the above-

mentioned types of pensions, including pensions due to reduced capacity to work or due to labour market reasons. Pensions and benefits can be paid out from specific schemes or directly from government budgets. Pensions should not include (additional) benefits in the form of reimbursements of certain costs to the beneficiaries or directly provided goods and services for the specific needs of the beneficiaries, including transfers from pension institutions to other social security schemes such as health schemes. The administrative costs of pension schemes should not be included.

Gross pensions cover pensions recorded as gross benefits, 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 pensions cover pensions recorded as net benefits, i.e. deducting from the gross pension the estimated tax and compulsory social security contributions by beneficiaries paid on pensions. Member States were advised to use relatively straightforward approximations for taxes and social security contributions paid by the pensioners. The aim of presenting net pensions as a share of GDP is to give a picture of the order of magnitude which taxation plays in the magnitude of pension expenditure. Regarding the evolution of the taxation over the projection period, it is assumed that the taxation in real terms remains at the level of 2004 - unless there are changes in the taxation regime of pensions - and, thus, the 2004 rules can be applied over the whole projection period.

Social security and other public pensions (later in the report also called 'public pensions') cover, first, social security schemes that are statutory and that the general government sector administers. The pensions provided by the social security schemes can be either earnings-related, flat-rate or means-tested. In addition, this category covers also pensions that are paid directly from the state or other public sector entity budgets without forming a specific scheme such as special pensions to public sector and armed force's employees. Also cash benefits that are equivalent to pensions, notably social assistance, are included. The aim is to cover those pension schemes that affect the public finances, in other words, the schemes that are considered to belong to the general government sector in the national accounts system.

Occupational pensions are pensions provided by schemes that link the access of an individual to such a scheme to an employment relationship between him/her 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 rather than being statutory by law. The schemes are run by private sector pension funds, insurance companies or the sponsoring companies themselves (the latter may appear only in balance sheets).

Private mandatory pensions are private individual pensions that are statutory and based on individual insurance contracts between the individual and the private pension scheme provider, usually an insurance company or a pension fund. In particular, the pension expenditure projections cover the individual schemes that switch a part either voluntarily or statutorily (especially to new entrants to the labour market) of the current social security scheme to private funds. Such schemes will have an increasing relevance in the future in a number of countries (SE, EE, HU, LV, LT, PL and SK).

Old-age and early pensions are considered as one category of pensions due to the fact that in many countries a proper distinction between these pensions cannot be made, either because early retirement is built-in into 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

include, in addition to genuine (actuarial) early retirement schemes, other early pensions that are granted for a specified age group below the statutory retirement age primarily on the basis of reduced work capacity or due to labour market reasons. In addition, disability and widow's pensions paid out to persons over the standard retirement age are included in this category in order to properly reflect the expenditure related to old-age. Pensions in this category include both earnings-related pensions and flat-rate or means-tested minimum pensions.

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

Contributions include contributions to pension schemes paid both by employers and employees as well as self-employed persons. The projection of the contributions is based on the unchanged contribution rate of 2004, unless there are clear policies that the contribution rate changes over time. The purpose is to provide information as to whether a financial gap in the pension system exists. 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. If the pension is financed by general tax revenues, no estimate should be provided here. If the state is defined as a third contributor to the pension scheme (Luxembourg and Malta, in both countries paying an equal share (1/3) of the total contribution along with the employer and the employee), also the state contribution can be included in the contributions.

Assets of pension funds take into account both the increases in the revenues of the pension funds and the withdrawals for the payment of pensions. For the rate of return on assets, defined as the average of the assets at the beginning and the end of the year, the assumption of the fixed annual real return of 3.0% is used. This rate is assumed to cover also the administrative expenses of the fund and no calculations have been made on the accumulation of the funds, net of administrative expenses. The information on the total value of assets in pension funds, including pre-financing to specific reserves within the government sector, is provided separately concerning social security schemes, occupational pension schemes and private pension schemes.

Inclusion of the impact of pension reforms: The (future) impact of pension reforms enacted by the end of 2004 (in the case of Portugal, also the impact of the Spring 2005 reform) is included in the projections.

3.3. Baseline projection results

3.3.1. Projected trend in public pension expenditure and a comparison with the 2001 projection

Gross social security and other public pensions correspond conceptually to the coverage of the 2001 projections of public pension expenditure. Table 3-3 presents the projections for public pension spending before taxes and social security contributions paid out to the beneficiaries, as a percentage of GDP. Concerning the coverage of public pension schemes in these projections, it can be considered as being very good for all countries, including all significant schemes.

Table 3-3 Gross public pension expenditure as a share of GDP between 2004 and 2050

Public pensions, gross as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	10,4	10,4	11,0	12,1	13,4	14,7	15,7	15,5	4,3	0,8	5,1
CZ	8,5	8,2	8,2	8,4	8,9	9,6	12,2	14,0	1,1	4,5	5,6
DK	9,5	10,1	10,8	11,3	12,0	12,8	13,5	12,8	3,3	0,0	3,3
DE	11,4	10,5	10,5	11,0	11,6	12,3	12,8	13,1	0,9	0,8	1,7
EE	6,7	6,8	6,0	5,4	5,1	4,7	4,4	4,2	-1,9	-0,5	-2,5
GR											
ES	8,6	8,9	8,8	9,3	10,4	11,8	15,2	15,7	3,3	3,9	7,1
FR	12,8	12,9	13,2	13,7	14,0	14,3	15,0	14,8	1,5	0,5	2,0
IE	4,7	5,2	5,9	6,5	7,2	7,9	9,3	11,1	3,1	3,2	6,4
IT	14,2	14,0	13,8	14,0	14,4	15,0	15,9	14,7	0,8	-0,4	0,4
CY	6,9	8,0	8,8	9,9	10,8	12,2	15,0	19,8	5,3	7,6	12,9
LV	6,8	4,9	4,6	4,9	5,3	5,6	5,9	5,6	-1,2	-0,1	-1,2
LT	6,7	6,6	6,6	7,0	7,6	7,9	8,2	8,6	1,2	0,7	1,8
LU	10,0	9,8	10,9	11,9	13,7	15,0	17,0	17,4	5,0	2,4	7,4
HU	10,4	11,1	11,6	12,5	13,0	13,5	16,0	17,1	3,1	3,7	6,7
MT	7,4	8,8	9,8	10,2	10,0	9,1	7,9	7,0	1,7	-2,1	-0,4
NL	7,7	7,6	8,3	9,0	9,7	10,7	11,7	11,2	2,9	0,6	3,5
AT	13,4	12,8	12,7	12,8	13,5	14,0	13,4	12,2	0,6	-1,7	-1,2
PL	13,9	11,3	9,8	9,7	9,5	9,2	8,6	8,0	-4,7	-1,2	-5,9
PT	11,1	11,9	12,6	14,1	15,0	16,0	18,8	20,8	4,9	4,8	9,7
SI	11,0	11,1	11,6	12,3	13,3	14,4	16,8	18,3	3,4	3,9	7,3
SK	7,2	6,7	6,6	7,0	7,3	7,7	8,2	9,0	0,5	1,3	1,8
FI	10,7	11,2	12,0	12,9	13,5	14,0	13,8	13,7	3,3	-0,3	3,1
SE	10,6	10,1	10,3	10,4	10,7	11,1	11,6	11,2	0,4	0,2	0,6
UK	6,6	6,6	6,7	6,9	7,3	7,9	8,4	8,6	1,3	0,7	2,0
EU15 [1)]	10,6	10,4	10,5	10,8	11,4	12,1	12,9	12,9	1,5	0,8	2,3
EU10	10,9	9,8	9,2	9,5	9,7	9,8	10,6	11,1	-1,0	1,3	0,3
EU12 [1)]	11,5	11,3	11,4	11,8	12,5	13,2	14,2	14,1	1,6	0,9	2,6
EU25 [1)]	10,6	10,3	10,4	10,7	11,3	11,9	12,8	12,8	1,3	0,8	2,2

1) excluding Greece

As regards the starting position in 2004, public pension spending accounted for an average of about 10.6% of GDP in the EU Member States, with a large variation from 4.7% of GDP in Ireland to 14.2% of GDP in Italy. The low levels of public spending on pensions in Ireland and the United Kingdom stem from the fact that the public pension schemes primarily provide flat-rate pensions, while occupational pensions play an important role in the total provision of pensions. Public pension spending is clearly below the EU average also in a number of EU10 Member States such as Cyprus and Malta as well as Estonia, Latvia, Lithuania, and Slovakia. In the latter group of countries, this can be attributed partially to the fact that the current pensions are relatively flat-rate as most of pensioners acquired their pension rights before the collapse of the communist regime in societies which had relatively small wage differences, and in some cases to the fact that the levels of pensions have been based only on the length of service. It is also partially due to the fact that, in recent years, economic growth rate has been rapid thereby reducing spending as a percentage of GDP from the figures seen, for example, in 2000.

In contrast, high GDP percentages of public spending in countries, such as France, Austria, Poland and Italy, reflect the fact that the pension provision mainly relies on social security schemes and that the main scheme is an earnings-related one.

The main results of the 2005 projections can be presented as follows:

- the projections show very different increases in public pension spending over the period between 2004 and 2050, ranging from a decrease of 5.9 percentage points of GDP in Poland to an increase of 9.7 p.p. of GDP in Portugal and 12.9 p.p. of GDP in Cyprus;

- in the EU15 Member States, public pension spending is projected to rise by 2.3 p.p. of GDP on average and to rise in all countries except in Austria. In Austria, the spending peaks around 2035 but decreases thereafter. This can be attributed to the effects of the latest reforms since 2000. These reforms have increased legal retirement age, linked contributions more closely to benefits with actuarial reductions for early pensions and will switch from a wage to a price indexation of pensions as of 2006;

- in Italy and Sweden, the projected increases are very small due to the fact that the schemes are defined-contribution and, thus, the spending on pensions is driven primarily by the accumulation of contributions;

- relatively moderate increases (between 1.7 and 3.5 percentage points) in public pension expenditures are projected in a great number of the EU15 Member States such as Germany, the United Kingdom, France, Finland, Denmark and the Netherlands. Somewhat larger increases are projected in Belgium (5.1 p.p.) and Ireland (6.4 p.p.). In Ireland, the increase will largely be due to the maturing of the social security pension system;

- the largest challenges on pension expenditure in the EU are faced by Portugal (an increase of 9.7 p.p. of GDP), Luxembourg (7.4 p.p.) and Spain (7.1 p.p.);

- in the EU10 Member States, public pension expenditure is projected to decrease by 1 p.p. of GDP by 2030 on average but then to rise by 1.3 p.p. by 2050, with an overall increase by 0.3 p.p. between 2004 and 2050. However, the developments show very diverse trends in different countries: from a decrease of 5.9 p.p. of GDP in Poland to an increase of 6.7 p.p. in Hungary ,7.3 p.p. of GDP in Slovenia and 12.9 p.p. in Cyprus. Excluding Poland, in the remaining 9 new Member States, the projected increase in public pension spending is 4.9 p.p. of GDP.

- the projected decreases in Poland, Estonia and Latvia, as well as the projected small increases in Lithuania and Slovakia, stem partly from the pension reforms enacted during the last decade. These countries have switched part of the public old-age pension scheme into private funded schemes. Thus, the public provision of pensions will decrease while the private part, which remains mandatory, will increase. Another reason for the projected decrease in terms of the percentage of GDP is that the GDP growth rate is projected to be relatively high, in particular during the next two decades. This growth rate will be higher than the increase in the level of pensions, as pensions are indexed to prices only or only partially to wages.

- in Malta, the projected decrease in pension spending after 2020 stems from the current parameters of the pension scheme, notably, the indexation of the maximum pension to prices, which would lead to relatively flat-rate pensions over time.

- the challenges faced by Cyprus, Slovenia, Hungary and the Czech Republic are among the biggest in the whole of the EU. While Slovenia and the Czech Republic have undertaken parametric reforms of their pension systems during the 1990s, these systems remain predominantly pay-as-you-go public pension schemes. The large increase in the Slovenian pension system is largely due to the fact that pensions will be fully indexed to the net wage growth as of 2006 (in 2001-2005, 80% to wages and 20% to prices).

- in Hungary, the dynamic effect of the increasing wage level on the level of new pensions is projected to weigh more than the decrease due to the partial switch into a private scheme. Also, recent measures include improvements in the widow's pension level and a gradual introduction of the 13th month pension. Furthermore, the introduction of taxes on pensions in 2013 will result in an additional increase in gross pensions while it should not affect net pensions. As a result, a significant overall increase in (gross) public pension spending as a share of GDP is projected.

Table 3-4 Comparison of the 2005 projections of gross public pension expenditure as a share of GDP with the 2001 projections

	2005 projections			2001 projections		
Country	2004	2050	2004-50	2005	2050	2005-50
BE	10,4	15,5	5,1	9,5	13,3	3,8
CZ	8,5	14,0	5,6			
DK	9,5	12,8	3,3	11,3	13,3	2,0
DE	11,4	13,1	1,7	11,4	16,9	5,5
EE	6,7	4,2	-2,5			
GR				12,2	24,8	12,4
ES	8,6	15,7	7,1	8,8	17,3	8,5
FR [1)]	12,8	14,8	2,0	12,2	15,8 [1)]	3,6
IE [2)]	4,7	11,1	6,4	4,5 [2)]	9 [2)]	4,5
IT	14,2	14,7	0,4	13,8	14,1	0,3
CY	6,9	19,8	12,9			
LV	6,8	5,6	-1,2			
LT	6,7	8,6	1,8			
LU	10,0	17,4	7,4	7,4	9,3	1,9
HU	10,4	17,1	6,7			
MT	7,4	7,0	-0,4			
NL	7,7	11,2	3,5	8,3	13,6	5,3
AT	13,4	12,2	-1,2	14,5	17,0	2,5
PL	13,9	8,0	-5,9			
PT	11,1	20,8	9,7	10,9	13,2	2,3
SI	11,0	18,3	7,3			
SK	7,2	9,0	1,8			
FI	10,7	13,7	3,1	10,9	15,9	5,0
SE	10,6	11,2	0,6	9,2	10,7	1,5
UK	6,6	8,6	2,0	5,3	4,4	-0,9
EU15	10,6	12,9	2,3	10,4	13,3	2,9

1) FR: 2040 in the 2001 projection

2) IE: as % of GNP in the 2001 projection, corresponding appr. to 3.8% and 7.7% of GDP.

The comparison between the results of the 2005 and 2001 projections presented in Table 3-4 can be made only for the EU15 Member States because only they were included in the 2001 projection exercise. Before comparing the projected increases, changes in the starting positions should be taken into account. It is more appropriate to compare the 2004 base year in the current projection with the projection for 2005 in the 2001 projection than the base year of 2001. In about half the countries (DE, ES, FR, IT, NL, PT, FI), the level of public pension expenditure as a percentage of GDP in the starting position is broadly the same as in the 2001 projections, while in most of the remaining countries the starting level is 1-2 percentage points higher. In many cases, this difference can be attributed to a broader coverage of pensions such as the inclusion of public sector employees' pensions in Luxembourg and the United Kingdom. In Sweden, the disability pensions have been added in the 2005 projection.

In contrast, the Danish spending is almost 2 percentage points lower due to the exclusion of supplementary occupational pensions (ATP) from the government sector.

The main findings of a comparison between the two projections can be concluded as follows:

- in half the EU15 Member States (DE, ES, FR, NL, AT, FI and SE), the projected increase in public pension spending between 2005 and 2050, according to the current projections, is smaller than in the 2001 projections. The smaller increase can be largely attributed to major pension reforms undertaken since 2001, in particular in DE, FR, AT and FI. Reforms undertaken in other countries have probably affected the projected evolution of pension expenditure, but their effect is more difficult to disentangle by comparing the results of the 2001 and 2005 projections. Table 2-6 of the Annex provides a short description of recent reforms in Member States;

- in Italy, the projected increase in public pension spending between 2004 and 2050 is virtually the same, while the recent reform increasing the standard retirement age as of 2008 will decrease pension spending over the period of 2010-2040. Belgium, Denmark, Ireland, Luxembourg, Portugal and the United Kingdom project larger increases than in the 2001 projection. The projected larger increase in public pension spending in the United Kingdom is mainly due to the measures that have increased the level of social insurance pensions;

- in Luxembourg and Portugal, the 2005 and 2001 projections differ greatly from each other and the differences are due to several factors. In the case of Portugal, the revised population projections are significantly more unfavourable than those in the 2001 exercise and, consequently, they result in a less favourable macroeconomic framework. Moreover, minimum pensions have converged to minimum wages, thereby increasing the average level of pensions. For Luxembourg, the macroeconomic framework has been substantially revised, resulting in a less favourable projection regarding long-term economic development. Furthermore, the projection models have been improved.

Another explanation for changes in projected public pension expenditure is the population projections, notable changes in life expectancy and old-age dependency ratios. Table 3-5 below provides an overview of the changes in forecasted life expectancies and Table 3-6 of changes in the old-age dependency ratio between the 2005 and 2001 projections. The most significant changes in demographic projections (the 2001 projections were based on the 1995 census and the 2005 projections on the 2000 census) were the following:

- in the EU15, life expectancies at birth in the base year of the projections are, on average, more than one year higher for men and almost one year higher for women in the 2005 projections than in the previous one;

- the projected increase in life expectancies at birth up to 2050 are about two years higher in Portugal and for men in Italy, and about 1.5 years higher in Spain and Ireland in the 2005 projections compared with the 2001 exercise;

- in the EU15, on average, the old-age dependency ratio is 1.5 percentage points higher both at the beginning and at the end of the projection period in the 2005 projections

compared with the previous projection. The increase in the old-age dependency ratio is the same in both population projections.

- the old-age dependency ratios have risen most in Portugal (10 p.p.), Ireland and Greece (6 p.p.) and Denmark and Spain (5 p.p.) when compared the 2005 projections with the 2001 ones.

Table 3-5 Life expectancies in the 2004 and 2001 population projections

	2005 projections				2001 projections			
	Male 2004	change 2004-2050	Female 2004	change 2004-2050	Male 2000	change 2000-2050	Female 2000	change 2000-2050
BE	75,5	6,6	81,6	5,9	75,3	5,2	81,4	4,0
DK	75,2	6,2	79,6	5,6	75,2	4,2	79,6	3,5
DE	76,1	5,9	81,7	5,1	74,7	5,3	80,8	4,2
GR	76,4	4,6	81,4	4,5	75,9	5,1	81,0	4,0
ES	76,6	5,1	83,4	3,9	74,9	4,1	82,1	2,9
FR	76,2	6,1	83,4	4,5	74,8	5,2	82,8	4,2
IE	75,5	6,6	80,7	6,2	74,0	5,0	79,4	4,6
IT	77,3	5,5	83,2	4,6	75,5	5,5	82,0	4,1
LU	75,0	6,8	81,4	5,3	74,4	5,6	80,8	4,2
NL	76,2	4,8	80,8	4,3	75,5	4,5	80,9	4,1
AT	76,2	6,6	82,1	5,2	75,0	6,0	81,2	4,8
PT	74,2	6,9	81,0	5,7	72,0	6,0	79,2	4,8
FI	75,3	6,6	81,9	4,8	73,9	6,1	81,1	3,9
SE	78,1	4,6	82,4	4,3	77,3	4,7	82,0	4,0
UK	76,4	6,0	80,9	5,7	75,2	4,8	80,0	5,0
CY	76,3	5,6	80,8	4,3				
CZ	72,4	7,4	78,8	5,3				
EE	65,5	9,4	76,9	6,3				
HU	68,5	9,6	76,8	6,6				
LT	66,5	9,0	77,6	6,1				
LV	64,9	9,3	76,2	6,3				
MT	76,2	5,6	80,7	4,3				
PL	70,5	8,7	78,5	5,9				
SK	69,7	8,0	77,8	5,6				
SI	72,6	7,3	80,2	5,0				
EU15	*76,4*	*5,8*	*82,2*	*4,9*	75,0	5,0	81,3	4,2
EU10	*70,1*	*8,6*	*78,2*	*5,9*				
EU25	*75,4*	*6,3*	*81,5*	*5,1*				

Table 3-6 Dependency ratios in the 2004 and 2001 population projections

	2005 projections			2001 projections		
	2004	2050	change	2000	2050	change
BE	26,1	47,2	21	26	45	20
DK	22,5	41,9	19	22	36	14
DE	26,8	51,7	25	24	49	25
GR	26,4	60,4	34	26	54	28
ES	24,6	65,4	41	25	60	36
FR	25,2	46,4	21	24	46	22
IE	16,4	45,2	29	17	40	23
IT	28,9	62,2	33	27	61	35
LU	21,0	36,1	15	21	38	16
NL	20,5	40,6	20	20	41	21
AT	22,8	52,4	30	23	54	31
PT	24,9	58,5	34	23	46	24
FI	23,3	46,7	23	22	44	22
SE	26,4	40,9	14	27	42	16
UK	24,3	45,0	21	24	42	18
CY	17,5	43,2	26			
CZ	19,7	54,8	35			
EE	23,8	43,1	19			
HU	22,6	48,3	26			
LT	22,3	44,9	23			
LV	23,6	44,1	20			
MT	19,0	40,6	22			
PL	18,6	51,0	32			
SK	16,3	50,6	34			
SI	21,4	55,6	34			
EU15	25,5	51,6	26	24	49	26
EU10	19,6	50,4	31			
EU25	24,5	51,4	27			

3.3.2. The change in public pension expenditure and its driving factors

3.3.2.1. Peaks in public pension expenditures

The pressure for increased public pension spending over the projection period may vary for different reasons, notably due to the retirement of the baby-boom generation. Many countries see the peak in the level of public pension spending before the end of the projection period. For instance, the peak in pension spending is around 2040 in BE, DK, FR, IT, NL and SE, and already around 2030 in AT and FI. On the other hand, a number of countries face a growing trend in public pension expenditure up to the end of the projection period of 2050, such as DE, ES, IE, LU, PT and UK.

Table 3-7 Peaks in public pension expenditure as a share of GDP

Country	Starting year 2004	Peak year	Value	Difference: from 2004 to the peak	
				Absolute	%
BE	10,4	2042	15,7	5,3	51,5
CZ	8,5	2050	14,0	5,6	66,1
DK	9,5	2039	13,5	4,0	42,1
DE	11,4	2050	13,1	1,7	15,2
EE	6,7	2006	7,7	1,0	15,4
GR					
ES	8,6	2046	16,2	7,6	88,6
FR	12,8	2040	15,0	2,1	16,6
IE	4,7	2050	11,1	6,4	134,8
IT	14,2	2039	15,9	1,7	11,7
CY	6,9	2050	19,8	12,9	188,5
LV	6,8	2004	6,8	0,0	0,0
LT	6,7	2050	8,6	1,8	27,3
LU	10,0	2047	17,7	7,7	77,1
HU	10,4	2050	17,1	6,7	64,8
MT	7,4	2021	10,2	2,8	37,6
NL	7,7	2039	11,7	3,9	50,7
AT	13,4	2033	14,1	0,7	5,2
PL	13,9	2004	13,9	0,0	0,0
PT	11,1	2050	20,8	9,7	87,8
SI	11,0	2050	18,3	7,3	66,4
SK	7,2	2050	9,0	1,8	24,7
FI	10,7	2033	14,1	3,4	32,0
SE	10,6	2040	11,6	1,0	9,1
UK	6,6	2050	8,6	2,0	29,8
EU15 [1)]	10,6	2043	13,0	2,4	22,5
EU10	10,9	2050	11,1	0,3	2,5
EU12 [1)]	11,5	2044	14,3	2,7	23,8
EU25 [1)]	10,6	2044	12,8	2,2	21,0

1) excluding Greece

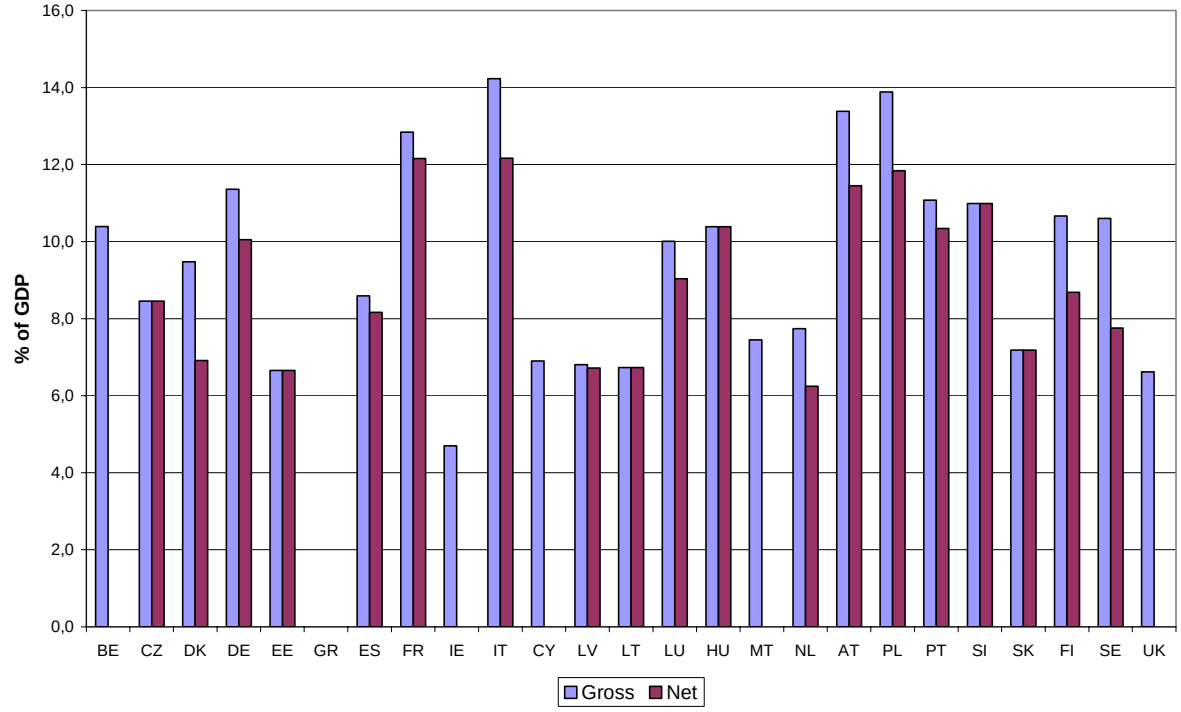
For the EU10 Member States, one has to look at total pension spending in order to get a picture of the path of the demographic pressure (see Table 3-17). In most of the EU10 Member States, demographic pressures will materialise only during the later part of the projection period and the main increase in pension spending will be seen over the period 2030-2050. A growing trend in total pension spending up to the end of the projection period is projected in CY, LT, HU, SK and SI. In Malta, the peak in pension spending does not match that of the demographic pressures. The decrease in pension spending after the peak year of 2021 is driven by the parameters of the pension system, which will lead to virtually no real increase in average pensions and a sharp decrease in the benefit ratio (that is the average

pension relative to output per worker), while the dependency ratio will remain on an increasing trend over the whole projection period.

3.3.2.2. The taxation of pensions

The comparison of the level of gross pension spending across countries is distorted by the fact that Member States tax pension benefits differently. While countries such as Denmark and Sweden tax pensions almost in the same way as wages, with a tax rate of 27% in 2004, no taxes are levied on pensions in Lithuania, Slovenia and Slovakia. Also in the Czech Republic and Estonia public pensions and in the United Kingdom state pensions are in practice tax-free because the tax threshold is set at such a level that only a very small number of public pensions are subject to taxes. In a large group of countries (DE, ES, FR, IT, LU, AT, PL, PT), taxes levied on pensions are in the range of 5-15%, and in Finland and the Netherlands about 19%.

Graph 3-1 Gross and net public pension expenditure as a share of GDP in 2004



Graph 3-1 provides an approximation of the impact of income taxes levied on pensions. It should be noted that Member States may have applied different methods in estimating the average effective tax rate on pensions. It was generally assumed that, unless there will be a clear change to the current tax regime of pensions, the same effective tax rate can be applied over the whole projection period. In fact, only Germany and Hungary indicated a change in the tax regime: in both of the countries, this would lead to an increase in the taxation of public pensions; in Germany, from an average tax rate of 12% in 2004 to 17% in 2050, when both taxes and social security contributions are considered; in Hungary, the taxation will be introduced in 2013, leading from the current zero level of taxation to a 15% tax rate in 2050, thereby pushing also the gross level of pension expenditure upwards. Some countries (BE, IE, CY, MT and UK) did not provide estimates on net pension expenditure developments.

Taking the taxation of public pensions into account, the differences in the levels of spending are equalised to some degree, as the countries with the highest level of pension spending tend to tax pensions while those with the lowest level of pension spending do not. Also the projected increases in net pension spending are slightly lower than in gross spending in the countries where the taxation matters, even notably lower in Germany and Hungary. In contrast, Portugal and Slovenia stand out in that they have, already at the beginning of the projection period, relatively high levels of pension spending and the highest increases. As there is no taxation on pensions in Slovenia and only a light taxation in Portugal, at the end of the projection period, their net spending on pensions would be by far the highest of all EU countries.

3.3.2.3. Old-age and early pensions

In order to have a better understanding of the importance of demographic pressures, and to examine the effect of pension policies to reduce the take-up of disability pensions, it is important to separately analyse the developments of old-age pensions and other (disability and survivors') pensions. In this exercise, it was aimed to separate old-age and early pensions from others on the basis of the age of the pension beneficiary rather than according to the type of the pension in the national scheme. In particular, in some Member States, the type of the pension (i.e. disability pension) remains unchanged irrespective of the fact that the pensioner reaches the statutory old-age retirement age. The purpose of categorising more closely according to the age was to include in old-age and early pensions, all pensions that can be considered as age-related pensions and, thus, their evolution is mainly driven by the age. It was instructed to include in this category all pensions that are provided to persons above the statutory old-age pension age and that are provided to persons in the age bracket typical for early pensions (usually 55-64 years) if these pensions could be considered as substitutes for early retirement pensions as it is often the case regarding disability pensions.

While there are differences across Member States as to how much pensions other than old-age pensions are provided, there are also differences in the data availability as to how well old-age and early pensions can be separated from other pensions. For instance, the French pension schemes mainly provide only old-age pensions, whilst disabled people are entitled to sickness benefits rather than disability pensions. Although such pensions have existed, their share in the total number of pensions has been very small and they have not been shown separately in the statistics[41]. Furthermore, in many countries, there have been problems to apply the agreed common age brackets for the disaggregation of pensions. Germany, France, Cyprus and Slovenia did not break down public pensions into the requested categories. All public pensions are thus included in the category of 'old-age and early pensions'. The UK did not provide data on public disability benefits.

Table 3-2 reports in detail how Member States have applied the break-down between old-age and early pensions, on one hand, and other pensions, on the other hand. It is thus obvious that the share of old-age and early pensions in total public pensions shown in Table 3-8 is not fully comparable across countries, but it might be indicative as to the extent to which the ageing of the population influences the total public pension expenditure. Also, the projected development over time can be considered to provide a picture of the changes in national pension provisions as to the role of old-age pensions, on the one hand, and that of other pensions, on the other hand.

[41] For instance, Slovenia reported that disability pensions account for 3% of all pensions.

Table 3-8 Old-age and early pensions, gross, as a share of all public pensions

Old-age and early pensions, gross / Public pensions, gross									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	92	92	93	94	94	95	96	96	3	1	3
CZ	90	91	91	91	90	91	93	94	1	3	4
DK	77	81	83	83	83	84	85	84	8	-1	7
DE 2)	100	100	100	100	100	100	100	100	0	0	0
EE	89	88	88	88	88	89	89	90	0	2	2
GR											
ES	65	65	65	66	68	71	76	78	6	7	13
FR 2)	100	100	100	100	100	100	100	100	0	0	0
IE	74	76	79	81	82	84	86	88	10	5	15
IT	98	98	98	98	99	99	99	99	1	0	1
CY 2)	100	100	100	100	100	100	100	100	0	0	0
LV	84	88	88	88	88	88	88	89	4	1	4
LT	85	85	85	85	86	86	86	86	1	0	1
LU	61	62	64	68	72	75	79	80	15	5	19
HU	80	81	86	90	90	90	92	92	10	2	12
MT	52	59	65	69	73	76	83	92	24	16	40
NL	64	68	72	75	78	80	84	83	17	3	20
AT	84	85	87	88	89	90	91	92	7	2	9
PL	77	83	84	86	87	86	83	82	9	-3	5
PT	78	79	80	82	82	82	82	83	4	0	5
SI 2)	100	100	100	100	100	100	100	100	0	0	0
SK	75	71	67	66	65	65	67	70	-11	5	-5
FI	74	79	81	83	85	86	87	88	12	2	14
SE	74	76	80	82	83	85	88	88	11	4	15
UK	100	100	100	100	100	100	100	100	0	0	0
EU15 1)	96	97	97	97	97	97	98	98	1	0	1
EU10	81	84	85	87	88	87	87	88	6	1	7
EU12 1)	94	94	95	95	95	96	96	96	2	0	2
EU25 1)	96	96	96	96	97	97	97	97	1	0	2

1) excluding Greece

2) DE, FR, CY and SI: no break-down according to the type of pension has been provided.

It can be seen that there is a general tendency towards an increasing share for old-age pensions. This is a consequence of demographic developments and, secondly, a consequence of pension policies that aim to reduce the use of disability pension schemes as substitutes for early pensions and to redirect their use to genuine disability cases. Large increases in the share of old-age pensions are projected in the Netherlands (+20 p.p.), Luxembourg (+19p.p.), Ireland and Sweden (+15 p.p.), Finland (+14 p.p.), Spain (+13 p.p.) and Hungary (+12 p.p.)[42]. Only in Slovakia is the share of public old-age pensions projected to decrease. However, this development must be attributed primarily to the partial switch of old-age pensions to a private scheme while disability pensions will remain in the public system.

42 The share of old-age pensions is projected to increase by 40 percentage points in Malta. However, this figure is largely driven by the break-down applied, the category of old-age pensions was limited to main schemes while other pensions included also specific pensions - but rather equivalent to old-age pensions - being phased out over a transition period.

3.3.2.4. Disability and survivors' pensions

Looking at the evolution of disability and survivors' pensions[43] provides insights into the projected impact of pension reforms with the aim of tightening access to disability pensions in particular. In most cases, where a significant decrease in other pension expenditure is projected, the access to disability pension schemes has been tightened and its use as a substitute for an early pension reduced. In addition, in some countries, in particular in Sweden, the provision of widows' pensions will be phased out. A significant decrease in these pensions is projected for Poland (by 1.8 percentage points of GDP), Sweden (by 1.5 p.p.), Austria[44] (by 1.2 p.p.), Finland (by 1.1 p.p.), the Netherlands (by 1 p.p.) and Hungary (by 0.8 p.p.)[45]. Public spending on disability and survivors' pensions is projected to increase only in Portugal (by 1.2 p.p.), Slovakia (by 0.9 p.p.), Spain (by 0.5 p.p.) and Lithuania (by 0.2p.p.). In particular, in Lithuania, the projected increase reflects recent measures, which made the disability pension more accessible.

Table 3-9 Disability and survivors' pensions as a share of GDP between 2004 and 2050

Other pensions (disability, survivors), gross as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	0,8	0,8	0,8	0,8	0,7	0,7	0,7	0,7	-0,1	-0,1	-0,1
CZ	0,8	0,8	0,8	0,8	0,9	0,8	0,8	0,8	0,0	-0,1	-0,1
DK	2,2	1,9	1,9	1,9	2,0	2,0	2,0	2,1	-0,2	0,1	-0,1
DE											
EE	0,8	0,8	0,7	0,6	0,6	0,5	0,5	0,4	-0,2	-0,1	-0,4
GR											
ES	3,0	3,1	3,1	3,2	3,3	3,4	3,6	3,5	0,5	0,0	0,5
FR											
IE	1,3	1,2	1,3	1,3	1,3	1,3	1,3	1,3	0,0	0,0	0,0
IT	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	-0,1	0,0	-0,1
CY											
LV	1,1	0,6	0,6	0,6	0,6	0,7	0,7	0,6	-0,4	-0,1	-0,4
LT	1,0	1,0	1,0	1,0	1,1	1,1	1,2	1,2	0,1	0,1	0,2
LU	3,9	3,7	3,9	3,9	3,9	3,7	3,6	3,5	-0,3	-0,2	-0,5
HU	2,1	2,1	1,6	1,3	1,2	1,3	1,3	1,3	-0,7	0,0	-0,8
MT	3,6	3,6	3,5	3,2	2,7	2,2	1,3	0,5	-1,4	-1,6	-3,0
NL	2,8	2,4	2,3	2,3	2,2	2,1	1,9	1,9	-0,7	-0,2	-1,0
AT	2,2	1,9	1,7	1,6	1,5	1,3	1,2	0,9	-0,8	-0,4	-1,2
PL	3,2	2,0	1,6	1,3	1,3	1,3	1,5	1,4	-1,9	0,1	-1,8
PT	2,4	2,5	2,5	2,6	2,7	2,8	3,3	3,6	0,4	0,8	1,2
SI											
SK	1,8	1,9	2,1	2,3	2,5	2,7	2,7	2,7	0,9	0,0	0,9
FI	2,8	2,4	2,3	2,2	2,1	2,0	1,8	1,7	-0,8	-0,3	-1,1
SE	2,8	2,4	2,1	1,9	1,8	1,7	1,4	1,3	-1,1	-0,4	-1,5
UK [2)]											
EU15 [1)]	1,8	1,7	1,6	1,6	1,6	1,6	1,6	1,5	-0,1	-0,1	-0,2
EU10 [1)]	2,2	1,6	1,4	1,3	1,3	1,3	1,4	1,3	-0,9	0,0	-0,9
EU12 [1)]	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,5	0,0	-0,1	-0,1
EU25 [1)]	1,8	1,7	1,6	1,6	1,6	1,6	1,6	1,5	-0,2	-0,1	-0,3

1) excluding countries which have not provided data or been able to show this catecory separately

2) UK: no data provided on disability benefits

43 The caveats concerning the separation of disability and survivors' pensions described in the context of Table 3-8 apply to this table, too.

44 AT: The figures of this table include only survivors' pensions.

45 MT: the category includes also pensions other than disability pensions, cf. footnote 42.

3.3.2.5. The factors driving the change in pension spending

The factors driving the increases in pension spending can be further analysed by decomposing the results of the projections into four main explanatory factors, namely:

- *A dependency effect (or a population ageing effect),* which measures the changes in the dependency ratio over the projection period as the ratio of persons aged 65 and over to the population aged 15 to 64;

- *an employment effect* which measures changes in the share of the population of working age (15 to 64) relative to the number of the employed, i.e. an inverse employment rate;

- *a take-up effect of pensions*[46], which measures changes in the share of pensioners relative to the population aged 65 and over. In effect, it measures the take-up of pensions relative to the number of old people. For some countries, the reported number of pensioners represents the number of pensions rather than the number of pensioners. However, this bias should not affect the evolution in the take-up ratio over time;

- *a benefit effect*, which captures changes in the average pension relative to output per employed person. Average pension and output per worker, approximating the average wage, are measured each year of the projection exercise for the total population of pensioners and employees. Thus, the benefit ratio also captures changes in the structure of the respective population groups, in addition to the assumed increases in pensions due to the indexation rules, the maturation of the pension system and longer contribution periods as well as in wages due to the assumptions of labour productivity growth rates. In particular, it should be noted that the benefit ratio does not measure the level of the pension for any individual relative to his/her own wage and, hence, is not equivalent to a replacement rate indicator[47].

The following equation is used:

$$\frac{PensExp}{GDP} = \frac{Pop>65}{Pop(15\text{-}64)} \times \frac{Pop\ (15\text{-}64)}{EmplNo} \times \frac{PensNo}{Pop>65} \times \frac{PensExp/PensNo}{GDP/EmplNo}$$

The following tables (Table 3-10 and Table 3-12) decompose the projected change in public spending, as a per cent of GDP, into the changes in the dependency ratio, employment rate, take-up ratio of pensions and benefit ratio. Further tables (Table 3-13 and Table 3-14) present then the contributions in terms of the increase in pension spending over the whole projection period relative to spending in 2004. The contributions of the different factors to the changes in pension spending have been measured as the sum of changes over 5-year periods in order to reduce the magnitude of the residual component. Table 3-15 presents annual growth rates in pension spending over selected time periods.

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[46] This effect is also known as 'eligibility effect' in the literature.

[47] Table 2-2 of the Annex presents the gross and net replacement ratios of pensions calculated for a hypothetical individual with a full career of 40 years at average earnings.

Table 3-10 The contribution of the decomposed factors to the change (in percentage points) in all public pensions relative to GDP

	Public pensions, gross as % of GDP		Due to growth in:				Interaction effect (residual)
			Dependency ratio	Employment rate	Take up ratio	Benefit ratio	
	start level 2005 [2]	p.p. change 2005-50	Pop(65+) / Pop(15-64)	Employed / Pop(15-64)	Pensioners / Pop65+	Average pension / GDP per worker	
BE	10,4	5,1	7,7	-1,5	-0,4	-0,6	-0,1
DK	9,6	3,2	7,2	-0,4	-2,8	-0,5	-0,3
DE	11,1	1,9	7,5	-1,1	-0,6	-3,5	-0,4
GR	:						
ES	8,7	7,0	12,4	-1,8	-2,3	-0,8	-0,4
FR	12,8	2,0	8,7	-0,9	-1,8	-3,5	-0,5
IE	4,6	6,5	7,9	-0,5	-1,4	0,8	-0,2
IT	14,3	0,4	11,5	-2,0	-3,2	-5,3	-0,7
LU	10,0	7,4	7,2	-4,4	2,5	2,1	0,0
NL	7,4	3,8	6,3	-0,2	-1,6	-0,4	-0,3
AT	13,2	-1,0	11,3	-1,3	-5,8	-4,3	-0,8
PT	11,5	9,3	13,7	-0,2	-0,9	-3,0	-0,4
FI	10,4	3,3	8,8	-0,9	-3,1	-0,9	-0,6
SE	10,4	0,9	4,8	-0,6	-0,2	-2,8	-0,2
UK	6,7	1,9	4,7	-0,1			-2,6
CY	7,0	12,8	10,2	-1,2	1,2	2,5	0,1
CZ	8,5	5,6	10,5	-0,3	-3,5	-0,6	-0,6
EE	7,1	-3,0	3,1	-0,6	-1,5	-3,8	-0,2
HU	10,7	6,4	10,5	-1,1	-4,5	2,0	-0,4
LT	6,7	1,9	5,4	-1,0	-2,1	-0,2	-0,2
LV	6,4	-0,9	3,4	-0,7	-1,3	-2,4	0,0
MT	7,5	-0,5	7,3	-1,2	-1,0	-5,0	-0,6
PL	13,7	-5,7	10,4	-3,2	-4,5	-7,5	-0,8
SK	7,4	1,5	9,0	-1,3	-2,5	-3,1	-0,6
SI	11,0	7,3	13,3	-1,0	-3,6	-0,9	-0,6
EU15 [1]	10,5	2,3	8,2	-1,0	-1,7	-2,8	-0,4
EU10	11,5	0,3	9,9	-1,7	-3,8	-3,5	-0,6
EU12 [1]	10,6	2,7	9,3	-1,3	-1,8	-3,1	-0,4
EU25 [1]	10,6	2,2	8,6	-1,1	-2,1	-2,7	-0,4

1) excluding countries which have not provided information

2) The base year of the decomposition calculations is 2005 (insted of 2004 in other tables) because the changes have been measured as the sum of changes over 5-year periods.

Table 3-10 shows the impact of the decomposed factors in terms of percentage point changes in public pension expenditure relative to GDP. The findings can be summarised as follows:

- In almost all countries, the old-age dependency ratio weighs on the increase in pension spending by far more than the total increase, while the other factors offset part of the increase coming from the ageing of the population. The strongest offsetting effect comes from the benefit ratio and in the EU10 Member States also from the eligibility ratio.

- Demographic change alone, measured by the dependency ratio, would result in expenditure increases by over 10 percentage points of GDP in Spain, Italy, Austria, Portugal, Cyprus, the Czech Republic, Hungary, Poland and Slovenia. On average, in the EU15, the demographic pressure alone would push public pension spending upwards by over 8 percentage points of GDP and in the EU10 by almost 10 percentage points.

- The offsetting factors, notably the projected reduction in the benefit ratio, are projected to have a very large impact on the increase. In the EU15, these factors are expected to offset some 70% of the pressure caused by demographic development alone and in the EU10 almost all the pressure.

- The contribution of the relative benefit ratio reflects for a number of countries institutional changes, notably the partial switch of social security pensions into private schemes (PL, SK, LV and EE). Secondly, it reflects the change in the indexation rules of pensions. If the indexation of pensions is shifted towards prices only, the average benefit to average output per employee (average wage) will decrease over time. The earlier switch to price indexation of pension in Italy and the recently reformed indexation rules in Germany, France and Austria explain the relatively large offsetting impact of the relative benefit ratio on the pension expenditure increase. In the case of Malta, the indexation of the maximum pension to a price index explains a large decrease in the relative benefit ratio. In contrast, subjecting pensions more to taxes, as in Hungary, will increase the gross pension, which is measured by the benefit ratio, but not to the same degree the net pension. The level of pensions relative to wages (approximated by output per employee is projected to increase also in Ireland, Luxembourg and the most strongly in Cyprus, reflecting largely the maturation of their pension systems, which takes account of longer careers with contributions paid to the system.

- Large decreases in the take-up ratio of pensions are projected in particular for Austria, Hungary and Poland but also in the Czech Republic, Italy, Finland and Slovenia. These reflect changes in pension policies that have aimed at increasing the effective retirement age either through increases in the statutory retirement age and/or through tightening access to early and disability pension schemes. In contrast, the number of pensioners relative to the number of older people in the population is projected to remain, by and large, unchanged in Belgium, Germany and Sweden. However, this may include structural changes in the take-up of pensions, for instance, a higher take-up of pensions by women thanks to their increasing participation in the labour market and a lower take-up of pensions by men due to reforms undertaken.

- Employment rates are projected to increase in all countries and, consequently, this would help to offset some of the demographic pressures on pension expenditure. Particularly large contributions from higher employment are projected for Poland. Other countries with relatively low current employment rates such as Spain, Belgium, Italy, Austria and Slovakia are also projected to get relief from higher employment rates. In the remaining countries, the offsetting impact of employment is projected to be about one percentage point or less.

- In Luxembourg, the pressure on public pension spending coming from changes in dependency ratio, employment rate and eligibility rate should be considered together because a considerable part of the labour supply is provided by cross-border workers, making the trends of the employed persons and the resident population inconsistent with each other. Thus, the population components alone do not reflect correctly the driving forces of pension expenditure developments, while the three components together reflect the evolution of the number of persons accruing pension rights in the system.

