

ECONOMIC GROWTH AND FISCAL SUSTAINABILITY IN THE EU: THE IMPACT OF AN AGEING POPULATION

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This paper presents an assessment of the budgetary impact of ageing for the EU Member States. It draws upon the macroeconomic assumptions developed jointly by the Ageing Working Group of the Economic Policy Committee and the European Commission-Directorate General for Economic and Financial Affairs for the purpose of making age-related expenditure projections. The paper presents and analyses projections of the impact of ageing populations on the main age-related public expenditure items. The projections are not forecasts, but nonetheless provide an indication of the potential timing and scale of budgetary changes that could result from ageing populations in a no-policy change scenario. The projections show where, (in which countries), when and to what extent ageing pressures will accelerate as the baby-boom generation retires. In doing so, the projections are helpful in highlighting the immediate and future challenges for governments posed by demographic trends.

The projections point to pressing economic policy challenges for the EU. From an economic perspective, potential growth rates are projected to fall to levels below those observed in recent decades. Fiscal challenges will come from a higher share of the total population in older age cohorts and a decline in the share of the population that is economically active. The fiscal impact of ageing is projected to be substantial in almost all Member States, with the effects accelerating as of 2010. Overall, on the basis of current policies, age-related public expenditures are projected to increase on average by almost 4 percentage points of GDP by 2050 in the EU and rise considerably more in several Member States, especially through pension, health care and long-term care. Ageing populations are expected to lead to a substantial increase in public pension expenditure in some countries. In eleven EU Member States the increase is projected to be over 5 percentage points of GDP. However, reforms implemented in recent years in some other Member States are having visible positive impacts. They have sharply reduced the projected increase in expenditures, diminishing the budgetary impact of ageing. Nonetheless, in some countries, the scale of reforms has been insufficient and they need to be pursued further to cope with the budgetary challenge. At the same time, implementing other measures, for instance promoting higher employment rates of older workers that contribute to adequate retirement incomes in the future might be required in order to ensure the lasting success of the pension reforms.

In the EU as a whole, the current fiscal positions coupled with the projected cost of ageing would lead to government debt being on an explosive path and it would reach some 130 per cent of GDP in 2050. The required fiscal adjustment to set the public finances on a sustainable path, the so-called sustainability gap, is estimated to be about 2½ per cent of GDP. The situation however varies greatly among EU member states, as a result of the diversity and degree of maturity of their public pension arrangements and the effects of pension reforms enacted so far. Nearly all countries have sustainability gaps. This implies that based on the current budgetary position (in 2007) and

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with no changes in fiscal policies, an adjustment is necessary so as to render the public finances sustainable over the long term for most EU countries.

In some EU Member States, there is a risk of unsustainable public finances even before the long-term budgetary impact of ageing populations is considered. Indeed, the current budgetary position, in addition to the long-term budgetary impact of ageing, affects the sustainability of public finances. However, for the EU as a whole and for several Member States, the current budgetary position contributes in part to cover the longer term budgetary impact of ageing. This clearly shows that the fiscal consolidation in recent years bears fruit and that fiscal policy can affect strongly the sustainability position.

As regards policy conclusions, the paper underlines the critical need for ensuring that retirement behaviour takes due account of future increases in life expectancy and the need for more efficient and cost-effective service provision, in particular in health care and long-term care, in order to reduce the main sources of potential fiscal pressure. Nonetheless, containing the observed trend increase in health-care spending above that motivated by ageing is likely to be challenging. Moreover, it shows that progress has been made in recent years in terms of consolidating the public finances, with a visible impact on the sustainability positions in the EU Member States. However, it also reveals that several Member States still have a long way to go. First, they need to reach the medium-term budgetary targets (the MTOs) that have been set; and second, seriously consider pursuing more ambitious fiscal policies so as to put the public finances on a more sustainable footing, for the benefit of enabling both the people currently working and especially for those who will do so tomorrow to embrace the future with greater confidence.