Table 3-11 The projected benefit ratio: average public pension relative to output per worker

Benefit ratio: Average public pension relative to output per worker									p.p. change	p.p. change	p.p. change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	17,7	17,8	17,8	17,8	17,6	17,4	16,9	16,4	-0,3	-1,0	-1,3
CZ	15,7	14,1	13,5	13,2	13,0	13,1	13,7	14,1	-2,7	1,0	-1,7
DK	20,2	19,9	19,5	19,4	19,3	19,2	19,0	19,2	-1,0	0,0	-1,1
DE	18,5	16,6	16,6	16,2	15,6	14,8	13,9	13,3	-3,6	-1,5	-5,2
EE	10,5	11,3	10,2	9,0	8,0	7,2	6,2	5,3	-3,4	-1,9	-5,3
GR											
ES	17,2	19,6	19,1	18,9	19,0	19,1	18,8	17,1	2,0	-2,0	-0,1
FR	24,4	24,1	23,0	22,0	21,1	20,3	19,3	18,9	-4,2	-1,3	-5,5
IE	14,3	14,9	15,9	16,2	16,6	16,5	16,1	15,7	2,2	-0,8	1,4
IT	20,0	20,8	20,4	19,8	18,8	17,7	15,7	14,0	-2,2	-3,7	-6,0
CY	25,6	28,6	27,9	26,9	25,5	25,7	28,9	30,8	0,1	5,1	5,2
LV	11,4	9,9	9,4	9,2	9,1	9,1	8,9	7,2	-2,2	-1,9	-4,2
LT	7,7	7,9	8,1	8,4	8,6	8,4	8,0	7,5	0,8	-0,9	-0,1
LU	23,5	23,4	24,7	25,0	26,4	26,6	27,5	28,0	3,1	1,4	4,5
HU	13,4	14,4	14,7	15,3	15,5	15,6	16,1	16,2	2,3	0,5	2,8
MT	18,4	19,9	20,1	19,0	17,2	15,2	12,4	10,3	-3,2	-4,9	-8,1
NL	19,5	18,8	18,6	18,4	18,2	18,1	18,0	18,1	-1,4	0,0	-1,4
AT	21,8	21,4	21,0	20,6	19,9	19,0	16,7	15,2	-2,8	-3,8	-6,6
PL	25,0	24,1	21,1	19,7	18,4	16,9	13,8	10,7	-8,1	-6,2	-14,3
PT	18,6	18,4	18,1	17,9	17,2	16,5	15,9	15,4	-2,1	-1,0	-3,2
SI	18,9	18,5	18,0	17,7	17,4	17,3	17,2	17,3	-1,6	0,0	-1,6
SK	13,0	12,6	12,4	12,3	12,0	11,4	9,9	8,8	-1,7	-2,6	-4,2
FI	19,8	19,6	19,4	19,1	18,8	18,5	18,3	18,0	-1,3	-0,5	-1,9
SE	21,3	20,0	18,7	17,5	16,9	16,5	16,2	15,9	-4,8	-0,6	-5,4
UK											
EU15 [1)]	22,6	22,1	21,6	21,0	20,3	19,6	18,4	17,6	-3,0	-2,0	-5,0
EU10 [1)]	18,2	17,8	16,6	16,2	15,7	15,1	14,1	12,8	-3,1	-2,3	-5,4
EU12 [1)]	20,2	19,9	19,5	19,0	18,4	17,6	16,5	15,6	-2,5	-2,0	-4,6
EU25 [1)]	21,7	21,4	21,0	20,4	19,8	19,1	18,0	17,0	-2,6	-2,2	-4,7

1) excluding countries which have not provided data

Table 3-11 shows more specifically the evolution of the benefit ratios embedded in the projections. Only four countries (CY, IE, LU and HU) project that average pension benefits will increase relative to wages (approximated by output per employee). A projected decrease in the benefit ratio mainly reflects that pensions in payment will not be raised at the same pace as the wages increase. Among the EU15 Member States, particularly large decreases in the benefit ratios are projected in countries that have already moved (Italy) or decided recently to move to price indexation such as France and Austria[48]. However, the initial level of benefits is at a relatively high level at the beginning of the projection period and the benefit level at the end of the projection period would still be close to the EU average level. In Germany, the sustainability factor as part of the indexation formula will reduce the relative benefit level to about the same degree as the price indexation in some other countries. In the EU10 Member States, the projected decrease is partially due to the indexation and partially due to the switch to private schemes. For these countries, the level of public pensions alone should not be interpreted as an indicator of the future pension generosity. The level of total pensions is shown in Table 3-17 and the benefit ratio for total pensions in Table 3-18.

48 Table 2-3 of the Annex describes the indexation rules of Member States' pension schemes.

Table 3-12 The contribution of the decomposed factors to the change (in percentage points) in the public old-age and early pensions relative to GDP

	Old-age and early pensions, gross as % of GDP		Due to growth in:				Interaction effect (residual)
			Dependency ratio	Employment rate	Take up ratio	Benefit ratio	
	start level 2005 [2]	p.p. change 2005-2050	Pop(65+) / Pop(15-64)	Employed / Pop(15-64)	Pensioners / Pop65+	Average pension / GDP per worker	
BE	9,6	5,3	7,3	-0,8	0,1	-1,2	-0,1
DK	7,5	3,3	5,9	-0,3	-1,6	-0,5	-0,2
DE	11,1	1,9	7,5	-1,1	-0,6	-3,5	-0,4
GR	:						
ES	5,7	6,6	8,9	-1,2	0,0	-1,0	-0,1
FR	12,8	2,0	8,7	-0,9	-1,8	-3,5	-0,5
IE	3,5	6,4	6,5	-0,4	0,3	0,0	-0,1
IT	14,0	0,5	11,4	-2,0	-2,9	-5,3	-0,7
LU	6,1	7,8	5,0	-3,2	4,3	1,5	0,2
NL	4,8	4,6	4,6	-0,2	0,0	0,1	0,0
AT	11,0	0,2	9,9	-1,1	-4,5	-3,3	-0,7
PT	9,0	8,1	11,2	-0,1	0,4	-3,0	-0,3
FI	8,0	4,0	7,1	-0,7	-1,1	-0,9	-0,4
SE	7,6	2,3	3,8	-0,5	0,9	-1,7	-0,1
UK	6,7	1,9	4,7	-0,1	-0,7	-1,7	-0,2
CY	7,0	12,8	10,2	-1,2			3,8
CZ	7,6	5,6	9,6	-0,3	-2,6	-0,6	-0,5
EE	6,3	-2,5	2,8	-0,5	-1,1	-3,5	-0,2
HU	8,6	7,2	9,3	-0,9	-1,9	0,9	-0,2
LT	5,7	1,7	4,6	-0,9	-1,6	-0,3	-0,2
LV	5,7	-0,8	3,0	-0,6	-1,0	-2,2	0,0
MT	3,9	2,6	4,8	-0,7	2,6	-3,9	-0,3
PL	11,1	-4,5	8,7	-2,6	-3,6	-6,2	-0,8
SK	5,6	0,7	6,1	-0,9	-1,5	-2,6	-0,4
SI	11,0	7,3	13,3	-1,0	-0,5	-4,0	-0,6
EU15 [1]	9,8	2,4	7,7	-0,9	-1,2	-2,8	-0,3
EU10	10,7	0,9	8,6	-1,4	-2,8	-3,0	-0,5
EU12 [1]	9,8	2,7	8,7	-1,2	-1,4	-3,1	-0,4
EU25 [1]	9,8	2,3	8,0	-1,1	-1,5	-2,8	-0,4

1) excluding countries which have not provided information

2) The base year of the decomposition calculations is 2005 (insted of 2004 in other tables) because the changes have been measured as the sum of changes over 5-year periods.

The main findings concerning the driving forces for the increase in public old-age and early pensions can be summarised as follows:

- as old-age pensions constitute the greatest share of all social security pensions, the decomposition of the old-age pension expenditure increase confirms the findings for all public pensions;

- the main difference relative to the decomposition of the increase in all pensions comes from the take-up ratio. In the case of the old-age pensions, the take-up ratio has a smaller offsetting impact, reflecting a closer relationship between the number of old-age pensioners and the older population. This suggests that the gains in a lower take-up of pensions would result more from changes in the take-up of pensions other than old-age pensions, i.e., among persons below the age of 65. This can be expected as a consequence of increased statutory retirement ages and tightened access to early retirement or pre-retirement pensions. Nevertheless, notable decreases in the take-up ratio of old-age pensions are projected in particular in Austria, Poland, the Czech Republic and Italy;

- an increase in the take-up ratio reflects in the first instance the increasing number of old-age people, due to larger age cohorts reaching the age of retirement and the increasing longevity. This impact is particularly large in Malta, but positive also in Belgium, Ireland, Portugal and Sweden. In some countries, in particular in Belgium, Spain and Malta, this reflects the increase in the female participation rate and, subsequently, the accrual of own pension rights of women and a higher number of female pensioners. It could be noted that the number of pensioners may also include persons receiving pensions abroad while they are excluded from the resident population. In the Swedish case, this explains the rising eligibility ratio;

- when only old-age pension spending is concerned, the demographic challenge is the largest in Slovenia, Italy, Portugal and Cyprus.

The following tables present the decomposition effects in terms of the increase of pension spending (in %) over the projection period relative to the spending in 2005. The findings largely support those presented above by the analysis of the contribution to the percentage point increase relative to GDP.

Table 3-13 Decomposition of the increase (in %) in public pension expenditure between 2005 and 2050

	Public pensions, gross as % of GDP		Due to growth in:				Interaction effect (residual)
	start level 2005 [2]	% change 2005-50	Dependency ratio Pop (65+) / Pop(15-64)	Employment rate Employed / Pop(15-64)	Take up ratio Pensioners / Pop65+	Benefit ratio Average pension / GDP per worker	
BE	10,4	49,7	61,6	-13,8	-2,4	-2,7	7,0
DK	9,6	33,3	65,1	-3,7	-24,1	-4,7	0,6
DE	11,1	17,4	65,8	-10,3	-5,6	-29,6	-2,8
GR	:		85,4	-16,1			
ES	8,7	81,4	105,0	-19,7	-17,5	-1,3	14,9
FR	12,8	15,4	63,6	-7,0	-12,9	-25,7	-2,6
IE	4,6	141,9	107,0	-9,9	-20,7	19,3	46,2
IT	14,3	2,8	78,5	-13,8	-21,4	-35,3	-5,1
LU	10,0	73,7	56,3	-31,1	16,2	16,7	15,6
NL	7,4	51,4	71,9	-2,1	-19,3	-4,3	5,1
AT	13,2	-7,5	84,5	-10,1	-43,3	-32,3	-6,4
PT	11,5	80,3	88,5	-0,9	-3,9	-20,1	16,6
FI	10,4	32,0	72,9	-7,7	-25,2	-6,1	-1,8
SE	10,4	8,5	45,6	-6,2	-2,0	-26,7	-2,1
UK	6,7	28,3	64,2	-1,8			
CY	7,0	183,5	94,4	-16,2	12,4	19,8	73,1
CZ	8,5	65,9	109,3	-3,6	-36,8	-9,0	6,1
EE	7,1	-41,4	60,3	-7,7	-26,8	-73,2	5,9
HU	10,7	60,1	79,4	-10,3	-33,4	16,3	8,1
LT	6,7	28,5	72,1	-16,0	-27,3	0,0	-0,2
LV	6,4	-13,4	62,7	-11,1	-20,6	-40,9	-3,5
MT	7,5	-6,4	80,8	-13,6	-10,5	-53,5	-9,5
PL	13,7	-41,7	108,3	-26,7	-43,7	-79,1	-0,5
SK	7,4	20,3	122,0	-19,0	-34,0	-40,6	-8,2
SI	11,0	66,2	99,7	-8,5	-26,8	-7,5	9,2
EU15 [1]	10,5	22,1	72,1	-9,3	-14,9	-24,1	-1,6
EU10	10,9	2,6	100,0	-16,9	-38,2	-34,8	-7,5
EU12 [1]	11,5	23,2	74,8	-11,0	-14,6	-24,3	-1,5
EU25 [1]	10,6	20,9	76,1	-10,8	-18,7	-23,5	-2,1

1) excluding countries which have not provided information

2) The base year of the decomposition calculations is 2005 (insted of 2004 in other tables) because the changes have been measured as the sum of changes over 5-year periods.

Table 3-14 Decomposition of the increase (in %) in public old-age and early pension expenditure between 2005 and 2050

	Old-age and early pensions, gross as % of GDP		Due to growth in:				Interaction effect (residual)
			Dependency ratio Pop(65+) / Pop(15-64)	Employment rate Employed / Pop(15-64)	Take up ratio Pensioners / Pop65+	Benefit ratio Average pension / GDP per worker	
	start level 2005 [2]	% change 2005-50					
BE	9,6	55,4	61,6	-8,2	1,8	-8,7	8,8
DK	7,5	43,7	65,1	-3,7	-15,8	-5,5	3,6
DE	11,1	17,4	65,8	-10,3	-5,6	-29,6	-2,8
GR	:		85,4	-16,1			
ES	5,7	116,9	105,0	-19,7	5,3	-6,3	32,7
FR	12,8	15,4	63,6	-7,0	-12,9	-25,7	-2,6
IE	3,5	182,9	107,0	-9,9	3,1	11,1	71,7
IT	14,0	3,9	78,5	-13,8	-20,2	-35,5	-5,1
LU	6,1	128,6	56,3	-31,1	43,3	17,9	42,2
NL	4,8	94,8	71,9	-2,1	-0,1	1,3	23,6
AT	11,0	2,3	84,5	-10,1	-38,4	-27,5	-6,2
PT	9,0	89,8	88,5	-0,9	6,0	-24,7	20,7
FI	8,0	50,1	72,9	-7,7	-11,0	-8,0	3,9
SE	7,6	30,9	45,6	-6,2	10,7	-20,8	1,6
UK	6,7	28,3	64,2	-1,8	-9,9	-23,7	-0,6
CY	7,0	183,5	94,4	-16,2			
CZ	7,6	73,8	109,3	-3,6	-30,2	-11,1	9,4
EE	6,3	-40,2	60,3	-7,7	-21,3	-76,3	4,8
HU	8,6	82,9	79,4	-10,3	-13,7	9,3	18,2
LT	5,7	30,0	72,1	-16,0	-23,9	-2,3	0,2
LV	5,7	-13,5	62,7	-11,1	-17,2	-43,9	-3,9
MT	3,9	65,1	80,8	-13,6	46,1	-51,7	3,7
PL	11,1	-40,9	108,3	-26,7	-41,2	-79,7	-1,5
SK	5,6	12,1	122,0	-19,0	-31,3	-50,2	-9,5
SI	11,0	66,2	99,7	-8,5	-3,6	-30,5	9,1
EU15 [1]	9,8	24,6	72,1	-9,2	-11,0	-26,2	-1,2
EU10	9,1	9,5	100,0	-16,9	-32,8	-34,0	-6,8
EU12 [1]	10,7	25,2	74,8	-10,8	-11,6	-26,0	-1,1
EU25 [1]	9,8	23,6	76,1	-10,7	-14,2	-26,0	-1,6

1) excluding countries which have not provided information

2) The base year of the decomposition calculations is 2005 (insted of 2004 in other tables) because the changes have been measured as the sum of changes over 5-year periods.

Table 3-15 analysis the time path of the projected increases in old-age pension spending and how the different components influence these projected increases over selected time periods:

- as the dependency ratio is the strongest driving force for increases in pension spending, the time path of the increases is also dominated by this fact. Dependency ratios have the largest impact in the period 2015-2030, in particular in the EU15 Member States, while in the EU10 Member States the impact is more evenly spread over the whole projection period;

- the employment rate and the eligibility rate are projected to have their largest offsetting impact at the beginning of the projection period (2005-2015). This is a credible result when bearing in mind that the labour force projections are based on an assumption of unchanged policies and only the impact of the already legislated policy changes is included;

- the decrease in the benefit ratio is projected to be more evenly spread over the projection period than the decreases in the employment and eligibility ratios, with some tendency to strengthen over time. In particular, in the EU10 Member States, this would reflect the maturation of the switch from public schemes to private ones.

Table 3-15 Annual growth rates of public old-age and early pensions over selected time periods and decomposed by driving factors

		2005 - 2015	2015 - 2030	2030 - 2050	2005 - 2030	2005 - 2050
	Old-age and early pensions, gross as % of GDP	0,69	2,07	0,31	1,51	0,98
	Dependency ratio	1,03	2,33	0,69	1,81	1,31
BE	*Employment*	-0,58	-0,12	-0,02	-0,31	-0,18
	Take up ratio	0,23	0,01	-0,04	0,10	0,04
	Benefit ratio	0,00	-0,18	-0,30	-0,11	-0,19
	Interaction effect	-0,01	-0,02	0,01	-0,02	0,00
	Old-age and early pensions, gross as % of GDP	1,77	1,29	-0,03	1,48	0,81
	Dependency ratio	2,46	1,80	0,53	2,06	1,38
DK	*Employment*	-0,28	0,01	-0,05	-0,11	-0,08
	Take up ratio	-0,13	-0,40	-0,44	-0,29	-0,36
	Benefit ratio	-0,27	-0,11	-0,06	-0,18	-0,12
	Interaction effect	0,01	0,01	0,00	0,01	0,01
	Old-age and early pensions, gross as % of GDP	-0,56	1,02	0,33	0,38	0,36
	Dependency ratio	1,28	2,26	0,81	1,86	1,40
DE	*Employment*	-0,90	-0,07	-0,01	-0,40	-0,22
	Take up ratio	-0,14	-0,39	0,07	-0,29	-0,13
	Benefit ratio	-0,79	-0,76	-0,55	-0,77	-0,67
	Interaction effect	0,01	0,02	0,00	0,02	0,01
	Old-age and early pensions, gross as % of GDP					
	Dependency ratio	1,25	1,77	2,15	1,56	1,82
GR	*Employment*	-1,54	0,07	-0,05	-0,57	-0,34
	Take up ratio					
	Benefit ratio					
	Interaction effect					
	Old-age and early pensions, gross as % of GDP	0,10	2,62	1,90	1,61	1,74
	Dependency ratio	1,18	2,20	2,74	1,79	2,21
ES	*Employment*	-1,64	-0,07	-0,08	-0,70	-0,42
	Take up ratio	0,20	0,56	-0,26	0,41	0,11
	Benefit ratio	0,36	-0,07	-0,49	0,10	-0,16
	Interaction effect	-0,01	-0,01	0,02	0,00	0,01
	Old-age and early pensions, gross as % of GDP	0,27	0,56	0,16	0,44	0,32
	Dependency ratio	1,51	2,12	0,71	1,87	1,36
FR	*Employment*	-0,42	-0,13	-0,04	-0,25	-0,15
	Take up ratio	-0,18	-0,54	-0,16	-0,40	-0,29
	Benefit ratio	-0,63	-0,86	-0,34	-0,77	-0,58
	Interaction effect	0,01	0,03	0,00	0,02	0,01
	Old-age and early pensions, gross as % of GDP	2,98	2,33	2,02	2,59	2,34
	Dependency ratio	1,94	2,36	2,37	2,19	2,27
IE	*Employment*	-0,70	-0,14	-0,03	-0,36	-0,22
	Take up ratio	-0,21	0,11	0,17	-0,02	0,07
	Benefit ratio	1,94	0,01	-0,48	0,78	0,22
	Interaction effect	-0,01	0,00	0,01	-0,01	0,00
	Old-age and early pensions, gross as % of GDP	-0,28	0,60	-0,12	0,25	0,08
	Dependency ratio	1,50	1,75	1,70	1,65	1,67
IT	*Employment*	-0,95	-0,12	-0,12	-0,45	-0,30
	Take up ratio	-1,01	-0,05	-0,48	-0,44	-0,46
	Benefit ratio	0,18	-0,95	-1,20	-0,50	-0,81
	Interaction effect	0,01	0,02	0,02	0,01	0,02
	Old-age and early pensions, gross as % of GDP	1,40	3,24	1,05	2,50	1,85
	Dependency ratio	0,75	2,19	0,68	1,61	1,20
LU	*Employment*	-0,60	-0,60	-0,78	-0,60	-0,68
	Take up ratio	0,57	1,18	0,95	0,94	0,94
	Benefit ratio	0,67	0,45	0,20	0,54	0,39
	Interaction effect	0,00	-0,02	0,00	-0,01	-0,01
	Old-age and early pensions, gross as % of GDP	2,24	2,42	0,43	2,35	1,49
	Dependency ratio	2,32	2,41	0,44	2,38	1,51
NL	*Employment*	-0,01	-0,03	-0,07	-0,02	-0,05
	Take up ratio	-0,01	0,00	0,00	0,00	0,00
	Benefit ratio	-0,06	0,03	0,07	0,00	0,03
	Interaction effect	0,00	0,00	0,00	0,00	0,00
	Old-age and early pensions, gross as % of GDP	-0,03	0,93	-0,56	0,54	0,05
	Dependency ratio	1,75	2,49	1,28	2,19	1,79
AT	*Employment*	-0,78	-0,08	-0,05	-0,36	-0,22
	Take up ratio	-1,10	-0,72	-0,87	-0,87	-0,87
	Benefit ratio	0,11	-0,73	-0,91	-0,39	-0,63
	Interaction effect	0,02	0,03	0,01	0,03	0,02
	Old-age and early pensions, gross as % of GDP	1,17	1,74	1,34	1,51	1,43
	Dependency ratio	1,35	2,06	2,03	1,78	1,89
PT	*Employment*	-0,02	0,00	-0,04	-0,01	-0,02
	Take up ratio	0,28	0,50	-0,22	0,41	0,13
	Benefit ratio	-0,45	-0,81	-0,42	-0,66	-0,56
	Interaction effect	0,00	0,01	0,01	0,01	0,01

		2005 - 2015	2015 - 2030	2030 - 2050	2005 - 2030	2005 - 2050
	Old-age and early pensions, gross as % of GDP	1,94	1,41	0,01	1,63	0,91
	Dependency ratio	2,90	2,38	0,19	2,59	1,52
FI	*Employment*	-0,47	-0,17	-0,02	-0,29	-0,17
	Take up ratio	-0,49	-0,36	-0,05	-0,41	-0,25
	Benefit ratio	0,01	-0,42	-0,10	-0,24	-0,18
	Interaction effect	0,02	0,02	0,00	0,02	0,01
	Old-age and early pensions, gross as % of GDP	0,80	0,87	0,29	0,85	0,60
	Dependency ratio	1,92	1,24	0,31	1,51	0,98
SE	*Employment*	-0,51	-0,03	-0,03	-0,22	-0,14
	Take up ratio	0,37	0,42	0,03	0,40	0,24
	Benefit ratio	-0,96	-0,74	-0,02	-0,83	-0,47
	Interaction effect	0,02	0,01	0,00	0,01	0,00
	Old-age and early pensions, gross as % of GDP	0,01	1,09	0,43	0,66	0,56
	Dependency ratio	1,44	1,91	0,94	1,72	1,37
UK	*Employment*	-0,10	-0,01	-0,03	-0,05	-0,04
	Take up ratio	-0,50	-0,29	-0,05	-0,38	-0,23
	Benefit ratio	-0,81	-0,50	-0,43	-0,62	-0,54
	Interaction effect	0,01	0,01	0,00	0,02	0,01
	Old-age and early pensions, gross as % of GDP	2,36	2,16	2,47	2,24	2,34
	Dependency ratio	2,21	2,69	1,38	2,50	2,00
CY	*Employment*	-1,42	-0,17	0,05	-0,67	-0,35
	Take up ratio					
	Benefit ratio					
	Interaction effect					
	Old-age and early pensions, gross as % of GDP	-0,31	1,10	2,12	0,54	1,24
	Dependency ratio	3,09	2,19	1,97	2,55	2,29
CZ	*Employment*	-0,43	-0,09	0,11	-0,22	-0,08
	Take up ratio	-1,43	-0,71	-0,32	-1,00	-0,70
	Benefit ratio	-1,46	-0,27	0,35	-0,75	-0,26
	Interaction effect	0,07	0,02	0,00	0,04	0,02
	Old-age and early pensions, gross as % of GDP	-1,88	-1,50	-0,49	-1,65	-1,14
	Dependency ratio	0,87	1,60	1,29	1,31	1,30
EE	*Employment*	-0,88	0,02	0,05	-0,34	-0,17
	Take up ratio	-0,82	-0,71	-0,14	-0,75	-0,48
	Benefit ratio	-1,06	-2,38	-1,67	-1,85	-1,77
	Interaction effect	-0,01	0,03	0,02	0,01	0,02
	Old-age and early pensions, gross as % of GDP	1,41	1,34	1,33	1,37	1,35
	Dependency ratio	1,60	1,85	1,61	1,75	1,69
HU	*Employment*	-0,87	-0,24	0,11	-0,49	-0,22
	Take up ratio	0,14	-0,43	-0,45	-0,20	-0,31
	Benefit ratio	0,54	0,17	0,06	0,31	0,20
	Interaction effect	0,00	0,01	0,01	0,01	0,01
	Old-age and early pensions, gross as % of GDP	-0,11	1,32	0,38	0,74	0,58
	Dependency ratio	0,72	2,17	1,48	1,59	1,54
LT	*Employment*	-1,50	-0,17	0,10	-0,70	-0,34
	Take up ratio	-0,05	-0,91	-0,51	-0,57	-0,54
	Benefit ratio	0,71	0,24	-0,67	0,43	-0,06
	Interaction effect	-0,01	0,02	0,01	0,01	0,01
	Old-age and early pensions, gross as % of GDP	-3,36	1,33	-0,01	-0,57	-0,32
	Dependency ratio	0,89	1,60	1,40	1,32	1,35
LV	*Employment*	-1,38	0,09	0,09	-0,49	-0,24
	Take up ratio	-1,22	-0,25	-0,11	-0,64	-0,40
	Benefit ratio	-1,70	-0,11	-1,36	-0,75	-1,02
	Interaction effect	-0,04	0,00	0,02	0,01	0,01
	Old-age and early pensions, gross as % of GDP	4,85	0,65	-0,35	2,31	1,12
	Dependency ratio	2,98	2,26	0,61	2,55	1,68
MT	*Employment*	-1,13	-0,34	0,15	-0,65	-0,29
	Take up ratio	1,71	0,61	0,90	1,05	0,98
	Benefit ratio	1,23	-1,83	-1,99	-0,62	-1,23
	Interaction effect	-0,05	0,04	0,03	0,01	0,02
	Old-age and early pensions, gross as % of GDP	-3,02	-0,26	-0,89	-1,38	-1,16
	Dependency ratio	1,48	3,38	1,80	2,62	2,25
PL	*Employment*	-1,76	-0,80	0,19	-1,18	-0,57
	Take up ratio	-1,62	-1,48	-0,21	-1,54	-0,95
	Benefit ratio	-1,15	-1,29	-2,63	-1,24	-1,86
	Interaction effect	-0,03	0,07	0,05	0,04	0,04
	Old-age and early pensions, gross as % of GDP	-2,31	0,74	1,20	-0,49	0,25
	Dependency ratio	1,60	3,43	2,37	2,69	2,55
SK	*Employment*	-1,52	-0,57	0,27	-0,95	-0,40
	Take up ratio	-1,01	-1,04	-0,31	-1,03	-0,71
	Benefit ratio	-1,39	-1,03	-1,11	-1,17	-1,14
	Interaction effect	-0,01	0,06	0,03	0,04	0,04
	Old-age and early pensions, gross as % of GDP	0,50	1,48	1,20	1,08	1,14
	Dependency ratio	1,76	3,02	1,61	2,51	2,11
SI	*Employment*	-0,72	-0,09	0,01	-0,34	-0,18
	Take up ratio	0,38	-0,52	0,02	-0,16	-0,08
	Benefit ratio	-0,91	-0,89	-0,43	-0,89	-0,69
	Interaction effect	0,02	0,04	0,01	0,03	0,02

		2005 - 2015	2015 - 2030	2030 - 2050	2005 - 2030	2005 - 2050
	Old-age and early pensions, gross as % of GDP	-0,04	1,02	0,36	0,59	0,49
	Dependency ratio	1,45	2,05	1,22	1,81	1,54
EU15	*Employment*	-0,69	-0,07	-0,06	-0,32	-0,20
	Take up ratio	-0,34	-0,23	-0,22	-0,27	-0,25
	Benefit ratio	-0,45	-0,71	-0,57	-0,61	-0,59
	Interaction effect	0,01	0,02	0,02	0,02	0,02
	Old-age and early pensions, gross as % of GDP	-1,35	0,57	0,71	-0,20	0,20
	Dependency ratio	1,68	2,83	1,78	2,37	2,11
EU10	*Employment*	-1,21	-0,50	0,16	-0,78	-0,36
	Take up ratio	-1,12	-1,11	-0,28	-1,11	-0,75
	Benefit ratio	-0,69	-0,60	-0,93	-0,64	-0,77
	Interaction effect	0,01	0,04	0,02	0,03	0,03
	Old-age and early pensions, gross as % of GDP	-0,07	1,04	0,38	0,59	0,50
	Dependency ratio	1,42	2,10	1,31	1,83	1,60
EU12	*Employment*	-0,83	-0,08	-0,06	-0,38	-0,24
	Take up ratio	-0,33	-0,23	-0,25	-0,27	-0,26
	Benefit ratio	-0,33	-0,74	-0,60	-0,57	-0,58
	Interaction effect	0,00	0,02	0,02	0,01	0,02
	Old-age and early pensions, gross as % of GDP	-0,12	0,98	0,38	0,54	0,47
	Dependency ratio	1,49	2,16	1,30	1,89	1,63
EU25	*Employment*	-0,79	-0,14	-0,03	-0,40	-0,23
	Take up ratio	-0,46	-0,35	-0,23	-0,39	-0,32
	Benefit ratio	-0,34	-0,67	-0,64	-0,54	-0,59
	Interaction effect	0,01	0,02	0,02	0,02	0,02

Legenda: *Dependency ratio = Pop 65+ / Pop (15-64)* *Employment = Employed / Pop (15-64)*
Take up ratio = Pensioners / Pop 65+ *Benefit ratio = Average pension / GDP per worker*

3.3.3. Total pension expenditure

Public pensions are of great importance in all EU Member States and are even dominant in the total pension provision of most countries. However, in a number of Member States, a significant share of the pension provision comes from occupational and private statutory schemes. And more importantly, their share of the total pension provision will increase in the future.

Occupational pensions provide an equivalent to earnings-related social security schemes in Denmark, the Netherlands, Ireland and the United Kingdom. In other countries, they complement the earnings-related social security provision, thereby increasing the total level of retirement income for pensioners. Furthermore, a part of the statutory social security pension scheme has been switched into private schemes in a great number of countries. These countries are: Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia and Sweden.

Table 3-16 presents the projections of the Member States for occupational and private statutory pensions. The projections of occupational pensions have been provided by the Netherlands, Slovenia and Sweden. In the case of Sweden, the figures represent complementary occupational pensions, while private statutory pensions are included in public pensions. No projections of occupational pensions are presented for Denmark, Ireland and the United Kingdom. The figures for the remaining countries in the Table 3-16 (EE, LV, LT, HU, PL and SK) represent private statutory pensions.

Table 3-16 Occupational and private statutory pensions as a share of GDP between 2004 and 2050

Occupational and private mandatory pensions, gross as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE											
CZ											
DK											
DE											
EE		0,0	0,1	0,2	0,3	0,6	1,3	2,4	0,6	1,8	2,4
GR											
ES											
FR											
IE											
IT											
CY											
LV			0,0	0,1	0,2	0,4	1,1	2,7	0,4	2,3	2,7
LT		0,0	0,0	0,1	0,2	0,4	1,0	1,8	0,4	1,4	1,8
LU											
HU			0,0	0,1	0,2	0,5	1,6	3,1	0,5	2,7	3,1
MT											
NL	4,6	4,7	5,2	5,8	6,7	7,7	9,0	8,7	3,1	1,0	4,1
AT											
PL		0,0	0,0	0,1	0,2	0,3	0,7	1,3	0,3	1,1	1,3
PT											
SI			0,0	0,1	0,2	0,3	0,7	1,0	0,3	0,7	1,0
SK		0,0	0,1	0,2	0,4	0,7	1,4	2,3	0,7	1,6	2,3
FI											
SE	2,3	2,3	2,5	2,5	2,6	2,8	2,9	2,6	0,5	-0,2	0,3
UK											
SE: private mandatory pensions (included in public pensions (Table 3- 3))											
			0,1	0,2	0,3	0,5	0,9	1,1	0,5	0,6	1,1

Occupational and private statutory pension provision will play an increasingly important role over time in all countries where such provisions are in place. In particular, in the Netherlands, occupational pensions are projected to amount to 8.7% of GDP in 2050, accounting for over 40% of the total pension provision. Private statutory pension schemes in the new Member States are projected to increase the level of total pension expenditure by 1.3-3.1% of GDP at the end of the projection period.

Table 3-17 Total pension expenditure as a share of GDP between 2004 and 2050

Total pension expenditure, gross as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	10,4	10,4	11,0	12,1	13,4	14,7	15,7	15,5	4,3	0,8	5,1
CZ	8,5	8,2	8,2	8,4	8,9	9,6	12,2	14,0	1,1	4,5	5,6
DK											
DE	11,4	10,5	10,5	11,0	11,6	12,3	12,8	13,1	0,9	0,8	1,7
EE	6,7	6,8	6,0	5,6	5,4	5,3	5,6	6,6	-1,4	1,3	-0,1
GR											
ES	8,6	8,9	8,8	9,3	10,4	11,8	15,2	15,7	3,3	3,9	7,1
FR	12,8	12,9	13,2	13,7	14,0	14,3	15,0	14,8	1,5	0,5	2,0
IE											
IT	14,2	14,0	13,8	14,0	14,4	15,0	15,9	14,7	0,8	-0,4	0,4
CY	6,9	8,0	8,8	9,9	10,8	12,2	15,0	19,8	5,3	7,6	12,9
LV	6,8	4,9	4,6	5,0	5,6	6,0	7,0	8,3	-0,8	2,3	1,5
LT	6,7	6,6	6,6	7,1	7,8	8,3	9,2	10,4	1,6	2,1	3,7
LU	10,0	9,8	10,9	11,9	13,7	15,0	17,0	17,4	5,0	2,4	7,4
HU	10,4	11,1	11,6	12,6	13,3	13,9	17,6	20,3	3,6	6,3	9,9
MT	7,4	8,8	9,8	10,2	10,0	9,1	7,9	7,0	1,7	-2,1	-0,4
NL	12,4	12,3	13,6	14,8	16,4	18,4	20,6	20,0	6,0	1,5	7,6
AT	13,4	12,8	12,7	12,8	13,5	14,0	13,4	12,2	0,6	-1,7	-1,2
PL	13,9	11,3	9,8	9,8	9,7	9,4	9,3	9,3	-4,5	-0,1	-4,6
PT	11,1	11,9	12,6	14,1	15,0	16,0	18,8	20,8	4,9	4,8	9,7
SI	11,0	11,1	11,6	12,4	13,5	14,7	17,5	19,3	3,7	4,6	8,3
SK	7,2	6,7	6,7	7,2	7,8	8,3	9,7	11,2	1,2	2,9	4,1
FI	10,7	11,2	12,0	12,9	13,5	14,0	13,8	13,7	3,3	-0,3	3,1
SE	12,9	12,4	12,8	12,9	13,3	13,9	14,5	13,9	0,9	0,0	0,9
UK											
EU15 [1)]	12,0	11,7	11,9	12,4	13,1	13,8	14,9	14,8	1,8	0,9	2,8
EU10	10,9	9,8	9,3	9,6	9,9	10,1	11,4	12,6	-0,7	2,5	1,7
EU12 [1)]	12,0	11,7	11,9	12,3	13,0	13,8	15,0	14,8	1,9	1,0	2,8
EU25 [1)]	11,9	11,6	11,7	12,2	12,8	13,5	14,6	14,6	1,6	1,1	2,7

1) excluding countries which have not provided data

The projections for total pension expenditure have been summed up from the data provided for public, occupational and private statutory pensions. The sums are presented also for countries which have not provided data on complementary occupational schemes if they are not of major importance for total pension provision. Currently, such provision in many countries is less than one percent of GDP and in some others around one percent of GDP. In contrast, in Denmark and the United Kingdom, and to some extent also in Ireland, occupational pension provision is clearly of greater importance and, consequently, the data provided for public pensions only should not be considered as representing total pension expenditure.

The projected total pension expenditure as a share of GDP in 2004 was the same as public pension expenditure for all countries except those with occupational pensions (NL and SE) because the private mandatory pensions were still at an early stage and virtually no pensions have yet been paid out from those schemes. By 2050, the dispersion in pension provision across countries will somewhat lessen, since many of those countries which have projected very low public spending on pensions will have major private provisions.

Concerning the change in total pension expenditure as a share of GDP between 2004 and 2050, the negative change observed for public pensions in the case of Latvia and virtually also in Estonia will disappear while the changes remain negative for Poland. Another major change when compared with public pension spending is that the total pension expenditure in the Netherlands, Hungary and Slovenia will become to the same level, about 20% of GDP, with Portugal (20.8% of GDP) and Cyprus (19.8% of GDP).

Table 3-18 takes into account the impact of occupational and private mandatory pensions showing the total benefit ratio, i.e. to the level of average total pensions relative to output per worker. In particular, in the EU10 Member States, the decrease in the relative benefit level is much smaller than for the relative level of public pensions alone (see Table 3-11). In fact, total benefit levels are projected, by and large, to maintain their current levels relative to earnings, except in Poland where a significant decrease is still projected. However, it should be noted that the benefit ratio of public pensions to wages in Poland was the highest in the whole EU in 2004.

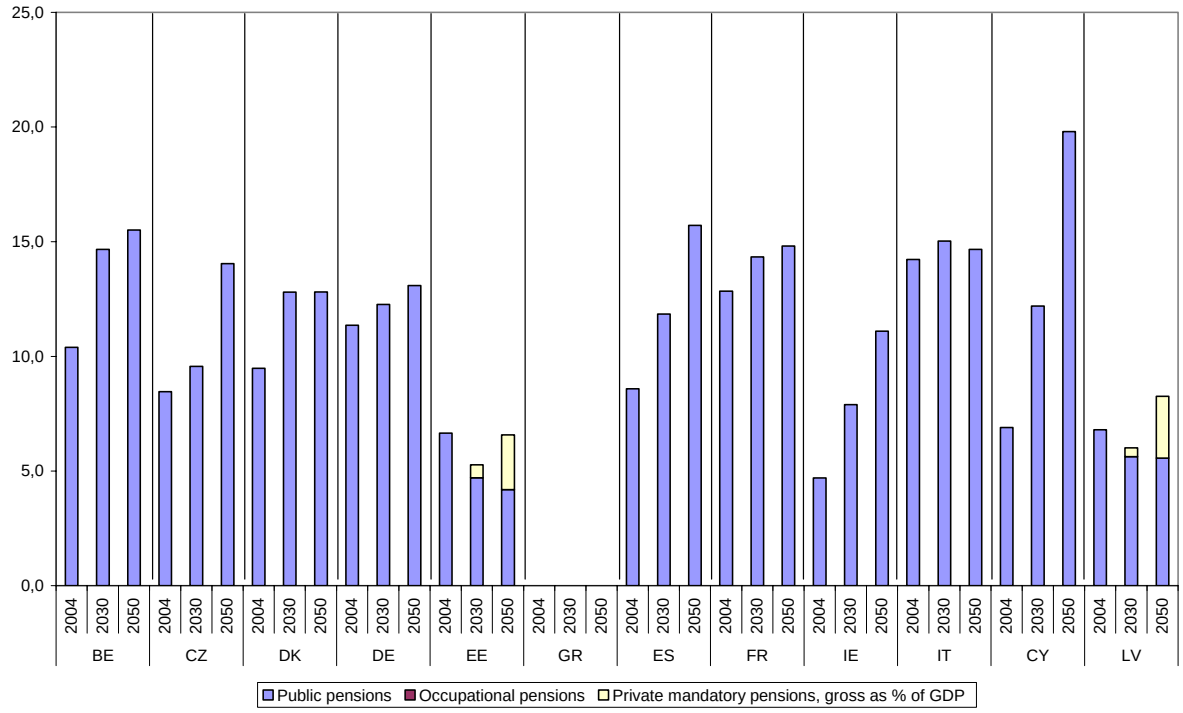
Table 3-18 Benefit ratio: average total pension relative to output per worker

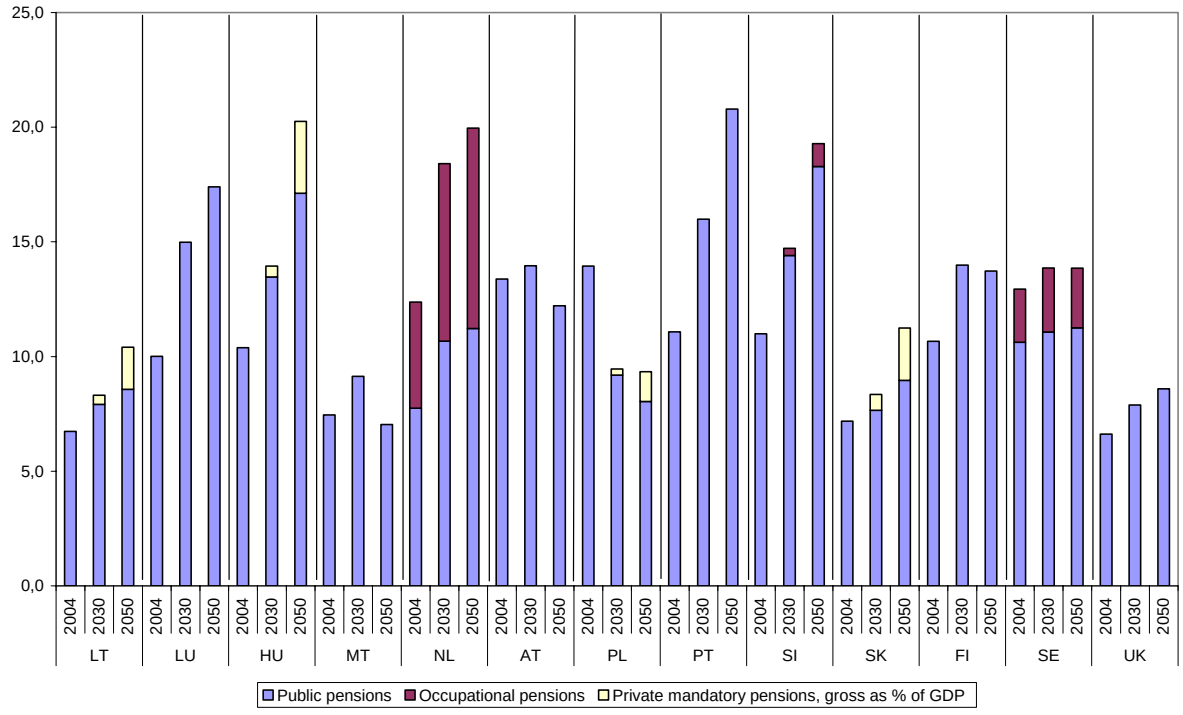
Benefit ratio: Average total pension relative to output per worker									p.p. change	p.p. change	p.p. change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	17.7	17.8	17.8	17.8	17.7	17.4	16.9	16.4	-0.3	-1.0	-1.3
CZ	15.7	14.1	13.5	13.2	13.0	13.0	13.7	14.1	-2.7	1.0	-1.7
DK											
DE	18.5	16.6	16.6	16.2	15.6	14.8	13.9	13.3	-3.6	-1.5	-5.2
EE	10.5	11.4	10.3	9.3	8.5	8.1	8.1	8.3	-2.5	0.2	-2.2
GR											
ES	17.2	19.6	19.1	18.9	19.0	19.1	18.8	17.1	2.0	-2.0	-0.1
FR	24.4	24.1	23.1	22.0	21.1	20.3	19.3	18.9	-4.2	-1.3	-5.5
IE											
IT	20.0	20.8	20.4	19.8	18.8	17.7	15.7	14.0	-2.2	-3.7	-6.0
CY	25.6	28.6	27.9	26.9	25.5	25.7	28.9	30.8	0.1	5.1	5.2
LV	11.4	9.9	9.4	9.4	9.5	9.8	10.6	10.7	-1.6	0.9	-0.7
LT											
LU	23.5	23.4	24.7	25.0	26.4	26.6	27.5	28.0	3.1	1.4	4.5
HU	13.4	14.4	14.7	15.4	15.8	16.2	17.7	19.1	2.8	2.9	5.8
MT	18.4	19.9	20.1	19.0	17.2	15.2	12.4	10.3	-3.2	-4.9	-8.1
NL	29.2	27.6	27.9	28.2	28.5	29.2	30.3	30.4	0.0	1.3	1.2
AT	21.8	21.4	21.0	20.6	19.9	19.0	16.7	15.2	-2.8	-3.8	-6.6
PL	19.2	19.2	17.6	17.1	16.4	15.3	13.1	11.1	-3.9	-4.3	-8.2
PT	18.6	18.4	18.1	17.9	17.2	16.5	15.9	15.4	-2.1	-1.0	-3.2
SI	18.9	18.5	18.1	17.8	17.6	17.6	17.9	18.2	-1.2	0.6	-0.6
SK	13.0	12.7	12.7	12.7	12.7	12.4	11.6	11.0	-0.6	-1.4	-2.0
FI	19.8	19.7	19.4	19.1	18.8	18.5	18.3	18.0	-1.3	-0.5	-1.9
SE	25.9	24.6	23.2	21.7	21.0	20.7	20.2	19.6	-5.2	-1.1	-6.3
UK											
EU15 [1)]	20.3	19.6	19.1	18.5	17.9	17.2	16.3	15.4	-3.0	-1.9	-4.9
EU10 [1)]	17.2	17.2	16.5	16.4	16.1	15.7	15.2	14.7	-1.4	-1.1	-2.5
EU12 [1)]	20.6	20.3	19.9	19.4	18.8	18.1	17.0	16.0	-2.6	-2.0	-4.6
EU25 [1)]	19.3	19.0	18.6	18.1	17.6	17.0	16.1	15.1	-2.3	-2.0	-4.3

1) excluding countries which have not provided data

Graph 3-2 below summarises the levels of expenditure on public, occupational and private statutory pensions in 2004 and 2050.

Graph 3-2 Public, occupational and private mandatory pensions as a per cent of GDP in 2004, 2030 and 2050





3.3.4. Pensioners and contributors

The 2005 projections include information on the number of pensioners and contributors for most countries. It should be noted, however, that in some countries (DE, ES, LT, LU, AT) the number of pensioners represents the number of pensions rather than the number of pensioners. This is due to the data sources used in the projections which often deal with (semi-)aggregated data on pensions without attaching them to individuals, and the fact that in some cases (notably in the case of old-age pensions and survivor's pensions) it is possible that the same person receives more than one pension. This bias should not, however, be large and should not affect the evolution over time. In some countries, the number of contributors is also an approximation based on the number of persons employed, due to the fact that, in principle, every employed individual is under an obligation to pay a pension contribution to social security schemes.

The following tables summarise the information received and allow for verifying the credibility of the projections, for instance, the relationship between the projected numbers of pensioners and the population over the age of 65. Also, the pension system dependency ratio between the numbers of pensioners and contributors and the inverse ratio, the support ratio, between the numbers of contributors and pensioners, are important indicators as regards the sustainability of the pension systems.

Table 3-19 Number of pensioners in public pension schemes

Public pensions, number of pensioners									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	2501	2635	2870	3144	3456	3748	4052	4050	1247	302	1549
CZ	2629	2795	2893	2984	3099	3215	3483	3496	586	281	867
DK	1255	1395	1511	1598	1675	1749	1787	1702	494	-47	446
DE	23840	25684	26829	28256	30066	32082	33792	34441	8242	2360	10601
EE	378	369	357	352	356	359	365	377	-19	18	-1
GR											
ES	8519	9088	9676	10392	11389	12623	14715	15059	4104	2436	6540
FR	12925	13815	15023	16288	17417	18484	19948	19931	5559	1447	7006
IE [2]	606	721	814	916	1033	1162	1416	1674	556	512	1068
IT	15595	15665	16088	16783	17777	19131	20774	20206	3535	1076	4611
CY	89	113	138	166	194	218	243	293	129	76	205
LV	599	533	529	544	567	575	588	611	-24	36	12
LT	1248	1292	1295	1314	1335	1357	1388	1402	108	46	154
LU	128	142	158	178	204	235	293	335	107	100	207
HU	3069	3210	3262	3343	3353	3353	3529	3467	284	114	398
MT	60	74	86	97	107	113	122	130	53	16	69
NL	3317	3437	3818	4156	4514	4879	5291	5120	1562	241	1803
AT	2337	2449	2525	2611	2777	2912	3023	2892	575	-20	555
PL	7652	7254	7445	7975	8392	8635	9139	9574	983	940	1922
PT	3048	3304	3585	4005	4351	4698	5244	5454	1649	757	2406
SI	524	571	609	647	686	722	778	781	198	59	257
SK	1212	1282	1347	1458	1570	1664	1833	1919	452	255	707
FI	1282	1413	1530	1640	1721	1771	1748	1714	488	-57	432
SE	2126	2275	2507	2715	2902	3079	3297	3327	953	248	1201
UK											
EU15 [1]	77481	79093	79892	80731	81347	82023	83703	85882	4542	3859	8401
EU10	17460	17572	17560	17545	17521	17491	17578	17816	31	325	356
EU12 [1]	74100	75630	76388	77177	77737	78354	79889	81928	4254	3574	7828
EU25 [1]	94941	96665	97453	98276	98869	99515	101281	103698	4574	4184	8757

1) excluding countries which have not provided data

2) IE: only the number of pensioners in the social security scheme

Table 3-20 Number of pensioners receiving public pensions relative to the population aged 65 and over

Public pensions, number of pensioners / 100 persons aged 65+									Change 2004	Change 2030	Change 2004
Country	2004	2010	2015	2020	2025	2030	2040	2050	2030	2050	2050
BE	140	143	142	142	141	139	136	137	-2	-2	-4
CZ	185	178	159	145	141	141	140	127	-44	-14	-58
DK	156	156	148	144	140	136	127	124	-20	-12	-32
DE	160	152	155	153	151	146	141	148	-14	2	-12
EE	173	166	159	151	146	140	136	130	-33	-10	-43
GR	:	:	:	:	:	:	:	:			
ES	119	118	116	116	115	114	108	100	-5	-14	-19
FR	132	134	129	125	122	119	115	115	-13	-4	-17
IE [2]	135	142	135	131	127	125	120	117	-10	-8	-18
IT	140	130	125	124	124	123	115	111	-18	-12	-29
CY	102	107	109	112	113	113	111	115	10	2	13
LV	160	137	138	140	139	134	129	125	-26	-9	-34
LT	241	239	238	235	222	205	190	182	-36	-23	-59
LU	201	205	206	208	209	209	215	235	8	26	34
HU	196	192	184	170	159	158	154	138	-38	-20	-57
MT	116	123	113	110	108	106	109	103	-10	-3	-12
NL	147	138	131	128	125	122	118	119	-26	-2	-28
AT	185	167	161	155	148	137	123	117	-48	-20	-68
PL	155	142	130	118	108	105	104	97	-50	-8	-58
PT	173	175	176	182	183	180	175	169	7	-11	-4
SI	175	172	170	157	149	144	139	132	-31	-12	-43
SK	195	195	185	169	159	154	152	138	-41	-16	-57
FI	158	158	142	134	129	125	122	122	-33	-3	-36
SE	138	136	133	134	135	135	134	135	-3	0	-3
UK	:	:	:	:	:	:	:	:			
EU15 [1]	144	140	137	135	133	130	125	124	-14	-7	-21
EU10	173	164	153	140	131	127	126	116	-45	-12	-57
EU12 [1]	144	140	137	135	133	130	124	123	-14	-7	-21
EU25 [1]	149	144	140	136	133	130	125	122	-19	-8	-27

1) excluding countries which have not provided data

2) IE: only the number of pensioners in the social security scheme

As expected, the number of pensioners is greater than the number of persons aged 65 or more because the number of pensioners also includes persons who receive early, disability and survivors' pensions. Also, in many countries, the statutory old-age retirement age is below 65. Furthermore, in principle, the number of pensioners also includes those pensioners who receive their pensions abroad but are not included in the resident population. In this respect, the quality of data may differ across countries and this aspect is better reflected in some countries' figures (e.g. Sweden) than for some others. The comparison between these figures shows, however, by how much the numbers of pensioners exceed the old-age population and provides some help in assessing whether the projected trend in the numbers of pensioners is feasible. All countries expect a decreasing trend in the relationship between the number of pensioners and the old-age population. It is also expected to remain well above 1, except in Spain, Malta and Poland where it will be close to 1[49].

Table 3-21 compares the numbers of pensioners and contributors in the public pension scheme for those countries that have provided data for both of these variables, while Table 3-22 presents the numbers of contributors. In principle, the number of contributors includes those who pay a specific pension (or social security) contribution, calculated at the end of the year, in order to avoid double counting due to short-term work contracts. The figures largely reflect the demographic old-age dependency ratios, but provide a more focused insight into

[49] In Luxembourg, the relationship is not very meaningful because the number of pensioners is largely driven by the number of cross-border workers becoming eligible to pensions.

the projected numbers of pension recipients and contributors. In general, the pension system dependency ratio is much higher than that drawn from the population figures alone due to the fact that persons aged 65 and more are virtually all pensioners while the number of contributors constitutes only a part of the working-age population. In many countries, the pension system dependency ratio is double the demographic old-age dependency ratio (BE, DE, LT, SI, SK). In contrast, the pension system dependency ratio is close to the demographic dependency ratio in Ireland (concerning social security pensions only) and the Netherlands.

Table 3-21 Pension system dependency ratio: number of pensioners relative to the number of contributors in public pension schemes

Public pensions, number of pensioners / 100 contributors									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2050	2030-2050	2004-2050
BE	59	59	62	68	76	84	93	95	25	11	36
CZ	55	57	59	62	67	71	86	97	16	25	41
DK											
DE	74	75	75	80	88	98	109	117	24	19	43
EE	63	59	57	59	62	64	68	77	1	13	14
GR											
ES											
FR	52	54	57	62	66	71	77	78	18	8	26
IE [2]	23	24	26	28	30	33	40	49	10	16	26
IT	68	65	65	68	73	82	97	99	13	18	31
CY	26	28	32	37	42	47	52	64	22	17	38
LV	55	45	45	49	54	57	61	70	2	13	15
LT	92	90	88	93	100	106	114	126	13	20	34
LU	42	41	44	47	51	56	61	62	14	6	20
HU	76	76	78	81	83	85	97	103	9	19	27
MT	38	43	48	54	58	59	61	63	22	4	25
NL	27	28	30	32	34	36	39	38	8	2	10
AT	66	64	65	67	74	80	86	86	13	6	20
PL	53	45	44	46	49	51	59	71	-2	19	18
PT	71	74	82	92	102	114	140	157	43	43	86
SI	65	65	69	75	82	90	105	113	25	24	49
SK	54	53	53	57	61	67	83	101	13	34	47
FI	55	60	65	70	75	78	78	78	22	0	23
SE											
UK											
EU15 [1]	71	71	73	78	85	93	105	109	22	16	38
EU10	59	54	54	57	60	63	73	84	4	21	25
EU12 [1]	68	68	70	75	81	89	101	104	21	15	36
EU25 [1]	68	67	69	74	79	87	98	104	18	18	36

1) excluding countries which have not provided information

2) IE: only the number of pensioners and contributors in the social security scheme

Table 3-22 Number of contributors to public pension schemes

Public pensions, number of contributors									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	4249	4491	4623	4620	4545	4457	4355	4281	208	-176	32
CZ	4767	4880	4911	4776	4650	4500	4056	3620	-267	-881	-1147
DK											
DE	32206	34316	35624	35263	34135	32698	30869	29472	492	-3226	-2734
EE	599	626	624	600	578	563	538	492	-37	-70	-107
GR											
ES											
FR	24645	25796	26342	26229	26224	26194	25835	25527	1549	-667	882
IE [2)]	2661	3003	3175	3317	3445	3541	3557	3437	880	-104	776
IT	22777	24247	24755	24775	24323	23378	21440	20340	601	-3038	-2437
CY	344	404	438	454	458	459	469	456	115	-3	112
LV	1089	1183	1167	1111	1053	1013	963	872	-76	-141	-217
LT	1350	1442	1464	1416	1339	1284	1216	1112	-66	-171	-237
LU	307	344	364	378	398	421	477	541	115	119	234
HU	4026	4206	4201	4137	4057	3956	3629	3351	-70	-605	-675
MT	159	171	177	181	185	191	199	205	32	14	45
NL	12064	12484	12844	13156	13454	13612	13660	13615	1548	3	1551
AT	3526	3799	3864	3870	3764	3653	3500	3370	127	-283	-156
PL	14433	16156	16988	17287	17227	16815	15443	13565	2382	-3250	-868
PT	4285	4436	4362	4335	4268	4108	3751	3468	-177	-640	-817
SI	807	873	878	860	833	803	741	688	-4	-115	-119
SK	2244	2419	2550	2579	2568	2483	2213	1901	239	-582	-343
FI	2311	2365	2360	2341	2305	2272	2246	2187	-38	-85	-123
SE											
UK											
EU15 [1)]	109031	115281	118313	118284	116859	114335	109692	106238	5304	-8097	-2793
EU10	29819	32360	33399	33401	32948	32067	29466	26262	2248	-5805	-3557
EU12 [1)]	109031	115281	118313	118284	116859	114335	109692	106238	5304	-8097	-2793
EU25 [1)]	138850	147641	151712	151685	149807	146402	139158	132501	7552	-13902	-6349

1) excluding countries which have not provided data

2) IE: only the number of contributors to the social security scheme

Table 3-23 compares the projected evolution between the numbers of contributors and pensioners, showing how many contributors relative to each pensioner there will be. This is known as the support ratio. As the ageing of the population will increase the numbers of pensioners and the numbers of the persons employed are projected to decrease, the support ratio will decline.

Currently, in most countries there are between 1.5 and 2.0 contributors for each pensioner; with the highest numbers of contributors in Ireland (4.4), Cyprus (3.9), the Netherlands (3.6), Malta (2.6) and Luxembourg (2.4) and the lowest numbers in Lithuania (1.1), Germany and Portugal (1.4). By 2050, the support ratio is projected to come close to 1 in most countries; in some countries (DE, PT, LT and SI) even significantly below 1 while remaining above 1.5 only in the Netherlands (2.7), Ireland (2.0), Luxembourg, Cyprus and Malta (1.6).

Table 3-23 Support ratio: Number of contributors relative to the number of pensioners in public pension schemes

Public pensions, number of contributors / 100 pensioners									Change 2004-2030	Change 2030-2050	Change 2004-2050
Country	2004	2010	2015	2020	2025	2030	2040	2050			
BE	170	170	161	147	132	119	107	106	-51	-13	-64
CZ	181	175	170	160	150	140	116	104	-41	-36	-78
DK											
DE	135	134	133	125	114	102	91	86	-33	-16	-50
EE	159	170	175	171	162	157	147	130	-2	-26	-28
GR											
ES											
FR	191	187	175	161	151	142	130	128	-49	-14	-63
IE [2]	439	416	390	362	333	305	251	205	-134	-99	-234
IT	146	155	154	148	137	122	103	101	-24	-22	-45
CY	387	359	317	273	235	211	193	156	-176	-55	-232
LV	182	222	220	204	186	176	164	143	-6	-33	-39
LT	108	112	113	108	100	95	88	79	-13	-15	-29
LU	240	242	230	212	195	179	163	162	-60	-18	-78
HU	131	131	129	124	121	118	103	97	-13	-21	-35
MT	264	233	206	186	173	168	163	158	-95	-11	-106
NL	364	363	336	317	298	279	258	266	-85	-13	-98
AT	151	155	153	148	136	125	116	117	-25	-9	-34
PL	189	223	228	217	205	195	169	142	6	-53	-47
PT	141	134	122	108	98	87	72	64	-53	-24	-77
SI	154	153	144	133	121	111	95	88	-43	-23	-66
SK	185	189	189	177	164	149	121	99	-36	-50	-86
FI	180	167	154	143	134	128	128	128	-52	-1	-53
SE											
UK											
EU15 [1]	166	166	162	152	140	128	115	111	-38	-17	-55
EU10	171	185	186	177	168	159	137	119	-12	-40	-52
EU12 [1]	166	166	162	152	140	128	115	111	-38	-17	-55
EU25 [1]	167	170	166	157	145	134	119	112	-33	-22	-55

1) excluding countries which have not provided data

2) IE: only the numbers of contributors to and pensioners from the social security scheme

3.3.5. Pension contributions and assets of pension funds

The projections of contributions to pension schemes were made under the assumption of a constant contribution rate unless there are clear decisions on changes in the contribution policy. The contributions to social security or occupational and private pension schemes include only specific contributions to pension schemes paid by the employers and employees as well as the self-employed. In the case of Luxembourg and Malta, it is stipulated that also the state pays a contribution to the social security pension scheme. This contribution is equal to the contributions paid by the employer and the employee, thus amounting to one third of the total contribution revenues. In the Luxembourg projections, the state contribution is also included in the contributions. In general, however, state subsidies are not included in the contributions but the difference between the pension expenditure and pension contributions shows what part of the expenditure needs to be financed from other sources, in general from government tax revenues. Some countries (BE, ES) have only a general contribution rate for all social insurance expenditure and they were not able to provide a separate estimate of the pension contribution while for Portugal and Malta decided to present the total amount of the general social security contribution. Moreover, in Denmark, social security pensions are financed virtually entirely by taxes and no contributions are shown.

Table 3-24 shows the projection for pension contributions to social security pension schemes as a share of GDP. As the contribution revenues are driven by wage growth, their share of GDP would remain relatively constant. However, there are a number of reasons why the share

of contributions changes over time. In Germany, the share of contributions relative to GDP will grow because it is already in the legislation that the contribution rate has to be raised (however, not higher than 22% of wages) in order to cover the constant ratio of expenditure. Also in France, an increase in the contribution rate will materialise already in 2006. In contrast, in Malta, the ceiling of the contribution base is indexed to prices, which results in a decreasing trend in contribution revenues as a share of GDP. Moreover, a decreasing trend in contribution revenues is observed in those new Member States which have switched a part of the social security scheme into a private scheme and where an increasing number of people are joining the private scheme or the switched part is still growing. Consequently, an increasing share of the total contribution will be directed to the private scheme in EE, LV, LT, HU and SK.

Table 3-24 Pension contributions to public pension schemes as a share of GDP

Public pensions, contributions as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE											
CZ	8,9	8,9	8,9	8,9	8,9	8,9	8,9	8,9	0,0	0,0	0,0
DK											
DE	7,7	7,3	6,9	7,3	7,8	8,3	8,7	8,9	0,6	0,6	1,2
EE	6,5	6,6	6,5	6,4	6,3	6,2	6,1	6,1	-0,3	-0,1	-0,4
GR											
ES											
FR	12,8	12,9	12,9	12,9	12,9	12,9	12,9	12,9	0,0	0,0	0,0
IE	3,6	3,4	3,4	3,4	3,4	3,4	3,4	3,4	-0,3	0,0	-0,3
IT	10,2	10,3	10,4	10,4	10,4	10,3	10,5	10,6	0,1	0,3	0,4
CY	5,5	6,4	6,9	7,2	7,2	7,2	7,4	7,1	1,7	-0,1	1,6
LV	7,1	6,1	5,7	5,6	5,5	5,4	5,4	5,4	-1,6	0,0	-1,7
LT	6,8	6,3	6,2	6,1	5,9	6,0	6,1	6,1	-0,8	0,2	-0,6
LU	9,9	10,0	10,1	10,1	10,1	10,0	10,0	10,0	0,1	0,0	0,2
HU	7,7	6,8	6,6	6,6	6,5	6,6	6,7	6,8	-1,1	0,2	-1,0
MT [2]	7,1	6,8	6,4	5,9	5,4	4,8	3,9	3,3	-2,3	-1,4	-3,8
NL	6,8	6,4	6,4	6,4	6,4	6,5	6,7	6,6	-0,3	0,1	-0,2
AT	9,0	9,1	9,0	8,9	8,7	8,6	8,5	8,6	-0,3	-0,1	-0,4
PL	7,7	8,0	8,1	8,1	8,0	7,9	7,9	7,9	0,3	0,0	0,3
PT [2]	10,5	10,5	9,9	9,6	9,5	9,4	9,1	9,2	-1,1	-0,1	-1,2
SI	9,3	10,1	10,4	10,6	10,7	10,7	10,6	10,6	1,4	-0,1	1,3
SK	6,5	5,0	4,9	4,8	4,7	4,7	4,7	4,4	-1,8	-0,3	-2,0
FI	9,1	9,0	9,7	10,3	10,8	11,2	11,2	11,2	2,0	0,1	2,1
SE	7,7	7,5	7,4	7,4	7,4	7,4	7,3	7,3	-0,3	-0,1	-0,4
UK	5,7	5,9	6,1	6,2	6,2	6,3	6,3	6,3	0,6	0,0	0,5
EU15 [1]	8,7	8,6	8,5	8,6	8,8	8,9	9,0	9,0	0,2	0,2	0,3
EU10	7,8	7,6	7,6	7,6	7,5	7,5	7,5	7,5	-0,2	0,0	-0,3
EU12 [1]	9,6	9,4	9,3	9,4	9,6	9,7	9,9	10,0	0,2	0,3	0,5
EU25 [1]	8,7	8,5	8,5	8,5	8,7	8,8	8,9	8,9	0,1	0,2	0,3

1) excluding countries which have not provided data

2) MT and PT: including the total social security contribution

Table 3-25 shows the projections for the extent to which the contributions alone can finance the future public pension expenditure and how the additional financing needs will develop under current policies, concerning both pensions and their contributions. It can be seen that additional financing need will grow markedly in most countries. However, it should be noted that public pensions already include in the starting position pensions which are by their very nature solidarity pensions or aimed at preventing poverty in the old age (such as minimum guarantee pensions in all countries and also disability pensions in countries with defined-contribution pension schemes) and, thus, financed by general tax revenues. Moreover, in some countries, disability pensions (benefits) are under the sickness insurance scheme; in these cases (FR and SE) the contribution paid to sickness insurance schemes is not included in these projections.

The results show that only in a few countries (CZ, EE, FR, LV, LT and LU) are public pensions more or less entirely financed by dedicated contributions[50], while in a number of countries a significant share of pensions is financed from general tax revenues (or other social insurance contributions); almost one third of the expenditure in Germany, Italy, Austria and Sweden; over 40% of the expenditure in Poland. Towards the end of the projection period, the additional financing needs are projected to grow to about one third also in CZ and LT, and even greater in IE, HU, LU, MT, NL, PT, SI and SK while the financing situation in Poland is projected to be balanced. On average in the EU, the contribution financing of public pensions would drop from about 80% to 72% between 2004 and 2050.

Table 3-25 Social security pension contributions relative to public pensions

Public pensions, contributions / gross pensions									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE											
CZ	105	108	109	105	100	93	73	63	-12	-30	-42
DK											
DE	68	69	66	67	68	68	68	68	0	0	0
EE	98	97	109	119	125	132	139	146	33	14	47
GR											
ES											
FR	100	99	98	94	92	90	86	87	-10	-3	-13
IE	76	65	57	52	46	43	36	30	-34	-12	-46
IT	72	74	75	74	72	68	66	72	-3	4	1
CY	80	80	79	73	67	59	49	36	-21	-23	-44
LV	104	124	125	115	104	97	91	97	-7	1	-7
LT	101	96	94	87	78	75	75	72	-25	-4	-29
LU	99	102	93	85	74	67	59	58	-32	-9	-41
HU	74	61	57	52	50	49	42	40	-25	-9	-35
MT [2)]	96	77	66	58	53	52	50	47	-43	-5	-48
NL	88	84	77	71	66	61	57	59	-27	-2	-29
AT	67	71	71	69	65	62	64	70	-5	8	3
PL	55	71	83	83	84	87	92	99	31	13	44
PT [2)]	95	88	78	68	64	59	49	44	-36	-14	-50
SI	85	91	90	86	80	74	63	58	-10	-16	-27
SK	90	75	75	69	64	61	56	49	-29	-12	-41
FI	85	81	81	80	80	80	81	82	-6	2	-4
SE	72	74	72	71	70	67	63	65	-6	-2	-8
UK	87	90	91	90	86	80	76	73	-7	-7	-14
EU15 [1)]	80	82	80	79	77	74	71	72	-6	-2	-8
EU10	72	78	83	80	78	77	71	67	5	-9	-4
EU12 [1)]	80	81	79	77	75	73	71	72	-7	-1	-7
EU25 [1)]	80	81	80	79	77	74	71	72	-6	-2	-8

1) excluding countries which have not provided data

2) MT and PT: including the total social security contribution

One way of meeting the additional financing needs is to accumulate reserve funds for social security pension schemes. A statutory partial funding is required in the social security pension schemes in Finland, Luxembourg and Sweden. Furthermore, many more countries have established reserve funds which may be accumulated by surpluses in the social security funds or in central government budgets or by other commitments taken by the government (notably Ireland). Such reserve funds[51] dedicated to the financing of future increased pension

50 The figures for Malta and Portugal include also contributions for benefits other than pensions.

51 The term 'reserve funds' is used to cover also other reserves dedicated for the financing of future pensions, such as accumulated reserves of state pension special budget in Latvia, which do not constitute a fund in its proper meaning.

expenditure exist currently in BE, CZ, CY, DE, EE, FR, IE, LV, PL and PT. However, the magnitude of these reserve funds is essentially smaller than that of the statutory pension funds in LU, FI and SE.

The projection of the assets is based on the projected flows of contributions coming into the fund and pensions paid out of the fund. An annual real rate of return of 3% over the whole projection period is assumed. The figures shown for Sweden also include the funds of private pension funds for the part which concerns the statutory part of the social security scheme. For Ireland, the figures of assets presented cover both Social Security and Public Services occupational pensions.

The projections show that most of the reserve funds will be exhausted before the end of the projection period (except in EE and IE in particular). In Portugal, the fund will be exhausted already by 2015 and, thereafter, a continuously increasing gap will emerge. It is projected to reach 35% of GDP in 2030 and 173% of GDP in 2050. Also the statutory fund in the Luxembourg pension scheme will be exhausted by 2035 under current contribution and accumulation policies and the debt of the pension system would reach 34% of GDP in 2040 and 100% in 2050. In Cyprus, the financing gap in 2050 is projected to rise 45% of GDP. In contrast, it is projected that the Finnish and Swedish (up to 2040) pension funds will grow in size. It should be noted that the funds may not be used for all of the financing needs of public pensions. In particular, the statutory funds in Luxembourg are only for the earnings-related pension scheme of the private sector, in Finland for the earnings-related pension schemes of all sectors and the Swedish fund is only for the old-age insurance pensions.

Table 3-26 Assets in public pension schemes as a share of GDP

Public pensions, assets as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	4,4	7,3	13,4	16,4	13,6	1,9			-2,5		
CZ	0,3	3,5	6,8	9,9	11,0	9,4			9,1		
DK											
DE	0,1	0,4	0,8								
EE	1,0			2,6	7,5	13,0	25,6	40,2	12,0	27,2	39,2
GR	:	:	:	:	:	:	:	:	:	:	:
ES											
FR [1)]	1,2	2,0	2,9	4,0	3,5	2,8	1,5	0,0	1,6	-2,8	-1,2
IE	7,3	11,1	14,4	18,1	22,5	26,0	28,3	21,9	18,7	-4,1	14,6
IT											
CY	39,3	39,6	39,7	37,9	33,4	25,1	1,9		-14,2		
LV	-0,3	5,2	7,8	9,3	8,7	6,5	0,2		6,8		
LT											
LU	23,6	31,7	37,4	39,2	32,9	17,8			-5,8		
HU											
MT											
NL											
AT											
PL	0,1	0,4	0,4	0,3	0,3	0,4	0,4	0,5	0,3	0,2	0,4
PT	4,3	4,0									
SI											
SK											
FI	52,4	59,3	63,1	66,0	68,2	69,9	71,3	72,9	17,5	2,9	20,5
SE	32,1	40,0	43,1	45,6	47,7	49,6	47,7	44,4	17,4	-5,2	12,2
UK											

1) France: only the assets of the Fonds de Réserves des Retraites, not those of specific pension schemes

Table 3-27 presents the projections for the assets in all pension funds, including funds in social security schemes and also the occupational and private funds. These funds are covered in the projections corresponding to the coverage of occupational and private statutory pensions presented in Table 3-16.

Table 3-27 Assets in all pension schemes as a share of GDP

All pensions, assets as % of GDP									Change	Change	Change
Country	2004	2010	2015	2020	2025	2030	2040	2050	2004-2030	2030-2050	2004-2050
BE	4,4	7,3	13,4	16,4	13,6	1,9			-2,5		
CZ	0,3	3,5	6,8	9,9	11,0	9,4			9,1		
DK											
DE	0,1	0,4	0,8								
EE	2,8	9,4	15,9	25,3	37,6	50,5	76,9	101,0	47,7	50,5	98,2
GR											
ES											
FR	1,2	2,0	2,9	4,0	3,5	2,8	1,5	0,0	1,6	-2,8	-1,2
IE											
IT											
CY	39,3	39,6	39,7	37,9	33,4	25,1	1,9		-14,2		
LV	0,3	12,9	25,9	38,0	48,2	57,4	68,8	71,5	57,1	14,1	71,1
LT	0,3	4,3	8,6	14,0	20,7	27,9	41,5	52,7	27,6	24,8	52,4
LU	23,6	31,7	37,4	39,2	32,9	17,8			-5,8		
HU	4,0	13,2	21,9	31,5	41,1	50,0	67,7	73,7	46,0	23,7	69,7
MT									:	:	:
NL	135,5	160,6	177,5	195,6	214,5	230,1	241,0	243,7	94,6	13,6	108,1
AT									:	:	:
PL	7,1	15,9	24,0	33,5	42,5	51,1	69,9	85,0	44,0	34,0	78,0
PT	4,3	4,0									
SI	1,4	5,5	9,6	13,9	18,3	22,6	30,1	35,9	21,3	13,3	34,5
SK		7,0	12,8	18,9	25,1	31,5	45,7	58,0	31,5	26,5	58,0
FI	52,4	59,3	63,1	66,0	68,2	69,9	71,3	72,9	17,5	2,9	20,5
SE	38,6	53,5	60,7	66,0	69,7	72,3	68,1	60,9	33,7	-11,4	22,3
UK											

3.4. Sensitivity analyses

A number of sensitivity analyses were carried out in the projections with the aim of providing some insight into the question of how sensitive the projections are to different assumptions and projected population and labour force developments, which inherently bring a major degree of uncertainty to long-run expenditure projections.

The sensitivity scenarios were all run in relation to the baseline scenario, changing only one parameter in each sensitivity scenario from that in the baseline scenario. The following sensitivity tests were run:

- ***Higher life expectancy scenario*** assumes an increase in life expectancy, which corresponds roughly to an increase in life expectancy at birth of 1-1.5 years by 2050. Specifically, it was introduced by decreasing the age-specific mortality rates by 15% linearly over the period 2004-2050.

- ***Higher employment rate scenario*** assumes that the employment rate will increase by 1 p.p. over the period 2005-2015 and thereafter will remain at a 1 p.p. higher level in the period 2015-2050 compared with the baseline projection. The higher employment rate was assumed to be achieved by lowering the rate of structural unemployment (i.e. the NAIRU).

- ***Higher employment rate of older workers scenario*** assumes that the employment rate of older workers will increase by 5 p.p. over 2005-2015 and thereafter will remain at a 5 p.p. higher level over the period 2015-2050, compared with the baseline projection. The higher employment rate is assumed to be achieved through a reduction in the inactive population.

- ***Higher and lower labour productivity scenarios*** assumes an increase/decrease in the labour productivity growth rate by 0.25 p.p. over 2005-2015 and thereafter remaining at the 0.25 p.p. higher/lower level in comparison with the labour productivity growth rate in the baseline projection.

- ***Higher and lower interest rate scenarios*** assume interest rates of 4 and 2% vs. 3% in the baseline scenario.

Table 3-28 and Table 3-29 provide an indication of the sensitivity of the pension expenditure projections to various assumptions while Table 3-30 looks at the sensitivity of the projections of the total assets of pension funds and Table 3-31 at the sensitivity of the projections of the ratio between contributions and pensions in public schemes. Although the assumed magnitude of the changes in different sensitivity scenarios is not easily comparable, it could be interpreted that the public pension expenditure projections are most sensitive to the assumption of life expectancy and the assumption of labour productivity growth rate, while the assumptions of the interest rate and of higher employment rates have only a small impact on the results.

The magnitude of the impact of different assumptions on pension spending depends critically on the pension system design: how responsive the system is to changes in economic and demographic developments.

A higher life expectancy should have a larger impact on pension spending in a defined-benefit scheme where the initial level of the pension does not depend on the time being spent in retirement. In contrast, a defined-contribution scheme fully accommodates with the time being spent in retirement as the accumulated pension capital will be converted into annuities at the time of retirement and this calculation takes into account life expectancy.

Higher and lower labour productivity assumptions affect pension spending through their link to the increase in wages. Usually in the projections, it is assumed that real wages increase in line with labour productivity growth rates. The impact on pension spending depends directly on the extent to which pensions are indexed to wage increases. If pensions are indexed to wages, the share of pension spending relative to GDP should remain unchanged under different assumptions about the labour productivity growth rates, since the labour productivity growth rate determines wage growth. In contrast, if pensions are indexed to prices only (or to a hybrid index of wages and prices) and the real wage growth rate is positive, the share of pension spending relative to GDP will decrease.

Higher and lower interest rates have no impact on pension spending (relative to GDP) as far as fully pay-as-you-go pension systems are concerned. Only in funded schemes does the interest rate assumption matter. A higher interest rate (thus also a higher return on pension assets) helps the financing of the pension scheme and results in a higher accumulation of pension funds if it concerns a defined-contribution scheme. In this case, the contribution rate remains unchanged but asset accumulation increases, also allowing higher pensions to be paid, thereby resulting in higher pension spending. In contrast, in a funded defined-benefit

scheme (such as there are in the Netherlands in particular), the pension expenditure would not be affected but higher interest (return) rates would allow lower contributions, which in turn would result in a lower accumulation of pension assets as well.

The impact of higher employment rates (whether overall employment rates or employment rates of older workers) on pension spending depends critically on what is assumed of how the gain in higher employment rates is achieved and how the pension system design responds to such changes. If a gain in higher employment rates is achieved through decreased unemployment rates, it usually also increases the accrual of pension rights of the person moving from unemployment to employment, thereby increasing the level of his pension and the overall spending on pensions. However, the higher employment rate also results in higher GDP and, consequently, the ratio between pension spending and GDP would not be affected much. Also the effect on the ratio between contributions and pensions remains largely unchanged provided that there is a close link between the contributions and the pension rights. Similarly, when considering the change in the employment rate of older workers, the impact depends essentially on whether it increases the person's pension rights or not. Only in the case of a defined-benefit pension system and if the higher employment rate of older workers was gained through a reduction of non-actuarial early pensions, would the decrease in pension spending relative to GDP be notable. Nevertheless, higher employment rates result in welfare gains both at the individual level, allowing higher earnings when still employed and higher pensions when retired, and for society, resulting in higher GDP and higher income per capita.

Detailed projection results for each sensitivity test are presented in Annex (Tables 3-1 – 3-28). The results of the sensitivity scenarios can be summarised as follows:

- ***Higher life expectancy*** is projected to increase public and total pension expenditure by 0.3 percentage points on the average in the EU. The largest projected impacts on public pension expenditure are in DK, FR, PT and SI (by 0.6 p.p. of GDP) and in BE, MT, NL and SK by 0.5 p.p. As expected, the projected impact is smaller in countries with defined-contribution schemes (IT, LV, PL and SE).

- ***Higher employment rate*** and ***higher employment rate of older workers*** are projected to result in only small and rather similar changes in pension spending. In most countries, the level of public or total pension spending as a share of GDP will remain unchanged; only in Hungary and Slovenia, notable decreases (0.4-1.1 p.p.) are projected and smaller decreases (0.3-0.4 p.p.) in BE, CZ, LT, AT). A higher employment rate of older workers appears to have a somewhat stronger impact in DK, EE and FR than a general increase in employment. In contrast, the German sustainability factor is designed in such a way that pension spending responses to changes in employment and to the change in ratio between the numbers of employed and pensioners. Some countries also project a small increase in pension spending, which is a feasible result in a defined-contribution scheme in particular because the persons in employment will accrue more pension rights. It can also be seen that the ratio between contributions and benefits is robust for changes in employment due to the fact that such changes affect both the contribution and the benefit side as well as the level of GDP.

- ***Higher and lower labour productivity*** result in relatively symmetric decreases/increases in the level of pension spending, on average by 0.3-0.4 percentage points of GDP. The changes are highest (0.7-1.0 p.p.) in ES, CY, MT, AT and PT,

while in DK, DE, IE, LU, NL and SI pensions are projected to rise in line with earnings and (virtually) no change is projected.

- ***Higher and lower interest rates*** have no impact on the level of public pension expenditure in most countries. Only in Sweden, does it have a noticeable impact: higher interest rates are projected to increase pension spending by 0.3 p.p. and lower interest rates to decrease spending by 0.3 p.p. This impact is due to the defined-contribution funded public scheme. However, the interest rate plays a more important role in countries with funded occupational and private statutory schemes. A more noticeable impact is seen for total pension expenditure as well as for total assets in pension funds. Due to the funded schemes, the total pension spending could increase/decrease by 0.5-1.1 percentage points in EE, LV, LT, HU, SK and SE. The impact of higher/lower interest rates on the increase/decrease in total pension assets is projected to be in the range of 10-17 percentage points in countries with private statutory schemes, while in the Netherlands (which has large occupational funds), the impact could be about 30-40 percentage points of GDP.

Table 3-28 Summary of the changes in gross public pension expenditure increases as a share of GDP between 2004 and 2050 [52]

		Difference in public pension expenditure increases as percentage points of GDP relative to the baseline projection						
	Baseline, change 2004-2050	Higher life expectancy	Higher employment	Higher empl of older workers	Higher labour productivity	Lower labour productivity	Higher interest rate	Lower interest rate
BE	5,1	0,5	-0,2	-0,3	-0,4	0,3	0,0	0,0
CZ	5,5	0,4	-0,2	-0,3	-0,3	0,2	0,0	0,0
DK	3,3	0,6	0,0	-0,3	0,0	0,0	0,0	0,0
DE	1,7	0,2	-0,1	0,0	0,0	0,0	0,0	0,0
EE	-2,5	0,1	0,0	-0,4	-0,2	0,2	0,0	0,0
GR								
ES	7,1	0,1	-0,1	-0,1	-0,9	1,0	0,0	0,0
FR	2,0	0,6	-0,1	-0,4	-0,4	0,5	0,0	0,0
IE	6,4	0,3	-0,1	-0,1	0,0	0,0	0,0	0,0
IT	0,4	0,3	0,0	0,2	-0,5	0,6	0,0	0,0
CY	12,9		-0,1		-1,4	1,6		
LV	-1,2	0,2	0,0	0,0	-0,1	0,2	0,0	0,0
LT	1,8	0,4	-0,2	-0,3	-0,3	0,0	0,0	0,0
LU	7,4				-0,1	0,1	0,0	0,0
HU	6,7	-0,3	-0,7	-1,1	-0,4	0,2	0,0	0,0
MT	-0,4	0,5	-0,1	0,0	-0,7	0,7	0,0	0,0
NL	3,5	0,5	-0,1	-0,1	-0,1	0,0	0,0	0,0
AT	-1,2	0,4	-0,2	-0,4	-0,8	1,0	0,0	0,0
PL	-5,9	0,2	-0,2	0,0	-0,4	0,2	0,0	0,0
PT	9,7	0,6	-0,2	-0,2	-1,2	1,3	0,0	0,0
SI	7,3	0,6	-0,4	-0,9	-0,1	-0,2	0,0	0,0
SK	1,8	0,5	0,0	0,1	-0,2	0,2	0,0	0,0
FI	3,1	0,2	0,0	-0,2	-0,4	0,5	0,1	-0,1
SE	0,6	0,3	-0,1		-0,2	0,3	0,3	-0,3
UK	2,0	0,2	-0,1	-0,1	-0,4	0,3	0,0	0,0
EU15 [1)]	2,3	0,3	-0,1	-0,1	-0,3	0,4	0,0	0,0
EU10 [1)]	0,3	-0,2	-0,3	-0,7	-0,4	0,2	0,0	0,0
EU12 [1)]	2,6	0,3	-0,1	-0,2	-0,4	0,4	0,0	0,0
EU25 [1)]	2,2	0,3	-0,1	-0,1	-0,3	0,4	0,0	0,0

1) excluding countries which have not provided data

[52] In the case of Luxembourg, where there is a large number of cross-border workers, it was agreed that the sensitivity scenarios for higher life expectancy and higher employment rates are not easily interpretable and comparable with other countries and that these scenarios were not be run for these reasons.

Table 3-29 Summary of the changes in all pension expenditure increases as a share of GDP between 2004 and 2050

		Difference in total pension expenditure increases as percentage points of GDP relative to the baseline projection						
	Baseline, change 2004-2050	Higher life expectancy	Higher employment	Higher empl of older workers	Higher labour productivity	Lower labour productivity	Higher interest rate	Lower interest rate
BE	5,1	0,5	-0,2	-0,3	-0,4	0,3	0,0	0,0
CZ	5,5	0,4	-0,2	-0,3	-0,3	0,2	0,0	0,0
DK								
DE	1,7	0,2	-0,1	0,0	0,0	0,0	0,0	0,0
EE	-0,1	0,1	0,0	-0,4	-0,4	0,3	0,7	-0,5
GR								
ES	7,1	0,1	-0,1	-0,1	-0,9	1,0	0,0	0,0
FR	2,0	0,6	-0,1	-0,4	-0,4	0,5	0,0	0,0
IE								
IT	0,4	0,3	0,0	0,2	-0,5	0,6	0,0	0,0
CY	12,9		-0,1		-1,4	1,6		
LV	1,5	0,2	0,0	-0,1	-0,3	0,3	0,8	-0,6
LT	3,7	0,4	-0,2	-0,4	-0,3	-0,1	0,5	-0,5
LU	7,4				-0,1	0,1	0,0	0,0
HU	9,9	-0,3	-0,8	-1,3	-0,6	0,4	1,1	-0,8
MT	-0,4	0,5	-0,1	0,0	-0,7	0,7	0,0	0,0
NL	7,6	0,8	-0,1	0,0	-0,3	0,3	0,2	-0,3
AT	-1,2	0,4	-0,2	-0,4	-0,8	1,0	0,0	0,0
PL	-4,6	0,2	-0,2	0,0	-0,5	0,3	0,3	0,0
PT	9,7	0,6	-0,2	-0,2	-1,2	1,3	0,0	0,0
SI	8,3	-0,4	-1,4	-1,9	-1,1	-1,2	0,0	0,0
SK	4,1	0,4	0,0	0,0	-0,3	0,3	0,6	-0,5
FI	3,1	0,2	0,0	-0,2	-0,4	0,5	0,1	-0,1
SE	0,9	0,4	-0,1		-0,4	0,4	0,7	-0,6
UK								
EU15 [1]	2,8	0,3	-0,1	-0,1	-0,4	0,4	0,1	-0,1
EU10 [1]	1,7	-0,2	-0,3	-0,7	-0,5	0,3	0,4	-0,2
EU12 [1]	2,8	0,3	-0,1	-0,2	-0,4	0,4	0,0	0,0
EU25 [1]	2,7	0,3	-0,1	-0,1	-0,4	0,4	0,1	-0,1

1) excluding countries which have not provided data

Table 3-30 Summary of changes in total assets as a % of GDP between 2004 and 2050

			Difference in total pension assets increases as percentage points of GDP relative to the baseline projection, 2004-2050 [1]						
	Baseline, start level in 2004	Baseline, change 2004-2050	Higher life expectancy	Higher employment	Higher empl of older workers	Higher labour productivity	Lower labour productivity	Higher interest rate	Lower interest rate
BE	4,4								
CZ	0,3								
DK									
DE	0,1								
EE	2,8	98,2	-0,2	4,5	1,6	1,3	-0,4	10,9	-8,8
GR									
ES									
FR	1,2	-1,2		0,0	0,0	0,0	0,0	0,0	0,0
IE									
IT									
CY	39,3								
LV	0,3	71,1	-1,3	0,3	-0,8	-0,1	0,9	12,1	-10,1
LT	0,3	52,4	1,5	0,1	-0,2	0,3	0,2	8,4	-7,1
LU	23,6								
HU	4,0	69,7	-1,0	0,1	-0,6	-3,1	2,4	10,8	-9,1
MT									
NL	135,5	108,1	13,7	1,1	0,7	-4,4	4,1	-32,4	40,7
AT									
PL	7,1	78,0	1,5	-0,5	0,0	-4,6	2,5	15,8	-12,6
PT	4,3								
SI	1,4	34,5						0,0	0,0
SK	0,0	58,0	1,1	0,3	0,1	-2,2	2,6	9,3	-7,6
FI	52,4	20,5	-0,2	0,6	-1,2	-4,4	4,3	16,0	-12,8
SE	38,6	22,3	-3,0	0,4		-1,7	2,8	17,2	-11,5
UK									

1) Differences shown only for countries where the assets are projected to be positive in 2050 (excluding countries where public reserves are projected to be exhausted before 2050, cf. tables 3-26 and 3-27)

Table 3-31 Summary of changes in the ratio between contributions and pension expenditure in public schemes between 2004 and 2050

		Change in the ratio between contributions and pension expenditure 2004-2050							
	Baseline 2004, public pensions	Baseline	Higher life expectancy	Higher employment	Higher empl of older workers	Higher labour productivity	Lower labour productivity	Higher interest rate	Lower interest rate
BE									
CZ	105	-42	-44	-41	-41	-41	-43	-42	-42
DK									
DE	68	0	0	0	0	0	0	0	0
EE	98	47	44	44	41	50	37	47	47
GR									
ES									
FR	100	-13	-16	-12	-11	-10	-16	-13	-13
IE	76	-46	-47	-46	-46	-46	-46	-46	-46
IT	72	1	0	1	0	4	-2	1	1
CY	80	-44		-45		-42	-47	-44	-44
LV	104	-7	-9	-6	-7	-4	-9	-7	-7
LT	101	-29	-29	-26	-25	-25	-27	-29	-29
LU	99	-41				-41	-41	-41	-41
HU	74	-35	-34	-33	-32	-34	-35	-34	-36
MT	96	-48	-51	-47	-48	-48	-48	-48	-48
NL	88	-29	-31	-28	-28	-29	-29	-29	-29
AT	67	3	1	5	6	9	-2	3	3
PL	55	44	43	45	45	49	40	45	45
PT	95	-50	-51	-50	-50	-47	-52	-50	-50
SI	85	-27	-24	-25	-23	-27	-27	-27	-27
SK	90	-41	-43	-40	-41	-40	-42	-41	-41
FI	85	-4	-4	-3	-3	-2	-5	-10	2
SE	72	-8		-8		-6	-9	-10	-6
UK	87	-14	-15	-13	-13	-11	-16	-14	-14
EU15 [1)]	80	-8	-9	-8	-7	-6	-10	-8	-8
EU10 [1)]	72	-4	-2	-3	0	-2	-6	-3	-4
EU12 [1)]	80	-7	-8	-7	-6	-6	-9	-8	-7
EU25 [1)]	80	-8	-9	-7	-7	-6	-10	-8	-8

1) excluding countries which have not provided data

4. HEALTH CARE

4.1. Introduction

A wider mandate covering demographic and non-demographic drivers of spending

The mandate from the ECOFIN Council to the EPC included a request to make projections for public spending on health care[53]. This followed the 2001 projection exercise of the EPC which examined the impact of demographic variables on health care spending.

The methodology used in 2001 was a *pure ageing* scenario which only considered the impact of changes in the size and age-structure of the population on health care spending. It consisted of applying profiles of average health expenditure per capita, provided for a base year by Member States, to a population projection of Eurostat. The projections were run under the assumption of constant age and gender-contingent demand and consumption of health care over time. They were also made under two cost assumptions, i.e. expenditures per capita grow exactly at the same rate as GDP per capita (which can be considered as neutral in macroeconomic terms), and expenditures per capita increase at the same rate as GDP per worker (to reflect labour intensity of the health care sector).

The 2001 report of the EPC recognised the limitations of this projection methodology, in particular the strong assumption of holding age-related expenditure profiles constant over time, the failure to link expenditure to years of remaining life (death-related costs), and the absence of non-demographic drivers of spending from the projection exercise.

[53] In April 2004, the ECOFIN Council held a discussion on approaches to achieving a better control of health care spending on the basis of a note by DG ECFIN, see '*Controlling health care expenditures: some recent experiences with reform'*, Note from DG ECFIN for the attention of the Economic Policy Committee, ECFIN/157/04 Rev.1 of 16 March 2004. Discussions subsequently took place on similar topics at a joint-meeting of Finance and Health Ministers organised by the OECD in May 2004, and also at a meeting of G8 Finance Ministers in June 2004. The issue of factors driving health care expenditures was also, under the Dutch Presidency, addressed by Health Ministers, see '*Health care in an ageing society: a challenge for EU countries*', Background Paper of the Netherlands EU Presidency for the Informal Health Council in Noordwijk, 9-10 September 2004.

Box 1. The importance of health care spending

The focus on health care spending in discussions on budgetary management and on the overall sustainability of public finances is hardly surprising given its size and past trends. Total health care spending, both public and private, as a share of GDP has been rising steadily in most EU Member States in recent decades, see Table 1. It increased rapidly during the 1960s and 1970s, continued growing in most countries, although at a slower rate, in the 1980s, and picked up again in the 1990s. Total spending on health as a proportion of GDP grew in the 1990s in all Member States except Finland, Luxembourg, Denmark and Sweden. Currently, total spending in the EU on health care ranges from 5.0% (LV) to 10.9% (DE) of GDP. A clear catch-up process in total health care spending has been visible in European countries over the last decades, as the countries with the lowest initial rates of expenditure have seen them rising considerably up to the levels comparable to those of most other Member States.