1 Introduction

This paper presents an assessment of the budgetary impact of ageing for the EU Member States. It draws upon the macroeconomic assumptions developed jointly by the Ageing Working Group of the Economic Policy Committee and the European Commission-Directorate General for Economic and Financial Affairs for the purpose of making age-related expenditure projections. The paper presents and analyses projections of the impact of ageing populations on the main age-related public expenditure items. It uses the results of the 2006 common long-term budgetary projections and an update is currently underway, envisaged for release in early 2009. The projections are not forecasts, but nonetheless provide an indication of the potential timing and scale of budgetary changes that could result from ageing populations in a no-policy change scenario. The projections show where (*i.e.*, in which countries), when and to what extent ageing pressures will accelerate as the baby-boom generation retires. In doing so, the projections are helpful in highlighting the immediate and future challenges for governments posed by demographic trends.

The key challenge for policy-makers in the EU over the medium and long-term will be to transform the European social models so that the challenges of tomorrow arising from an ageing population can be faced with greater confidence.

- First, achieving the budgetary targets set in countries' Medium Term Objectives is a necessary condition for fiscal sustainability to create the buffers required to face difficulties if needed. Sound public finances are even more important for euro area countries, as large and unsustainable budget deficits in one country hit the entire area via a more restrictive stance of monetary policy.
- Second, the Lisbon strategy for growth and jobs requires economic policy strategies that raise labour utilisation and productivity. While important by itself as a means to raise living

standards, higher labour utilisation and productivity are also necessary for sustainable public finances in the face of aging populations. Increases in labour utilisation via enhanced incentives for older workers to stay active longer are a double-edged sword; by stimulating job creation and growth they ease the financing of welfare systems and also reduce their cost.

- Third, welfare systems should be designed to be sustainable in the face of uncertain economic and demographic developments. Recent pension reforms in many EU Member States have reduced the budgetary impact of ageing and are helping to raise the effective retirement age. More specifically, in many cases these reforms have made pension systems less generous, by reducing the level of the average pension in relation to the average wage over time. However, it is important that pensions can be maintained at an adequate level to avoid eventual pressures on the reformed pension arrangements if the reduction in the benefit ratio fully materialises. This means raising employment rates and in particular giving older workers incentives to extend their working lives and to provide appropriate incentives for other types of retirement income, notably private pension arrangements.

The subsequent sections will look in more detail at these key challenges which the EU Member States will face over the medium to long term. The first main section describes the implications of ageing populations on labour force developments and on economic activity and the second one discusses the implications of ageing populations on the public finances – the fiscal sustainability challenge – and strategies for coping with it.

2 Demographic and macroeconomic assumptions underlying budgetary projections

2.1 Overview of the entire age-related expenditure projection exercise

The starting point of the entire age-related expenditure projection exercise is a common set of exogenous demographic (Eurostat) and macroeconomic assumptions (DG ECFIN) carried out jointly by the AWG-EPC and the European Commission, covering the labour force, labour productivity, GDP growth and the real interest rate for all Member States over the period 2004 to 2050 (see Figure 1). On the basis of these assumptions, separate projections were run for five age-related expenditure items. The results of the set of projections are aggregated to provide an overall projection of age-related public expenditures.