Table 1. Total expenditure (public and private) on health care as % of GDP

	as % of GDP					*change*		
	1970	**1980**	**1990**	**2000**	**2002**	***70-80***	***80-90***	***90-00***
BE	4,0	6,4	7,4	8,7	9,1	*2,4*	*1,0*	*1,3*
CZ	:	:	4,7	6,6	7,2	*:*	*:*	*1,9*
DK	:	9,1	8,5	8,4	8,8	*:*	*-0,6*	*-0,1*
DE	6,2	8,7	8,5	10,6	10,9	*2,5*	*-0,2*	*2,1*
EE	:	:	:	5,5	5,1	*:*	*:*	*:*
GR	6,1	6,6	7,4	9,9	9,8	*0,5*	*0,8*	*2,5*
ES	3,6	5,4	6,7	7,4	7,6	*1,8*	*1,3*	*0,7*
FR	5,4	7,1	8,6	9,3	9,7**	*1,7*	*1,5*	*0,7*
IE	5,1	8,4	6,1	6,3	7,3	*3,3*	*-2,3*	*0,2*
IT	:	:	7,9	8,1	8,4	*:*	*:*	*0,2*
CY	2,7	2,8	4,5	6,0	6,4	*0,1*	*1,7*	*1,5*
LV	:	2,1	2,5	4,8	5,0	*:*	*0,4*	*2,3*
LT	:	:	3,3	6,0	5,7	*:*	*:*	*2,7*
LU	3,6	5,9	6,1	5,5	6,1	*2,3*	*0,2*	*-0,6*
HU	:	:	:	7,1	7,8	*:*	*:*	*:*
MT	:	:	:	8,8	9,6	*:*	*:*	*:*
NL	:	7,5	8,0	8,3	9,3	*:*	*0,5*	*0,3*
AT	5,1	7,4	7,0	7,6	7,6	*2,3*	*-0,4*	*0,6*
PL	:	:	4,9	5,7	6,0	*:*	*:*	*0,8*
PT	2,6	5,6	6,2	9,2	9,3	*3,0*	*0,6*	*3,0*
SI	4,2	4,4	5,6	8,0	8,2*	*0,2*	*1,2*	*2,4*
SK	:	:	:	5,5	5,7	*:*	*:*	*:*
FI	5,6	6,4	7,8	6,7	7,2	*0,8*	*1,4*	*-1,1*
SE	6,9	9,1	8,4	8,4	9,2	*2,2*	*-0,7*	*0,0*
UK	4,5	5,6	6,0	7,3	7,7	*1,1*	*0,4*	*1,3*

*2001

**estimate

Source: European health for all database (HFA-DB), World Health Organization Regional Office for Europe (data on EE, CY, LV, LT, MT, SI); OECD HEALTH DATA 2005, (data on all other countries)

Broadly similar trends, including a catch-up process, are evident as regards public spending on health care, see Table 2. As a share of GDP, public spending on health expenditure rose over the period 1970-1980 in all EU countries for which data are available. In the 1980s, the increasing trend slowed down considerably and even reversed in a few countries (IE, DK, SE, DE). In the 1990s, another five countries (FI, LU, PL, IT, NL) saw their public expenditure falling, but in most other Member States average spending continued to grow. Judging by public spending as a share of GDP, efforts to control public spending during the 1980s and especially the 1990s have had some impact. In 2001, public spending as share of GDP was broadly 0.7% higher for the EU compared with 1990, 0.5% higher compared with 1980 and 2.3% higher compared with 1970 (unweighted average of available figures). There has also been a clear trend of narrowing dispersion in spending across countries, mainly through the catch-up process in the countries with the lowest initial levels of expenditure, like PT, where public spending on health grew from 1.5% of GDP in 1970 to 6.6% of GDP in 2002, ES (from 2.4% to 5.4%), or GR (from 2.6% to 5.2%).

Table 2. Public expenditure on health as a share of GDP and of total expenditure on health, 1970 to 2001

	Public health expenditure as % of total health expenditure					Public health expenditure as % of GDP					*Change*		
	1970	**1980**	**1990**	**2000**	**2002**	**1970**	**1980**	**1990**	**2000**	**2002**	***70-80***	***80-90***	***90-00***
BE	:	:	:	71	71	:	:	:	6,1	6,5	*:*	*:*	*:*
CZ	97	97	97	91	91	:	:	4,6	6,0	6,6	*:*	*:*	*1,5*
DK	:	88	83	83	83	:	8,0	7,0	6,9	7,3	*:*	*-1,0*	*-0,1*
DE	73	79	76	79	79	4,5	6,8	6,5	8,4	8,6	*2,3*	*-0,4*	*1,9*
EE	:	:	:	77	76	:	:	:	4,2	3,9	*:*	*:*	*:*
GR	43	56	54	54	53	2,6	3,7	4,0	5,3	5,2	*1,1*	*0,3*	*1,4*
ES	65	80	79	72	71	2,4	4,3	5,3	5,3	5,4	*2,0*	*1,0*	*0,0*
FR	76	80	77	76	76	4,1	5,7	6,6	7,0	7,4	*1,6*	*0,9*	*0,5*
IE	82	82	72	73	75	4,2	6,9	4,4	4,6	5,5	*2,7*	*-2,5*	*0,2*
IT	:	:	79	74	76	:	:	6,3	6,0	6,4	*:*	*:*	*-0,3*
CY	35	52	40	35	37	0,9	1,5	1,8	2,1	2,3	*0,5*	*0,3*	*0,3*
LV	:	:	100	74	68	:	:	2,5	3,5	3,4	*:*	*:*	*1,0*
LT	:	:	90	72	72	:	:	3,0	4,3	4,1	*:*	*:*	*1,4*
LU	89	93	93	90	85	3,2	5,5	5,7	4,9	5,2	*2,3*	*0,2*	*-0,7*
HU	:	:	:	71	70	:	:	:	5,0	5,5	*:*	*:*	*:*
MT	:	:	:	54	69	:	:	:	4,7	6,6	*:*	*:*	*:*
NL	:	69	67	63	63*	:	5,2	5,4	5,3	5,8*	*:*	*0,2*	*-0,1*
AT	63	69	74	70	70	3,2	5,1	5,1	5,3	5,3	*1,9*	*0,1*	*0,1*
PL	:	:	92	70	72	:	:	4,5	4,0	4,3	*:*	*:*	*-0,5*
PT	59	64	66	70	71	1,5	3,6	4,1	6,4	6,6	*2,1*	*0,5*	*2,3*
SI	100	100	100	87	87*	4,2	4,4	5,6	6,9	7,1*	*0,2*	*1,2*	*1,3*
SK	:	:	:	89	89	:	:	:	4,9	5,1	*:*	*:*	*:*
FI	74	79	81	75	76	4,1	5,1	6,3	5,0	5,5	*0,9*	*1,3*	*-1,3*
SE	86	93	90	85	85	5,9	8,4	7,6	7,1	7,8	*2,5*	*-0,9*	*-0,4*
UK	87	89	84	81	83	3,9	5,0	5,0	5,9	6,4	*1,1*	*0,0*	*0,9*

*2001

Source: European health for all database (HFA-DB), World Health Organization Regional Office for Europe (public health expenditure as % of total health expenditure and public health expenditure as % of GDP for EE, CY, LV, LT, MT, SI); OECD HEALTH DATA 2005 (public health expenditure as % of GDP for all other countries)

In most countries spending on health care has accounted for a growing share of total public spending (see Table 3). This occurred not only during the 1970s and 1980s with the widening of access to public health care systems, but especially during the 1990s. It has increased between 1990- 2003 in most countries by between 0 and 4.5 percentage points, again with the largest growth in the catch-up countries (GR, PT, IE). Currently, it ranges from 6.4% in SK to 20.9% in IE.

Table 3. Spending on health as % of total primary government spending, 1990-2002

	as % of total primary government spending				*change*		
	1990	**1995**	**2000**	**2003**	***90-95***	***95-00***	***00-03***
BE	13,0	14,2	15,0	15,4	*1,2*	*0,8*	*0,4*
CZ	:	:	:	12,6	*:*	*:*	*:*
DK	13,6	13,0	13,3	13,5	*-0,6*	*0,4*	*0,2*
DE	13,3*	12,2	14,7	14,3	*-1,1**	*2,5*	*-0,4*
EE	:	:	:	11,4	*:*	*:*	*:*
EL	2,6	9,0	7,5	6,8	*6,4*	*-1,5*	*-0,7*
ES	:	:	14,7	14,5**	*:*	*:*	*-0,2***
FR	:	15,3	15,7	16,5**	*:*	*0,4*	*0,8***
IE	16,1	17,1	19,0	20,9**	*1,0*	*1,9*	*1,9***
IT	14,5	12,8	15,0	14,8	*-1,7*	*2,2*	*-0,2*
CY	:	:	7,1	7,5	*:*	*:*	*0,5*
LV	:	:	:	9,3	*:*	*:*	*:*
LT	:	:	:	13,2	*:*	*:*	*:*
LU	11,0	12,3	11,0	11,8	*1,3*	*-1,3*	*0,8*
HU	:	:	:	12,3	*:*	*:*	*:*
MT	:	:	13,1	13,7	*:*	*:*	*0,6*
NL	:	7,8	9,6	9,8	*:*	*1,9*	*0,2*
AT	:	14,7	16,1	13,8	*:*	*1,4*	*-2,3*
PL	:	:	:	7,3	*:*	*:*	*:*
PT	11,8	15,1	16,2	15,8	*3,3*	*1,1*	*-0,4*
SI	:	:	:	14,7	*:*	*:*	*:*
SK	:	:	:	6,4	*:*	*:*	*:*
FI	:	:	:	13,3	*:*	*:*	*:*
SE	:	10,4	11,9	12,9	*:*	*1,4*	*1,1*
UK	13,2	13,7	15,5	16,3	*0,5*	*1,8*	*0,8*

* 1991 and 91-95
** 2002 and 00-02
Source: Eurostat

Contribution to the work on health care projections

The decision to include non-demographic factors in the projection exercise substantially added to the complexity of the projection exercise. As a first step, DG ECFIN carried out a literature survey on the drivers of health care spending and methodologies that have used to project health care spending[54]. DG ECFIN also organised a conference jointly with the Health Division of the OECD on 21/22 February 2004 entitled *Understanding trends in disability among elderly populations and the implications of demographic and non-demographic factors for future health and long-term care costs*[55]. The Commission has also received valuable input from Ilija Batljan (University of Stockholm) and Adelina Comas-Herrera (PSSRU, London School of Economics and Political Science) who were visiting fellows with DG ECFIN in 2005. Several AWG members also provided written contributions to the work of the group[56].

Outline of this chapter

The remainder of this chapter is structured as follows. The next section provides an overview of the different approaches used to project health care spending and the sensitivity tests. Section 4.3 describes the data needed to run the projections. Section 4.4 presents the projection results: it starts with the projections results for a *pure ageing* scenario that is identical to the projection methodology used in 2001. It then presents the results for different sets of projections that examine additional drivers of health care spending, including scenarios looking at the health status of elderly citizens, death-related costs, the impact of changes in real income and finally at the evolution of unit costs. Section 4.5 contains an overall assessment of the budgetary projection results for all scenarios and contains policy conclusions. Four annexes are also included. Annex 4 describes the projection methodologies in more detail. Annex 5 provides information and analysis on the data inputs. Annex 6 presents a series of additional sensitivity tests the results of which should be seen as a complement to the analysis done in the report. Annex 7 contains tables with the detailed projection results for all discussed scenarios.

4.2. Short overview of the projection methodology

Capturing the various demographic and non-demographic drivers of spending

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[54] '*Factors driving public expenditures on health/long-term care over the long run and an overview of methodologies used to make expenditure projections*', Note for the attention of the AWG meeting of 18/19 April 2005, ECFIN/REP51821/05-EN of 15 April 2005.

[55] The presentations and papers circulated at the conference can be downloaded from: the DG ECFIN web-site at http://europa.eu.int/comm/economy_finance/events/2005/events_brussels_0205_en.htm

[56] Englert M. (2004), '*Assessing the budgetary cost of ageing and projecting health care (+care for the elderly) expenditure*', Federal Planning Bureau of Belgium, presentation to the joint AWG-OECD meeting of 3 June 2004. Englert M., M.J. Festjens, M.Lopez-Novella (2004), *L'évolution à long terme des dépenses de soins de santé*, Journée d'Etudes: 'Budget 2005', Institut Belge des Finances Publiques. Madsen M. (2004) '*Methodologies to incorporate 'death related costs' in projections of health and long-term care based on Danish data'*, Ministry of Finance, Denmark dated 4 November 2004. Note for the attention of the AWG meeting of 8/9 November 2004. Ragioneria Generale dello Stato (2004b) '*How to take account of death-related costs in projecting health care expenditure – the evidence from Italy and a proposal for the EPC-AWG*', Note for the attention of the AWG meeting of 10 March 2004.

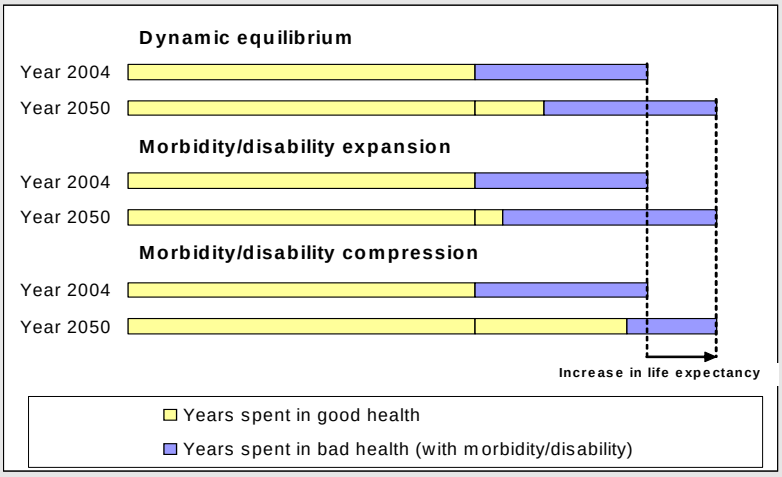
Health care spending is determined by a complex series of demand and supply side factors. These were extensively reviewed in EPC and European Commission (2005b). According to the literature, the demand for health care depends ultimately on the health status and functional ability of (elderly) citizens, and not on age *per se*. While age is a useful indicator of the health status of an elderly population (and shown by the steep upward slope of age-related expenditure profiles)[57], it is not the causal factor. Health care spending is therefore mostly driven by:

- the health status of the population (see box 2 below);
- 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.

Box 2. Healthy life expectancy – will the extra years of life be spent in good health and free of disability?

There is debate in literature on the extent to which, as life expectancy increases, the health status (or morbidity) of the population may change. Traditionally, a decrease in mortality rates was considered to reflect the improvement in the health status of the population, i.e. a decrease in morbidity. When reliable empirical evidence (life-tables, precise data on mortality, disability and morbidity) became available, this simple relationship was not supported by the data. Three main hypotheses have emerged in the literature which are illustrated on the graph 1 below (for an overview of existing theories see Nusselder (2003)).

Graph 1. Different hypothesis for the evolution of healthy life expectancy



Source: DG ECFIN

[57] Recent evidence, based on the data from a set of industrialised countries, shows that total health care provided to an average person over 65 years of age costs 2.7 to 4.8 times as much as health care provided to an average person aged 0-64 (Anderson and Hussey 2000). In other words, 35-50% of total health expenditure is spent on elderly people (Jacobzone 2002).

The expansion of morbidity hypothesis was proposed by Gruenberg (1977), Verbrugge (1984) and Olshansky et al (1991) and empirically supported by Guralnik (1991). It posits that as life expectancy increases, older people become more vulnerable to chronic diseases and spend more time in ill-health (represented by the dark shaded area on showing that most of the additional gains in life expectancy are spent in bad health). In other words, a higher proportion of people with health problems survive to an advanced age. This relationship works mainly through three mechanisms:

- 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;

- 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;

- 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.

The ***dynamic equilibrium hypothesis*** was proposed by Manton et al. (1995). It 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. On the graph, this is characterised by the number of years in good health (the lighter shade) increasing by the same amount as life expectancy at birth: hence, the total period spent in bad health during a lifetime is unchanged. The term 'dynamic equilibrium' is meant to capture the overall changes in life expectancy and severe disability, and this hypothesis is a simplified version of a more sophisticated theory proposed earlier by Manton (1982), which argued that an increased survival may lead to an increase in the number of years spent in bad health. However, the time spent with severe morbidity and disability remains approximately constant due to the fact that medical treatments and improvement in lifestyles reduce the rate of progression of chronic diseases. Thus, not everybody will enjoy the benefits of all gains in life expectancy being spent in full health. Instead, part of the gains in life expectancy may be spent in moderate health and the prevalence of chronic illness may increase; however, severe disability which is connected to the most costly part of health care services may be postponed to the final phase of life (meaning that age-related disability rates could decline). These effects may cancel out so that the average number of years spent in morbidity would remain unchanged.

The compression of morbidity hypothesis was proposed by Fries (1980, 1983, 1989, 1993), posits that as life expectancy increases the onset of disability will be postponed to an high ages thanks to improved living conditions, healthier lifestyles and the fact that more and more chronic diseases may be curable. According to the hypothesis, humankind has a genetically determined — albeit individually variable — limit to the lifespan and while life expectancy is increasing, it is approaching that limit (a hypothesis rejected later by several authors including Oeppen and Vaupel 2002, Robine and Vaupel 2002, Robine et al. 2005). Accordingly, morbidity and disability will be gradually compressed at very old ages (into the last years of life) and the number of years spent with diseases or disabilities will decrease over time. The graph above represents this by decreasing the total period spent in bad health during a lifetime. Thus, health life expectancy grows by more than life expectancy at birth.
Recent studies have not provided strong evidence in favour of any of the above hypothesis. Results have differed significantly not only across countries, but also across sexes. Batljan and Lagergren (2000) found that even if existing state of research does not allow for any conclusive statements, most empirical data support the hypothesis of morbidity postponement.

Given these considerations, the need to include non-demographic factors in the projection exercise was recognised[58]. Table 4-1 provides an overview of the different drivers of spending, and how they are captured within this budgetary projection exercise.

[58] EPC and European Commission (2005b).

Table 4-1 The drivers of health care spending: how they are incorporated in the projection exercise

Demand side factors				
	Mechanism/channel through which health care spending is affected	**Evidence in literature on likely impact on spending**	**Addressed in projections**	**Likely effect on projection results**
Size and age structure of the population	Population size and age structure determines the overall number of persons who potentially need some health care services. Morbidity rates tend to increase sharply at older ages, although age itself is not the causal factor.	Population projections show large increase in the number of older persons.	*Pure ageing* scenario (I) plus high life expectancy scenario (A-I).	The 'pure' effect of an ageing population will lead to strong pressure for increased spending.
Health care status of the population, especially of elderly cohorts	Changes in age-specific mortality rates will alter the demand for health care.	No clear cut evidence as to whether the health care status of elderly is static (expansion of morbidity hypothesis) or improving (dynamic equilibrium or compression of morbidity hypotheses).	*Constant health* scenario (II) and *improved health* scenario (A-II).	Future improvements of health care status will lower the projected impact on spending compared with a *pure ageing* scenario.
Death related costs	Large share of total health are spending is concentrated in the final phase of life linked to approaching death.	Large body of evidence confirming the existence of death-related costs, and that the ratio of spending between decedents and survivors declines with age. No clear evidence on whether the importance of death-related costs has changed over time.	*Death-related cost* scenario (III).	Reduces projected increases in spending compared with *pure ageing* scenario.
Income	If health care services are a luxury good, then the income elasticity of demand would be greater than one, and health care spending as % of GDP should increase if real living standards improve.	Studies at micro level show income elasticity of demand greater than 1 but neutral at an aggregate level. Real convergence process may lead to an increase in health care spending as a result of absolute increase in demand and a shift towards high quality medical goods and services demanded in fast growing economies.	Scenario IV considers an income elasticity of demand greater than 1 for all Member States. Scenario A-III considers the convergence in age-related expenditure profiles in EU10 to EU15 levels.	Projected increases in spending compared with *pure ageing* scenario.

Supply side factors				
	Mechanism/channel through which health care spending is affected	**Evidence in literature on likely impact on spending**	**Addressed in projections**	**Likely effect on projection results**
Technology	Technology can lower unit costs of providing more efficient treatment, but can push up total spending by making new treatments available for more persons. Technology can lower the demand for health care if early or less invasive interventions improve health care status and lower future health care needs: alternatively, it can increase future health care needs by increasing the survival probabilities of persons with chronic or multiple health conditions.	Not clear cut. Evidence to date suggests that technology has pushed up overall spending as increased demand appears to have outweighed unit cost savings. However, there is considerable uncertainty on future prospects. Prospective technological developments could radically alter treatment possibilities and the health care sector is starting to catch-up with other sectors on the deployment of IT.	Not modelled. All scenarios implicitly assume a neutral impact of technology on spending. From *fast cost growth* scenario (A-IV), and *extrapolation* scenario (A-V), one could infer a pessimistic the impact of technology (the effects of increased demand outweigh unit cost reductions).	
Relative costs in the health care sector	Total health care spending driven by the evolution of unit costs for key components (wages, capital investment and pharmaceuticals) relative to the economy as a whole.	Unclear due to data limitations and prevalence of non-market pricing in the health care sector. Wages often covered by collective agreements and pharmaceutical prices are regulated. Evidence from US points to high price inflation for pharmaceuticals but this may be driven by incentives embedded in their market structure.	*Unit cost – GDP per worker* scenario (V), *fast cost growth* scenario (A-IV), and *extrapolation* scenario (A-V).	Can push up (fast growth scenario) or reduce (slow growth scenario) projected spending compared with *pure ageing* scenario.
Government policy and institutional settings	Overall spending on health determined by policy choices on access to health care systems and on quality (waiting times, patient choice etc.) The evolution of spending is also determined by the effectiveness of aggregate budgetary control measures (e.g. spending caps) and micro incentives for patients and health care professionals favouring rational resource use. Real convergence process also plays a role in designing appropriate health policy setting.	Improved access has been major driver of spending in past decades. Governments face strong pressure to provide access to new medical treatments and to improve quality of services, and existing projections from national sources show that policy choices have a major impact on health care spending. Aggregate budgetary control measures appear to have stemmed increases in health care spending in the 1990s, but long-term effectiveness will require appropriate micro incentives.	Not modelled	

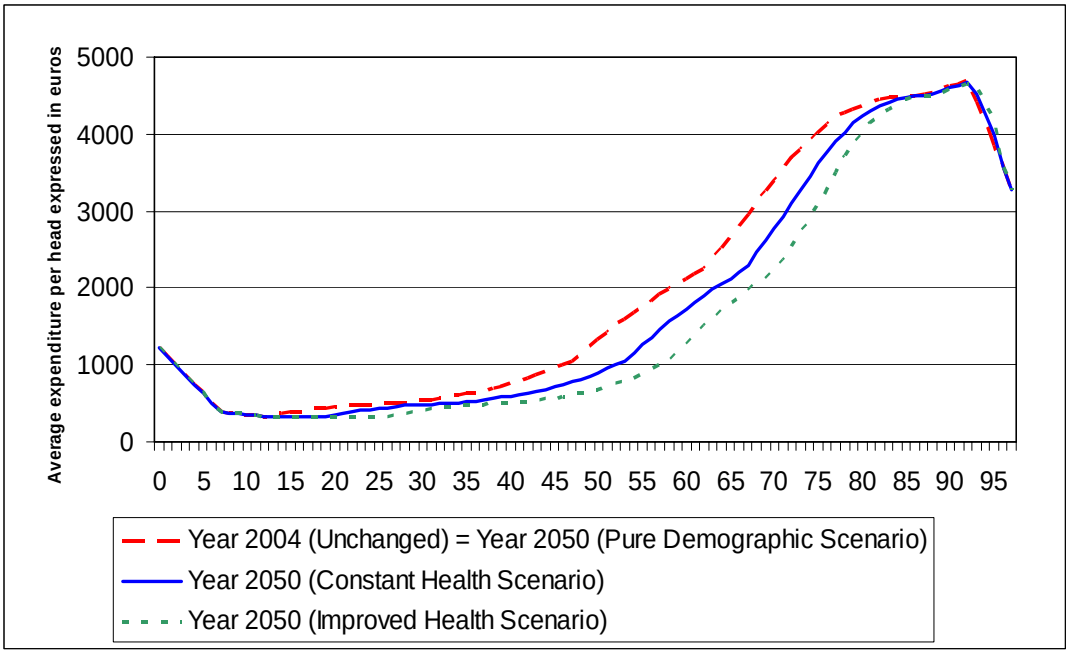
Six different types of scenarios

Rather than trying to construct an all-encompassing projection methodology to capture all demographic and non-demographic factors, it was agreed to run several different projection scenarios in order to tackle the issue from a variety of different angles. An overview of all approaches is presented in Table 4-2 below.

- ***Pure ageing scenario (I)****:* this scenario attempts to isolate the "pure" effects of an ageing population on health care spending. It is a repetition of the methodology used in the 2001 AWG budgetary projection exercise. It assumes that age-related spending per capita on health care in the base year (2004) 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 in the literature, as it *de facto* would assume that the gains in life expectancy up to 2050 are assumed to be spent in bad health. The constant age profile is applied to the baseline AWG population scenario (described in chapter 2.1) with an assumption that the costs evolve in line with GDP per capita (see table 5-4 in annex 5). Annex 4 describes the projection methodology in more detail;

- ***A constant health scenario (II) considering the health status of elderly citizens:*** as pointed out above, the *pure ageing* scenario may be pessimistic in that they implicitly assume that a large share of the gains in life expectancy up to 2050 would be spent in bad health. The *constant health* scenario is inspired by the 'dynamic equilibrium' hypothesis 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 in 2050 is identical to that in 2004, 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 (see tables 5-2 and 5-3 in annex 5). This procedure is illustrated on Graph 4-1 by the straight dark line, which illustrates the age-related expenditure profile that would be applied in the year 2050.

Graph 4-1 Illustration of the different scenarios for future morbidity/disability and longevity using age profiles on health care costs



***Source*:** DG ECFIN

- ***A death-related costs scenario (III)*** links health care spending to years of remaining life. There is strong evidence that a large share of total spending on health care during a person's life is concentrated in the final years of life. Based on data available supplied by AWG members, a profile of "death related" costs by age has been constructed, with unit costs differentiated between decedents (those who die within a calendar year) and survivors (for empirical evidence on death-related costs, see section 4.3.).

- ***A scenario looking at income effects (IV)*:** a key question concerns the income elasticity of demand for health care, and whether it is greater than unity. Scenario IV is identical to the *pure ageing* scenario (I) 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 2050. 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 the recent decades (see discussion in section 4.3.).

- ***A scenario where costs evolve in line with GDP per worker (V)*** is identical to the *pure ageing* scenario (I) except that costs are assumed to evolve in line with the evolution of GDP per worker (see table 5-5 in annex 4). 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. This is identical to a scenario run in 2001 budgetary projection exercise;

- ***An AWG reference scenario (VI):*** this scenario combines a number of the elements in the scenarios described above. In particular, it aims at incorporating death-related costs and the impact of income elasticity exceeding unity on health care spending. Both theoretical discussion and empirical results presented in scenario III suggest that incorporating death-related costs is expected to drive total costs of health care down from the level predicted by *pure ageing* scenario by somewhat less than the assumption of changes in health status

embedded in *constant health* scenario does. However, given very scarce and hardly comparable data on death-related costs, it cannot be considered as reliable enough to be used in the reference scenario. Instead, an intermediate scenario between *pure ageing* and *constant health* scenario has been calculated by assuming health status of the populations will improve, but only by half as much as in *constant health* scenario. This assumption has been complemented by adding the effect of income elasticity equal to 1.1 in the base year and converging to 1 by 2050. This scenario was developed so as to provide a prudent central reference scenario for undertaking policy analysis at EU level.

Additional scenarios for public spending on health care are presented in annex 6. They look at the impact of a higher than expected life expectancy, an *improved health* scenario where health life expectancy increases by more than life expectancy (inspired by the compression of morbidity hypothesis), an *EU10 cost convergence* scenario where average unit costs of health care provision in the EU10 Member States evolve over time to reach the EU15 cost structure, a *fast cost growth* scenario, and a projection where unit costs for the different components of health care spending evolve in line with past trends.

Table 4-2 Overview of different approaches used to make the projections on health care spending

	Pure ageing	**Constant health**	**Death related costs**	**Income elactity of demand**	**Unit costs - GDP per worker**	***AWG reference scenario***
	I	***II***	***III***	***IV***	***V***	***VI***
Population projection	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	***AWG scenario - baseline***
Age-related expenditure profiles	2004 profiles held constant over projection period	Constant health scenario whereby 2004 age profile shifts in line with changes in age-specific life expectancy	Constant 2004 profiles but split into spending on decedents and survivors	2004 profiles held constant over projection period	2004 profiles held constant over projection period	***Intermediate between pure ageing and constant health scenarios, whereby 2004 age profile shifts by half the change in age-specific life expectancy***
Unit cost development	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 in base year converging to 1 by 2050	1	***1,1 in base year converging to 1 by 2050***

4.3. Data used in the projections

A cross country comparison of health care spending per capita.

As discussed above, although age is not the causal factor which drives changes in health care spending, the developments of the two variables over an individual's lifespan may be linked according to the general pattern which is broadly uniform across the countries. This pattern can be graphically presented as the age-related expenditure profile, showing the average spending on health care for each age cohort.

It is important to keep in mind that age-related expenditure profiles are not direct measures of morbidity or the need for health care services. They also encompass measures of other demand and supply factors that affect health care use, such as availability of services and treatments and age-related rationing. In effect, it is assumed that spending on health care is a proxy for morbidity, which changes proportionately to the evolution of the number of years spent in bad health: this assumption is needed as no reliable quantitative indicator of morbidity is available, especially one which is comparable across Member States.

Graph 4-2 presents the age-related expenditure profiles for Member States for which data is available. In brief, profiles were reported for the 2005 exercise by eighteen Member States (BE, CZ, DK, DE, ES, IT, LV, LT, LU, MT, NL, AT, PL, SI, SK, FI, SE, UK). Table 4-3 and Table 4-4 present some key figures on age-related expenditure, both in nominal terms and as % of GDP per capita, for certain male and female older age cohorts. Based on this data (see annex 5.1 for more details), the following remarks are warranted:

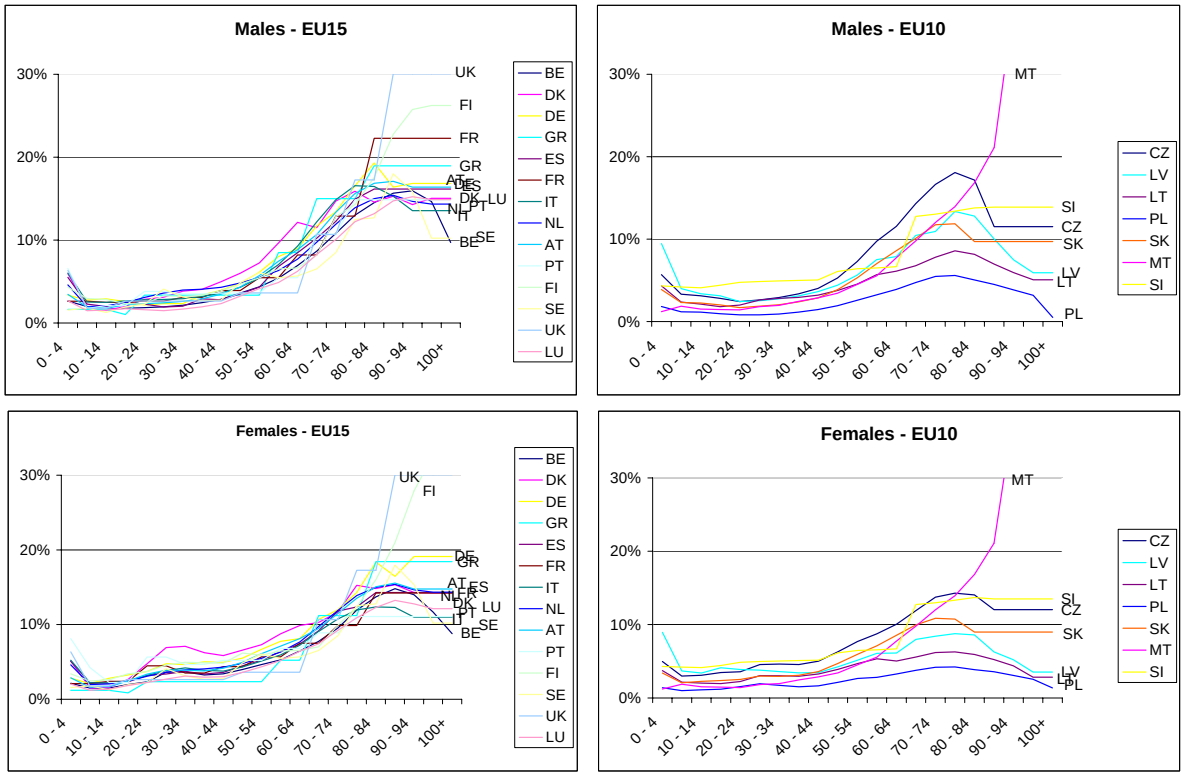
- in nearly all Member States, and for EU15 and EU10 aggregate, age-related expenditures for older cohorts are higher for males than for females;

- nominal spending on health is much higher in EU15 than EU10 countries. For example, in EU15 countries (excluding IE), for males aged 60-65, average spending amounted to €2117 and €1939 for females compared with €544 and €494 respectively in EU10 countries (excluding EE, CY, HU and MT). This gap grows with age. Average nominal spending for the cohort aged 60-64 in the EU15 is 4 times higher than in EU10 countries: this grow to 7 times higher for the cohort aged 90-94.

- expressed as a share of per capita GDP, there is an apparent difference in the age-related spending profiles between EU15 and EU10 countries[59]. First, in most EU15 countries, spending peaks at between 15 and 20% of per capita GDP compared to between 5 and 15% in available EU10 countries. Secondly, peak spending occurs somewhat later in EU15 countries in the cohort aged 85 to 90 compared with the EU10 where it occurs in the 75-80 cohort. Thirdly, there appears to be a much sharper tailing-off in spending for the oldest age-cohorts in EU10 countries, although the EU15 unweighted average figure is influenced by 'outlying' results for the UK and FI and considerable variation of data across the EU10 Member States. Spending for people aged 90-94 is on average 2.4 times higher than for people aged 60-64 in EU15 countries. In contrast, EU10 countries spend on the 90-94 years old only slightly more (120-130%) than on the 60-64 cohort.

[59] A significant exception is Malta where the shape of the age profile resembles much more that of the average EU15 country. This is why Maltese data has not been taken into account when calculating EU10 average profile. Furthermore, in all scenarios where composite age profiles are used both Malta and Cyprus have been assigned the EU15, rather than EU10, average profile.

Graph 4-2 Age related expenditure profiles for EU Member States, males and females



Source: National data

Table 4-3 A comparison of the age-related expenditure profiles – *males*

	Cohort aged 60-64		Cohort aged 70-74		Cohort aged 80-84		Cohort aged 90-94	
	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP
BE	1880	6,9	2933	10,8	3941	14,5	4330	15,9
CZ	975	11,5	1405	16,6	1449	17,1	972	11,5
DK	4384	12,2	5307	14,7	5252	14,6	5154	14,3
DE	2366	9,0	3539	13,4	5091	19,3	4442	16,8
EE	497	7,6	687	10,5	690	10,6	503	7,7
GR	1271	8,5	2245	15,0	2840	19,0	2840	19,0
ES	1676	8,5	2424	12,3	3196	16,2	3196	16,2
FR	2222	8,2	3496	12,9	6039	22,3	6039	22,3
IE	2800	7,7	4514	12,5	6034	16,6	6567	18,1
IT	2166	9,3	3471	14,9	3846	16,5	3163	13,5
CY	1314	7,7	2119	12,5	2833	16,6	3083	18,1
LV	373	7,9	517	10,9	605	12,8	355	7,5
LT	319	6,1	406	7,8	423	8,1	308	5,9
LU	3543	6,2	5725	10,1	7477	13,2	8646	15,2
HU	605	7,6	836	10,5	840	10,6	612	7,7
MT	847	7,8	1312	12,0	1839	16,8	4190	38,4
NL	2201	7,7	3409	11,9	4289	15,0	4193	14,7
AT	2524	8,8	3811	13,3	4811	16,9	4673	16,4
PL	200	3,9	280	5,5	259	5,1	196	3,8
PT	703	5,5	1379	10,7	1915	14,9	1915	14,9
SI	865	6,7	1692	13,0	1790	13,8	1802	13,9
SK	531	8,6	723	11,7	598	9,7	598	9,7
FI	1907	6,6	3681	12,8	5034	17,5	7388	25,8
SE	1759	5,7	2632	8,5	3936	12,7	4916	15,8
UK	1038	3,6	3053	10,7	4940	17,3	8599	30,1
EU15 average*	2117	7,6	3365	12,3	4472	16,4	4964	17,9
standard deviation*	*950*	*2,1*	*1130*	*2,0*	*1386*	*2,6*	*2064*	*4,8*
EU10 average**	544	7,5	837	10,9	854	11,1	705	8,7
standard deviation*	*312*	*2,6*	*577*	*3,9*	*616*	*4,3*	*604*	*3,7*
EU25 average***	1607	7,6	2545	11,9	3313	14,9	3710	16,3
standard deviation**	*1077*	*2,1*	*1528*	*2,6*	*2051*	*3,9*	*2585*	*7,9*

* unweighted average calculated without IE
** unweighted average calculated without EE, CY, HU, MT
*** unweighted average calculated without EE, IE, CY, HU
Note: For the countries with no individual age profile available, composite EU15 (IE, CY) or EU10 (EE, HU) age profiles applied

Table 4-4 A comparison of the age-related expenditure profiles – *females*

	Cohort aged 60-64		Cohort aged 70-74		Cohort aged 80-84		Cohort aged 90-94	
	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP	Level in nominal euros	Level as % of per capita GDP
BE	1759	6,5	2593	9,5	3727	13,7	3804	14,0
CZ	850	10,1	1161	13,7	1187	14,1	1018	12,0
DK	3564	9,9	4216	11,7	5348	14,8	5157	14,3
DE	2141	8,1	3164	12,0	4843	18,4	5042	19,1
EE	431	6,6	566	8,7	541	8,3	440	6,7
GR	781	5,2	1677	11,2	2758	18,4	2758	18,4
ES	1462	7,4	2334	11,8	2827	14,3	2827	14,3
FR	2037	7,5	2677	9,9	3857	14,2	3857	14,2
IE	2518	6,9	3854	10,6	5392	14,9	6110	16,9
IT	1694	7,3	2511	10,8	2889	12,4	2568	11,0
CY	1182	6,9	1810	10,6	2532	14,9	2869	16,9
LV	289	6,1	398	8,4	407	8,6	247	5,2
LT	261	5,0	322	6,2	308	5,9	228	4,4
LU	3646	6,4	5249	9,3	6972	12,3	7244	12,8
HU	524	6,6	689	8,7	658	8,3	535	6,7
MT	847	7,8	1312	12,0	1839	16,8	4190	38,4
NL	2201	7,7	3409	11,9	4289	15,0	4193	14,7
AT	2317	8,1	3284	11,5	4297	15,1	4215	14,8
PL	167	3,3	214	4,2	198	3,9	157	3,1
PT	878	6,8	1145	8,9	1427	11,1	1427	11,1
SI	869	6,7	1686	13,0	1777	13,7	1753	13,5
SK	526	8,5	669	10,9	553	9,0	553	9,0
FI	1875	6,5	2842	9,9	4596	16,0	8001	27,9
SE	1760	5,7	2637	8,5	3960	12,8	4761	15,3
UK	1038	3,6	3053	10,7	4940	17,3	8599	30,1
EU15 average*	1939	6,9	2914	10,5	4052	14,7	4604	16,6
standard deviation*	*853*	*1,5*	*1001*	*1,2*	*1347*	*2,2*	*2100*	*5,7*
EU10 average**	494	6,6	741	9,4	738	9,2	659	7,9
standard deviation*	*307*	*2,4*	*574*	*3,8*	*617*	*4,1*	*624*	*4,3*
EU25 average***	1474	6,9	2217	10,3	3000	13,2	3457	15,1
standard deviation**	*978*	*1,7*	*1329*	*2,2*	*1911*	*3,8*	*2502*	*8,4*

* unweighted average calculated without IE
** unweighted average calculated without EE, CY, HU, MT
*** unweighted average calculated without EE, IE, CY, HU
Note: For the countries with no individual age profile available, composite EU15 (IE, CY) or EU10 (EE, HU) age profiles applied

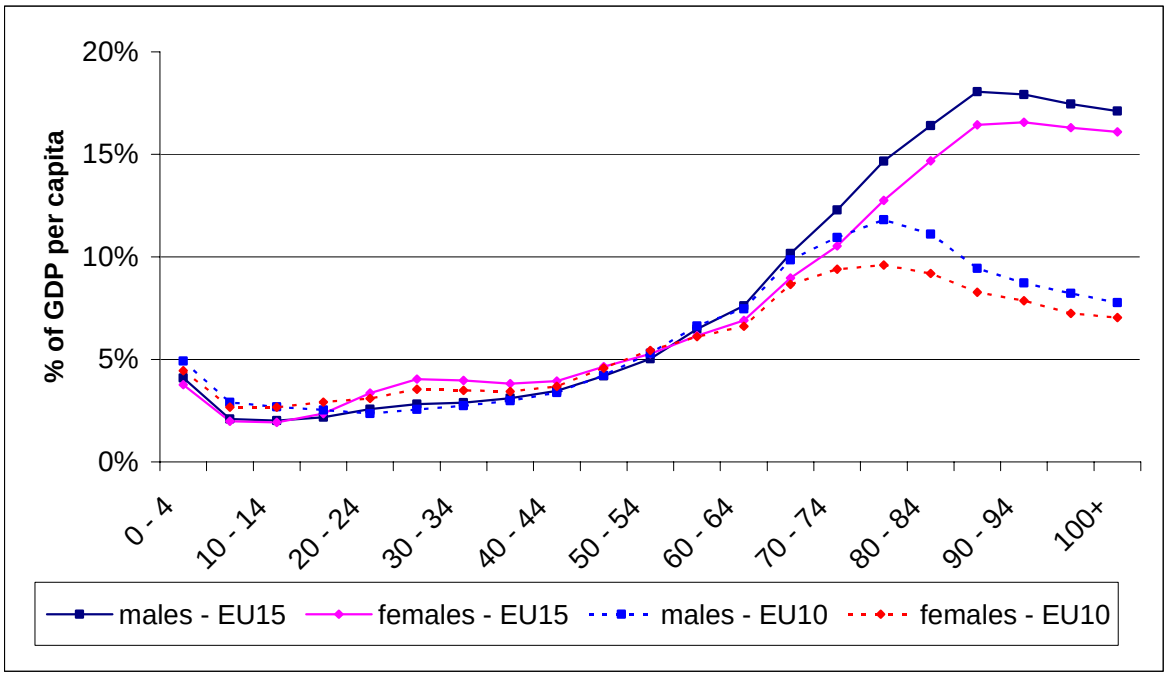
To be able to make projections for health care spending for all EU25 Member States, the following approach has been used for countries which did not provide age-related expenditure profiles to the AWG:

- profiles reported for the 2001 exercise adjusted to 2004 by applying GDP per capita growth rate have been used for three Member States (FR, GR, PT);

- for four countries (EE, IE, CY, HU) where no profiles exist, an 'average profile' was used, calculated as the unweighted average of per capita expenditure expressed as % of GDP per capita. Two separate profiles were established for EU10 and EU15, as there is a clear difference in the shape of the curve between the Old and the New Member States. As shown on Graph 4-3, the share of GDP per capita spent on health care is comparable, but the shape shows an increasing gap in spending on people in their older ages.

- Actual data on total spending on health care have been reported by Member States and used in the base year of the projection.

Graph 4-3 Average age-related expenditure profiles for the EU15 and EU10 (males and females)



Source: National data

Available empirical evidence on death-related costs

An item that deserves a special consideration in the present long-term projections of health care expenditure is incorporation of death-related costs (or costs related to the number of remaining years of life) to the projection methodology, which is a significant step forward in comparison to the previous round of projections.

The rationale behind stems from empirical evidence that the last years of life, irrespective of how long people live, are associated with high health care costs. Consequently, the decline in

the number of people who, in a given age group, have few remaining years of life, results in the fall in average health care cost for all age groups, except for the oldest age cohorts[60].

To quantify the significance of death related costs, data is needed on the difference in health care costs borne by decedents (people who are going to die within a predefined short period of time) and survivors (people who are not in their terminal phase of life). Eight Member States provided the AWG with data on death related costs from a variety of national sources, namely BE, CZ, DK, ES, IT, NL, AT and PL (see annex 5.4 for more details on the data used as well as additional estimates of death-related costs from academic sources). Table 4-5 and Table 4-6 summarise the general characteristics of available data from national sources on death related costs for males and females respectively. In particular, it shows the ratio of spending on a person of a particular age who dies within one year compared with a person who survives that period. For example, spending on an average male child aged 0-4 who dies within a particular year is on average 25.9 times higher compared with an average child of the same age who survives.

There appears to be a clear pattern of decline in the ratio of spending on decedents to survivors with age. Moreover, while the ratios diverge widely across countries at younger age cohorts, there is less dispersion amongst older age cohorts where most deaths occur. However, due to different methodologies of data gathering, calculation (e.g. ratio of decedents to survivors differs when calculated on the basis of per capita and per patient spending) and coverage (e.g. either only hospital patients or also other cases taken into account), the data varies significantly across the Member States. For example, Spain[61] and Austria[62] appear to be outliers for both males and females across all age cohorts, with a respectively much lower and higher ratio compared with other countries.

Given the wide divergences in the report estimates of death-related costs, and taking account of the fact that no data is available for the majority of Member States, the budgetary projections for the death-related costs scenario were run, for all Member States on the basis of "average" death-related costs profile calculated as unweighted average of available datasets (it is shown in the final column of Table 4-5 and Table 4-6).

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[60] This observation shows that the proposed method is theoretically consistent with the so called 'dynamic equilibrium hypothesis', according to which falling mortality rate (and thus growing life expectancy) for each age cohort is associated with a parallel decline in morbidity/disability rate, which results in a fall in health care spending in each age cohort.

[61] The Spanish case provides an example of how sensitive are the results to changes in the methodology of calculating 'death-related costs'. The ratio used in the projections (ranging from around 7 for the age cohorts 5-35 to 1.3 for the 80+) is calculated by dividing *per patient* cost of decedents (patients) by the *per patient* cost of survivors (patients). Meanwhile, using a different methodology of dividing the *per discharge* cost of decedent (discharges) by the *per capita* cost of survival discharges, gives extremely different results, ranging from 228 for age cohort 10-14 to 7 for the 80+.