2.2 Demographic projections

2.2.1 Fertility rates slightly upward and life expectancy continues to increase

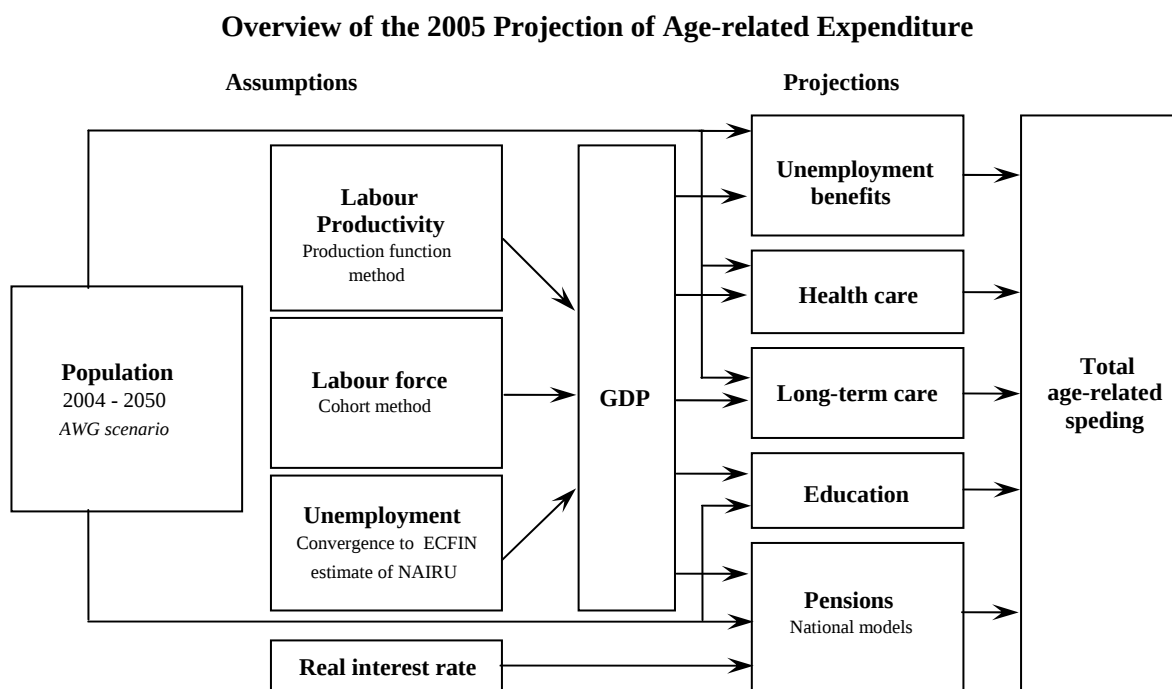
Changes in the size and age profile of a population depend upon assumptions regarding fertility rates, life expectancy and migration.

Fertility rates – Total fertility rates are projected to increase over the projection period in all Member States, except France, Ireland and Malta, where small declines are projected¹ (see Table 1). 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 EU25,² fertility rates are projected

¹ The population projection used to make the age-related expenditure projection was prepared by Eurostat. For the EU15 Member States, fertility is derived from an analysis of postponement of childbearing and recuperation of fertility rates at a later age. For the EU10, fertility is projected to be 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.

² Note that all EU averages are weighted by the population size.

Figure 1



to rise from 1.48 in 2004 to 1.60 by 2030 and to stay constant around that level until 2050. 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.

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.

Life expectancy at birth is projected to increase by 6.3 years for males 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.

2.2.2 Net inward migration to the EU projected to continue

Annual net migration inflows to the EU25 currently amount to 1.3 million people or

Table 1

Baseline Assumptions on Fertility Rates, Life Expectancy and Migration Flows in EU Member States

Country	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	67	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	70	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	57	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	80	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	111	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	77	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	219	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	64	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	124	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	91	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	95	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	83	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	73	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	60	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	78	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	193	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	93	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	33	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	60	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	49	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	30	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	141	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	100	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	124	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	97	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	77	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	75	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	75	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	88	1.9	5.7	193

Source: EPC and European Commission (2006), Eurostat, EUROPOP2004, AWG variant.

0.35 per cent of the population. The AWG population scenario³ involves large net flows into the EU25 over the projection period. For the EU25 as a whole, annual net inflows are projected to fall, to inflows of some 800,000 people by 2015 and thereafter hovering around 850,000 people, or 0.2 per cent of the EU25 population. These net inflows cumulate to close to 40 million people between 2004 and 2050.⁴

2.2.3 The size and age structure of the population

As a result of these demographic trends, the population in the EU25 will be both smaller and older in 2050 (see Table 2). 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 considerable diversity at the country level. While the total population is projected to increase in some Member States (e.g. BE: +4 per cent, FR: +9 per cent, IE: +36 per cent, SE: +13 per cent, UK: +8 per cent), this contrasts with large projected falls in other countries (DE: -6 per cent, IT: -7 per cent PL: -12 per cent).

Even more dramatic changes are projected to occur at the age structure of the population. Population pyramids on Figure 2 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 cohort. 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.

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 per cent (-30 per cent in the 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 per cent 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 per cent), by 2050. The fastest growing segment of the population will be the very old (80+), projected to rise by almost 32 million or 174 per cent.

2.3 Labour force projections

2.3.1 Projection results for labour force participation and labour supply

The labour force projections are based on an age-cohort methodology developed by the OECD⁵ and refined by DG ECFIN⁶ and the AWG. The methodology takes into account explicitly

³ The assumptions on net migration in the AWG population scenario are the same as those used in the baseline of EUROPOP2004 for all Member States, except for Germany, Italy and Spain. For the latter two countries, 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.

⁴ The data on migration flows are sketchy and it is extremely difficult to project migration flows. 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. 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).

⁵ Burniaux *et al.* (2003).

⁶ A more detailed description of the projection methodology and results can be found in Carone (2005).

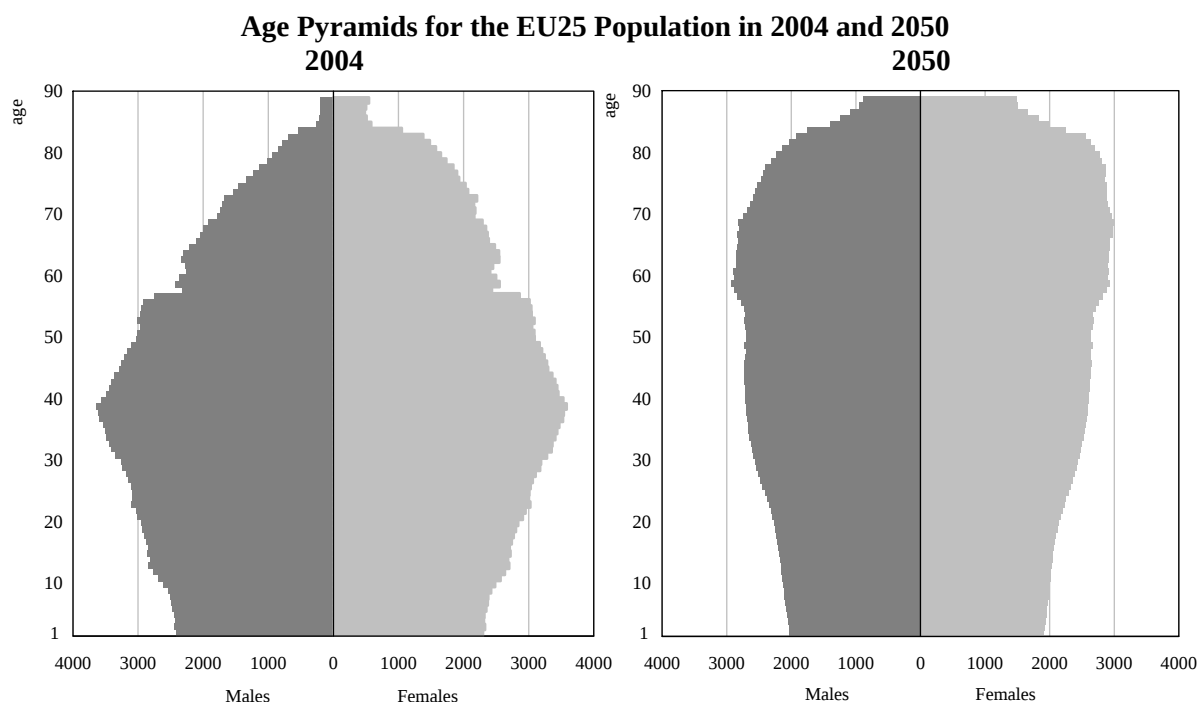
Table 2

Overview of the Projected Changes in the Size and Age Structure of the Population
(millions)

Country	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	67	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	70	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	57	3.4	9.9	187
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CZ	10.2	8.9	-13	1.6	1.1	-28	7.2	5.0	-31	1.4	2.8	93	0.3	0.8	164
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Euro area	308.6	308.4	0	48.9	40.8	-17	206.5	174.2	-16	53.3	93.4	75	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	88	1.9	5.7	193

Source: EPC and European Commission (2006).