[62] Given lack of precise information about costs borne by people dying outside hospitals, Austria has provided two sets of data according to two opposite (extreme) assumptions: in the first case deaths occurring outside hospitals are assumed not to generate any costs at all, while in the second case death cases outside hospitals are assumed to cause the same costs as those in hospitals. The ratio of costs borne by decedents to those of survivors shows similar decreasing pattern with age, but differs significantly in value between the two situations: while in the first dataset it ranges from 74.2 for age cohort 10-14 to 3.1 for the 85+, in the second dataset it amounts to 121.6 for the aged 10-14 and 7.3 for the 85+.

Table 4-5 Ratio between cost borne by a decedent and a survivor, by age cohort - males

Males	BE	CZ	DK	ES	IT	NL	AT	PL	*EU average*
0 - 4	12,1	34,5	4,5	3,4	68,0	31,7	27,0	25,7	*25,9*
5 - 9	33,3	55,3	77,4	6,4	79,5	39,6	104,8	47,0	*55,4*
10 - 14	27,7	74,0	8,7	6,9	73,1	26,9	121,6	40,7	*47,4*
15 - 19	10,7	31,0	1,1	4,1	38,7	21,6	64,7	29,5	*25,2*
20 - 24	8,9	17,1	0,3	3,3	26,0	47,4	41,7	23,0	*21,0*
25 - 29	9,4	19,1	12,0	3,9	29,0	38,0	57,7	27,4	*24,6*
30 - 34	13,6	23,1	11,4	3,2	30,4	25,3	48,1	21,2	*22,0*
35 - 39	14,3	20,2	7,1	2,8	40,5	26,7	42,9	18,3	*21,6*
40 - 44	12,4	19,2	6,3	2,6	35,3	17,0	34,6	13,6	*17,6*
45 - 49	11,0	16,8	8,2	2,3	30,9	15,1	31,4	11,1	*15,9*
50 - 54	10,1	11,0	7,5	2,3	21,1	14,2	21,4	8,9	*12,1*
55 - 59	9,5	8,1	7,5	2,2	17,1	8,8	18,9	7,8	*10,0*
60 - 64	7,4	7,2	6,2	2,0	12,1	8,3	16,3	6,6	*8,3*
65 - 69	5,5	5,4	5,0	1,8	8,5	6,4	13,2	5,6	*6,4*
70 - 74	4,5	4,3	4,4	1,7	6,2	5,1	11,6	4,5	*5,3*
75 - 79	3,3	3,5	2,8	1,6	4,5	4,1	8,9	3,9	*4,1*
80 - 84	2,8	2,8	2,0	1,3	3,3	3,4	8,0	3,3	*3,4*
85 - 89	2,1	2,3	1,7	1,3	2,5	3,0	7,3	3,0	*2,9*
90 - 94	1,7	2,3	1,4	1,3	1,7	2,5	7,3	2,9	*2,6*
95 - 99	1,4	2,3	1,6	1,3	1,7	2,0	7,3	3,0	*2,6*
100+	0,7	2,3	1,6	1,3	1,7	2,0	7,3	3,0	*2,5*

Source: National sources with ECFIN calculations

Table 4-6 Ratio between cost borne by a decedent and a survivor, by age cohort - females

Females	BE	CZ	DK	ES	IT	NL	AT	PL	*EU average*
0 - 4	20,1	43,5	4,0	3,4	79,5	79,1	39,1	39,7	*38,5*
5 - 9	33,0	48,2	58,4	6,9	163,0	60,0	153,0	50,3	*71,6*
10 - 14	9,5	42,5	14,5	6,3	101,4	43,3	120,4	49,3	*48,4*
15 - 19	21,1	26,2	1,3	7,0	46,7	24,7	69,1	37,3	*29,2*
20 - 24	11,7	26,2	0,3	7,1	32,5	33,2	87,3	26,1	*28,0*
25 - 29	13,1	28,7	12,1	5,9	25,5	10,4	41,3	24,5	*20,2*
30 - 34	11,4	32,0	12,7	6,2	28,4	18,9	33,4	25,6	*21,1*
35 - 39	11,7	25,7	6,0	4,6	37,2	23,5	29,6	23,0	*20,2*
40 - 44	13,8	20,4	5,9	3,2	40,7	18,1	33,9	20,5	*19,6*
45 - 49	14,3	17,1	7,2	2,8	31,5	17,2	28,0	15,1	*16,6*
50 - 54	12,1	13,6	7,0	2,6	26,9	15,5	25,7	12,3	*14,5*
55 - 59	10,4	10,7	6,8	2,4	23,7	12,9	22,0	10,9	*12,5*
60 - 64	9,6	10,0	6,0	2,3	16,8	12,4	20,6	9,3	*10,9*
65 - 69	6,8	6,8	5,0	2,1	11,9	8,3	15,0	7,4	*7,9*
70 - 74	5,0	5,1	4,3	1,8	8,2	6,4	11,0	5,6	*5,9*
75 - 79	3,5	3,7	2,9	1,6	5,4	4,6	8,9	4,4	*4,4*
80 - 84	2,5	2,9	2,1	1,3	3,8	3,1	7,1	3,7	*3,3*
85 - 89	1,8	2,2	1,7	1,3	2,6	2,5	6,5	3,3	*2,7*
90 - 94	1,4	2,2	1,4	1,3	1,7	2,0	6,5	2,8	*2,4*
95 - 99	1,1	2,2	1,8	1,3	1,7	1,7	6,5	2,6	*2,4*
100+	0,9	2,2	1,8	1,3	1,7	1,7	6,5	2,6	*2,3*

Source: National sources with ECFIN calculations

Income elasticity of health care spending – historical evidence

In order to analyse the past developments in income elasticity of health care spending and find the value of elasticity which could be used in the projection exercise, a simple analysis of the past trends has been done. For that purpose, the growth in health care spending over the last 10, 20 and 30 years has been compared with GDP growth rate.

The results, based on the OECD Health Data 2005, are presented in the table below. Left panel presents the elasticity of *total* spending on health care and right panel the elasticity of *public* spending on health care for nineteen countries being members of the European Union and the OECD.

Table 4-7 Elasticity of health care spending per capita with respect to GDP per capita

	Total health care spending					Public health care spending				
	2002-1992	2002-1982		2002-1972		2002-1992	2002-1982		2002-1972	
Austria	1,88	1,28		1,56		0,55	1,15		1,73	
Belgium	3,34	1,45		2,34		:	:		:	
Czech Republic	1,70	:		:		1,59	:		:	
Denmark	1,40	0,92		1,11		1,37	0,84		1,09	
Finland	-0,40	1,14		1,25		-0,62	1,05		1,35	
France	3,20	1,76	2002-1980	1,91	2002-1970	2,99	1,62	2002-1980	1,93	2002-1970
Germany	-1,79	1,43		1,70		-0,93	1,44		1,78	
Greece	2,13	1,80	2002-1980	1,68	2002-1970	1,79	1,63	2002-1980	2,08	2002-1970
Hungary	1,03	:		:		0,55	:		:	
Ireland	1,08	0,93		1,21		1,19	0,85		1,21	
Italy	0,38	1,32	2002-1988	:		0,84	1,22	2002-1988	:	
Luxembourg	0,97	1,02		1,77	2002-1970	0,70	0,92		1,70	2002-1970
Netherlands	1,65	1,28		1,41		0,65	1,07		1,46	
Poland	0,96	:		:		0,85	:		:	
Portugal	3,15	1,77		2,93		4,72	2,29		3,49	
Slovak Republic	0,78	2002-1997 :		:		0,56	2002-1997 :		:	
Spain	2,01	1,47		1,86		0,26	1,28		1,99	
Sweden	0,13	0,98		1,34		0,32	0,85		1,32	
United Kingdom	1,39	1,49		1,73		1,33	1,40		1,63	
Unweighted average	1,32	1,34		1,70		1,04	1,26		1,75	
Standard deviation	1,25	0,30		0,48		1,27	0,40		0,61	

Source: OECD Health Data 2005

Three different time periods have been analysed where available: last 10, 20 and 30 years by 2002 which is the latest year in which data for most Member States were available. The availability of the data depends on the time period concerned. It is almost complete for the last 10 years and decreases as the time frame gets larger.

As shown in the table, elasticity decreases as the time frame gets longer into the past. This broadly confirms the theoretical finding that health care spending is less and less sensitive to changes in national income. However, a period of 10 years seems not to be a sufficient reference period, given high volatility of results across countries (see standard deviation) and high dependence of total and especially public health care spending on short and medium-term political decisions. In this context, the figures on elasticity over the last 20 and 30 years seem much more reliable, even if the measuring techniques were arguably less sophisticated in the 1970s and 1980s than they are now.

A strong drawback of presented analysis is the lack of data for the New Member States. The OECD database includes only four new Member States (CZ, HU, PL, SK), but even for them the time series available are relatively short (5-15 years). This makes it difficult to estimate the current value of elasticity for all EU10 countries.

Existing caveats and prospects for improvement

Arguably, the agreed methodology has limitations and the following caveats should be borne in mind:

- ideally, projections should take into account changes in the health care status of the population over time, looking at the prevalence of different medical conditions (which may change over time linked to factors such as lifestyle) and the costs of treating each medical condition (which may be affected by technological developments). While a projection methodology looking at specific medical conditions may be feasible at a national level (see Holly 2005), it is not a practical approach for a cross-country projection exercise given the lack of comparable epidemiological data on the health status across EU populations in a base year. The only comparable data that is available is essentially of a macro nature. While lack of comparable data is a constraint for this projection exercise, the situation may

improve in coming years. For example, results have recently become available from the first SHARE survey on the economic, social and health conditions for 13 countries (see Börsch-Supan et al. 2005). SHARE is financed under the 5th Research Framework Programme of the EU.

- health care spending is to a large extent determined by the policy decisions of national governments, e.g. whether specific treatment are provided by public health systems, the coverage of people eligible for public health services, the 'quality' of public health care (policy choices/preferences for waiting lists, size of hospital wards, etc.). The different institutional arrangements of health care systems across Member States imply that these factors cannot be taken into account in projections made at a multilateral level, although they can be included in national projections when clear policy goals/targets exist (see Wanless 2002).

4.4. Results of the budgetary projection exercise

4.4.1. Pure ageing scenario

Table 4-8 presents the projection results for the *pure ageing* scenario under the assumption that costs evolve in line with GDP per capita (scenario I). Public spending on health care is projected to increase by between 1 and 2 percentage points of GDP in most Member States between 2004 and 2050. Despite their less favourable demographic prospects, public spending on health is projected to grow by less in the EU10 than in the EU15 countries, i.e. on average by 0.5% of GDP. This reflects both lower initial level of spending (4.9% compared to 6.4% of GDP in 2004) and their flatter age-related expenditure profiles.

Table 4-8 Projection results for the *pure ageing scenario* (I): public spending on health care as % of GDP

	Projected spending as % of GDP				
	2004	**2010**	**2030**	**2050**	***change 2004-2050***
BE	6,2	6,4	7,3	7,7	*1,5*
DK	6,9	7,0	7,7	8,0	*1,1*
DE	6,0	6,3	7,0	7,3	*1,3*
GR	5,1	5,3	5,9	6,9	*1,8*
ES	6,1	6,3	7,3	8,3	*2,2*
FR	7,7	8,0	9,0	9,5	*1,8*
IE	5,3	5,5	6,4	7,3	*2,0*
IT	5,8	6,0	6,7	7,2	*1,4*
LU	5,1	5,2	5,8	6,2	*1,1*
NL	6,1	6,3	7,1	7,4	*1,3*
AT	5,3	5,5	6,3	6,9	*1,7*
PT	6,7	6,8	6,7	7,3	*0,6*
FI	5,6	5,8	6,7	7,0	*1,5*
SE	6,7	6,8	7,5	7,8	*1,0*
UK	7,0	7,2	8,3	9,3	*2,3*
CY	2,9	3,1	3,6	4,0	*1,1*
CZ	6,4	6,7	7,7	8,3	*1,9*
EE	5,4	5,6	6,0	6,3	*0,9*
HU	5,5	5,7	6,2	6,5	*1,0*
LT	3,7	3,8	4,1	4,4	*0,7*
LV	5,1	5,3	5,6	5,9	*0,7*
MT	4,2	4,5	5,6	6,2	*2,0*
PL	4,1	4,3	5,0	5,4	*1,3*
SK	4,4	4,6	5,5	6,1	*1,8*
SI	6,4	6,6	7,4	7,8	*1,4*
EU25	*6,4*	*6,6*	*7,4*	*8,1*	*1,7*
EU15	*6,4*	*6,7*	*7,5*	*8,2*	*1,7*
EU12	*6,3*	*6,5*	*7,3*	*7,9*	*1,6*
EU10	*4,9*	*5,1*	*5,7*	*6,1*	*1,2*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.4.2. Scenario on the health status

Table 4-9 presents the projection results for the *constant health* scenario under the assumption that costs evolve in line with GDP per capita. It also compares the difference in projection results with the results for the *pure ageing* scenario outlined on Table 4-8 above. As expected, improved health care status will attenuate future pressure on health care spending. If one assumes that healthy life expectancy increases at the same pace as the projected gains in total age-specific life expectancy (*constant health* scenario), then the projected increase in health care spending due to ageing (represented by *pure ageing* scenario) would be halved. For the EU15 countries, public spending on health in the *constant health* scenario is projected to increase by only 0.9% of GDP (0.6% in the EU10 countries) compared with 1.7% (1.2%) in the *pure ageing* scenario. Most of the projected expenditure savings compared with the *pure ageing* scenario appear to materialise before 2030.

Table 4-9 Projection results for *constant health* scenario (II)

	Projected spending as % of GDP					Difference as % of GDP compared to pure ageing scenario		
	2004	2010	2030	2050	*change 2004-2050*	2010	2030	2050
BE	6,2	6,2	6,6	6,9	*0,7*	-0,2	-0,6	-0,8
DK	6,9	6,8	7,2	7,1	*0,3*	-0,2	-0,6	-0,8
DE	6,0	6,1	6,4	6,7	*0,6*	-0,1	-0,5	-0,7
GR	5,1	5,3	5,5	6,3	*1,2*	-0,1	-0,4	-0,6
ES	6,1	6,1	6,8	7,7	*1,6*	-0,1	-0,5	-0,6
FR	7,7	7,8	8,4	8,8	*1,1*	-0,2	-0,6	-0,7
IE	5,3	5,3	5,8	6,4	*1,1*	-0,1	-0,6	-0,8
IT	5,8	5,8	6,3	6,6	*0,8*	-0,1	-0,4	-0,5
LU	5,1	5,1	5,4	5,6	*0,5*	-0,1	-0,4	-0,6
NL	6,1	6,2	6,8	6,9	*0,8*	-0,1	-0,3	-0,5
AT	5,3	5,3	5,8	6,3	*1,0*	-0,1	-0,5	-0,7
PT	6,7	6,7	6,2	6,6	*-0,1*	-0,1	-0,5	-0,7
FI	5,6	5,6	6,2	6,4	*0,9*	-0,1	-0,5	-0,6
SE	6,7	6,7	6,9	7,0	*0,3*	-0,1	-0,5	-0,8
UK	7,0	7,0	7,4	7,9	*0,9*	-0,2	-0,9	-1,4
CY	2,9	3,0	3,3	3,6	*0,7*	-0,1	-0,2	-0,4
CZ	6,4	6,6	7,1	7,5	*1,0*	-0,1	-0,7	-0,9
EE	5,4	5,5	5,5	5,7	*0,2*	-0,1	-0,4	-0,7
HU	5,5	5,5	5,6	5,8	*0,3*	-0,1	-0,5	-0,7
LT	3,7	3,8	3,9	4,0	*0,3*	0,0	-0,2	-0,4
LV	5,1	5,3	5,2	5,3	*0,2*	-0,1	-0,4	-0,5
MT	4,2	4,4	5,1	5,5	*1,2*	-0,1	-0,5	-0,7
PL	4,1	4,2	4,5	4,8	*0,7*	-0,1	-0,4	-0,6
SK	4,4	4,5	5,0	5,5	*1,1*	-0,1	-0,5	-0,7
SI	6,4	6,6	7,0	7,3	*0,9*	-0,1	-0,4	-0,5
EU25	*6,4*	*6,4*	*6,8*	*7,3*	*0,9*	*-0,1*	*-0,6*	*-0,8*
EU15	*6,4*	*6,5*	*6,9*	*7,4*	*0,9*	*-0,1*	*-0,6*	*-0,8*
EU12	*6,3*	*6,4*	*6,8*	*7,2*	*0,9*	*-0,1*	*-0,5*	*-0,7*
EU10	*4,9*	*5,0*	*5,2*	*5,5*	*0,6*	*-0,1*	*-0,5*	*-0,6*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.4.3. Death-related costs

Table 4-10 shows the budgetary projection results for the death-related costs scenario[63]. The projection is made using the baseline population projection and assuming costs evolve in line with GDP per capita. Taking death-related costs into account when projecting future health

[63] To run scenario VI on death related costs, the following additional data inputs were also used (i) life expectancy in each single year of life and gender, by single year of time over the period 2004-2050 based on the AWG population scenario described in chapter 2.1, (ii) projections on the mortality rate for each single year of life and gender, by single year of time over the period 2004-2050 based on the AWG population scenario, (iii) the average expenditure per capita on health care disaggregated by 5-year age groups and by gender (expressed in euros) as used the *pure ageing* scenario, (iv) GDP per capita growth over the period 2004-2050 based on in agreed underlying assumptions and reported on table 4-6 in Annex 4.

care spending leads to a considerable reduction of expenditure in comparison with the pure ageing scenario over the whole projection period. Public spending on health care is projected to increase by on average 1.3% of GDP, i.e. about 0.4 p.p. of GDP less than in pure ageing scenario. However, the extent of projected changes varies significantly, ranging from 0.2% of GDP in PT to an increase by 1.9% of GDP in ES). Overall, the projected change in public spending on health care is close to projection results for the *constant health* scenario (II) inspired by the dynamic equilibrium hypothesis. As in the other scenarios reflecting changes in health status of the populations, the projected increase in spending is somewhat lower in EU10 than EU15 countries (due to lower initial levels of spending but also to their flatter age-related expenditure profiles described in the previous section).

Table 4-10 Projection results for the death-related costs scenario (III)

	Projected spending as % of GDP					Difference as % of GDP compared to pure ageing scenario		
	2004	2010	2030	2050	change 2004-2050	2010	2030	2050
BE	6,2	6,4	6,9	7,3	*1,1*	0,0	-0,3	-0,4
DK	6,9	6,9	7,5	7,6	*0,7*	-0,1	-0,3	-0,4
DE	6,0	6,2	6,8	7,0	*1,0*	-0,1	-0,2	-0,3
GR	5,1	5,3	5,7	6,5	*1,4*	0,0	-0,2	-0,4
ES	6,1	6,2	7,1	8,0	*1,9*	-0,1	-0,2	-0,4
FR	7,7	7,9	8,7	9,1	*1,4*	-0,1	-0,3	-0,4
IE	5,3	5,4	6,1	6,8	*1,5*	-0,1	-0,3	-0,5
IT	5,8	5,9	6,5	6,8	*1,1*	0,0	-0,2	-0,3
LU	5,1	5,2	5,7	6,0	*0,8*	0,0	-0,1	-0,2
NL	6,1	6,2	6,9	7,1	*1,0*	0,0	-0,2	-0,3
AT	5,3	5,4	6,1	6,6	*1,3*	-0,1	-0,2	-0,4
PT	6,7	6,8	6,5	6,9	*0,2*	-0,1	-0,2	-0,4
FI	5,6	5,7	6,4	6,7	*1,1*	-0,1	-0,2	-0,4
SE	6,7	6,8	7,2	7,5	*0,7*	0,0	-0,2	-0,3
UK	7,0	7,1	8,0	8,8	*1,8*	-0,1	-0,3	-0,5
CY	2,9	3,0	3,4	3,8	*0,9*	0,0	-0,1	-0,2
CZ	6,4	6,6	7,4	7,8	*1,4*	-0,1	-0,3	-0,5
EE	5,4	5,6	5,7	5,9	*0,5*	0,0	-0,2	-0,4
HU	5,5	5,6	5,8	6,0	*0,5*	-0,1	-0,3	-0,6
LT	3,7	3,8	4,0	4,1	*0,4*	0,0	-0,1	-0,3
LV	5,1	5,3	5,4	5,5	*0,4*	0,0	-0,2	-0,3
MT	4,2	4,4	5,1	5,4	*1,1*	-0,1	-0,4	-0,8
PL	4,1	4,3	4,8	5,0	*0,9*	0,0	-0,2	-0,4
SK	4,4	4,6	5,3	5,7	*1,3*	0,0	-0,3	-0,4
SI	6,4	6,6	7,1	7,4	*1,0*	-0,1	-0,3	-0,4
EU25	*6,4*	*6,5*	*7,2*	*7,7*	*1,3*	*-0,1*	*-0,2*	*-0,4*
EU15	*6,4*	*6,6*	*7,3*	*7,8*	*1,4*	*-0,1*	*-0,2*	*-0,4*
EU12	*6,3*	*6,5*	*7,1*	*7,6*	*1,3*	*-0,1*	*-0,2*	*-0,3*
EU10	*4,9*	*5,0*	*5,4*	*5,7*	*0,8*	*-0,1*	*-0,3*	*-0,4*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.4.4. Income elasticity of demand

As discussed in EPC and European Commission (2005b), there is strong empirical evidence as regards the link between per capita national income and public expenditure on health care as a share of GDP. Scenario IV is the same as the *pure ageing* scenario (I) in all respects except the income elasticity of public spending is assumed to be 1.1 in the base year of 2004 and thereafter converge to 1 by the end of the projection period in 2050. As expected, higher responsiveness of health care spending to the national income results in proportionately higher expenditure linked to each percentage point of GDP per capita growth, even though this effect declines as elasticity converges to 1 at the end of projection period. Given the agreed assumptions, total spending on health care is projected to increase on average by 2.0% of GDP, i.e. 0.3% of GDP more than in the *pure ageing* scenario. In nominal terms EU15 can expect higher increase than EU10 (2.1% compared to 1.7% of GDP), but in terms of percentage increase spending in EU10 countries is projected to marginally exceed that in EU15.

Table 4-11 Projection results for scenario IV capturing a positive income elasticity of demand for health care spending

	Projected spending as % of GDP					Difference as % of GDP compared to pure ageing scenario		
	2004	2010	2030	2050	*change 2004-2050*	2010	2030	2050
BE	6,2	6,5	7,5	8,0	*1,8*	0,1	0,2	0,3
DK	6,9	7,1	8,0	8,3	*1,4*	0,1	0,2	0,3
DE	6,0	6,3	7,2	7,6	*1,6*	0,1	0,2	0,3
GR	5,1	5,4	6,1	7,2	*2,1*	0,1	0,2	0,2
ES	6,1	6,3	7,6	8,7	*2,6*	0,1	0,3	0,3
FR	7,7	8,1	9,2	9,9	*2,2*	0,1	0,3	0,3
IE	5,3	5,6	6,8	7,7	*2,4*	0,1	0,4	0,5
IT	5,8	6,0	6,9	7,4	*1,6*	0,1	0,2	0,3
LU	5,1	5,4	6,2	6,7	*1,5*	0,1	0,4	0,5
NL	6,1	6,3	7,3	7,7	*1,6*	0,0	0,2	0,2
AT	5,3	5,5	6,5	7,2	*1,9*	0,1	0,2	0,3
PT	6,7	6,9	6,9	7,5	*0,8*	0,1	0,2	0,3
FI	5,6	5,8	6,9	7,3	*1,8*	0,1	0,2	0,3
SE	6,7	6,9	7,8	8,1	*1,4*	0,1	0,3	0,4
UK	7,0	7,3	8,6	9,7	*2,7*	0,1	0,3	0,4
CY	2,9	3,1	3,8	4,2	*1,3*	0,1	0,2	0,3
CZ	6,4	6,8	8,2	8,9	*2,4*	0,1	0,5	0,5
EE	5,4	5,8	6,5	6,9	*1,5*	0,2	0,5	0,6
HU	5,5	5,8	6,6	6,9	*1,4*	0,1	0,4	0,4
LT	3,7	4,0	4,5	4,8	*1,1*	0,1	0,4	0,4
LV	5,1	5,6	6,1	6,5	*1,4*	0,2	0,6	0,6
MT	4,2	4,6	5,8	6,5	*2,2*	0,0	0,2	0,3
PL	4,1	4,4	5,4	5,8	*1,7*	0,1	0,4	0,4
SK	4,4	4,7	6,0	6,7	*2,3*	0,1	0,4	0,5
SI	6,4	6,8	7,8	8,3	*1,9*	0,1	0,4	0,5
EU25	*6,4*	*6,7*	*7,7*	*8,4*	*2,0*	*0,1*	*0,3*	*0,3*
EU15	*6,4*	*6,7*	*7,8*	*8,5*	*2,1*	*0,1*	*0,3*	*0,3*
EU12	*6,3*	*6,6*	*7,6*	*8,2*	*1,9*	*0,1*	*0,2*	*0,3*
EU10	*4,9*	*5,2*	*6,1*	*6,6*	*1,7*	*0,1*	*0,4*	*0,5*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.4.5. Unit costs evolve in line with GDP per worker

Table 4-12 presents the results for scenario V where unit costs evolve in line with GDP per worker. Public spending on health care is projected to increase by between 0.7 and 3.6 percentage points of GDP in most Member States between 2004 and 2050, with a noticeable exception of LU, where spending is expected to fall. As expected, dispersion of results appears higher than in *pure ageing* scenario and the projected expenditure increases are in most countries higher when unit costs evolve in line with GDP per worker compared with GDP per capita. For the EU25, average spending on health care is projected to increase by 2.3% of GDP by 2050 if costs evolve in line with GDP per capita compared with a projected increase of 1.7% of GDP if costs evolve in line with GDP per worker.

Table 4-12 Projection results for scenario V where unit costs evolve in line with GDP per worker

	Projected spending as % of GDP					Difference as % of GDP compared to pure ageing scenario		
	2004	2010	2030	2050	*change 2004-2050*	2010	2030	2050
BE	6,2	6,2	7,4	8,1	*1,9*	-0,2	0,1	0,4
DK	6,9	7,0	8,3	8,6	*1,7*	0,0	0,5	0,6
DE	6,0	6,0	7,0	7,8	*1,8*	-0,3	0,1	0,5
GR	5,1	5,2	6,0	7,9	*2,8*	-0,1	0,1	1,0
ES	6,1	5,9	7,0	9,4	*3,3*	-0,3	-0,3	1,1
FR	7,7	7,8	9,2	10,1	*2,4*	-0,2	0,2	0,6
IE	5,3	5,2	6,1	7,7	*2,4*	-0,2	-0,3	0,5
IT	5,8	5,7	6,5	7,8	*2,0*	-0,3	-0,2	0,6
LU	5,1	4,9	5,2	4,9	*-0,2*	-0,3	-0,5	-1,3
NL	6,1	6,2	7,6	7,9	*1,8*	-0,1	0,5	0,4
AT	5,3	5,3	6,6	7,6	*2,4*	-0,2	0,2	0,7
PT	6,7	6,7	6,9	8,5	*1,8*	-0,1	0,2	1,2
FI	5,6	5,7	7,1	7,5	*2,0*	-0,1	0,5	0,5
SE	6,7	6,7	7,8	8,1	*1,4*	-0,1	0,3	0,3
UK	7,0	7,0	8,6	10,0	*3,0*	-0,1	0,3	0,7
CY	2,9	2,9	3,5	4,2	*1,3*	-0,1	0,0	0,2
CZ	6,4	6,6	7,9	9,8	*3,4*	-0,1	0,2	1,5
EE	5,4	5,2	5,7	6,5	*1,1*	-0,4	-0,2	0,2
HU	5,5	5,4	6,0	7,1	*1,6*	-0,2	-0,1	0,6
LT	3,7	3,5	3,8	4,4	*0,7*	-0,3	-0,3	0,0
LV	5,1	4,8	5,2	6,1	*0,9*	-0,5	-0,3	0,2
MT	4,2	4,4	5,5	6,4	*2,2*	-0,1	-0,1	0,2
PL	4,1	4,0	4,4	5,4	*1,3*	-0,3	-0,6	0,0
SK	4,4	4,4	5,0	6,6	*2,2*	-0,2	-0,6	0,5
SI	6,4	6,5	8,0	9,4	*2,9*	-0,1	0,6	1,5
EU25	*6,4*	*6,4*	*7,5*	*8,7*	*2,3*	*-0,2*	*0,1*	*0,6*
EU15	*6,4*	*6,5*	*7,7*	*8,8*	*2,4*	*-0,2*	*0,1*	*0,6*
EU12	*6,3*	*6,3*	*7,4*	*8,5*	*2,2*	*-0,2*	*0,0*	*0,6*
EU10	*4,9*	*4,9*	*5,4*	*6,6*	*1,7*	*-0,2*	*-0,3*	*0,5*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.4.6. An AWG reference scenario

This scenario combines a number of elements in the scenarios described above. In particular, in order to approximate the effect of death-related costs, it assumes the health status to improve by half as much as in the *constant health* scenario. Moreover, it includes the effect of income elasticity of health care spending converging from 1.1 in the base year to unity by 2050, while the costs are assumed to evolve following GDP per capita developments.

The results show the impact of two separate effects partially offsetting each other. In EU15 countries the reduction in spending due to health effect is expected to be somewhat larger than extra spending due to higher income elasticity, thus average increase in expenditure (1.6% of GDP between 2004 and 2050) is expected to be marginally lower than the level predicted by the *pure ageing* scenario (1.7% of GDP). The opposite applies to the EU10 countries where income effect slightly exceeds health effect and *AWG reference* scenario produces higher results than *pure ageing* scenario.

Table 4-13 Projection results for AWG reference scenario

	Projected spending as % of GDP					Difference as % of GDP compared to pure ageing scenario		
	2004	2010	2030	2050	*change 2004-2050*	2010	2030	2050
BE	6,2	6,4	7,1	7,6	*1,4*	0,0	-0,1	-0,1
DK	6,9	7,0	7,7	7,8	*1,0*	0,0	-0,1	-0,1
DE	6,0	6,3	6,9	7,2	*1,2*	0,0	-0,1	-0,1
GR	5,1	5,4	5,9	6,8	*1,7*	0,0	0,0	-0,1
ES	6,1	6,3	7,3	8,3	*2,2*	0,0	0,0	0,0
FR	7,7	8,0	8,9	9,5	*1,8*	0,0	0,0	-0,1
IE	5,3	5,5	6,4	7,3	*2,0*	0,1	0,1	0,0
IT	5,8	6,0	6,7	7,1	*1,3*	0,0	0,0	0,0
LU	5,1	5,3	5,9	6,3	*1,2*	0,1	0,1	0,1
NL	6,1	6,3	7,1	7,4	*1,3*	0,0	0,0	0,0
AT	5,3	5,5	6,3	6,8	*1,6*	0,0	-0,1	-0,1
PT	6,7	6,8	6,6	7,2	*0,5*	0,0	-0,1	-0,1
FI	5,6	5,8	6,6	7,0	*1,4*	0,0	0,0	0,0
SE	6,7	6,8	7,5	7,7	*1,0*	0,0	0,0	0,0
UK	7,0	7,2	8,1	8,9	*1,9*	0,0	-0,2	-0,4
CY	2,9	3,1	3,6	4,0	*1,1*	0,0	0,1	0,1
CZ	6,4	6,8	7,8	8,4	*2,0*	0,1	0,1	0,1
EE	5,4	5,8	6,2	6,5	*1,1*	0,2	0,3	0,2
HU	5,5	5,7	6,3	6,5	*1,0*	0,1	0,1	0,0
LT	3,7	4,0	4,4	4,6	*0,9*	0,1	0,2	0,2
LV	5,1	5,5	5,9	6,2	*1,1*	0,2	0,4	0,3
MT	4,2	4,5	5,5	6,1	*1,8*	0,0	0,0	-0,1
PL	4,1	4,4	5,1	5,5	*1,4*	0,1	0,1	0,1
SK	4,4	4,7	5,7	6,3	*1,9*	0,1	0,2	0,1
SI	6,4	6,7	7,6	8,0	*1,6*	0,1	0,2	0,2
EU25	*6,4*	*6,6*	*7,4*	*7,9*	*1,6*	*0,0*	*0,0*	*-0,1*
EU15	*6,4*	*6,7*	*7,5*	*8,1*	*1,6*	*0,0*	*-0,1*	*-0,1*
EU12	*6,3*	*6,5*	*7,3*	*7,8*	*1,5*	*0,0*	*0,0*	*-0,1*
EU10	*4,9*	*5,2*	*5,8*	*6,2*	*1,3*	*0,1*	*0,1*	*0,1*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.5. Overall results of the health care projections

4.5.1. A comparison of projection results for all approaches

Table 4-14 presents a summary of the projected change in health care spending between 2004 and 2005, expressed as a % of GDP, for all scenarios presented. To cast light on the difference in spending projections across approaches, Table 4-15 presents the projection results in terms of difference from scenario I. The following overall conclusions can be drawn:

- the pure demographic effect of an ageing population is projected to push up health care spending by between 1 and 2% of GDP in most Member States. At first sight, this may not appear to be very large when spread over several decades. However, on average it would amount to approximately a 25% increase in spending on health care as a share of GDP;

- changes in the health care status of elderly citizens would have a large effect on health spending. If healthy life expectancy (falling morbidity rates) evolve broadly in line with change in age-specific life expectancy (similar to the dynamic equilibrium hypothesis), then the projected increase in spending on health care due to ageing would be halved;

- if so-called 'death-related costs' are taken into account, expenditure is projected to increase significantly slower than in the *pure ageing* scenario as the share of people in their final phase of life in each age cohort is getting smaller as average life expectancy increases. At the same time, death-related costs are affected by terminal illnesses only

and do not reflect developments in other kinds of morbidity. Therefore, reduction in spending is not as high as in the *constant health* scenario, which assumes overall morbidity to improve in line with changes in life expectancy;

- changes in per capita income could have an important impact on health care spending, especially if it is viewed as a luxury good. Introducing stylised effect of a 1.1 income elasticity converging to 1 over the whole projection period increases total spending by extra 0.3% over 'pure demographic' effect of ageing. This impact will arguably be stronger in the EU10 Member States which will face a particular challenge in balancing the demands of their citizens for wider access to health care services and for services of similar quality to that in the rest of the EU, with their capacity to pay;

- the projection results are sensitive to the assumptions on unit costs. This can be seen by contrasting the results where costs evolve in line with GDP per capita (scenario I) and GDP per worker (scenario V). Contingent on the macroeconomic assumptions, the overall spending on health care calculated with GDP per worker may be twice as much as expenditure calculated using GDP per capita in some countries, and about the same in the others;

- compared with the 2001 projection exercise, the most significant progress relates to the inclusion of scenarios dealing with the health care status of the elderly and death-related costs. This progress is broadly reflected in the choice of AWG reference scenario which includes demographic changes, health status and national income as the factors driving health care spending in the decades to come. Caution should be exercised, however, as there is not conclusive evidence that the 'positive' trends will occur nor of the scale of their likely impact. Overall, more progress has been made in extending the projection methodology for health care on factors that tend to lower health care spending than on driving forces that could potentially increase spending. Less progress, however, has been made in incorporating other non-demographic factors into the projection exercise (some tentative results are presented in the annex 6). In particular, the possible impact of technology on health care spending warrants further analysis.

Table 4-14 Overview of projected changes in health care spending as a % of GDP between 2004 and 2050

	Pure ageing GDP per capita	Constant health	Death-related costs	Income elasticity	Unit costs - GDP per worker	AWG reference scenario
BE	1,5	0,7	1,1	1,8	1,9	1,4
DK	1,1	0,3	0,7	1,4	1,7	1,0
DE	1,3	0,6	1,0	1,6	1,8	1,2
GR	1,8	1,2	1,4	2,1	2,8	1,7
ES	2,2	1,6	1,9	2,6	3,3	2,2
FR	1,8	1,1	1,4	2,2	2,4	1,8
IE	2,0	1,1	1,5	2,4	2,4	2,0
IT	1,4	0,8	1,1	1,6	2,0	1,3
LU	1,1	0,5	0,8	1,5	-0,2	1,2
NL	1,3	0,8	1,0	1,6	1,8	1,3
AT	1,7	1,0	1,3	1,9	2,4	1,6
PT	0,6	-0,1	0,2	0,8	1,8	0,5
FI	1,5	0,9	1,1	1,8	2,0	1,4
SE	1,0	0,3	0,7	1,4	1,4	1,0
UK	2,3	0,9	1,8	2,7	3,0	1,9
CY	1,1	0,7	0,9	1,3	1,3	1,1
CZ	1,9	1,0	1,4	2,4	3,4	2,0
EE	0,9	0,2	0,5	1,5	1,1	1,1
HU	1,0	0,3	0,5	1,4	1,6	1,0
LT	0,7	0,3	0,4	1,1	0,7	0,9
LV	0,7	0,2	0,4	1,4	0,9	1,1
MT	2,0	1,2	1,1	2,2	2,2	1,8
PL	1,3	0,7	0,9	1,7	1,3	1,4
SK	1,8	1,1	1,3	2,3	2,2	1,9
SI	1,4	0,9	1,0	1,9	2,9	1,6
EU25	*1,7*	*0,9*	*1,3*	*2,0*	*2,3*	*1,6*
EU15	*1,7*	*0,9*	*1,4*	*2,1*	*2,4*	*1,6*
EU12	*1,6*	*0,9*	*1,3*	*1,9*	*2,2*	*1,5*
EU10	*1,2*	*0,6*	*0,8*	*1,7*	*1,7*	*1,3*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

Table 4-15 Difference in the projected changes in health care spending 2004-2050 between Scenario I (pure ageing, costs evolve in line with GDP per capita, using national age-related expenditure profiles) and the other scenarios

	Pure ageing GDP per capita	Constant health	Death-related costs	Income elasticity	Unit costs - GDP per worker	AWG reference scenario
BE	1,5	-0,8	-0,4	0,3	0,4	-0,1
DK	1,1	-0,8	-0,4	0,3	0,6	-0,1
DE	1,3	-0,7	-0,3	0,3	0,5	-0,1
GR	1,8	-0,6	-0,4	0,2	1,0	-0,1
ES	2,2	-0,6	-0,4	0,3	1,1	0,0
FR	1,8	-0,7	-0,4	0,3	0,6	-0,1
IE	2,0	-0,8	-0,5	0,5	0,5	0,0
IT	1,4	-0,5	-0,3	0,3	0,6	0,0
LU	1,1	-0,6	-0,2	0,5	-1,3	0,1
NL	1,3	-0,5	-0,3	0,2	0,4	0,0
AT	1,7	-0,7	-0,4	0,3	0,7	-0,1
PT	0,6	-0,7	-0,4	0,3	1,2	-0,1
FI	1,5	-0,6	-0,4	0,3	0,5	0,0
SE	1,0	-0,8	-0,3	0,4	0,3	0,0
UK	2,3	-1,4	-0,5	0,4	0,7	-0,4
CY	1,1	-0,4	-0,2	0,3	0,2	0,1
CZ	1,9	-0,9	-0,5	0,5	1,5	0,1
EE	0,9	-0,7	-0,4	0,6	0,2	0,2
HU	1,0	-0,7	-0,6	0,4	0,6	0,0
LT	0,7	-0,4	-0,3	0,4	0,0	0,2
LV	0,7	-0,5	-0,3	0,6	0,2	0,3
MT	2,0	-0,7	-0,8	0,3	0,2	-0,1
PL	1,3	-0,6	-0,4	0,4	0,0	0,1
SK	1,8	-0,7	-0,4	0,5	0,5	0,1
SI	1,4	-0,5	-0,4	0,5	1,5	0,2
EU25	*1,7*	*-0,8*	*-0,4*	*0,3*	*0,6*	*-0,1*
EU15	*1,7*	*-0,8*	*-0,4*	*0,3*	*0,6*	*-0,1*
EU12	*1,6*	*-0,7*	*-0,3*	*0,3*	*0,6*	*-0,1*
EU10	*1,2*	*-0,6*	*-0,4*	*0,5*	*0,5*	*0,1*

Note: EU25, EU15, EU12 and EU10 – average weighted by GDP

4.5.2. Tentative conclusions

First, governments in all EU countries are heavily involved in the financing and/or provision of health care services, and universal access is virtually assured in all countries. There is, nevertheless, a wide variety of institutional arrangements, making it very difficult to draw general conclusions on detailed factors and policies driving expenditures. What is apparent, however, is that

- ***increases in spending on health care as a share of GDP in past decades have not been strongly influenced by demographic developments,*** but rather by policy decisions to enlarge access, by the demand for better quality health care linked to growing income levels, and (albeit less conclusively) by technology (as falls in unit costs to date appear to have been more than offset by increased demand and quality improvements);

- there are very ***big differences across Member States in terms of per capita spending on and inputs to health care systems, which do not appear to be correlated with health care outcomes***. *A priori*, this suggests there is considerable scope for efficiency gains. It is difficult to draw conclusions as to whether and how institutional design affects health care outcomes or efficiency.

Second, the demand for health care (and social care) depends ultimately on the health status and functional ability of (elderly) citizens, and not on age *per se*. ***Even if age is not the causal factor, ageing populations may lead to pressure for higher public spending on health care***. This will result from the very large projected increase (70% for persons aged 65+, and 170% for persons aged 85+ in EU25) in older cohorts with a higher prevalence of medical conditions, sometimes chronic, that require (expensive) health care services.

Third, ageing is only one of several factors driving health care spending, and other ***non-demographic determinants are likely to be of equal significance in determining future spending levels***. On balance, overall public spending looks set to increase in the context of an ageing society. However, there are upside and downside risks (possibly substantial) to the projected increase in public spending on health care based on a *pure ageing* scenario. In particular, the different approaches to projecting health care spending underline the critical role played by

- the ***health status of the population***. The projections illustrate that if most of the future gains in life expectancy are spent in broadly good health and free of disability, this could offset up to one half of the projected increases in spending due to an ageing population (the *pure ageing* scenario). It should, however, be stressed that the current projections are not modelled on the basis of a direct indicator of morbidity, but rather on the basis of stylised assumptions. This is a shortcoming as morbidity patterns change over time (multi- and chronic diseases such as cardiovascular problems now outweigh infectious diseases) and an ageing society may possibly lead to new patterns of morbidity and mortality. For example, the increase in the share of persons surviving to very old ages (80+) may lead to an increase in the prevalence of chronic and degenerative diseases (e.g. neuro-degenerative and musculoskeletal diseases);

- ***relative cost developments in the health care***. The projection results show that spending levels are sensitive to the assumptions on evolution of unit costs in the health care sector. Leaving aside demographic factors, spending on health as a share of GDP could change as a result of several factors, e.g. unit costs (wages, pharmaceutical prices) growing faster

than their equivalents in the economy as a whole, public policies to improve access to health or improve quality (reduce waiting lists, increase choice), rising income levels and the impact of technology on total health care spending. The current set of projections is not capable of disentangling the contribution of each factor, which suggests a possible avenue for future work;

- ***the effective incorporation of technology*** into health care system. Technology could either increase or decrease overall public spending on health depending on whether the savings from more effective medical treatments and lower unit costs outweigh the additional spending resulting from the opening up of new and more affordable services.

Fourth, ageing will not only raise a policy challenge in terms of putting pressure for increased spending on health care. Of equal, if not more relevance, is ***the impact of ageing on the type of health care services that will be needed***. As argued above (and in the literature), morbidity and mortality patterns are changing in the context of an ageing society, and a key challenge for health care systems is to adapt accordingly. There may be a need to rebalance the various types of care (primary and secondary, outpatient and hospital care, classical health care, long-term care and social care).

Fifth, while the current set of projection do not model the institutional arrangements for the provision of health care services within Member States, the projection results may nonetheless provide several useful policy insights as follows:

- as outlined above, changing morbidity patterns and 'healthy life expectancy' will be of critical importance. What is ***striking from the review of existing literature is the lack of comparable data and evidence and analysis within Europe*** on this matter. A heavy reliance is therefore placed on data and analysis from third countries, notably the US, which may only be of partial relevance for the EU, given possible differences in morbidity patterns and also the very different organisational arrangements of the health care sector. The situation as regards data is improving with the recent release of the SHARE survey. However, more investment is required, especially in longitudinal surveys, in order to get a more accurate and comparable picture on the evolution of health care trends of the European population over time;

- past improvements in life expectancy (and healthy life expectancy) are attributable to a variety of factors including better public health systems, improved education, changes in nutrition and lifestyle. Understanding the precise role which public policies play in shaping health care outcomes is of critical importance. ***Effective preventive actions to tackle obesity, smoking and drug abuse could have large effects on the health care status of citizens, and thus on future spending needs.*** However the evidence of the effectiveness of preventive schemes is mixed and warrants further analysis.

Sixth, the prospect of ***increased spending on health care in an ageing society will be a cause for concern for Finance Ministers as it will make the tasks of achieving and sustaining sound budget positions more challenging***. However, the policy challenge needs to be viewed in terms of general welfare and not budgetary considerations alone, bearing in mind the equally important goals of access and adequacy of health care systems. *A priori*, there is no economic reasons why countries should not devote a larger share of resources to health care. Increased government intervention can be justified if the income elasticity of demand is such that demand outpaces income growth, and also if investment in technology is more than

compensated by improved quality and/or productivity. Notwithstanding these caveats, simply spending more money is not an option, and difficult choices on priorities will have to be made. The management and control of health care spending will be a critical part of overall efforts to ensure sustainable overall public finance positions. In this regard,

- ***aggregate cost-containment measures to control volume, prices and wages, as well as budgetary caps, have helped constrain expenditure especially in the hospital sector, and are likely to remain key elements in comprehensive health care strategies of Member States***. However, their effectiveness may diminish over time as suppliers alter their behaviour and they risk introducing distortions that could lead to costly inefficiencies. Shifting some of the costs to the private sector, for example via cost-sharing requirements, can also help to control public expenditures: however, the expected saving may be modest given the need to pursue public policy objectives related to access and equity;

- efforts to improve the cost efficiency will play an increasingly important role in controlling expenditures over the long-run. However, it is difficult to draw general conclusions on the effectiveness of different types of cost efficiency measures, as much depends on the institutional structure of the health care system concerned. Governments face a considerable challenge in designing reforms that ***achieve a better alignment of the economic incentives facing health care providers and users that encourage rational resource use***, in part linked to lack of data and information.

5. LONG-TERM CARE

5.1. Introduction

Some limitations with the 2001 projection exercise

The number of people aged 80 and above in the EU is projected to treble until 2050. As their share in the population increases over the next decades, an increase in the ratio of long-term care expenditure to GDP is expected in the future in all EU Member States. The mandate from the ECOFIN Council to the EPC included a request to make projections for public spending on long-term care. This followed the 2001 projection exercise which examined the impact of demographic variables on long-term care in ten EU15 countries. The methodology used in 2001 was a "pure" demographic scenario which only considered the impact of changes in the size and age-structure of the population on long-term care spending. It consisted of applying profiles of average long-term care expenditure per capita by age and gender (provided for a base year by Member States) to a population projection of Eurostat. The projections were run under the assumption of constant age and gender-contingent consumption of long-term care over time. Projections were run under two cost assumptions, i.e. expenditures per capita grow at the same rate as GDP per capita (which can be considered as neutral in macroeconomic terms), and expenditures per capita increase at the same rate as GDP per worker (to reflect the labour intensity of the long-term care sector).