Figure 2



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 (1998-2003). These probabilities are kept constant over the projection period and, in the baseline scenario, reflect a working assumption of “no policy change”. The potential impact on the probability of exit 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 encouraged workers to leave the labour force.⁷

2.3.2 Projected increases in overall participation rates...

Participation rates (for the age group 15-64) in the EU25 are projected to increase by about 6 percentage points over the period 2003-50; from 69.6 per cent in 2003 to 74.9 per cent in 2025 and to 75.5 per cent in 2050 (see Table 3).

⁷ 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 *et al.* (2005), and the economic rationale for tracking changes in labour market institutions can be found in Arpaia and Mourre (2005).

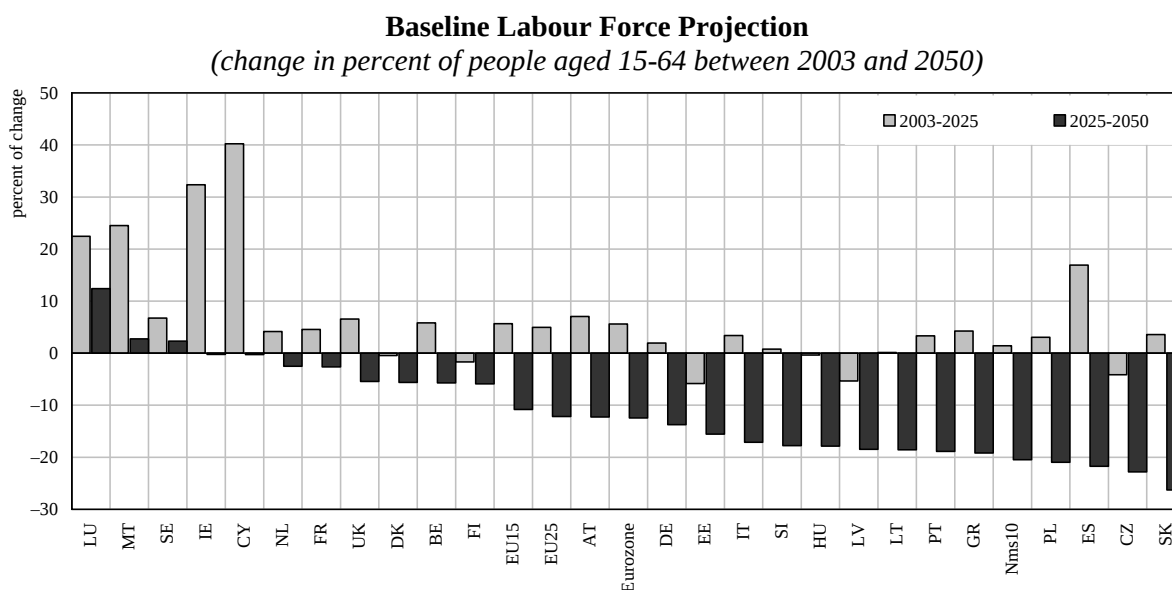
Table 3

Baseline Assumptions on Labour Forces in EU Member States, 2003-50

	Participation Rates (aged 15-64)				Employment Rates (aged 15-64)				Unemployment Rates		Employment	
	Total (15-64)		Older workers (55-64)		Total (15-64)		Older Workers (55-64)		2003	2050	(absolute change in thousand persons)	
	2003	2050	2003	2050	2003	2050	2003	2050			2003-25	2025-50
BE	65.0	70.0	28.9	44.9	59.6	65.5	28.1	44.4	8.2	6.5	315	-249
DK	79.3	81.3	62.8	69.0	74.9	77.9	59.8	66.7	5.5	4.3	23	-151
DE	72.6	79.0	45.2	69.2	65.4	73.5	39.5	65.7	9.9	7.0	1,887	-5,260
GR	65.3	70.0	43.5	53.7	58.9	65.1	42.1	52.9	9.8	7.0	331	-908
ES	67.5	76.8	43.6	63.9	59.7	71.4	40.6	62.5	11.6	7.0	3,906	-4,552
FR	69.3	73.1	38.3	54.1	63.1	68.0	36.3	52.9	9.0	7.0	1,664	-694
IE	68.8	77.2	50.1	69.5	65.5	74.6	48.8	68.9	4.8	3.4	604	-5
IT	62.9	70.2	30.5	55.3	57.2	65.7	29.4	54.6	8.9	6.5	1,348	-3,985
LU	65.0	68.3	30.7	42.2	62.6	65.4	30.3	41.8	3.7	4.2	41	28