The 2001 report of the EPC recognised the limitations of this projection methodology, in particular the strong assumption of holding age-related expenditure profiles constant over time. In particular, it was recognised that:

- holding the age-specific spending on long-term care constant over the projection period at the level in a base year (usually 2000) implied that a large share of the projected gains in life expectancy would be spent in poor health with a high degree of disability: in the literature, this is referred to as the "expansion of morbidity/disability" hypothesis. However, the literature points to other potential scenarios, including a "dynamic equilibrium" hypothesis (nearly all gains in life expectancy are spent in good health and without disability) and a "compression of morbidity/disability" hypothesis (gains in healthy/disability-free life expectancy exceed the gains in life expectancy);[64]

- the 2001 projection only included scenarios on the basis of current institutional arrangements for the provision and financing of long-term care by the public sector, i.e. a "no policy change" scenario. This approach is an appropriate starting point for making long-run projections. However, it could usefully be complemented with additional scenarios to assess the impact of possible future policy changes. Pressure for more public provision/financing of long-term care services could grow substantially in coming decades due to changes in family structure and the growing attachment of women to the labour market, trends which may constrain the supply of informal care provision within households;

[64] See chapter 4 on health care for a discussion of changes in the health status of the population as life expectancy increases.

- the 2001 projection methodology implicitly assumed that the balance between care provided in institutional and home-based settings remained unchanged over the projection period. As above, this is a reasonable starting point, but it would be useful to complement this with additional policy scenarios as unit costs may differ substantially between the two settings.

A methodology based on the projected need for long-term care services and allowing the exploration of different policy settings

A substantially different projection methodology has been employed in this projection exercise. DG ECFIN has built a simple macro simulation or cell-based model, based on a proposal by Comas-Herrera et al., (2005) and similar to those used for Germany, Italy and Spain in the *European Study of Long-Term Care Expenditure* (Comas-Herrera and Wittenberg, 2003 and Comas-Herrera et al, 2003). That project in turn built on the experience of constructing the Personal Social Services Research Unit (PSSRU) Long Term Care expenditure model for England (Wittenberg et al., 1998 and 2001).

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 made about:

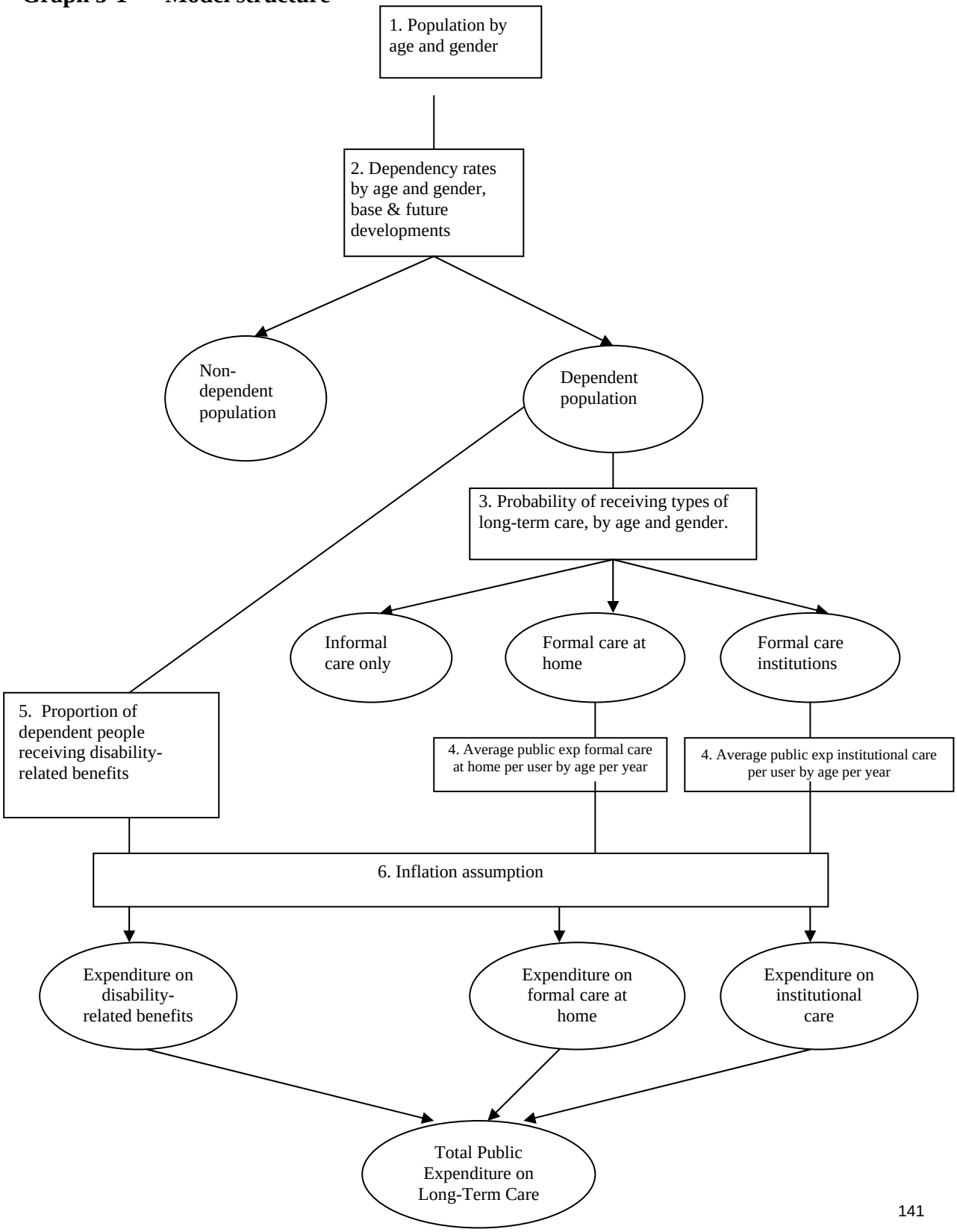
- the future numbers of elderly people (through changes in the population projections used);
- the future numbers of dependent elderly people (by making changes to the prevalence rates of dependency);
- the balance between formal and informal care provision;
- the balance between home (domiciliary) care and institutional care within the formal care system;
- the costs of a unit of care.

5.2. The projection methodology and scenarios

5.2.1. Overview of the projection model

Graph 5-1 provides an overview of the model structure. The square boxes indicate data that need to be entered into the model to make projections for each year, and the round boxes indicate calculations that are produced within the model for each year.

Graph 5-1 Model structure



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 extrapolating age and gender-specific dependency ratios of a base year (estimated using existing indicators of disability from comparable sources) 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, this note makes use of the concept of ADL-dependency which refers to difficulties in performing at least one Activity of Daily Living (ADL) (Katz et al., 1963).

Step 2 is to split, by age and gender, the dependent elderly population into three groups depending on the type of care they receive, namely (i) informal care, which has no impact on public spending, (ii) formal care at home and (iii) formal care in institutions (both of which impact on public spending but their unit costs may differ). The model implicitly assumes that all those receiving home care or institutional care have difficulties with one or more ADLs, and that all persons deemed ADL-dependent either receive informal care, home care or institutional care. The split by type of care received is made by calculating the "probability of receiving different types of long-term care by age and gender". This is calculated for a base year using data on the numbers of people with dependency (projected in step 1), and the numbers of people receiving formal care at home and in institutions (provided by Member States). It is assumed that the difference between the total number of dependent people and the total number of people receiving formal care (at home or in institutions) is the number of people who rely exclusively on informal care.

Step 3 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). Two assumptions are required:

- it is implicitly assumed that current expenditure in services divided by the number of users equals the long-run unit costs of services;
- it is assumed that average expenditure per user increases with the age of the user.[65]

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

[65] 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.

total public expenditure on long-term care; note that cash benefits are assumed to grow in line with the numbers of people with dependency and also with the age of the user.

Overall, given the availability of a numerical measure of disability, the projection methodology described above is more precise than that used in chapter 4 on health care where there is no direct indicator of health status and the age-related expenditure profile is used as a proxy. However, an important caveat to note is that while dependency rates are an indicator of the need for care, those needs may not necessarily translate into actual public expenditure, 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 (Wittenberg et al, 1998). Most of these factors, in turn, are also correlated with age.

5.2.2. 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. Table 5-1 below outlines the scenarios carried out as part of the projection exercise.

Table 5-1 Overview of scenarios

	Pure ageing scenario	**Unit costs evolve in line with GDP per capita**	**Constant disability scenario**	**Increase in formal care provision**	**AWG reference scenario**
	I	**II**	**III**	**IV**	**V**
Population projection	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline	AWG scenario - baseline
Disability status over time	Disability rates held constant at 2004 level	Disability rates held constant at 2004 level	Age-specific disability rates evolve in line with changes in age-specific mortality rates	Disability rates held constant at 2004 level	Intermediate between pure ageing and constant health scenarios, whereby age-specific disability rates decrease by half of the decrease in age-specific mortality rates
Policy setting	Probability of receiving care held constant at 2004 level	Probability of receiving care held constant at 2004 level	Probability of receiving care held constant at 2004 level	1% p.a. decrease in number of persons receiving informal care up to 2020, half going to institutions, half to home care	Probability of receiving care held constant at 2004 level
Unit costs	GDP per worker	GDP per capita	GDP per worker	GDP per worker	GDP per worker

- A '*pure ageing scenario*' (column I in Table 5-1) involves keeping the proportion of the older disabled population who receive either informal care, formal at home or institutional care constant and applying them to the projected dependent population. It also assumes that prevalence of ADL-dependency is 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 almost 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 2004 level. This scenario is based on the same approach as that used in the 2001 projection exercise of the EPC.

- A '*unit costs scenario'* (column II) is identical to the pure ageing scenario, except that costs are assumed to evolve in line with GDP per capita.

- A '*constant disability scenario'* (column III in Table 5-1) is run to reflect an alternative assumption about trends in age-specific ADL-dependency rates. There is substantial debate about the extent to which, gains in life expectancy will be spent free of disability (Robine and Michel, 2004). Trends in ADL-dependency rates have decreased in the United States (Crimmins, 2004), but the evidence for European countries and other developed countries, such as Australia, is more mixed. Robine and Michel (2004) conclude that the available evidence does not point to a single forecast of expansion or compression of morbidity, but to a series of transitional stages that could drive the trends encountered in different countries and at different times. In the '*constant disability scenario*', which is inspired by the dynamic equilibrium hypothesis, disability rates evolve exactly in line with age-specific mortality rates. This is equivalent to the approach followed in chapter 4 on health care.

- A policy change scenario is run to examine the impact of '*an increase in the prevalence of receiving formal care'* (column IV). This scenario examines the impact of an increase of 1% a year in the proportion of dependent elderly people receiving formal care, for the period 2004-2020, with the additional people receiving care in institutions and at home in the same ratio as observed in the base year of 2004.

- An *'AWG reference scenario"* (column V in Table 5-1) is a prudent scenario that aims to bring together several different drivers of long-term care spending. It assumes that age-specific disability rates fall by half of the projected decrease in age-specific mortality rates. This implies that some half of projected gains in life expectancy up to 2050 would be spent in good health and free of disability. Note that that the aim is to facilitate the comparison of budgetary projections across expenditure items, and thus it should be symmetrical with the "AWG reference scenario" for health care.

5.3. Data availability and quality

In order to run the projections, a wide variety of data is required. Table 5-2 provides an overview of all the data inputs. It indicates which data has been supplied by Member States (shaded) and which data is only available on the basis of average estimates (blank).

On the basis of available data, it is possible to make projections for 18 countries[66], namely Belgium, Denmark, Germany, Spain, Ireland, Italy, Luxemburg, the Netherlands, Finland, Sweden, the UK, the Czech Republic, Lithuania, Latvia, Malta, Poland, Slovakia and Slovenia. A key difficulty is that while many countries have supplied some data sets, very few have done so for all data sets and in practice, it proved extremely difficult to collect a complete set of the data required for many countries. Therefore, for most of these countries, it was necessary to use estimates based on EU averages for one or two variables. Table 7-1 in the Annex provides a detailed description of the data used.

Table 5-2 Overview of data availability

	Age profile	Disability rate	Total number of people			Age breakdown of population			Total spending		
			in institutions	home care	cash benefits	in institutions	home care	cash benefits	in institutions	home care	cash benefits
BE											
DK						estimated	estimated				
DE							estimated	estimated			
GR											
ES						estimated	estimated				estimated
FR											
IE							estimated				
IT											
LU											
NL						estimated			estimated		
AT											
PT											
FI											
SE						estimated	estimated				
UK											
CY											
CZ						estimated	estimated				
EE											
HU											
LT											
LV											
MT						estimated	estimated				
PL						estimated	estimated				
SK						estimated	estimated				
SI				estimated			estimated				

5.3.1. Age-related expenditure profiles

Fifteen Member States have provided age-related expenditure profiles, namely Belgium, Denmark, Germany, Italy, Luxemburg, the Netherlands, Finland, Sweden, the UK, the Czech Republic, Lithuania, Latvia, Malta, Poland and Slovenia. A summary of key characteristics for specific age cohorts is presented on Table 5-3 for males and Table 5-4 for females.

Graph 5-2 to Graph 5-9 display the age-related expenditure profiles, both as % of GDP per capita and in nominal euros, grouped into EU15 and EU10 countries. The data are not comparable as regards coverage, breakdown by age cohort and the year when the data was collected and thus DG ECFIN has made a number of technical adjustments to arrive at a standardised format. The main features of the age-related expenditure profiles can be summarised as follows:

- in most countries, the age-related expenditure profile is steep, more so than for health care. This is explained by the fact that the prevalence of frailty and disability increases significantly with age, especially amongst the very old age cohorts. Sweden appears to be an exception with relatively high levels of spending at younger age cohorts;

- expressed as % of GDP per capita, spending on long-term care is usually substantially higher than for health care;

[66] Austria provided data on cash-benefits, but as the data on care at home and in institutions is not available, the results of the projection have not been included in the report.

- there is a huge variation in spending across countries, both in nominal terms and as a % of GDP per capita. There is a striking gap between the EU10 and E15. For example, EU10 countries on average spend €103 on long-term care for females aged 90-94 (equivalent to 2.5% of per capita GDP) which contrasts with €12443 for EU15 countries (equivalent to 41.3% of per capita GDP). However, within EU15 countries, there is enormous variation: spending ranges from €4764 (20.4% of per capita GDP) for people aged 90 to 94 years in Italy to €22336 (62% of per capita GDP) in Denmark;

- spending on females is in general higher than for males of the same age-cohort. In some cases, the differences can be large. For example, spending on males aged 90-94 amounts on average to €10526 in the EU15 compared with €12443 for females. In the EU10, the difference is more marked, €20 for males and €103 for females.

Table 5-3 Age-related expenditure profiles for long-term care, in euros and GDP per capita – males

	cohort aged 60-64		cohort aged 70-74		cohort aged 80-84		cohort aged 90-94	
	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP
BE	120	0.4	288	1.1	1019	3.7	3430	12.6
DK	975	2.7	2265	6.3	8806	24.4	15080	41.8
DE	115	0.4	381	1.4	1690	6.4	5921	22.4
IT	268	1.1	494	2.1	1606	6.9	3045	13.0
LU	66	0.1	778	1.4	3022	5	12575	22.2
NL	464	1.6	1485	5.2	6577	23.0	19658	68.7
FI	240	0.8	961	3.3	3484	12.1	11597	40.4
SE	469	1.5	960	3.0	9593	29.7	19867	62
UK	566	2.0	752	2.6	2604	9.1	5610	19.6
CZ	20	0.2	57	0.7	182	2.2		
LV	35	0.7	55	1.2	63	1.3	120	2.5
LT	36	0.7	51	1.0	87	1.7	179	3.4
MT	5.5	0.1	22.7	0.2	2.0	2.0	2.0	2.0
PL	5	0.1	9	0.2	16	0.3	26	0.5
SI	114	1	312	2	928	7	916	7
EU15 average*	365	1.0	929	2.9	4267	13.4	10754	33.6
standard deviation	*289*	*0.6*	*618*	*1.8*	*3231*	*9.7*	*6595*	*20.7*
EU10 average*	36	0.4	84.3	0.9	213.0	2.4	248.6	3.1
standard deviation	*40*	*0.4*	*113.1*	*0.8*	*356.2*	*2.4*	*380*	*2.5*

* unweighted average of the available figures

Source: National data

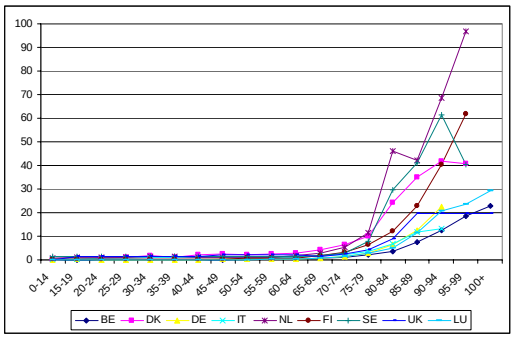
Table 5-4 Age-related expenditure profiles for long-term care in euros and GDP per capita – females

	cohort aged 60-64		cohort aged 70-74		cohort aged 80-84		cohort aged 90-94	
	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP	level in nominal euros	level in % of per capita GDP
BE	119	0.4	391	1.4	1835	6.7	5667	20.8
DK	1149	3.2	3187	8.8	13324	36.9	22336	61.9
DE	115	0.4	381	1.4	1690	6.4	5921	22.4
IT	255	1.1	603	2.6	2676	11.5	4764	20.4
LU	261	0.5	917	1.6	5618	9.9	18125	31.9
NL	464	1.6	1485	5.2	6577	23.0	19658	68.7
FI	245	0.9	1034	3.6	5106	17.8	15719	54.8
SE	469	1.5	960	3.0	9593	29.7	19867	62
UK	566	2.0	752	2.6	2604	9.1	5610	19.6
CZ	15	0.2	74	0.9	305	3.6	:	:
LV	22	0.5	29	0.6	75	1.6	135	2.9
LT	19	0.4	40	0.8	141	2.7	219	4.2
MT	5.5	0.1	22.7	0.2	2.0	2.0	2.0	2.0
PL	3	0.1	9	0.2	28	0.6	57	1.1
SI	91	0.7	313	2.4	1494	11.5	1482	11.4
EU15 average*	405	1.3	1079	3.4	5447	16.8	13074	40.2
standard deviation	*320*	*0.9*	*862*	*2.4*	*3930*	*10.9*	*7404*	*21.0*
EU10 average*	26	0.3	81	0.8	341	3.7	379	4.3
standard deviation	*33*	*0.3*	*115*	*0.8*	*575*	*4.0*	*622*	*4.1*

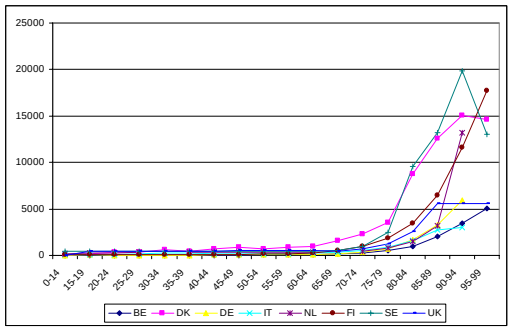
* unweighted average of the available figures

Source: National data

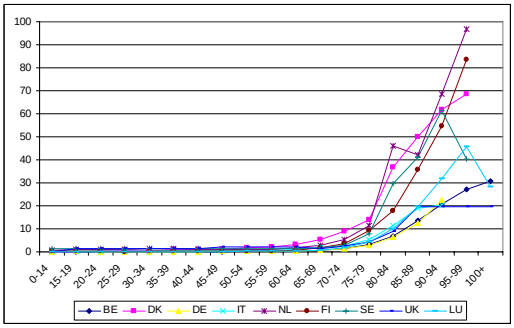
Graph 5-2 Age-related expenditure profiles for long-term care, % of GDP per capita, males, 2004



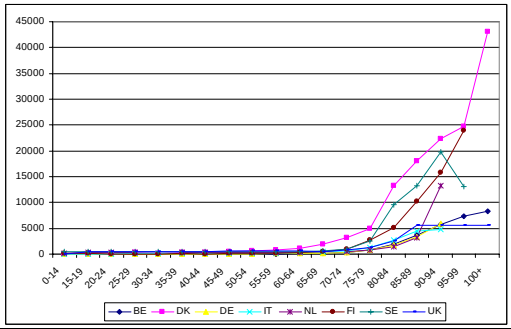
Graph 5-3 Age-related expenditure profiles for long-term care in Euros, males, 2004



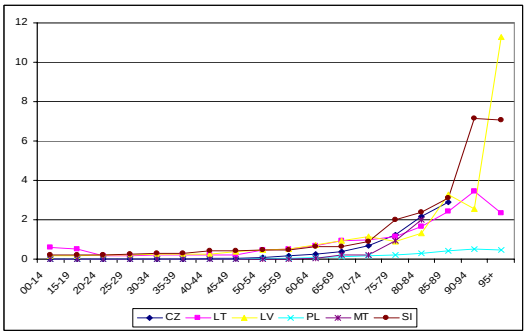
Graph 5-4 Age-related expenditure profiles for long-term care, % of GDP per capita, females, 2004



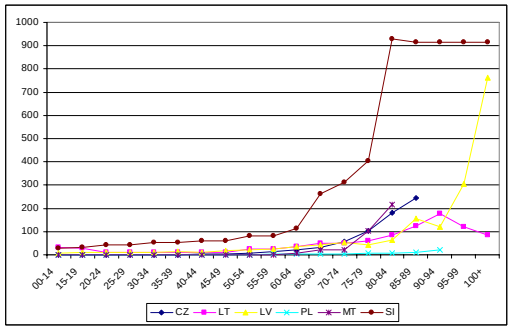
Graph 5-5 Age-related expenditure profiles for long-term care in Euros, females, 2004



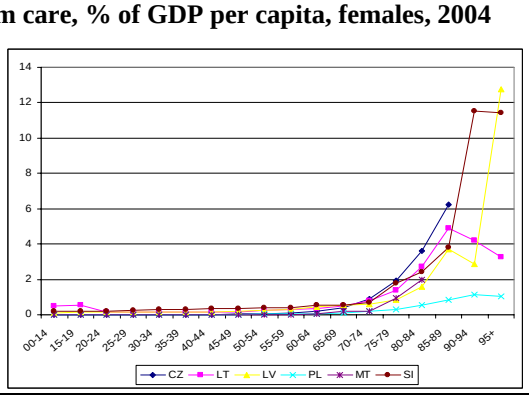
Graph 5-6 Age-related expenditure profiles for long-term care, % of GDP per capita, males, 2004



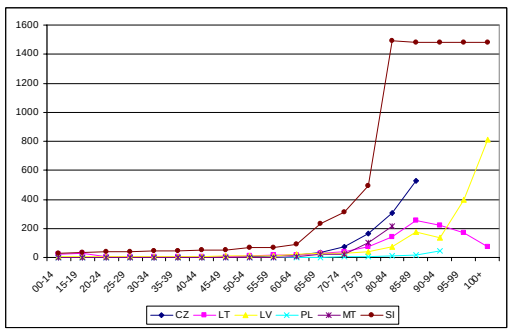
Graph 5-7 Age-related expenditure profiles for long-term care in Euros, males, 2004



Graph 5-8 Age-related expenditure profiles for long-term care, % of GDP per capita, females, 2004



Graph 5-9 Age-related expenditure profiles for long-term care in Euros, females, 2004



Source: National data

To make projections for Spain, Ireland and Slovakia where no age-related expenditure profiles are available, an 'average' profile was used, calculated as the unweighted average of per capita expenditure expressed as % of GDP per capita. The figures are reported on Table 5-3 and Table 5-4. Two separate profiles were established for EU10 and EU15, as the shape of the curve differs clearly between EU10 and EU15 Member States.

5.3.2. ADL-dependent population

The comparability of ADL-dependency rates is an important issue, especially when scenarios that involve shifting dependent elderly people between alternative care options as a result of changing patterns of care are investigated. The European Study of Long-Term Care showed that the impact on expenditure of some of the investigated scenarios about informal care and changes to formal care entitlement was affected by the differences in the definitions of dependency used in each country (see Pickard, 2003a and 2003b). With regard to dependency rates, Eurostat reviews of the data available on ADL-related dependency in European countries (Grammenos, 2003 and Eurostat, 2003) showed that there is a very low level of comparability of the data collected in national surveys. However, comparable data on ADL-dependency rates has recently become available for the 10 EU countries participating in the SHARE survey on the economic, social and health conditions[67], see Table 5-5.

The SHARE data results show that:

- while the levels of ADL-dependency differ across countries, a common pattern can be discerned. Dependency rates rise with age. Based on an average of results, they increase for males from 7.1% when they are aged 65-70 to 27.7% when they are aged 80+;
- they are generally, though not always, higher amongst females than males.

Table 5-5 Dependency rates among elderly population in households, by age group

	65-70		70-74		75-79		80+	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
DK	0.095	0.125	0.056	0.095	0.143	0.105	0.333	0.31
DE	0.075	0.065	0.069	0.163	0.141	0.205	0.332	0.314
GR	0.007	0.091	0.006	0.119	0.103	0.238	0.241	0.341
ES	0.065	0.07	0.112	0.126	0.152	0.181	0.296	0.458
FR	0.058	0.089	0.172	0.143	0.335	0.157	0.306	0.367
IT	0.072	0.068	0.098	0.191	0.203	0.228	0.31	0.342
NL	0.061	0.06	0.04	0.088	0.095	0.115	0.189	0.359
AT	0.059	0.105	0.077	0.125	0.19	0.152	0.133	0.324
SE	0.045	0.061	0.088	0.071	0.107	0.171	0.256	0.373
UK	0.176	0.202	0.239	0.253	0.27	0.306	0.37	0.441
average	0.071	0.094	0.096	0.137	0.174	0.186	0.277	0.363
standard deviation	0.04	0.04	0.07	0.05	0.08	0.06	0.07	0.05

Source: SHARE, 1+ ADLs

[67] See Börsch-Supan et al., 2005 and http://www.share-project.org/ The following countries participate: Denmark, Germany, Greece, Spain, France, Italy, the Netherlands, Austria, Sweden and the UK.

The ADL-dependent population is estimated on the basis of data available from SHARE and data on the numbers of people in institutions provided by Member States. The SHARE project covers the population in households only, excluding the population in institutions. To estimate the size of the elderly dependent population in the base year 2004,

- the elderly population in households is estimated, by subtracting the elderly population in institutions as reported by Member States from the total elderly population, see next section for details);

- number of dependent elderly people in households is estimated by applying the disability rates in Table 5-5 to the estimated number of elderly people living in households;

- finally, the estimated number of dependent elderly persons living in households is added to the number of elderly persons living in institutions to obtain the total dependent elderly population.

The estimated number of dependent elderly people is presented on Table 5-6 for countries where both SHARE data on disability rates are available as well as data from national sources on the numbers of people living in institutions. In most countries, around 20% of the population aged 65+ has some form of disability. For males this ranges from 12% in the Netherlands to 27% in the UK, and for females from 19% in Denmark, the Netherlands and Austria to 33% in the UK.

Table 5-6 Estimated elderly dependent population in 2004 for 8 EU Member States, in thousands (based on SHARE data and reported number of people in institutions)

	65-69		**70-74**		**75-79**		**80+**		**Total dependent population aged 65+**		***as a % of total population aged 65+***	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	***Men***	***Women***
DK	11	16	5	10	11	11	27	49	54	86	*16*	*19*
DE	191	183	117	340	174	414	390	980	873	1,917	*15*	*22*
ES	67	83	109	150	115	189	189	546	480	968	*16*	*23*
IT	113	124	128	310	201	337	299	702	741	1,473	*16*	*23*
NL	23	24	14	34	23	44	51	150	111	251	*12*	*19*
AT	9	19	11	22	20	27	12	77	52	145	*11*	*19*
SE	9	13	16	15	17	36	62	154	104	218	*16*	*25*
UK	230	285	266	329	231	356	361	841	1,088	1,811	*27*	*33*

Source: SHARE, 1+ ADLs, AWG population scenario reported in EPC and European Commission (2005a)
Note: Estimates of the number of people in institutions by age are made for Denmark, Spain, the Netherlands and Sweden.

Using the average disability rates, by age and gender in Table 5-5, a projection for the size of the disabled population has been made for eleven additional EU countries in 2004. This reported on Table 5-7. Approximately, 17% of males and 23% of females aged 65+ are assumed to be disabled (with small differences due to diverge in the age structure of populations in 2004).

Table 5-7 Estimated size of dependent population in 2004 using 'average' dependency rates by age and gender from SHARE data, in thousands

	65-69		70-74		75-79		80+		Total dependent population aged 65+		*as a % of total population aged 65+*	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
BE	20	28	26	43	33	55	53	159	132	284	18	27
IE	5	7	6	9	8	11	13	32	32	59	16	23
LU	1	1	1	1	1	2	2	5	4	9	16	24
FI	9	13	10	19	15	25	22	70	55	128	17	26
CZ	18	29	20	41	25	46	31	90	93	206	17	24
LT	6	11	7	15	7	17	9	31	29	75	16	22
LV	4	8	4	10	4	11	4	20	16	49	13	19
MT	1	1	1	1	1	2	2	4	5	8	21	28
PL	61	91	68	124	71	136	84	251	284	601	15	20
SK	10	12	10	17	11	19	14	35	44	83	19	21
SI	3	5	4	8	4	9	5	19	16	41	14	22

Note: Estimates of the number of people in institutions by age are made for Ireland, the Czech Republic, Poland and Slovakia.

Table 5-8 presents an overall estimated of the disabled population for EU10, EU15 and EU25 (countries for which it is available), made by combing the projections of the total disabled population using SHARE data with the projections based on an average disability rate (on Table 5-5).

Table 5-8 Total dependent population estimated, EU25, in thousands

	65-69		70-74		75-79		80+		Total dependent population aged 65+		*as a % of total population aged 65+*	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
EU15	688	795	710	1,284	848	1,505	1,480	3,764	3,727	7,348	16	24
EU10	102	157	113	215	123	240	148	451	487	1,063	17	22
EU25	791	952	824	1,498	971	1,745	1,628	4,216	4,214	8,411	16	23

Source: SHARE, 1+ ADLs, EPC population projection

Note: The following Member States are included: Belgium, Denmark, Germany, Spain, Ireland, Luxembourg, Italy, the Netherlands, Finland, Sweden, the UK, the Czech Republic, Lithuania, Latvia, Malta, Poland, Slovakia and Slovenia.

Table 5-9 Estimated ADL-dependent population aged 65 and above, 2004

	Dependent population		Population receiving formal care in institutions		Population receiving formal care at home	
	000s	as % of 65+	000s	*share of dependent population receiving care*	000s	*share of dependent population receiving care*
BE	416	23	147	*35*	114	*27*
DK	139	17	13	*10*	176	*126*
DE	2790	19	535	*19*	975	*35*
GR						
ES	1449	20	158	*11*	286	*20*
FR						
IE	91	20	20	*22*	29	*32*
IT	2214	20	193	*9*	933	*42*
LU	13	20	3	*23*	4	*33*
NL	362	16	79	*22*		
AT	197	16				
PT						
FI	183	22	57	*31*	52	*28*
SE	322	21	102	*32*	142	*44*
UK	2899	30	278	*10*	440	*15*
CY						
CZ	299	21	77	*26*	56	*19*
EE						
HU						
LT	103	20	24	*23*	5	*5*
LV	65	17	5	*8*	4	*5*
MT	13	25	6	*48*	5	*37*
PL	885	18	105	*12*	44	*5*
SK	127	20	31	*24*	37	*29*
SI	58	19	12	*20*	10	*18*

Source: National data, SHARE and ECFIN calculations

Table 5-9 presents the estimated number of dependent elderly people in 2004. In most Member States, around 20% of the elderly population aged 65+ is dependent. About 20% of the estimated dependent population receives long-term care in an institution and about 30% receives formal care at home: hence some 50% of people considered dependent receive no formal care financed by the State and instead rely on informal or no care. Differences across Member States are wide and reflect the variety of institutional arrangements in the provision of long-term care.

5.3.3. Public spending on different types of formal care and unit costs

Eighteen countries provided data on public spending on long-term care. Of those, fifteen were able to provide data on spending on care in institutions[68], seventeen as regards spending on care at home and thirteen as regards cash transfers. In general terms, spending is greatest on care institutions. In EU15 countries, considerable resources are also spent on formal care at home, which is negligible in the EU 10 countries.

By combining the data on public spending on different types of care with the data on numbers of persons receiving care, it is possible to calculate the unit cost per beneficiary. For EU15 countries, the average cost per person receiving care in an institution is expensive at close to €24000, and in seven Member States exceeds 70% of GDP per capita. The average cost of providing formal care at home is €9373 per beneficiary. Cash transfers amount to €4619 per person receiving aid.

Nominal spending per person on formal care is much lower in EU10 countries amounting to an average of €3745 for care in institutions, €739 for care at home and €430 for countries reporting cash benefits.

Table 5-10 Total public expenditure on long-term care, all ages, 2004, as a % of GDP

	Institutional care			Home-based care			Cash benefits		
	Nominal euros in billions	Unit cost	% GDP per capita	Nominal euros in billions	Unit cost	% GDP per capita	Nominal euros in billions	Unit cost	% GDP per capita
BE	1.43	9067	33	0.85	6520	24	0.14	1106	4
DK	0.36	23129	64	1.86	7947	22			
DE	11.65	18517	70	5.04	3886	15	4.38	3740	14
ES	1.45	8275	42	0.63	2832	14	2.51	5981	30
IE	0.52	24477	68	0.14	3887	11	0.21	8857	24
IT	5.50	19352	83	6.69	3717	16	8.63	6589	28
LU	0.12	37199	66	0.10	16410	29			
NL	2.15	23129	81						
FI	1.62	24343	85	0.61	10097	35	0.36	1439	5
SE	7.57	62972	203	3.12	16579	53			
UK	4.20	12824	45	12.80	21856	76			
CZ	0.18	1270	15	0.06	1792	21	0.03	274	3
LT	0.07	1878	36	0.00	312	6	0.01	71	1
LV	0.04	3945	83	0.01	731	15			
MT	0.02	1732	16	0.01	588	5	0.01	113	1
PL	0.11	1160	23	0.00	91	2	0.10	823	16
SK	0.08	2970	48	0.04	1219	20	0.11	869	14
SI	0.18	13260	102	0.01	440	3	0.06		
EU15		*23935*			*9373*			*4619*	
EU10		*3745*			*739*			*430*	

Source: National data and ECFIN calculations

5.4. Projected size of the dependent population up to 2050 and projected number of persons receiving different types of care

Table 5-11 presents the projected numbers of dependent people and of people receiving long-term care, both formal and informal, under the '*pure ageing scenario*'. The dependent population is projected to increase by about 120%. Note, this is larger than the projected increase in the old-age dependency ratio, and reflects the fact that it is the oldest-old (aged 80 and above) who will have the most dynamic population growth. While the probability of receiving care is assumed to remain constant, the share of the population aged 65 and above increases. The number of people receiving long term-care is projected rise in all Member States. According to the projection, the population receiving formal care in institutions would

[68] In addition, total expenditure in institutional care in the Netherlands was estimated using available information on people in institutions and EU15 average unit cost.

rise by about 140% on average and as regards long-term care at home, by about 130%. The population receiving informal or no care would increase by about 100% on average. On average, about 45% of the dependent population is projected to rely on informal or no care, ranging from less than 60% in Sweden and Latvia to over 120% in Spain, Ireland, Luxemburg, the Netherlands, Poland, Slovakia and Slovenia.

Table 5-12 shows the projection of the dependent population under the '*constant disability scenario*'. The dependent population is projected to increase by about 40%, a smaller increase relative to the '*pure ageing scenario*'. Compared to 2004, higher increases are projected in the population in institutions compared to the population receiving formal care at home in most Member States. In 2050, the dependent population receiving formal care at home is projected to be larger than the population receiving care in institutions, in most EU15 Member States except in Belgium, Lithuania, Latvia, Malta, and Slovakia.

Table 5-11 Projection of dependent population, in thousands – pure ageing scenario

	Dependent population				Population receiving formal care in institutions				Population receiving formal care at home				Population receiving informal or no care			
	2004	**2050**	***2004-50***	***% change 2004-50***	**2004**	**2050**	***2004-50***	***% change 2004-50***	**2004**	**2050**	***2004-50***	***% change 2004-50***	**2004**	**2050**	***2004-50***	***% change 2004-50***
BE	416	841	*425*	*102*	147	331	*184*	*125*	114	247	*133*	*116*	154	263	*108*	*70*
DK	139	275	*136*	*97*	13	29	*16*	*117*	176	368	*192*	*109*				
DE	2790	5689	*2900*	*104*	535	1321	*786*	*147*	975	2100	*1125*	*115*	1280	2269	*989*	*77*
GR																
ES	1449	3494	*2045*	*141*	158	348	*190*	*120*	286	667	*380*	*133*	1004	2480	*1475*	*147*
FR																
IE	91	319	*228*	*250*	20	75	*55*	*274*	29	109	*80*	*274*	42	135	*93*	*222*
IT	2214	4272	*2058*	*93*	193	403	*211*	*109*	933	1798	*865*	*93*	1088	2071	*983*	*90*
LU	13	35	*22*	*173*	3	10	*7*	*221*	4	12	*8*	*178*	6	14	*8*	*143*
NL	362	833	*471*	*130*	79	194	*116*	*147*								
AT	197	419	*221*	*112*												
PT																
FI	183	374	*191*	*104*	57	130	*73*	*128*	52	113	*61*	*117*	74	131	*57*	*78*
SE	322	569	*247*	*77*	102	188	*86*	*85*	142	254	*112*	*79*	79	127	*48*	*61*
UK	2899	5564	*2665*	*92*	278	619	*341*	*123*	440	934	*494*	*112*	2181	4011	*1829*	*84*
CY																
CZ	299	625	*326*	*109*	77	162	*85*	*110*	56	118	*62*	*110*	166	344	*179*	*108*
EE																
HU																
LT	103	184	*80*	*78*	24	44	*20*	*87*	5	10	*5*	*87*	74	129	*55*	*74*
LV	65	99	*34*	*52*	5	8	*3*	*59*	4	6	*2*	*59*	57	85	*29*	*51*
MT	19	49	*31*	*166*	13	34	*21*	*172*	5	13	*8*	*170*	1	2	*1*	*95*
PL	885	2004	*1119*	*126*	105	251	*146*	*140*	44	105	*61*	*140*	737	1648	*911*	*124*
SK	127	309	*182*	*143*	31	78	*47*	*153*	37	94	*57*	*153*	59	137	*78*	*133*
SI	58	135	*77*	*134*	12	30	*18*	*155*	10	24	13	*131*	36	82	*46*	*128*
EU25	12631	26089	*13459*	*107*	1850	4255	*2405*	*130*	3312	6970	3657	*110*	7038	13929	*6891*	*98*
EU15	11075	22685	*11610*	*105*	1585	3649	*2064*	*130*	3151	6601	3449	*109*	5909	11500	*5592*	*95*
EU10	1556	3404	*1848*	*119*	*265*	*606*	*341*	*129*	161	369	208	*129*	1129	2429	*1300*	*115*

Source: DG ECFIN calculation

Table 5-12 Projection of dependent population, in thousands – constant disability scenario

	Dependent population				Population receiving formal care in institutions				Population receiving formal care at home				Population receiving informal or no care			
	2050	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***
BE	547	131	*32*	*-294*	*229*	*81*	*55*	*-103*	166	*52*	*45*	*-81*	152	*-2*	*-1*	*-110*
DK	179	39	*28*	*-97*	*20*	*6*	*48*	*-9*	245	*69*	*39*	*-123*				*0*
DE	3731	941	*34*	*-1959*	*930*	*396*	*74*	*-390*	1417	*442*	*45*	*-683*	1383	*104*	*8*	*-885*
GR																
ES	2224	775	*53*	*-1270*	*200*	*42*	*26*	*-148*	408	*122*	*43*	*-258*	1616	*611*	*61*	*-864*
FR																
IE	199	108	*118*	*-120*	*51*	*31*	*153*	*-24*	73	*44*	*153*	*-35*	75	*33*	*78*	*-60*
IT	2698	484	*22*	*-1574*	*272*	*79*	*41*	*-131*	1151	*218*	*23*	*-647*	1275	*187*	*17*	*-796*
LU	23	10	*76*	*-13*	*7*	*4*	*125*	*-3*	8	*4*	*81*	*-4*	8	*3*	*45*	*-5*
NL	543	181	*50*	*-290*	*127*	*48*	*61*	*-68*								*0*
AT	263	66	*34*	*-155*												*0*
PT																
FI	242	59	*32*	*-132*	*89*	*33*	*57*	*-40*	76	*24*	*46*	*-37*	77	*3*	*4*	*-55*
SE	378	56	*17*	*-191*	*134*	*32*	*31*	*-55*	172	*30*	*22*	*-82*	73	*-6*	*-8*	*-55*
UK	3408	509	*18*	*-2156*	*428*	*151*	*54*	*-191*	624	*184*	*42*	*-310*	2355	*174*	*8*	*-1655*
CY																
CZ	377	*77*	*26*	*-248*	*99*	*22*	*28*	*-63*	72	*16*	*28*	*-46*	205	*40*	*24*	*-139*
EE																
HU																
LT	114	11	*11*	*-69*	*28*	*5*	*19*	*-16*	6	*1*	*19*	*-4*	80	*6*	*8*	*-50*
LV	61	-4	*-6*	*-38*	*5*	*0*	*0*	*-3*	4	*0*	*0*	*-2*	52	*-4*	*-7*	*-33*
MT	30	11	*61*	*-20*	*21*	*8*	*66*	*-13*	8	*3*	*67*	*-5*	1	*0*	*-19*	*-1*
PL	1226	341	*39*	*-778*	*156*	*51*	*49*	*-95*	65	*21*	*49*	*-40*	1006	*269*	*36*	*-643*
SK	185	58	*46*	*-124*	*47*	*16*	*53*	*-31*	57	*20*	*53*	*-37*	82	*22*	*38*	*-56*
SI	85	27	*47*	*-50*	*20*	*8*	*70*	*-10*	15	5	46	-9	50	*15*	*41*	*-31*
EU25	16513	3882	*31*	*-9577*	*2861*	*1011*	*55*	*-1394*	4567	1255	38	-2402	8491	*1453*	*21*	*8229*
EU15	14434	3359	*30*	*-8251*	*2486*	*901*	*57*	*-1163*	4341	1189	38	-2260	1476	*-4432*	*-75*	*1476*
EU10	2078	523	*34*	*-1326*	*375*	*110*	*41*	*-231*	227	66	41	-142	1476	*347*	*31*	*-792*

Source: DG ECFIN calculation

5.5. Projected spending on long-term care

5.5.1. Pure ageing scenario

Table 5-13 presents the projection results for the '*pure ageing scenario'* under the assumption that costs evolve in line with GDP per worker (scenario I). Public spending on long-term care is projected to increase by between 0.7 and 1.4 p.p. of GDP in most countries between 2004 and 2050. Given their well developed system of formal care provision, public spending is projected to rise by over 2 p.p. in Finland, Sweden and Slovenia. Public spending is projected to rise by less than 1 p.p. in EU10 Member States, except Slovakia and Malta. The striking differences across countries (for example, a projected increase of only 0.1pp of GDP by 2050 in Poland) reflect differences in the level of spending in the base year.

Table 5-13 Projection results for the pure ageing scenario (I)

	Projected spending as % of GDP						
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***2004-2050***
BE	0.9	1.0	1.1	1.4	1.8	2.1	*1.2*
DK	1.1	1.2	1.3	1.9	2.3	2.6	*1.4*
DE	1.0	1.0	1.3	1.5	1.8	2.3	*1.3*
GR							
ES	0.5	0.5	0.5	0.6	0.7	0.8	*0.3*
FR							
IE	0.6	0.6	0.6	0.8	1.0	1.3	*0.7*
IT	1.5	1.5	1.6	1.8	2.0	2.4	*0.8*
LU	0.9	1.0	1.1	1.2	1.5	1.7	*0.8*
NL	0.5	0.5	0.6	0.8	1.0	1.2	*0.7*
AT	0.6	0.7	0.8	1.0	1.2	1.5	*0.9*
PT							
FI	1.7	1.9	2.3	3.2	3.8	4.0	*2.2*
SE	3.8	3.7	3.9	5.3	5.8	6.3	*2.4*
UK	1.0	1.0	1.1	1.4	1.7	2.0	*1.0*
CY							
CZ	0.3	0.3	0.4	0.6	0.7	0.8	*0.5*
EE							
HU							
LT	0.5	0.6	0.6	0.7	0.8	1.0	*0.5*
LV	0.4	0.4	0.5	0.6	0.7	0.8	*0.4*
MT	0.9	0.9	0.9	1.1	1.2	1.2	*0.4*
PL	0.1	0.1	0.1	0.1	0.2	0.2	*0.1*
SK	0.7	0.8	0.8	0.9	1.2	1.4	*0.7*
SI	0.9	1.1	1.3	1.6	2.1	2.4	*1.5*
EU25	*0.9*	*0.9*	*1.0*	*1.2*	*1.4*	*1.7*	*0.8*
EU15	*0.9*	*0.9*	*1.0*	*1.2*	*1.5*	*1.7*	*0.8*
EU10	*0.2*	*0.3*	*0.3*	*0.4*	*0.4*	*0.5*	*0.3*

Source: DG ECFIN calculation
Note: EU25, EU15 and EU10 – average weighted by GDP

Taking account of existing policy settings in the Member States: the German long-term care system

In the EPC projection of public expenditure on long-term care, unit costs are indexed to GDP per worker or GDP per capita. Under existing rules in Germany, all long-term care benefits (that is the benefits paid out by the public insurance for people receiving formal care at home, care in institutions or cash benefits) are fixed by law without any indexation. The difference between the amounts financed by the State and the costs of long term care are either recovered by private insurance or are paid by the beneficiaries themselves.

To better reflect the current setting in German legislation, an alternative projection has been run where unit costs of long-term care services are assumed to remain constant in real terms. This would mean that the amounts financed by the State are adjusted in line with prices. The table below presents the results of the projection assuming an indexation of unit costs to prices and to GDP per worker, respectively.

Assuming constant unit costs in real terms, the long-term care public expenditure is projected to remain around 1% of GDP over the whole projection period, as compared to an increase from close to 1% of GDP today up to 2% of GDP when assuming unit costs evolve in line with GDP per worker. The results of the two scenarios illustrate the difference between what the State is projected to spend under these two assumptions (under current legislation there would not even be an indexation to prices).

Projected spending on long-term care in Germany under existing legislation

	2004	2010	2020	2030	2040	2050	*change 2004-2050*
AWG reference scenario							
Unit costs are constant in real terms	0.97	0.96	0.99	0.94	0.97	1.00	*0.03*
Unit costs evolve in line with GDP per worker	0.97	1.02	1.21	1.36	1.64	2.00	*1.03*
Pure ageing scenario							
Unit costs are constant in real terms	0.97	0.98	1.03	1.01	1.06	1.12	*0.15*
Unit costs evolve in line with GDP per worker	0.97	1.03	1.26	1.46	1.81	2.25	*1.28*

5.5.2. Unit costs evolve in line with GDP per capita

Table 5-14 presents the projection results for the scenario under the assumption that '*unit costs evolve in line with GDP per capita'*. It also compares the results relative to the '*pure ageing scenario'* presented on Table 5-13. The increase in spending projected is somewhat smaller at the end of the projection period. Compared to the pure ageing scenario where unit costs evolve in line with GDP per worker, the differences are very small. Spending would tend to be higher in the first period of the projection and lower in the second period; this reflects the different patterns in the evolution of GDP per capita and GDP per worker.

Table 5-14 Projection results for the *scenario where unit costs evolve in line with GDP per capita* (II)

	Projected spending as % of GDP							Difference as % of GDP compared to pure demographic scenario		
	2004	2010	2020	2030	2040	2050	*2004-2050*	2010	2030	2050
BE	0.9	1.0	1.2	1.3	1.7	2.0	*1.1*	0.0	0.0	-0.1
DK	1.1	1.2	1.3	1.8	2.0	2.4	*1.2*	0.0	-0.1	-0.2
DE	1.0	1.1	1.3	1.5	1.8	2.2	*1.2*	0.0	0.0	-0.1
GR							*:*			
ES	0.5	0.5	0.6	0.6	0.7	0.8	*0.2*	0.0	0.0	-0.1
FR										
IE	0.6	0.6	0.7	0.8	1.0	1.3	*0.7*	0.0	0.0	-0.1
IT	1.5	1.6	1.7	1.8	2.0	2.2	*0.7*	0.1	0.1	-0.1
LU	0.9	1.0	1.2	1.3	1.7	2.1	*1.3*	0.1	0.1	0.4
NL	0.5	0.5	0.6	0.8	1.0	1.1	*0.7*	0.0	-0.1	-0.1
AT	0.6	0.7	0.8	0.9	1.1	1.4	*0.8*	0.0	0.0	-0.1
PT										
FI	1.7	1.9	2.2	3.0	3.6	3.7	*2.0*	0.0	-0.2	-0.3
SE	3.8	3.8	3.8	5.1	5.5	6.0	*2.2*	0.1	-0.2	-0.3
UK	1.0	1.0	1.1	1.4	1.6	1.9	*0.9*	0.0	-0.1	-0.1
CY										
CZ	0.3	0.4	0.4	0.5	0.6	0.7	*0.4*	0.0	0.0	-0.1
EE										
HU										
LT	0.5	0.6	0.7	0.7	0.8	1.0	*0.5*	0.0	0.1	0.0
LV	0.4	0.5	0.6	0.6	0.7	0.8	*0.4*	0.0	0.0	0.0
MT	0.9	0.9	1.0	1.1	1.2	1.2	*0.3*	0.0	0.0	0.0
PL	0.1	0.1	0.1	0.2	0.2	0.2	*0.1*	0.0	0.0	0.0
SK	0.7	0.8	0.9	1.0	1.2	1.3	*0.6*	0.0	0.1	-0.1
SI	0.9	1.1	1.3	1.5	1.9	2.1	*1.1*	0.0	-0.1	-0.4
EU25	0.9	0.9	1.0	1.2	1.3	1.6	*0.7*	0.0	0.0	-0.1
EU15	0.9	0.9	1.0	1.2	1.4	1.6	*0.8*	0.0	0.0	-0.1
EU10	0.2	0.3	0.3	0.4	0.4	0.5	*0.2*	0.0	0.0	-0.1

Source: DG ECFIN calculation
Note: EU25, EU15 and EU10 – average weighted by GDP

5.5.3. Constant disability scenario

Table 5-15 presents the projection results for the '*constant disability scenario'*, under the assumption that costs evolve in line with GDP per worker. As expected, an improved disability status would lead to a considerably lower number of disabled persons in the future who would have some need for care. Under the constant disability scenario, the projected increase in spending due to ageing would be between 40% and 60% lower (up to 100% in Luxemburg) as compared to the pure ageing scenario. According to the projection, spending would increase by about 0.5 p.p. of GDP in most countries, with smaller increases in EU10 Member States.

Table 5-15 Projection results for the *constant disability scenario* (III)

	Projected spending as % of GDP							*Difference as % of GDP compared to pure demographic scenario*		
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***2004-2050***	**2010**	**2030**	**2050**
BE	0.9	0.9	1.0	1.1	1.4	1.5	*0.7*	0.0	-0.2	-0.5
DK	1.1	1.1	1.2	1.6	1.8	1.9	*0.8*	-0.1	-0.3	-0.7
DE	1.0	1.0	1.1	1.3	1.5	1.8	*0.8*	0.0	-0.2	-0.5
GR										
ES	0.5	0.5	0.5	0.5	0.6	0.7	*0.2*	0.0	0.0	-0.1
FR										
IE	0.6	0.6	0.6	0.7	0.8	1.0	*0.4*	0.0	-0.1	-0.3
IT	1.5	1.5	1.5	1.6	1.8	2.0	*0.5*	0.0	-0.1	-0.3
LU	0.9	0.9	1.0	1.0	1.1	1.3	*0.4*	0.0	-0.2	-0.4
NL	0.5	0.5	0.5	0.7	0.8	0.9	*0.4*	0.0	-0.2	-0.3
AT	0.6	0.7	0.8	1.0	1.2	1.5	*0.9*	0.0	0.0	0.0
PT										
FI	1.7	1.8	2.0	2.7	3.0	3.0	*1.3*	-0.1	-0.5	-0.9
SE	3.8	3.6	3.5	4.5	4.6	4.7	*0.9*	-0.2	-0.9	-1.5
UK	1.0	1.0	1.0	1.2	1.3	1.5	*0.5*	0.0	-0.2	-0.5
CY										
CZ	0.3	0.3	0.3	0.5	0.5	0.6	*0.3*	0.0	-0.1	-0.2
EE										
HU										
LT	0.5	0.5	0.5	0.6	0.7	0.8	*0.3*	0.0	-0.1	-0.2
LV	0.4	0.4	0.5	0.5	0.6	0.6	*0.2*	0.0	-0.1	-0.2
MT	0.9	0.9	0.9	1.0	1.1	1.0	*0.1*	0.0	-0.1	-0.2
PL	0.1	0.1	0.1	0.1	0.2	0.2	*0.1*	0.0	0.0	0.0
SK	0.7	0.8	0.7	0.8	1.0	1.2	*0.5*	0.0	-0.1	-0.2
SI	0.9	1.1	1.2	1.4	1.7	1.9	*1.0*	0.0	-0.2	-0.5
EU25	0.9	0.8	0.9	1.0	1.1	1.3	*0.5*	0.0	-0.2	-0.4
EU15	0.9	0.9	0.9	1.1	1.2	1.4	*0.5*	0.0	-0.2	-0.4
EU10	0.2	0.3	0.3	0.3	0.4	0.4	*0.2*	0.0	0.0	-0.1

Source: DG ECFIN calculation
Note: EU25, EU15 and EU10 – average weighted by GDP

5.5.4. Increase in formal care provision scenario

The entire age-related expenditure projection exercise is founded upon an assumption of "no policy change". However, as shown in the results for the pure ageing scenario, the projected increase in public spending on long-term is much higher in countries with well developed formal care systems and *vice versa.* Extrapolating forward on the basis of existing policies and expenditure patterns may give a misleading picture of possible future pressures on public finances. Countries with low levels of formal care provision today (and thus low levels of public spending) will also witness a very large increase in the projected numbers of persons in need of care, and thus pressure may emerge in the future for policy changes to increase formal

care provision. The gap between the need for care and supply of formal care will grow (i.e. the difference projected number of persons with disability on Table 5-11 and the projected numbers of person receiving formal care on the same table).

In brief, the headline projected change in public spending on long-term care may not fully capture the scale or nature of the policy challenge. Growing numbers of elderly persons in need of care may lobby governments to enact policy changes to increase the availability of formal care. On top of the effects of growing numbers of elderly persons, the supply of informal care within households may diminish, as family sizes decline and more women are in active employment (although the scale of this effect will depend on the starting employment rates of women).

To capture the budgetary effects of possible future policy changes, a scenario has been devised which quantifies the budgetary impact of more formal care being provided/financed by the public sector. In particular, it assumes that until 2020, the number of persons receiving informal (or no) care falls by 1% per annum: half of these persons are assumed to receive formal care in institutions and the other half would receive formal care at home.

Table 5-16 shows the projection of the dependent population under the '*increase in formal care provision scenario*'. According to the projection, the population receiving formal care in an institution would increase by 350% on average and the population receiving formal care at home by 400%. The population relying on informal or no care would fall by about 90% on average, 60% in the EU15 and 130% in the EU10. In 2050, the number of people receiving informal or no care in 2050 would be about 20% of the dependent population on average.

Table 5-16 Projection of dependent population, in thousands – *increase in formal care provision*

	Dependent population			Population receiving formal care in institutions				Population receiving formal care at home				Population receiving informal or no care			
	2050	***2004-2050***	***% change 2004-50***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***	**2050**	***2004-2050***	***% change 2004-50***	***difference in 2050 from pure ageing***
BE	841	*425*	*102*	*405*	*258*	*175*	*73*	321	207	*181*	*73*	116	*-39*	*-25*	*-147*
DK	275	*136*	*97*					334	158	*90*	*-34*				
DE	5689	*2900*	*104*	*1956*	*1421*	*266*	*635*	2735	1760	*181*	*635*	998	*-281*	*-22*	*-1270*
GR															
ES	3494	*2045*	*141*	*1042*	*884*	*559*	*694*	1361	1074	*375*	*694*	1091	*87*	*9*	*-1388*
FR															
IE	319	*228*	*250*	*113*	*93*	*462*	*38*	146	117	*405*	*38*	60	*17*	*42*	*-76*
IT	4272	*2058*	*93*	*983*	*790*	*411*	*580*	2378	1444	*155*	*580*	912	*-177*	*-16*	*-1160*
LU	35	*22*	*173*	*14*	*11*	*347*	*4*	16	12	*266*	*4*	6	*0*	*7*	*-8*
NL	833	*471*	*130*	*373*	*294*	*374*	*179*								
AT	419	*221*	*112*												
PT															
FI	374	*191*	*104*	*167*	*110*	*193*	*37*	149	97	*188*	*37*	58	*-16*	*-22*	*-74*
SE	569	*247*	*77*	*224*	*122*	*120*	*36*	289	148	*104*	*36*	56	*-23*	*-29*	*-71*
UK	5564	*2665*	*92*	*1742*	*1464*	*527*	*1123*	2057	1617	*368*	*1123*	1765	*-416*	*-19*	*-2245*
CY															
CZ	625	*326*	*109*	*259*	*181*	*235*	*96*	215	158	*281*	*96*	151	*-14*	*-9*	*-193*
EE															
HU															
LT	184	*80*	*78*	*80*	*57*	*240*	*36*	46	41	*759*	*36*	57	*-17*	*-23*	*-72*
LV	99	*34*	*52*	*32*	*27*	*545*	*24*	30	26	*734*	*24*	38	*-19*	*-33*	*-48*
MT	37	*24*	*181*	*21*	*14*	*228*	*1*	14	9	*195*	*1*	2	*0*	*-4*	*-2*
PL	2004	*1119*	*126*	*712*	*608*	*581*	*461*	566	523	*1195*	*461*	725	*-11*	*-2*	*-923*
SK	309	*182*	*143*	*116*	*85*	*277*	*38*	132	95	*256*	*38*	60	*1*	*2*	*-77*
SI	135	*77*	*134*	*53*	*41*	*352*	*23*	47	36	355	23	36	*0*	*1*	*-46*
EU25	26077	*26019*	*6254*	*8290*	*6446*	*350*	*4050*	*10836*	7523	6578	3866	*6131*	*-907*	*-13*	*-7800*
EU15	22685	*22658*	*83066*	*7018*	*5433*	*343*	*3369*	*9786*	6635	*3777*	3185	*5062*	*-847*	*-14*	*-6439*
EU10	3391	*-489*	*-13*	*1272*	*1013*	*391*	*680*	*1049*	888	91	680	*1070*	*-60*	*-5*	*-1361*

Source: DG ECFIN calculation

Table 5-17 presents the projection results under the assumption of a policy change in the provision of formal care, as well as the comparison with the results of the pure ageing

scenario. An increase in the provision of formal care, where the population who were receiving informal care is split in half between home care and institutions, would result in increases in public spending of more than 100% in many countries: Spain, Italy, Luxemburg, the Netherlands, the UK, Lithuania, Latvia and Poland. Relative to the pure ageing scenario where the probability of receiving formal care is kept constant during the projection period, expenditure in 2050 would be higher by between 0.6 and 1 p.p. in most Member States.

Table 5-17 Projection results for the *increase in formal care provision scenario* (IV)

	Projected spending as % of GDP							*Difference as % of GDP compared to pure demographic scenario*		
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***2004-2050***	**2010**	**2030**	**2050**
BE	0.9	1.0	1.3	1.5	2.0	2.3	*1.5*	0.1	0.2	0.3
DK										
DE	1.0	1.1	1.6	1.8	2.3	2.8	*1.8*	0.1	0.3	0.6
GR										
ES	0.5	0.7	0.9	1.0	1.3	1.7	*1.1*	0.1	0.4	0.9
FR								0.0	0.0	0.0
IE	0.6	0.6	0.7	1.0	1.2	1.6	*1.0*	0.0	0.2	0.3
IT	1.5	1.7	2.1	2.3	2.8	3.3	*1.7*	0.2	0.6	0.9
LU	0.9	1.1	1.4	1.5	1.8	2.1	*1.2*	0.1	0.3	0.4
NL	0.5	0.7	1.1	1.5	1.9	2.3	*1.8*	0.2	0.7	1.0
AT										
PT										
FI	1.7	2.0	2.6	3.7	4.4	4.6	*2.8*	0.1	0.5	0.6
SE	3.8	3.9	4.2	5.8	6.2	6.8	*3.0*	0.1	0.4	0.5
UK	1.0	1.4	2.0	2.5	3.0	3.6	*2.6*	0.3	1.1	1.6
CY										
CZ	0.3	0.4	0.6	0.8	1.0	1.2	*0.9*	0.1	0.3	0.4
EE										
HU										
LT	0.5	0.7	0.9	1.0	1.2	1.5	*1.0*	0.1	0.3	0.6
LV	0.4	0.9	1.8	2.0	2.5	3.0	*2.6*	0.5	1.4	2.2
MT	0.9	0.9	0.9	1.1	1.3	1.3	*0.4*	0.0	0.0	0.0
PL	0.1	0.2	0.2	0.3	0.4	0.4	*0.3*	0.0	0.1	0.2
SK	0.7	0.8	0.9	1.1	1.5	1.8	*1.1*	0.1	0.2	0.4
SI	0.9	1.3	1.9	2.3	3.1	3.6	*2.7*	0.2	0.7	1.2
EU25	*0.9*	*1.0*	*1.3*	*1.6*	*1.9*	*2.3*	*1.5*	*0.1*	*0.4*	*0.7*
EU15	*0.9*	*1.0*	*1.4*	*1.7*	*2.0*	*2.4*	*1.5*	*0.1*	*0.4*	*0.7*
EU10	*0.2*	*0.3*	*0.4*	*0.6*	*0.7*	*0.9*	*0.6*	*0.1*	*0.2*	*0.3*

Source: DG ECFIN calculation
Note: EU25, EU15 and EU10 – average weighted by GDP

5.5.5. AWG reference scenario

An *'AWG reference scenario"* (V) is a prudent scenario that aims to bring together several different drivers of long-term care spending. It assumes that age-specific disability rates fall by half of the projected decrease in age-specific mortality rates. This implies that some half of projected gains in life expectancy up to 2050 would be spent in good health and free of disability. Note that that the aim is to facilitate the comparison of budgetary projections across expenditure items, and thus it should be symmetrical with the "AWG reference scenario" for health care.

Table 5-18 presents the results of the AWG reference scenario. It shows that the projected increase in public spending lies midway between the results of the "pure ageing" and the "constant disability" scenario. The effects of the "AWG reference scenario" are stronger for long-term care than for health care, i.e. in terms of mitigating the projected increase in public

spending. This occurs because unlike the health care projection exercise, there is no assumption regarding the income elasticity of demand being greater than unity. Also, the age-specific disability rates used in the long-term care projection rise at a much steeper pace compared with the (implicit) assumptions on age-specific morbidity rates used in the health care projection (which uses the age-related expenditure profile as a proxy for morbidity).

Table 5-18 Projection results for the *AWG reference scenario*

	Projected spending as % of GDP						
	2004	**2010**	**2020**	**2030**	**2040**	**2050**	***2004-2050***
BE	0.9	0.9	1.1	1.3	1.6	1.8	*1.0*
DK	1.1	1.1	1.2	1.8	2.0	2.2	*1.1*
DE	1.0	1.0	1.2	1.4	1.6	2.0	*1.0*
GR							
ES	0.5	0.5	0.5	0.5	0.6	0.8	*0.2*
FR							*0.0*
IE	0.6	0.6	0.6	0.7	0.9	1.2	*0.6*
IT	1.5	1.5	1.6	1.7	1.9	2.2	*0.7*
LU	0.9	1.0	1.0	1.1	1.3	1.5	*0.6*
NL	0.5	0.5	0.5	0.8	0.9	1.1	*0.6*
AT	0.6	0.7	0.8	1.0	1.2	1.5	*0.9*
PT							
FI	1.7	1.9	2.1	3.0	3.4	3.5	*1.8*
SE	3.8	3.7	3.7	4.9	5.2	5.5	*1.7*
UK	1.0	1.0	1.1	1.3	1.5	1.8	*0.8*
CY							
CZ	0.3	0.3	0.4	0.5	0.6	0.7	*0.4*
EE							
HU							
LT	0.5	0.6	0.6	0.6	0.7	0.9	*0.4*
LV	0.4	0.4	0.5	0.5	0.6	0.7	*0.3*
MT	0.9	0.9	0.9	1.0	1.1	1.1	*0.2*
PL	0.1	0.1	0.1	0.1	0.2	0.2	*0.1*
SK	0.7	0.8	0.7	0.9	1.1	1.3	*0.6*
SI	0.9	1.1	1.3	1.5	1.9	2.2	*1.2*
EU25	*0.9*	*0.9*	*0.9*	*1.1*	*1.3*	*1.5*	*0.6*
EU15	*0.9*	*0.9*	*1.0*	*1.1*	*1.3*	*1.5*	*0.7*
EU10	*0.2*	*0.3*	*0.3*	*0.3*	*0.4*	*0.5*	*0.2*

Source: DG ECFIN calculation
Note: EU25, EU15 and EU10 – average weighted by GDP

5.6. Conclusion

An ageing population will be a strong upward impact on public spending for long term care. This is because frailty and disability rises sharply at older ages, especially amongst the very old (aged 80+) which will be the fastest growing segment of the population in the decades to come. The projection methodology has been upgraded considerably since the 2001 exercise, and has enabled to run scenarios which examine non-demographic drivers of spending.

According to a “pure ageing” scenario based on current policy settings, public spending on long-term care is projected to increase by between 0.5 and 1 p.p. of GDP between 2004 and 2050. The projected changes in public spending are very diverse reflecting very different approaches to the provision/financing of formal care. Countries with very low projected increases in public spending currently have very low levels of formal care. The projections show that with an ageing population, a growing gap may occur between the number of elderly citizens with disability who are in need of care (which will more than double by 2050) and the actual supply of formal care services. On top of an ageing population, this gap could further grow due to less informal care being available within households on account of trends in family size and projected increase in the participation of women in the labour market. In brief, for countries with less developed formal care systems today, the headline projected increase in public spending on long-term care may not fully capture the pressure on public finances, as future policy changes in favour of more formal care provision may be needed.

Public spending is very sensitive to trends in the disability rates of elderly citizens. Compared with a “pure ageing” scenario, projected change in spending would be between 40% and 60% lower if the disability status of elderly citizens improves broadly in line with the projected increase in life expectancy. Policy measures, which can either reduce disability, limit the need for formal care amongst elderly citizens with disabilities, or which favour formal care at home rather than in institutions, can have a very large impact on public spending.

6. EDUCATION

6.1. Introduction

The number of children and young people in the EU is expected to fall over the next decades. This has raised the question of whether savings in education expenditure can be expected. The results presented in this chapter indicate a reduced ratio of students to working-age population which leads to a reduction in the ratio of total education expenditure to GDP in all EU Member States. While this ratio ranged from 3.4 to 7.6 % in 2002 (the base year), it is projected to range from 2.4 to 7.5 % in 2050. The reductions are 1 percentage point or lower in 18 Member States, and 2 percentage point or higher only in two countries. As the reductions in education expenditure are relatively minor, they can not be expected to offset the rise in old-age-related expenditure.

The exercise takes into account expected demographic and labour market developments and the commonly agreed macroeconomic assumptions applied to the whole budgetary exercise. It does not assume a general rise in the education levels, but analyses the effects of expected demographic and labour market developments given the present enrolment and cost situation. As a consequence, a word of caution is in order. The projections of reduced education expenditure depend on a number of variables. As no underlying trend in enrolment rates is included, wealth effects on the demand side, or investment considerations e.g. related to the Lisbon objectives, could lead to savings being even more limited. The same can happen if expenditure per student should rise relative to GDP per worker, e.g. because of smaller classes or an increase in relative wages. In several Member States national expectations are that enrolment and/or cost levels will increase more than what follows from the projections, because of implemented or planned legislation or other policies. This is especially relevant for enrolment in tertiary education. As education is to a large extent an investment in future human capital, many Member States may also wish to direct any savings arising from demographic developments to exactly such increases in quality or intensity.

Historical experience further emphasizes that factors other than demographic developments have clearly been important to the developments of education expenditure over the last years. The projected savings are conditional on these factors not continuing to point in an upward direction. While a detailed analysis of such factors has been beyond the scope of the current exercise, it is important to note that the projections should in no way be taken to imply that large and easy savings can be expected for public finances due to developments in the educational sector.

Compared to the exercise in 2003, several improvements have been implemented in the current exercise. The main improvement lies in the more reliable and comparable data that have been used in this exercise. The present calculation of enrolment rates further ensures consistency between enrolment rates and labour market participation rates. The methodology also allows different assumptions on the developments of each cost element. For details on the methodology, refer to the Economic Policy Committee and European Commission (2005a).

6.2. Data collection and delimitation of the exercise

The data used have been collected from Eurostat, and then sent to the Member States for information and verification. For some countries complete data were not available. In these cases, simplifying assumptions have been made in order to run the projections; cf. Table 6-1.

Table 6-1: Detailed assumptions made in performing the projections

Country	Data situation	Assumptions made
Belgium	Complementary information has been provided by the Belgian authorities for year 2003 (number of personnel). Financial information for level 2 and level 3 are combined.	Number of personnel has been estimated for each level of education applying to year 2002 the same ratio student/personnel as in 2003. Expenditure has been split between level 2 and level 3/4 assuming that the salary level is the same across the three levels. For all other expenditure items the ratio between different categories of expenditure provided by the combined figures is kept constant.
Denmark	Data for personnel are missing for level 2 and 5	Number of staff in level 2 and 5 has been estimated using EU15 average class size.
Germany	The spending (around 0.25 per cent of GDP) at the workplace for combined workplace and school education as well as similar expenditure by "Bundesagentur für Arbeit" is not included. These data were provided by German authorities.	
Estonia	Personnel data for 2002 are missing. Data for Finance 2 (expenditure breakdown by type of expenditure: personnel, other than personnel) are missing Data covers exclusively public spending	The 2001 student/personnel ratio is applied to the 2002 figures. Assumption: Total public spending, as from Finance1, has been broken down in wage and no-wage related expenditure according to EU25 ratio.
Greece	Financial data for level 2 and 3 are combined.	The salary level is assumed to be equal across level 2 and 3. Other expenditures are assumed to have the same ratio between level 2 and 3 as salaries.
Spain	Financial data for levels 2 and 3/4 are combined.	The salary level is assumed to be equal across level 2 and 3/4. Other expenditures are assumed to have the same ratio between level 2 and 3/4 as salaries.
Ireland	Data for personnel for level 2 and 3/4 are combined.	The data have been broken down according to class size information provided by Irish authorities.

Lithuania	Data for private payments are missing. Financial data for level 1, 2 and 3/4 are combined.	Data for private payments (P5) have been provided by the Lithuanian authorities. Financial data for levels 1, 2 and 3/4 have been broken down according to number of teachers on the assumption that the salary is equal across levels.
Luxembourg	Data cover only spending up to ISCED level 3. Moreover figures represent exclusively public spending in public institutions. These data were provided by Luxembourg authorities.	
Netherlands	Number of personnel in ISCED level 2 is missing.	Number of staff in level 2 has been estimated using EU15 average class size.
Portugal	Data for staff are missing for level 5	Number of staff in level 5 has been estimated using EU15 average class size.
Slovenia	Data for Fin1 in level 1 include data for level 2. No data for Fin2 (break down of expenditure by type) exists.	The salary level is assumed to be equal across level 1 and 2. Assumption: Total public spending as from Finance1, has been broken down by wage and no-wage related expenditure according to EU25 ratio
United Kingdom	Data for level 3 include data for level 2.	The salary level is assumed to be equal across level 2 and 3. Other expenditures are assumed to have the same ratio between level 2 and 3 as salaries.

Source: Commission services

Education is classified into seven different levels according to a standard international classification system (ISCED).[69] The projections cover public education expenditure for basic, upper-secondary and tertiary education. In particular:

[69] Pre-primary education. Level 0 of ISCED classifications. It is defined as the initial stage of organised instruction, designed primarily to introduce very young children to a school-type environment. Such programmes are designed in general for children of at least 3 years. Basic (primary plus lower secondary) education. Level 1 and 2 of ISCED classification. 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 a 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. Upper-secondary education. Level 3 and 4 of ISCED classification. Level 3 is upper-secondary school and the entry is typically 15 or 16 year old. It also includes vocational and technical educational. Level 4 is post-secondary non-tertiary education and these programmes are typically designed to prepare students to the following level (university). Tertiary education. Level 5 and 6 of ISCED classification. Level 5 covers at least two years of education and the minimal access requirements is the completion of level 3 and 4. However a Master course that implies up to 6 years of tertiary education is included in level 5. Level 6 includes tertiary programmes which lead to the award of an advance research qualification. See Unesco, 1997.

a) Projections are run for primary (ISCED 1), lower secondary (ISCED 2), upper secondary and post secondary non-tertiary (ISCED 3 and 4), and tertiary education (ISCED 5 and 6). This allows distinguishing between compulsory schooling (ISCED 1 and 2), non compulsory schooling (ISCED 3 and 4) and tertiary education (ISCED 5 and 6). ISCED levels 4 and 6 play a marginal role. They are often assimilated to levels 3 and 5 respectively, and are treated as part of these levels also in this exercise.

b) The effective starting and ending age of each education level differ significantly across Member States. In addition the effective upper age-limit can differ considerably form the standard one[70]. However, data has been provided on all students across both age and level. All students are thus included in the projections, and the differences between standard ages and effective limits do not cause problems for the projections.

c) As this exercise focuses on comparability of data across countries, pre-primary education is not included in the projections. The 2003 exercise revealed serious data problems related to pre-primary education which makes it difficult to produce reliable projections. Comparability across countries is also hampered by large differences in the institutional settings of pre-primary systems and large shares of private institutions. Public expenditures on pre-primary education on average represent less than 0.5% of GDP.

The base year for the calculations is 2002. This is because 2002 is the last year for which a complete data set, comprising both the number of students and staff and financial data, is available. However, actual enrolment figures are also available for 2003 for all countries, and these are therefore included. This implies that for 2003 projected enrolment corresponds to actual enrolment, while cost levels are projected data which may differ somewhat from actual developments.

6.3. The number of students in public education

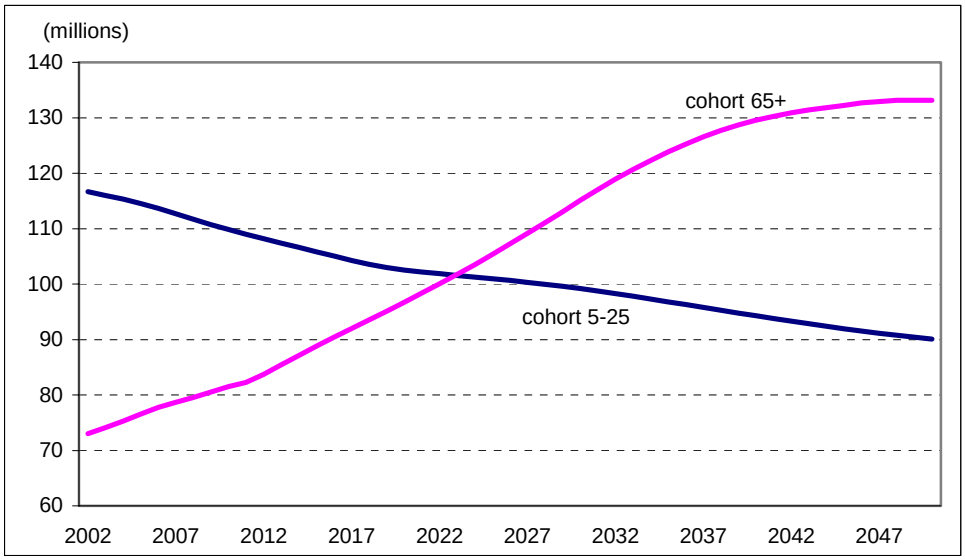
6.3.1. Demographic developments

The main driving force for the future trend in the number of students is demographic developments. While the AWG population scenario[71] indicates a relatively stable total population in the EU, much larger changes are expected in the composition of the population. The starting and ending ages in education varies greatly between countries, and especially in higher education, it is difficult to set an upper limit to the age where people are potentially affected by education policies. However, a broad indication can be given by looking at the number of people aged 5-25 years, as this is the most relevant age-group in most countries. For the EU, this number is projected to decline from 117 million in 2002 to 91 million by 2050 (see Graph 6-1). The number of old people (aged 65 and above) will rise markedly over the same horizon, and the number of old people will as a consequence be higher than that of younger ones in less than 20 years.

[70] A notable; but not the only; example here is Denmark, where according to national estimates approximately 2/3 of tertiary education students are over the standard age of 19-23.

[71] See Section 2.1.

Graph 6-1: Population aged 5-25 and over 65 in the EU25 (2002-2050). Millions



Source: Eurostat.

The number of young people must be seen in relative terms to be a useful indicator of expected changes in education expenditure as a share of GDP. Table 6-2 presents the size of the populations aged 5-25 and their share of the working-age population in all Member States. With the exception of The Netherlands, Luxembourg and Sweden, the size of the age group 5-25 is foreseen to contract between 2002 and 2050. The decline in the number of young people is expected to exceed 40% in six countries (CZ, EE, LT, LV, PL, SK) and to be between 30% and 40% in three countries (EL, HU, SI).

If the number of young people is instead considered in relation to the working-age population, the table shows that the share of young people will fall in all countries except Denmark, Luxembourg and the Netherlands. There were on average around 38 young out of 100 of working-age in the EU in 2002, while in 2050 there will be about 35 out of 100. This overall trend hides differences across countries. The biggest drops in young shares in absolute terms are expected in Cyprus, Lithuania, Poland and Slovakia where the ratio will fall more than 10 percentage points. This decline is, however, very small relative to the expected rise in the old-age dependency ratio[72], from 24 out of 100 in 2002 to 52 out of 100 in 2050.

[72] The old-age dependency ratio is defined as the ratio between people aged 65 or older and the population aged 15-64.

Table 6-2: Change in population aged 5-25 and young share of working-age population between 2002 and 2050.

	Total population (age 5-25) - in thousands			Young share[1]		
	2002	2050	Change 2002- 2050	2002	2050	change 2002-2050
BE	2603	2353	-250	38.5	37.4	-1.1
CZ	2841	1641	-1200	39.6	32.7	-7.0
DK	1338	1279	-59	37.5	39.1	1.6
DE	19049	14458	-4591	34.2	32.1	-2.0
EE	393	233	-161	42.9	34.7	-8.2
EL	2807	1942	-865	37.6	33.0	-4.6
ES	10356	7369	-2987	36.9	32.1	-4.8
FR	15845	14969	-875	41.0	40.0	-1.1
IE	1254	1210	-43	47.5	38.2	-9.3
IT	12618	9381	-3237	33.0	32.0	-1.0
CY	227	195	-32	48.2	33.0	-15.2
LV	674	382	-291	42.3	34.5	-7.8
LT	1043	574	-469	45.1	33.4	-11.6
LU	112	153	41	37.6	38.9	1.2
HU	2792	1818	-974	40.1	35.1	-5.0
MT	119	110	-9	44.1	35.5	-8.6
NL	4094	4109	14	37.5	38.9	1.3
AT	2006	1552	-454	36.7	33.0	-3.6
PL	12197	6452	-5745	46.2	33.3	-13.0
PT	2694	1928	-766	38.6	35.0	-3.6
SI	531	355	-176	38.0	33.4	-4.6
SK	1739	895	-844	46.3	32.7	-13.6
FI	1367	1150	-216	39.3	38.2	-1.2
SE	2307	2366	60	40.1	39.1	-0.9
UK	15648	13759	-1890	40.4	36.4	-3.9
EU	116653	90634	-26019	38.4	34.8	-3.6

[1] Young share is reported as ratio between population age 5-25 over population aged 15-64.
Source: Commission services calculations based on Eurostat data.

6.3.2. Enrolment

Given the size of the population in relevant age groups, enrolment rates for each age group decide the number of students[73]. For basic education (primary and low secondary) enrolment rates tend to be close to 100%, and can be expected to remain broadly constant over time as basic education is compulsory in all Member States. Frictions in the systems and lack of enforcement of the legislation, nevertheless lead to some deviations from 100% enrolment.

[73] The enrolment rate of people aged x is defined as the number of students aged x divided by the number of people aged x in the total population. This is sometimes referred to as a net rate, while the gross rate is the total number of students divided by the number of people in the age-group considered relevant. In 2003 gross rates had to be used as the age of the students was not available, but as the effective limits can exceed the official age, this lead to gross rates above 100% in some cases. The available figures sometimes show also net enrolment rates above 100%. This must be due to imprecise registration of either the age of the students or the size of the population in question.

In the age-groups most frequently enrolled in upper secondary and tertiary education, working constitutes an alternative. The combination of part-time studying and part-time working, is also quite frequent in some countries, especially for tertiary education. Without any specific reason to assume a shift in the number of part-time students, or in the number of young people neither working nor studying, enrolment rates are calculated as a complement to labour market participation rates[74]. This implies that, other things being equal, an increase in the participation rate gives a decrease of the enrolment rate.[75] Table 6-3 presents the projections of participation rates for the age-groups most relevant to secondary and tertiary education.

Table 6-3: Labour market participation rates for young people (2002-2050)

	Age 15-18			Age 19-24		
	2002	2050	Change 2002 - 2050	2002	2050	Change 2002 - 2050
BE	6.6	6.7	0.0	54.2	55.8	1.6
CZ	4.3	6.1	1.8	59.2	56.1	-3.1
DK	54.3	51.1	-3.3	77.0	79.0	2.1
DE	23.0	24.1	1.1	68.4	68.9	0.4
EE	4.5	7.0	2.5	56.7	59.6	2.9
EL	9.2	8.7	-0.5	52.2	51.0	-1.2
ES	15.1	14.5	-0.6	59.0	60.3	1.3
FR	9.6	11.0	1.3	55.3	58.5	3.3
IE	23.1	22.4	-0.7	70.8	73.2	2.4
IT	13.3	12.3	-1.0	54.6	52.9	-1.6
CY	5.0	9.0	4.0	65.1	69.2	4.1
LV	9.5	8.4	-1.1	62.3	64.2	1.9
LT	4.0	4.3	0.3	52.3	50.0	-2.3
LU	9.1	6.2	-2.9	51.3	43.5	-7.8
HU	2.9	4.9	2.0	50.2	48.6	-1.6
MT	32.8	30.2	-2.6	78.4	77.2	-1.2
NL	61.3	59.6	-1.6	81.9	82.7	0.7
AT	35.7	36.4	0.7	68.3	69.9	1.6
PL	6.5	6.7	0.2	58.1	59.2	1.1
PT	20.0	17.6	-2.4	63.3	61.5	-1.7
SI	7.7	5.9	-1.8	51.7	47.3	-4.4
SK	5.8	8.9	3.2	67.1	63.0	-4.1
FI	27.8	26.1	-1.7	67.9	69.5	1.7
SE	24.7	23.3	-1.3	66.1	69.7	3.6
UK	44.7	46.1	1.4	77.7	77.2	-0.6

Source: Commission services calculations based on Eurostat data.

Labour market participation varies strongly across countries in the lower age group: while it is below 10 per cent in half of the countries, it exceeds 50 per cent in Denmark and the Netherlands. As enrolment rates for the same age-group are high also in these countries, this entails that combining studies and work is common. In general, large shifts in labour market participation rates for young people are not expected over the next decades.

As the age limits for the upper secondary and tertiary education levels vary, Table 6-4 and Table 6-5 provide the combined enrolment rates for all levels of education by single year age groups for 2002 and 2003 respectively. Not surprisingly, enrolment falls with age, and there are wide variations between countries.

[74] The participation rate is defined as the ratio of the labour force in a given age group to the total population in that age group. Participation rates and total population in a determined age group are the ones used in other parts of the budgetary projection exercise.

[75] See EPC and COM (2005a) for details on the methodology.

A comparison between the two tables shows some difference in enrolment rates between 2002 and 2003. In most cases, enrolment is higher in 2003, hinting at an underlying upward trend. This is why the projections include actual 2003 enrolment rates.

Table 6-4: Enrolment rate across all level of education by age[1]. 2002

Country/Age	15	16	17	18	19	20	21	22	23	24
BE	100.9	99.7	103.1	91.8	79.3	65.8	53.3	41.0	30.0	22.7
CZ	100.0	100.0	98.3	87.5	63.1	40.3	30.3	26.3	22.1	16.3
DK	95.7	91.2	83.0	78.3	60.0	45.1	44.3	43.3	41.6	38.1
DE	98.5	99.4	94.2	85.7	67.4	50.6	40.9	51.1	26.1	21.3
EE	98.9	98.3	91.1	77.0	65.7	56.6	46.0	34.7	26.6	22.6
EL	92.7	92.7	69.7	75.9	89.5	56.3	45.0	35.9	25.4	21.4
ES	99.3	92.5	80.6	67.2	57.1	51.5	44.3	36.8	30.6	23.4
FR	97.4	96.7	91.0	79.6	65.5	51.1	40.1	32.2	24.5	16.9
IE	106.0	95.1	83.6	82.6	59.1	51.2	41.7	27.0	16.4	11.6
IT	95.3	88.2	80.9	74.8	52.4	41.4	35.8	31.0	27.0	24.0
CY	94.3	88.6	78.4	23.2	28.3	22.5	21.0	13.3	9.5	7.0
LV	97.9	95.8	91.6	76.6	61.7	48.7	41.6	41.6	26.3	20.8
LT	100.4	97.9	95.0	85.2	70.0	57.1	45.7	35.9	28.7	21.6
LU	91.6	84.9	80.1	70.3	50.1	30.4	16.6	8.6	4.3	2.5
HU	97.4	89.7	86.0	73.3	59.7	46.8	37.6	31.1	24.2	19.2
MT	103.8	60.2	59.6	56.6	36.7	27.1	20.0	11.6	5.9	4.3
NL	102.6	100.7	88.4	76.8	63.1	56.0	48.9	37.7	29.4	22.6
AT	94.4	91.4	88.3	69.3	43.9	31.4	27.5	24.7	22.3	19.7
PL	96.8	93.7	90.7	85.0	72.6	66.2	55.4	47.4	41.1	27.7
PT	93.5	83.0	71.2	60.5	52.0	45.9	41.9	36.4	29.4	21.6
SI	102.6	94.8	94.3	83.8	71.0	45.5	44.6	39.9	34.8	24.5
SK	98.8	94.5	87.5	63.8	37.2	27.0	24.4	22.5	16.0	10.1
FI	99.2	96.1	93.9	89.3	48.5	47.3	55.8	57.3	51.9	44.5
SE	99.2	97.0	96.0	93.6	43.3	45.3	47.6	46.1	43.0	38.1
UK	109.6	87.0	74.7	57.1	55.8	52.1	42.0	31.5	26.3	23.7

[1] Students studying abroad are taken into account in the country in which they study. This especially affects the figures for Luxembourg.
Source: Commission services calculation based on New Chronos database.

Table 6-5: Enrolment rate across all level of education by age[1]. 2003

Country/Age	15	16	17	18	19	20	21	22	23	24
BE	102.3	101.1	104.4	88.5	76.5	67.6	53.1	41.5	30.4	23.7
CZ	100.0	100.0	98.6	88.3	64.3	44.9	32.1	25.0	20.4	16.5
DK	100.7	92.8	86.0	80.9	60.9	43.0	45.5	43.3	42.6	38.6
DE	97.5	96.5	93.1	86.8	69.1	51.4	42.4	51.7	27.5	22.4
EE	98.1	98.5	91.5	79.3	64.2	53.9	45.0	34.9	25.7	21.3
EL	91.8	94.0	65.4	68.3	90.3	55.1	44.1	34.9	25.2	21.1
ES	98.5	92.1	81.9	68.8	56.9	50.9	42.1	35.7	28.5	22.1
FR	97.4	96.3	91.9	79.5	66.2	51.9	40.7	32.4	24.3	17.3
IE	105.3	97.5	84.6	85.5	60.4	54.7	43.1	28.7	16.8	12.0
IT	96.9	88.4	82.1	77.6	55.4	44.0	39.6	32.4	27.8	22.4
CY	96.0	93.1	80.9	28.4	17.6	37.6	25.0	18.3	16.2	10.9
LV	96.3	95.9	92.1	78.9	63.4	50.2	42.7	43.5	27.5	21.1
LT	100.7	100.1	95.1	87.4	72.0	58.0	48.9	40.9	33.2	24.3
LU	90.0	86.2	79.6	71.4	49.1	30.0	17.5	8.8	4.9	2.8
HU	99.8	92.9	85.5	75.9	63.5	50.0	41.0	33.4	25.9	20.1
MT	102.2	85.4	63.2	42.8	36.2	27.7	23.7	15.9	9.1	6.4
NL	101.6	94.8	85.4	76.2	65.5	57.3	50.7	39.6	30.1	24.0
AT	94.3	90.8	88.3	69.7	44.4	31.9	28.8	26.0	23.0	20.4
PL	97.6	95.8	92.3	85.4	75.5	67.7	57.8	49.9	43.8	28.5
PT	88.8	84.6	73.1	61.2	51.2	44.3	40.2	34.8	28.1	21.8
SI	99.0	98.5	95.5	85.7	75.4	47.4	45.6	41.2	35.6	27.2
SK	99.7	94.4	90.1	72.2	44.3	28.4	24.7	23.1	17.4	11.8
FI	99.2	96.3	94.1	92.0	51.7	49.7	57.0	57.9	54.4	46.2
SE	99.3	97.0	97.4	94.5	42.5	45.2	47.3	47.2	44.2	39.5
UK	105.9	87.6	75.2	53.8	52.2	50.2	39.9	30.0	24.8	22.5

[1] Students studying abroad are taken into account in the country in which they study. This especially affects the figures for Luxembourg.
Source: Commission services calculation based on New Chronos database.

Table 6-6 shows that enrolment in 2050 is mostly rather close to enrolment in 2002 and 2003. The changes from 2003 that do occur follow from developments in the labour market.

Table 6-6: Enrolment rate across all level of education by age[1]. 2050

Country/Age	15	16	17	18	19	20	21	22	23	24
BE	102.5	101.5	104.0	88.7	75.3	65.9	51.5	39.7	30.1	23.7
CZ	100.0	99.9	96.2	83.1	57.9	41.3	31.1	28.3	23.8	19.1
DK	100.7	92.8	81.2	80.6	59.9	42.1	34.4	34.7	30.4	31.1
DE	97.5	95.2	91.7	83.0	67.1	49.9	42.0	53.2	28.7	19.4
EE	98.1	98.5	91.5	77.9	62.2	50.6	43.6	39.7	27.1	23.1
EL	91.9	94.0	64.2	72.2	86.5	55.7	47.3	35.9	27.2	24.3
ES	98.5	92.6	82.2	67.0	57.3	50.2	40.8	34.7	26.3	21.9
FR	97.3	95.7	91.2	79.4	66.2	51.8	39.9	31.2	22.4	14.6
IE	105.3	96.2	84.4	84.5	60.0	49.3	38.7	25.5	15.1	10.5
IT	96.9	88.4	81.1	77.8	54.7	42.3	39.0	32.1	28.4	22.9
CY	96.0	93.1	80.9	27.4	14.5	35.1	20.1	18.7	17.4	9.0
LV	96.3	94.8	92.1	78.9	61.1	46.9	44.8	38.1	29.4	20.9
LT	100.7	100.1	95.0	84.6	72.0	55.5	47.4	44.8	41.9	32.0
LU	91.0	84.0	80.0	70.0	45.8	25.3	16.3	7.5	4.5	2.8
HU	99.8	92.8	83.7	70.7	58.4	47.2	39.7	33.0	26.7	23.5
MT	102.2	85.3	62.5	41.0	31.3	26.4	21.8	15.9	7.6	4.2
NL	101.6	94.8	85.4	74.5	62.5	53.5	47.4	37.1	30.0	21.8
AT	94.2	87.9	87.6	69.6	42.7	30.8	28.3	25.7	20.0	20.9
PL	97.6	95.0	92.3	85.4	72.1	63.4	54.1	45.9	41.0	27.4
PT	88.8	83.6	71.5	60.5	50.6	42.8	39.0	33.9	26.2	21.7
SI	98.9	98.5	94.7	85.1	72.9	47.3	47.8	45.6	41.5	34.1
SK	99.7	94.1	87.7	61.7	40.0	28.4	26.1	25.2	19.5	13.6
FI	99.2	93.4	94.1	92.0	51.6	48.7	49.5	55.2	50.8	42.3
SE	99.4	97.0	97.4	94.3	41.7	42.2	42.7	38.9	35.2	32.3
UK	105.9	85.9	72.2	51.3	50.9	48.6	37.7	29.7	24.8	20.2

[1] Students studying abroad are taken into account in the country in which they study. This especially affects the figures for Luxembourg.
Source: Commission services calculation based on New Chronos database.

Given the projected trends of the above described variables, the number of students enrolled in education in EU is expected to decline from 91.8 and 91.6 millions in 2002 and 2003 respectively to 71.7 millions in 2050. For all age groups the main explanation for the drop in the number of students is demographics, but for students aged 15 or more, labour market developments also influence the developments in enrolment rates. The number of students is expected to decline from 2002 to 2050 in all countries but Luxembourg (see Table 6-7).

Measured as a share of working-age population, the average EU student ratio is expected to decline by 2.4 percentage points. Declines in this ratio are expected in all countries but Denmark and the Netherlands, and the strongest expected reductions are foreseen for Cyprus and Poland with reductions of about 10 percentage points.

Table 6-7: Total number of students and student share of working-age population

	Total number of students (in thousands)			Student share of working-age population[1] (as a percentage)		
	2002	2050	change 2002-2050	2002	2050	change 2002-2050 (p.p)
BE	2332.6	2086.9	-245.7	34.5	33.2	-1.3
CZ	1935.3	1164.3	-770.9	27.0	23.2	-3.8
DK	1046.0	964.6	-81.5	29.3	29.5	0.2
DE	14442.9	10592.5	-3850.3	25.9	24.3	-1.6
EE	304.0	174.8	-129.2	33.2	26.1	-7.1
EL	1975.3	1443.8	-531.5	26.5	24.6	-1.9
ES	7461.2	5569.5	-1891.7	26.6	24.3	-2.3
FR	11712.4	11003.7	-708.8	30.3	29.4	-1.0
IE	992.2	992.1	-0.1	37.6	31.3	-6.3
IT	9198.7	7004.5	-2194.2	24.1	23.9	-0.2
CY	141.5	116.8	-24.7	30.0	19.8	-10.2
LV	510.1	279.5	-230.6	32.1	25.2	-6.8
LT	796.6	440.0	-356.7	34.4	25.6	-8.8
LU	69.0	90.6	21.6	23.1	23.0	-0.1
HU	1945.5	1324.3	-621.1	27.9	25.6	-2.4
MT	77.1	71.3	-5.9	28.7	23.1	-5.6
NL	3208.1	3125.8	-82.2	29.4	29.6	0.1
AT	1422.1	1056.7	-365.4	26.0	22.5	-3.5
PL	9098.3	4748.9	-4349.4	34.5	24.5	-10.0
PT	1963.6	1461.5	-502.1	28.1	26.5	-1.6
SI	392.0	281.7	-110.4	28.0	26.5	-1.6
SK	1108.5	589.5	-519.0	29.5	21.5	-8.0
FI	1178.8	967.2	-211.6	33.9	32.1	-1.8
SE	2114.8	2004.5	-110.3	36.7	33.2	-3.6
UK	16406.7	14154.5	-2252.1	42.3	37.5	-4.9
EU25	91833.3	71709.6	-20123.8	30.2	27.8	-2.4

[1] Working-age population is defined as population aged 15-64.
Source: Commission services

6.4. Projections of expenditure on education up to 2050

While education is primarily publicly founded in all Member States, private contributions also play some role. The share of public education expenditure varies across countries depending on the specific institutional setting for education and across ISCED levels of education. In most Member States the share of publicly funded education is close to 100 for basic and upper-secondary education.[76] For tertiary education the shares of publicly funded education vary somewhat and are generally lower than at lower levels (see Table 6-8). This is taken account of in the projections, where the share of public funding is kept constant for each education level.[77]

[76] Public education expenditure is defined as current and capital expenditures on education by local, regional and national governments, including municipalities. Household contributions are normally excluded.

[77] The share of public funding is defined as direct public expenditure as a share of direct public expenditure plus direct private expenditure, i.e. transfers are not included in the calculation of this share.

Table 6-8: Percentage share of education publicly funded (2002).

Country	Primary	Low Secondary	Upper Secondary	Tertiary
BE	96.6	95.9	95.9	86.0
CZ	96.3	96.4	99.1	87.5
DK	98.7	95.6	99.0	97.9
DE	98.2	98.0	97.5	91.6
EE[1]	100.0	100.0	100.0	100.0
EL	92.1	94.6	93.4	99.6
ES	92.9	93.8	93.8	76.3
FR	95.8	93.3	90.4	85.7
IE	96.5	97.1	96.0	85.8
IT	96.4	97.4	96.9	78.6
CY	94.4	91.8	92.0	42.0
LV	97.9	98.2	91.9	55.4
LT	99.8	100.0	100.0	93.5
LU[1]	100.0	100.0	100.0	n.a.
HU	93.5	93.1	94.6	78.7
MT	84.5	85.9	84.9	93.9
NL	97.0	94.8	87.7	78.1
AT	97.6	96.9	93.6	91.6
PL	98.1	97.9	94.9	69.7
PT	100.0	100.0	99.8	91.3
SI	90.0	90.0	90.7	76.4
SK	98.1	98.8	97.1	85.2
FI	99.8	99.8	98.2	96.3
SE	100.0	99.9	99.9	90.0
UK	89.7	85.0	85.0	72.0

[1] Data for Estonia and Luxembourg cover only public expenditure.

Source: Commission services based on Eurostat database. The share of publicly funded education has been estimated as the ratio between total (excluding transfers) public spending and total direct public and private spending.

Public education expenditure generally consists of direct current and capital expenses of educational institutions (direct expenditure for educational institutions), support to students and their families with scholarships and public loans, and/or public subsidies for educational activities to private institutions or non-profit organisations (transfers to private households and private institutions). It can thus take the form both of direct public expenditure and of transfers.

Education expenditure is the product of the number of students and the expenditure per student. As explained in detail in the methodological report (EPC and COM (2005a)) expenditure per student depends on three main components: (a) gross wages of teaching and non-teaching staff; (b) pupil/staff ratio; and (c) other cost than wages, both current and capital. The EPC has agreed that expenditure per student should increase in line with GDP per worker. This assumption implies that wages follow labour productivity and that the pupil/staff ratios remain constant, i.e. that any reduction in the number of students due to demographic factors is accompanied by a similar reduction in the education staff. Transfers are also assumed to evolve in line with GDP per worker[78].

[78] Assumptions on labour productivity growth and real GDP growth have been agreed by the AWG and are used for the whole budgetary exercise. The country appendix presents these assumptions.

Table 6-9 presents the main results for the development of expenditure on education to GDP ratios. It includes direct expenditure and transfers to households and institutions. Projections show a decrease of public expenditure on education to GDP in all countries. Significant savings (more than 1 per cent of GDP) are foreseen in Estonia, Ireland, Cyprus, Latvia, Lithuania, Poland and Slovakia. The overall change in public education expenditure hide some differences between the four different levels of education, but savings are in general projected at all levels.

Table 6-9: Total public expenditure on education as a share of GDP (2002-2050)

	Level, percentage points				Percentage points change 2002-2050 due to				
Country	2002	2010	2030	2050	Primary	Lower Secondary	Upper Secondary	Tertiary	Total[1]
BE	5.6	5.2	5.0	5.0	-0.2	-0.1	-0.2	-0.1	-0.6
CZ	3.9	3.3	3.0	3.1	-0.1	-0.2	-0.2	-0.2	-0.7
DK	7.6	7.5	7.3	7.5	-0.2	0.1	0.2	-0.2	-0.1
DE[2]	4.0	3.6	3.3	3.3	-0.1	-0.3	-0.1	-0.2	-0.7
EE	5.3	3.8	3.8	3.6	-0.3	-0.5	-0.5	-0.3	-1.6
EL	3.8	3.1	3.0	3.1	-0.1	-0.1	-0.2	-0.3	-0.7
ES	4.0	3.2	3.0	3.1	-0.1	-0.1	-0.3	-0.4	-0.9
FR[3]	5.0	4.7	4.5	4.5	-0.1	-0.1	-0.1	-0.1	-0.5
IE	4.3	3.5	3.2	3.1	-0.3	-0.2	-0.3	-0.5	-1.2
IT	4.3	3.9	3.5	3.7	-0.2	-0.1	-0.2	-0.2	-0.7
CY	6.1	5.1	4.3	4.0	-0.7	-0.6	-0.6	-0.2	-2.1
LV	5.2	3.5	3.7	3.5	-0.2	-0.7	-0.6	-0.3	-1.7
LT	5.0	4.2	3.3	3.3	-0.4	-0.8	-0.2	-0.2	-1.7
LU[4]	3.4	3.1	2.7	2.4	-0.5	-0.2	-0.2	0.0	-1.0
HU	4.6	3.9	3.5	3.8	-0.1	-0.2	-0.3	-0.2	-0.8
MT	4.3	3.7	3.3	3.3	-0.3	-0.4	-0.2	-0.2	-1.0
NL	4.7	4.7	4.6	4.6	-0.1	0.0	0.0	0.0	-0.1
AT	5.1	4.6	4.2	4.1	-0.3	-0.3	-0.2	-0.2	-1.0
PL	5.2	3.9	3.0	3.1	-0.7	-0.4	-0.6	-0.4	-2.0
PT	5.3	4.7	4.5	4.8	0.0	-0.1	-0.2	-0.2	-0.5
SI	5.4	4.6	4.7	4.9	0.1	-0.2	-0.3	-0.1	-0.5
SK	3.8	3.0	2.2	2.4	-0.2	-0.4	-0.5	-0.3	-1.4
FI	6.0	5.6	5.4	5.3	-0.2	-0.1	-0.2	-0.3	-0.8
SE	7.2	6.7	6.6	6.4	-0.3	-0.1	-0.2	-0.1	-0.8
UK[5]	4.6	4.2	4.1	4.0	-0.2	-0.2	-0.2	-0.1	-0.7

[1] Discrepancies are due to rounding.
[2] Data do not include spending (around 0.25 of GDP) at the workplace for combined workplace and school education as well as similar expenditure by "Bundesagentur für Arbeit".
[3] GDP includes over-sea Departments.
[4] Data cover only spending up to ISCED level 3 and only public spending in public institutions.
[5] The expenditure ratio is calculated using the calendar definition of GDP.
Source: European Commission services based on Eurostat data and National Statistic Offices.

6.5. Decomposition of the changes in the expenditure shares

Table 6-10 compares the percentage change in education expenditure as a share of GDP to the percentage changes in the young-age population (defined as aged 5-25), the total number of students and the share of students in the working-age population. The table shows that the correspondence between the change in the young-age population and the change in the number of students are generally high. However, there are some clear exceptions. Two

possible explanations are changes in enrolment from 2002 to 2003 and developments in the labour market leading to slight changes in enrolment for single year age-groups, cf. Table 6-6. In addition, changes in the composition within the age-group 5-25 and the fact that the age-group 5-25 does not completely correspond to the age-groups enrolled in education influence the figures.

Two examples can illustrate the effect of changes within the age-group 5-25. The demographic projections show an increase in the population aged 5-25 in Sweden, but a significant decrease in the age-groups 10-15. As enrolment is very high in these age-groups, the result is a decrease in the total number of Swedish students, despite the increase in the 5-25 age-group. Something similar happens in Cyprus, even if practically all the relevant age-groups will decline. This is because the percentage fall in the population aged 18 and more is much smaller than for younger children, while enrolment for people aged 18 and more is very low compared to younger age-groups or to the same age-group in other countries. Low enrolment among people aged 18 and more implies that developments in the age-group 5-17 are more important for the future number of students than developments in the age-group 18 and over. This explains why the larger fall in the number of children 17 and under heavily influences the expected total number of students.

Denmark can illustrate the latter mechanism: A significant number of Danish students are 26 years or older. Combined with large expected reductions in the size of these age groups, this leads to people aged 26 or more making up 40 per cent of the expected fall in students. This explains how the fall in the number of students (7.8) can be so much larger than the fall in the number of people aged 5-25 (4.4). The age-group chosen to illustrate the demographic developments is in other words less relevant in Denmark than in most other countries.

As education expenditure is measured as a share of GDP, an increasing or decreasing size of the working-age population will, for given labour market participation shares, greatly influence the figures. This can be seen in the table as a large difference between the developments in the total number of students and the students to working-age population-ratio. For a number of countries, developments in the latter variable correspond more closely with developments in the total expenditure ratio, but for other countries the opposite is the case.

Table 6-10: Education expenditure as a share of GDP compared to the young-age population (defined as aged 5-25), the total number of students and the share of students over population aged 15-64. Percentage changes 2002-2050

	Young age population	Total number of students	Students to working-age-population-ratio	Total expenditure in education
BE	-9.6	-10.5	-3.8	-11.2
CZ	-42.2	-39.8	-14.1	-19.3
DK	-4.4	-7.8	0.6	-1.2
DE	-27.1	-26.7	-9.1	-18.0
EE	-40.8	-42.5	-21.4	-31.0
EL	-30.8	-26.9	-7.3	-18.4
ES	-28.8	-25.4	-8.7	-22.5
FR	-5.5	-6.1	-3.1	-9.6
IE	-3.5	0.0	-16.7	-27.7
IT	-25.7	-23.9	-0.8	-15.1
CY	-14.2	-17.4	-34.1	-34.1
LV	-43.3	-45.2	-21.3	-32.8
LT	-45.0	-44.8	-25.5	-33.3
LU	36.4	31.3	-0.6	-28.5
HU	-34.9	-31.9	-8.5	-16.6
MT	-7.6	-7.6	-19.5	-23.9
NL	0.4	-2.6	0.5	-1.7
AT	-22.6	-25.7	-13.5	-19.5
PL	-47.1	-47.8	-29.0	-39.6
PT	-28.4	-25.6	-5.8	-9.8
SI	-33.1	-28.1	-5.6	-10.0
SK	-48.5	-46.8	-27.1	-36.5
FI	-15.8	-17.9	-5.4	-12.5
SE	2.6	-5.2	-9.8	-11.0
UK	-12.1	-13.7	-11.5	-14.5

Source: Commission services

A more detailed decomposition is therefore necessary to explain the developments in education expenditure. Table 6-11 sheds light on the different explanatory factors. The table indicates how much education expenditure would change from 2002 to 2050 if only one of the decisive factors change. The decomposition used is the following:

(1) $$\frac{EDU}{GDP} = \frac{S}{POP_{5-25}} * \frac{POP_{5-25}}{POP_{15-64}} * \frac{POP_{15-64}}{N} * \frac{ES}{\pi}$$ where

EDU/GDP is total public expenditure in education as a share of GDP, *S* is the number of students, $POP_{5\text{-}25}$ is the population aged 5-25, POP_{15-64} is the working-age population, *N* is employment, *ES* is expenditure per student and π is GDP per worker. Each fraction is represented by a column in Table 6-11. For example, the first column is calculated by assuming that the share of students to the population aged 5-25 changes as in the projections, while all other factors ($\frac{POP_{5-25}}{POP_{15-64}} * \frac{POP_{15-64}}{N} * \frac{ES}{\pi}$) remain at the 2002 level.

The table shows that in this case education expenditure in the Czech Republic would increase by 0.2 percentage points.

The first column shows the effect of the changes in the ratio between total number of students and the total population aged 5-25. As mentioned above, changes in this ratio can be due to changes in actual enrolment from 2002 to 2003, different demographic developments in single year age-groups within 5-25 years or above, or to labour market influence on enrolment rates. The effect of this factor varies between countries, but it is never very large.

The effect of a smaller share of young people relative to the working-age population is shown in the second column. Not surprisingly, this effect pulls expenditure downwards in most countries, and stands out as the most significant contribution to lower education expenditure overall.

The third column illustrates the importance of the change in the share of employed people to the working-age population. The higher employment rates for individual age groups that result from the applied cohort approach, point to higher GDP and therefore reduced education expenditure as a share of GDP. At the same time, an older workforce points in the opposite directions, but the latter effect is not large enough to outweigh the former. Overall, developments in employment point in the direction of reduced education expenditure measured as a share of GDP.[79]

Expenditure per student is assumed to develop in line with GDP per worker. This means that for each education level, column four shall by definition be zero. However, as the cost level differs between different education level and their relative importance change within the projection period, this is not necessarily the case for the average cost level. The table shows that the development in the average cost level have small effects in all countries.

The last column shows the total change in education expenditure over the period 2002 to 2050. This is not always equal to the sum of the first four columns due to multiplicative effects. However, in most cases the difference is small.

[79] The figures for Luxembourg are related to a continuous increase in labour input over the projection period. This must be seen in relationship with the assumptions on cross-border workers.

Table 6-11: **Decomposition of the change in the education expenditure to GDP-ratio. Percentage point contribution from different factors. 2002-2050**

	Enrolment[1]	Young share[2]	Inverse of employment[3]	Cost level[4]	Difference 2002-2050
BE	-0.1	-0.2	-0.5	0.1	-0.6
CZ	0.2	-0.7	-0.2	0.0	-0.7
DK	-0.3	0.3	-0.2	0.0	-0.1
DE	-0.1	-0.2	-0.4	0.1	-0.7
EE	-0.1	-1.0	-0.5	-0.1	-1.6
EL	0.2	-0.5	-0.3	-0.2	-0.7
ES	0.2	-0.5	-0.6	0.0	-0.9
FR	0.0	-0.1	-0.4	0.1	-0.5
IE	0.2	-0.8	-0.5	-0.1	-1.2
IT	0.1	-0.1	-0.6	0.0	-0.7
CY	-0.2	-1.9	-0.2	0.2	-2.1
LV	-0.2	-1.0	-0.7	-0.1	-1.7
LT	0.0	-1.3	-0.6	0.1	-1.7
LU	-0.1	0.1	-1.0	0.1	-1.0
HU	0.2	-0.6	-0.4	0.0	-0.8
MT	0.0	-0.8	-0.3	0.1	-1.0
NL	-0.1	0.2	-0.3	0.2	-0.1
AT	-0.2	-0.5	-0.4	0.0	-1.0
PL	-0.1	-1.4	-0.7	-0.1	-2.0
PT	0.2	-0.5	-0.3	0.1	-0.5
SI	0.4	-0.7	-0.3	0.0	-0.5
SK	0.1	-1.1	-0.5	0.0	-1.4
FI	-0.2	-0.2	-0.5	0.1	-0.8
SE	-0.5	-0.2	-0.2	0.2	-0.8
UK	-0.1	-0.5	-0.2	0.0	-0.7

[1] Enrolment is defined as total number of students over the population aged 5-25 years.
[2] The young share is defined as the population aged 5-25 years over population aged 15-64.
[3] The inverse of employment is defined as the population aged 15-64 over employment.
[4] The cost level is defined as the expenditure per student over GDP per worker
Source: Commission services

6.6. A word of caution

The projections of reduced education expenditure depend on a number of variables. Most importantly, no underlying trend neither in enrolment rates nor in expenditure per student relative to GDP per worker is included. Unlike some of the other elements of the age-related expenditure exercise, the projections thus illustrate only the effect of demographic developments on education expenditure, and do not comprise any estimation of non-demographic drivers other than labour market developments. Regarding enrolment, this in some cases do not reflect national expectations of increasing enrolment rates as a result of implemented or planned legislation or other policies.

As shown in Graph 6-2, most Member states have already seen a decline in the number of people aged 5-25[80]. In particular, significant reductions have been recorded in some south European countries and in some recently acceded Member States, with a decline of around 15 percentage points or more in the Czech Republic, Spain, Italy, Latvia, Portugal and Slovenia

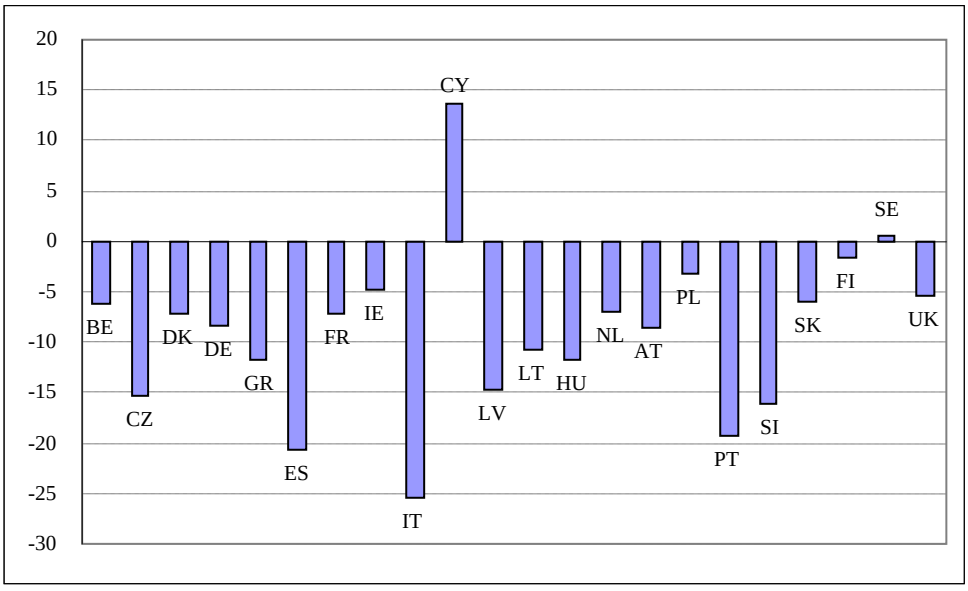
[80] The only significant increase was registered in Cyprus.

over the period 1990-2003. Still, there was no marked downward trend in education expenditure ratios (see Table 6-12).

This illustrates that factors other than demographic developments have been important to the historical developments of education expenditure. The projected savings are conditional on these factors not continuing to point in an upward direction. This is far from certain neither for costs per student nor for enrolment rates. First, emphasis on the quality of education and difficulties in adjusting downwards the number of teachers as the number of students fall, could point in the direction of increased costs per student. Second, some Member States have either planned or implemented policies to move students through the education system more rapidly. However, stated policy priorities, e.g. related to the Lisbon agenda, mostly emphasize the importance of increasing enrolment rates. Increased income levels may also lead to more people being able and willing to spend a larger part of their life on education. Together with some information available on actual enrolment in 2004, this indicates that average actual enrolment rates in the future may be more likely to be higher than this exercise projects than lower. Finally, education is largely an investment in human capital, though also partly a consumption good. Enrolment increases would therefore in addition often be beneficial also from a public finance point of view, once effects on productivity and labour market participation is taken into account.

A detailed analysis of these factors has been beyond the scope of this exercise. The important point is to note that the projections should in no way be taken to imply that large and easy savings can be expected for public finances due to developments in the educational sector.

Graph 6-2: Rate of change of population aged 5-25 between 1990 and 2003. Percentage points



Source: Commission services based on New Chronos Eurostat database.
Note: Due to lack of data in New Chronos Eurostat database, Estonia and Malta are not represented in the graph. For Cyprus the graph reports the rate of change between 1993 and 2003.

Table 6-12: Expenditure on education as share of GDP. EU15. 1990-2003

Education expenditure/GDP

	Early '90s (90-94)	Late '90 (95-99)	Early '00 (00-03)
BE	6.4	6.3	6.2
DK	7.5	7.9	8.3
DE	4.3	4.4	4.1
EL	3.4	3.3	3.3
ES	n.a.	n.a.	4.2
FR	n.a.	6.2	6.0
IE	n.a.	4.7	4.3
IT	5.5	5.0	5.1
NL	n.a.	4.9	4.9
AT	n.a.	6.0	5.8
PT	5.8	6.6	7.0
FI	7.4	6.8	6.5
SE	n.a.	7.3	7.3
UK	4.5	4.6	5.0

Source: European Commission Economic Database, AMECO (COFOG classification)

7. UNEMPLOYMENT BENEFITS

7.1. Description of the projection methodology

In order to get a comprehensive assessment of the total impact of ageing on public finances, and to guarantee consistency with the macroeconomic scenario, it was agreed to run projections for spending on unemployment benefit spending as part of the overall age-related expenditure projection exercise. 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, a simplified methodology has been used as it was the case in 2003 exercise.[81]

Projections have been carried out using the average per-capita unemployment insurance spending in a base year. In order to avoid that the choice of the base year was 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 the period 1998-2002 (last year for which figures are available in Eurostat database). This per capita spending has been combined with the agreed baseline assumptions on unemployed persons (which are referred to the projected NAIRU) reported on Table 7-4. This straightforward calculation implies assuming, under a no-policy change hypothesis, constant replacement rates, duration of benefit, entitlement conditions, eligibility criteria, take-up rates, and tax structure. Finally, as it is the case 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 "invariance" 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: $pcw = \frac{W}{Y} \times \frac{Y}{L}$, (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.

[81] EPC (2003).

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, if one assumes 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.

This methodology generates projections of UB expenditure, expressed as a share of GDP, 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 Annex 8):

- 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 was done by dividing the average amount of UB expenditures (as % of GDP) over the period 1998-2002[82] by the average of the ratio unemployed/employed persons over the same period (see Table 7-3)[83]. 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 used. Specifically, we used the two main components (i.e. "*kind of benefits*") of the Eurostat definition of social protection spending related to unemployment, that is benefit spending for "Partial unemployment" and "Full unemployment". A breakdown

[82] Latest available figures provided by EUROSTAT-Social Protection Expenditure, see table 2.

[83] In the case of Germany, Belgium and Luxembourg, figures used are not the original labour force projections calculated by the Commission, but are figures converted by Member States, in agreement with the AWG, in national-account equivalent (or in line with administrative concepts). This is consistent with what has been done for projecting pension expenditure and other age-related spending. See EPC-EC-DG ECFIN(2005), Carone (2005).

by kind of benefit of the total social protection expenditure related to unemployment[84] in 2002 is provided in Table 7-2

- for each projection year, the ratio unemployment benefit /GDP per head in the base year (from the step above - see results in Table 7-3) has been multiplied by the corresponding expected ratio between the future number of unemployed persons and employed persons (U/L) for each country and each of the year of projections (basic figures are reported in Table 7-5). The projections of employed and unemployed persons are those referred to the "current policy" macroeconomic scenario (see Table 7-4 and Table 7-5). This generates projections of UB spending, expressed as a share of GDP[85].

[84] In the Eurostat-ESSPROS database, the category "unemployment" also includes spending on placement services and job search assistance, early-retirement benefit for labour market reasons, vocational training, lump sum benefit redundancy compensation, mobility and resettlement benefits. As a general rule, early retirement and pre-retirement benefits to older workers are included in the projections on pension expenditures.

[85] The projection does not take into account that unemployment benefits are subject to income tax, so that after tax UB spending as % of GDP is lower. This should be taken into account when assessing fiscal sustainability. Still, given the assumption of invariant tax structure, results in terms of changes in the after-tax UB spending (as % of GDP) over the projection period would be broadly the same as those obtained by using before- tax spending as in this projection exercise.

Table 7-1 - Social protection expenditure as % of GDP: Unemployment

(2002)

Kind of benefit	EU15	EU12	B	CZ	DK	DE	EE*	EL	ES	F	IE	I	LV*	LT*	L	HU	MT	NL	AT	PL*	PT	SI	SK	FI	SE	UK
Social protection benefits:unemployment (a+b)	**1.8**	**1.9**	**3.2**	**0.7**	**2.7**	**2.5**	**0.2**	**1.6**	**2.7**	**2.2**	**1.3**	**0.4**	**0.5**	**0.1**	**0.8**	**0.6**	**1.2**	**1.4**	**1.5**	**0.9**	**0.9**	**0.8**	**0.8**	**2.5**	**1.7**	**0.9**
Cash benefits (a)	***1.6***	***1.8***	***3.2***	***0.6***	***2.6***	***2.2***	***:***	***0.5***	***2.4***	***2.2***	***1.1***	***0.4***	***:***	***:***	***0.8***	***0.5***	***1.1***	***1.4***	***1.1***	***:***	***0.9***	***0.7***	***0.6***	***2.3***	***1.4***	***0.8***
Full unemployment benefits	1	1.1	1.9	0.2	1.3	1.2	0.1	0.4	1.5	1.5	0.8	0.3	0.4	0.1	0.3	0.3	1	1.4	0.8	0.4	0.8	0.3	0.3	1.6	1	0.5
Partial unemployment	0	0	0.4	:	:	0	0..1	0.1	0	0	:	0	:	:	0	:	:	0	:	:	0	0	:	0	0	0
Placement services and job search assistance	0	0	0	:	0.1	0	:	0	0	:	0.1	0	:	:	0	0	0	0	0.1	:	0	0.1	0.1	0.1	0.1	0
Early retirement benefit for labour market reasons	0.2	0.2	0.4	0	:	0.3	:	0.1	0	0.2	:	0.1	:	:	0.2	0.1	:	0	0.1	0.5	0	0.2	0	0.5	0	0
Periodic benefit vocational training	0.2	0.2	0.1	0	1.3	0.5	:	0	0	0.2	0.2	0	:	:	0	:	0	0	0.1	:	0	0	:	0.1	0.3	0.1
Other periodic cash benefits	0	0	0.4	:	:	0	:	0	0.1	:	:	0	:	:	0.2	0.1	0.1	0	0	:	0	0	:	0	:	0
Lump sum cash benefits	0.2	0.2	0	0.4	0	0.1	:	0.1	0.7	0.3	0.1	0	:	:	0.1	0.1	:	0	0.1	:	0	0.1	0.3	0	0.1	0.3
Lump sum benefit vocational training	0	0	0	:	0	:	:	0	:	:	0	0	:	:	0.1	:	:	0	:	:	0	:	:	0	:	0
Lump sum benefit redundancy compensation	0.2	0.1	0	0.2	:	0.1	:	0	0.6	0.3	0.1	0	:	:	0	0.1	:	0	0	:	0	:	0.3	0	0.1	0.3
Other lump sum cash benefits	0	0	0	0.2	0	0	:	0	0	0	:	0	:	:	0	0	:	0	0.1	:	0	0.1	0	0	:	0
Benefits in kind (b)	***0.2***	***0.2***	***0.1***	***0***	***0.1***	***0.3***	***:***	***1.1***	***0.3***	***0***	***0.2***	***0***	***:***	***:***	***0***	***0.1***	***0***	***0***	***0.4***	***:***	***0***	***0.1***	***0.1***	***0.2***	***0.3***	***0.1***
Mobility and resettlement benefits	0	0	0	:	:	0.1	:	0.1	0	:	:	0	:	:	0	:	:	0	0	:	0	:	:	0	0	0
Vocational training	0.1	0.1	0	0	:	0.2	:	0.9	0.3	:	0.1	0	0.1	:	0	0.1	0	0	0.1	:	0	0	0	0.1	0.2	0.1
Other benefits in kind	0	0	:	0	:	0	:	0.1	0	0	0	0	:	:	0	:	0	0	0.3	:	0	0	:	0	0	0

* 2001

Source: Eurostat-Social protection expenditures database (ESPROS)

NB: Early retirement benefits are, as a general rule included in the pension projections.

Table 7-2 – Unemployment benefit spending, as % of GDP

	(Full + partial unemployment benefits)					
Country	**aver. 1998-2002**	**1998**	**1999**	**2000**	**2001**	**2002***
Belgium	2.20	2.3	2.2	2.1	2.1	2.3
Denmark	1.42	1.7	1.4	1.4	1.3	1.3
Germany	1.16	1.2	1.2	1.1	1.1	1.2
Greece	0.42	0.5	0.4	0.4	0.3	0.5
Spain	1.46	1.6	1.4	1.4	1.4	1.5
France	1.30	1.3	1.3	1.2	1.2	1.5
Ireland	0.92	1.3	1	0.8	0.7	0.8
Italy	0.34	0.4	0.4	0.3	0.3	0.3
Luxembourg	0.22	0.2	0.2	0.2	0.2	0.3
Netherlands	1.50	1.9	1.6	1.3	1.3	1.4
Austria	0.76	0.8	0.8	0.7	0.7	0.8
Portugal	0.72	0.7	0.7	0.7	0.7	0.8
Finland	1.82	2.2	2	1.7	1.6	1.6
Sweden	1.38	1.8	1.6	1.4	1.1	1
United Kingdom	0.42	0.4	0.4	0.3	0.5	0.5
Cypros	0.39	0.4	0.4	0.4	0.3	0.4
Czech Republic	0.24	0.2	0.3	0.3	0.2	0.2
Estonia	0.10	0.1	0.1	0.1	0.1	0.1
Hungary	0.30	0.3	0.3	0.3	0.3	0.3
Lithuania	0.16	0.2	0.2	0.2	0.1	0.1
Latvia	0.46	0.5	0.5	0.5	0.4	0.4
Malta	0.94	0.9	1	0.9	0.9	1
Poland	0.40	0.4	0.4	0.4	0.4	0.4
Slovak Republic	0.44	0.5	0.6	0.5	0.3	0.3
Slovenia	0.54	0.8	0.7	0.5	0.4	0.3
EU-25	0.99	1.1	1.0	0.9	0.9	1.0
EU15	1.01	1.1	1.0	0.9	0.9	1.0
EU12	1.10	1.2	1.1	1.0	1.0	1.2
EU10	0.36	0.4	0.4	0.4	0.3	0.3

Source: Eurostat-Social protection expenditures database (ESPROS).

* Estonia, Latvia, Lithuania and Poland: 2001

Table 7-3 Unemployment benefit spending per unemployed, as % of GDP per worker (yub_{pc})

Country	aver. 1998-2002	1998	1999	2000	2001	2002*
Belgium	14.4	14.2	14.1	14.2	14.4	15.0
Denmark	27.5	32.0	23.5	28.8	26.7	26.7
Germany	13.5	12.5	13.7	13.9	13.8	13.5
Greece	3.3	3.9	2.8	3.1	2.4	4.3
Spain	9.3	7.0	7.5	8.6	11.8	11.5
France	11.6	9.4	9.5	10.5	12.7	15.7
Ireland	16.6	15.3	16.7	17.4	16.9	16.8
Italy	3.9	2.9	3.1	2.5	2.8	3.4
Luxembourg	10.2	7.9	8.6	9.9	10.6	13.9
Netherlands	46.3	41.1	42.4	42.7	56.4	49.2
Austria	18.2	13.8	20.4	18.9	18.6	19.3
Portugal	14.4	12.4	14.0	15.7	15.8	14.2
Finland	16.3	16.9	17.5	15.5	15.8	15.9
Sweden	20.2	18.1	19.2	23.8	21.3	18.5
United Kingdom	7.2	6.0	6.2	5.1	9.4	9.2
Cypros	8.2	6.7	8.0	7.4	7.6	11.4
Czech Republic	2.8	2.9	3.1	3.1	2.2	2.5
Estonia	0.8	0.9	0.8	0.6	0.7	0.9
Hungary	4.2	3.1	4.0	4.4	4.9	4.8
Lithuania	0.9	1.3	1.1	1.0	0.5	0.6
Latvia	2.9	3.0	3.0	2.9	2.6	2.9
Malta	13.0	12.9	14.3	12.8	11.9	13.3
Poland	2.3	3.5	2.8	2.0	1.8	1.6
Slovak Republic	1.285**	3.5	3.1	2.2	1.25	1.31
Slovenia	7.1	9.8	8.5	6.8	5.9	4.4
EU-25	9.5	9.5	9.3	8.8	9.6	10.2
EU15	10.7	9.7	9.9	10.0	11.5	12.2
Euro area	10.8	9.6	10.0	10.2	11.5	12.4
EU10	2.5	3.5	3.1	2.4	2.0	1.9

Source: Eurostat-Social protection expenditures database (ESPROS)
* Estonia, Latvia, Lithuania and Poland: 2001
** Average 2001-2002

Table 7-4 –Unemployment rate – (AWG baseline scenario)

Country	1998	2001	2002	2003	2004	2005	2010	2015	2020	2025	2050	2003-2025
Belgium	13.9	12.6	13.3	14.0	13.7	13.4	12.4	11.4	11.2	11.1	10.9	-2.9
Denmark	5.0	4.6	4.6	5.5	5.3	4.9	4.3	4.3	4.3	4.3	4.3	-1.2
Germany	9.9	7.8	8.6	9.5	9.2	9.0	8.1	6.5	6.5	6.5	6.5	-3.0
Greece	11.4	11.0	10.5	9.8	9.3	9.3	8.6	7.0	7.0	7.0	7.0	-2.8
Spain	18.7	10.6	11.5	11.6	10.8	10.4	8.7	7.0	7.0	7.0	7.0	-4.6
France	12.1	8.6	8.7	9.0	9.3	9.1	8.3	7.0	7.0	7.0	7.0	-2.0
Ireland	7.8	4.0	4.5	4.8	4.3	4.0	3.4	3.4	3.4	3.4	3.4	-1.4
Italy	12.0	9.6	9.1	8.9	8.4	8.2	7.3	6.5	6.5	6.5	6.5	-2.4
Luxembourg	2.9	2.1	3.1	3.7	3.8	4.0	4.2	4.2	4.2	4.2	4.2	0.6
Netherlands	4.4	2.3	2.8	3.7	3.7	3.5	3.2	3.2	3.2	3.2	3.2	-0.5
Austria	5.5	3.6	4.0	4.3	4.2	3.9	3.4	3.4	3.4	3.4	3.4	-0.9
Portugal	5.4	4.2	5.3	6.7	6.2	6.0	5.6	5.6	5.6	5.6	5.6	-1.1
Finland	11.5	9.2	9.2	9.2	8.5	8.0	6.8	6.5	6.5	6.5	6.5	-2.7
Sweden	9.0	4.9	5.1	5.7	5.3	5.0	4.3	4.3	4.3	4.3	4.3	-1.4
United Kingdom	6.3	5.0	5.2	5.1	4.9	4.8	4.6	4.6	4.6	4.6	4.6	-0.5
Cypros	5.5	4.1	3.2	4.4	4.2	4.0	4.2	4.2	4.2	4.2	4.2	-0.2
Czech Republic	6.5	8.2	7.4	7.9	7.8	7.8	7.3	6.5	6.5	6.5	6.5	-1.4
Estonia	9.7	12.8	10.5	10.3	9.6	9.1	7.8	7.0	7.0	7.0	7.0	-3.3
Hungary	8.9	5.8	5.8	5.9	5.5	5.3	4.8	4.8	4.8	4.8	4.8	-1.2
Lithuania	13.6	17.7	13.9	12.5	11.9	11.2	8.9	7.0	7.0	7.0	7.0	-5.5
Latvia	14.2	13.2	12.2	10.7	9.8	9.1	7.6	7.0	7.0	7.0	7.0	-3.7
Malta	6.5	7.0	7.0	7.6	8.4	8.5	8.3	7.0	7.0	7.0	7.0	-0.6
Poland	10.2	18.6	20.3	20.1	19.0	18.7	15.8	12.9	9.9	7.0	7.0	-13.1
Slovak Republic	12.6	19.3	18.7	17.6	16.9	16.7	15.2	12.5	9.7	7.0	7.0	-10.6
Slovenia	7.6	6.3	6.4	6.8	6.3	6.0	5.5	5.5	5.5	5.5	5.5	-1.2
EU25	10.3	8.8	9.1	9.3	9.0	8.8	7.8	6.7	6.4	6.2	6.1	-3.2
EU15	10.3	7.6	7.9	8.3	8.0	7.8	7.0	6.1	6.1	6.1	6.0	-2.2
EU10	9.8	14.7	15.1	14.8	14.1	13.8	12.0	10.0	8.3	6.6	6.6	-8.3
*Belgium**				*8.2*	*7.9*	*7.7*	*7.0*	*6.5*	*6.5*	*6.5*	*6.5*	*-1.7*
*Germany**				*9.9*	*9.5*	*9.4*	*8.5*	*7.0*	*7.0*	*7.0*	*7.0*	*-2.9*

Source: Commission services

Note: *For Germany and Belgium figures used in the projections refers to national account and administrative concepts respectively.*

* *Figures based on labour force projections*

Table 7-5 –Unemployment/Employment ratio (U/L)

													% change	
	2002	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030	2050	2005-15	2005-50
Belgium	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.13	0.13	0.12	0.12	0.12	-17%	-21%
Denmark	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-14%	-14%
Germany	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.07	0.07	0.07	0.07	0.07	-29%	-30%
Greece	0.12	0.10	0.10	0.10	0.10	0.10	0.09	0.08	0.08	0.08	0.08	0.08	-27%	-27%
Spain	0.13	0.12	0.11	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.08	0.08	-35%	-35%
France	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.08	-25%	-25%
Ireland	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-15%	-15%
Italy	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	-22%	-22%
Luxembourg	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	4%	-18%
Netherlands	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-8%	-8%
Austria	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-13%	-13%
Portugal	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-8%	-8%
Finland	0.10	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-20%	-20%
Sweden	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-14%	-14%
United Kingdom	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-4%	-4%
Cypros	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	5%	5%
Czech Republic	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	-18%	-18%
Estonia	0.12	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	-25%	-25%
Hungary	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-10%	-10%
Lithuania	0.16	0.13	0.12	0.11	0.11	0.10	0.10	0.08	0.08	0.08	0.08	0.08	-40%	-40%
Latvia	0.14	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	-25%	-25%
Malta	0.08	0.09	0.10	0.10	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.08	-19%	-19%
Poland	0.25	0.23	0.22	0.21	0.20	0.20	0.19	0.15	0.11	0.08	0.08	0.08	-36%	-67%
Slovak Republic	0.23	0.20	0.20	0.20	0.20	0.19	0.18	0.14	0.11	0.08	0.08	0.08	-29%	-63%
Slovenia	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-8%	-8%
EU25	0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.07	0.07	0.06	0.06	0.06	-25%	-32%
EU15	0.09	0.08	0.08	0.08	0.08	0.08	0.07	0.06	0.06	0.06	0.06	0.06	-23%	-24%
Eurozone	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.07	0.07	0.07	0.07	0.07	-26%	-27%
EU10	0.18	0.16	0.16	0.15	0.15	0.14	0.14	0.11	0.09	0.07	0.07	0.07	-31%	-56%

Source: Commission services

Note: *For Germany and Belgium figures used in the projections refers to national account and administrative concepts respectively.*

7.2. Results of projections for public expenditure on unemployment benefit expenditure

The results of calculation, which depend critically upon previous assumptions on working-age population, labour market participation and unemployment rates, are reported in Table 7-6. Unemployment benefit spending in the EU25 and EU15 is projected to fall from about 1% of GDP in 2002-2003 to 0.6% in 2025-2050. This primarily reflects the assumed lower proportions of unemployed people over the projection period.

Table 7-6- Projections of unemployment benefit spending, as % of GDP

															Change in expenditure (percentage points)	
	2002	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030	2035	2040	2050	2002-2015	2002-2050
	(actual figures)															
BE	2.30	2.23	2.20	2.16	2.13	2.09	2.03	1.85	1.81	1.80	1.77	1.75	1.75	1.76	-0.45	-0.54
DK	1.30	1.43	1.33	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	-0.08	-0.08
DE	1.20	1.27	1.24	1.22	1.22	1.17	1.13	0.90	0.89	0.89	0.88	0.89	0.89	0.89	-0.30	-0.31
GR	0.50	0.34	0.34	0.34	0.34	0.32	0.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-0.25	-0.25
ES	1.50	1.07	1.02	0.96	0.96	0.92	0.89	0.70	0.70	0.70	0.70	0.70	0.70	0.70	-0.80	-0.80
FR	1.50	1.16	1.14	1.13	1.13	1.09	1.05	0.87	0.87	0.87	0.87	0.87	0.87	0.87	-0.63	-0.63
IE	0.80	0.69	0.64	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	-0.21	-0.21
IT	0.34	0.40	0.39	0.38	0.38	0.37	0.36	0.32	0.32	0.32	0.32	0.32	0.32	0.32	-0.02	-0.02
LU	0.30	0.26	0.27	0.28	0.28	0.28	0.28	0.27	0.27	0.26	0.25	0.24	0.23	0.22	-0.03	-0.08
NL	1.40	1.69	1.62	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	0.14	0.14
AT	0.80	0.74	0.69	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-0.15	-0.15
PT	0.80	0.92	0.88	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.05	0.05
FI	1.60	1.42	1.32	1.22	1.22	1.20	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.14	-0.46	-0.46
SE	1.00	1.05	0.98	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	-0.09	-0.09
UK	0.50	0.36	0.35	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	-0.16	-0.16
CY	0.37	0.34	0.33	0.31	0.31	0.31	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	-0.01	-0.01
CZ	0.20	0.23	0.23	0.23	0.23	0.23	0.22	0.19	0.19	0.19	0.19	0.19	0.19	0.19	-0.01	-0.01
EE	0.10	0.08	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-0.04	-0.04
HU	0.30	0.24	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	-0.09	-0.09
LT	0.10	0.11	0.10	0.10	0.10	0.09	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-0.03	-0.03
LV	0.40	0.29	0.27	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.22	0.22	0.22	0.22	-0.18	-0.18
MT	1.00	1.22	1.24	1.27	1.27	1.23	1.18	0.98	0.98	0.98	0.98	0.98	0.98	0.98	-0.02	-0.02
PL	0.40	0.54	0.52	0.50	0.48	0.46	0.44	0.34	0.26	0.18	0.18	0.18	0.18	0.18	-0.06	-0.22
SK	0.30	0.26	0.25	0.25	0.25	0.24	0.23	0.18	0.14	0.10	0.10	0.10	0.10	0.10	-0.12	-0.20
SI	0.30	0.45	0.43	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.11	0.11
EU25	1.01	0.90	0.88	0.85	0.85	0.82	0.79	0.68	0.64	0.61	0.61	0.61	0.61	0.61	-0.33	-0.40
EU15	1.04	0.89	0.87	0.85	0.84	0.82	0.80	0.69	0.68	0.68	0.68	0.68	0.68	0.68	-0.36	-0.37
Euro area	1.16	0.99	0.97	0.94	0.94	0.91	0.88	0.74	0.73	0.73	0.73	0.73	0.73	0.73	-0.42	-0.43
EU10	0.33	0.41	0.40	0.38	0.37	0.36	0.35	0.28	0.23	0.18	0.18	0.18	0.18	0.18	-0.04	-0.15

Source: Commission services

In 2050, as a straightforward outcome of previously projected demographic and labour market changes (see Table 7-4 and Table 7-5), overall levels of UB spending would range from about 1.8% of GDP in Belgium to 0.2 (in Greece, Luxembourg Czech Republic, Hungary, Latvia, and Poland) and a minimum of 0.07% in Lithuania. Compared to the starting year of calculation, the percentage change in the UB spending is somewhat high in some countries (higher than 60% in Poland and Slovakia, about 40% in Spain and Lithuania, 30% in Germany, Estonia, Latvia), reflecting the projected strong fall in the unemployment rates.

On the other hand, it is also worth noting that the impact of the assumed demographic/labour market changes on expenditure on unemployment benefits is relatively small when compared to projected effects on pension and health care spending. When compared to 2002, the maximum projected reduction in the unemployed benefit spending is about 0.8 percentage points of GDP in Spain, followed by France, Belgium and Finland (0.5-0.6 p.p.).

Among the new Member States, Poland is projected to record the biggest reduction in unemployment benefit spending (-0.22 percentage points), because of the assumed strong drop in the unemployment rate, from 19.9% in 2003 to 7% in 2025. Yet, the absolute impact

on the expenditure appears to be relatively limited, reflecting a lower initial per capita spending for unemployed allowances.

To conclude, figures provided by this projection exercise are useful in indicating some broad orders of magnitude of future public spending for unemployment benefits associated with assumed trends in population and labour market functioning. These figures should be used with caution. This is not only because of the high degree of uncertainty which always surround projections over a half-century, but also because the projection exercise does not incorporate the complex institutional details of the functioning of the unemployment benefit schemes in each Member State.

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