NL	76.4	80.5	45.6	56.0	73.6	77.9	44.4	55.2	3.7	3.2	381	-212
AT	72.2	79.1	31.9	59.2	69.1	76.4	30.1	58.0	4.3	3.4	304	-502
PT	72.7	77.7	53.7	66.2	67.8	73.4	51.4	64.7	6.7	5.6	218	-940
FI	74.5	79.6	53.4	67.5	67.7	74.4	49.4	64.9	9.2	6.5	28	-141
SE	77.5	81.1	72.1	79.0	73.1	77.6	68.8	76.6	5.7	4.3	353	107
UK	75.3	78.3	57.2	65.2	71.5	74.7	55.4	63.9	5.1	4.6	1,972	-1,625
CY	70.8	80.7	52.6	70.6	67.7	77.3	50.2	69.1	4.4	4.2	132	-1
CZ	70.3	74.5	44.5	60.1	64.8	69.7	42.5	58.9	7.9	6.5	-126	-1,034
EE	70.1	76.1	56.8	63.7	62.9	70.8	52.7	61.7	10.3	7.0	-14	-87
HU	60.5	66.4	29.5	50.1	56.9	63.2	28.7	49.5	5.9	4.8	35	-713
LT	70.0	77.1	51.3	68.4	61.2	71.7	45.3	66.2	12.5	7.0	92	-281
LV	69.3	76.8	47.8	60.5	61.9	71.4	44.1	58.7	10.7	7.0	-14	-179
MT	58.6	66.0	32.9	33.7	54.1	61.3	32.0	33.1	7.6	7.0	37	5
PL	63.8	71.0	29.9	49.3	51.0	66.1	26.7	48.7	20.1	7.0	2,698	-3,404
SK	70.1	73.9	29.1	52.0	57.8	68.7	25.2	51.2	17.6	7.0	369	-672
SI	67.3	73.4	24.2	53.0	62.8	69.3	23.5	52.6	6.8	5.5	18	-159
EU25	69.6	75.5	42.7	60.4	63.1	70.9	39.9	58.9	9.3	6.1	16,603	-25,615
EU15	70.4	76.1	44.2	61.9	64.6	71.5	41.4	60.2	8.2	6.0	13,376	-19,090
Euro area	69.1	75.3	40.4	60.5	62.9	70.5	37.4	58.8	9.0	6.4	11,028	-17,420
EU10	65.4	71.8	34.5	52.8	55.7	67.1	31.7	51.9	14.8	6.6	3,227	-6,525

Source: EPC and European Commission (2006).

Figure 3



Source: EPC and European Commission (2006).

2.3.3 ... 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 per cent from 2003 to 2025. 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. However, this positive trend in female labour supply is projected to reverse during the period 2025-50 and along with the drop in male supply, the overall labour force is expected to decrease by as much as 12 per cent (equivalent to around 27.5 million people, 16.5 million if compared with the level in 2003) although there are wide differences across countries (see Figure 3).

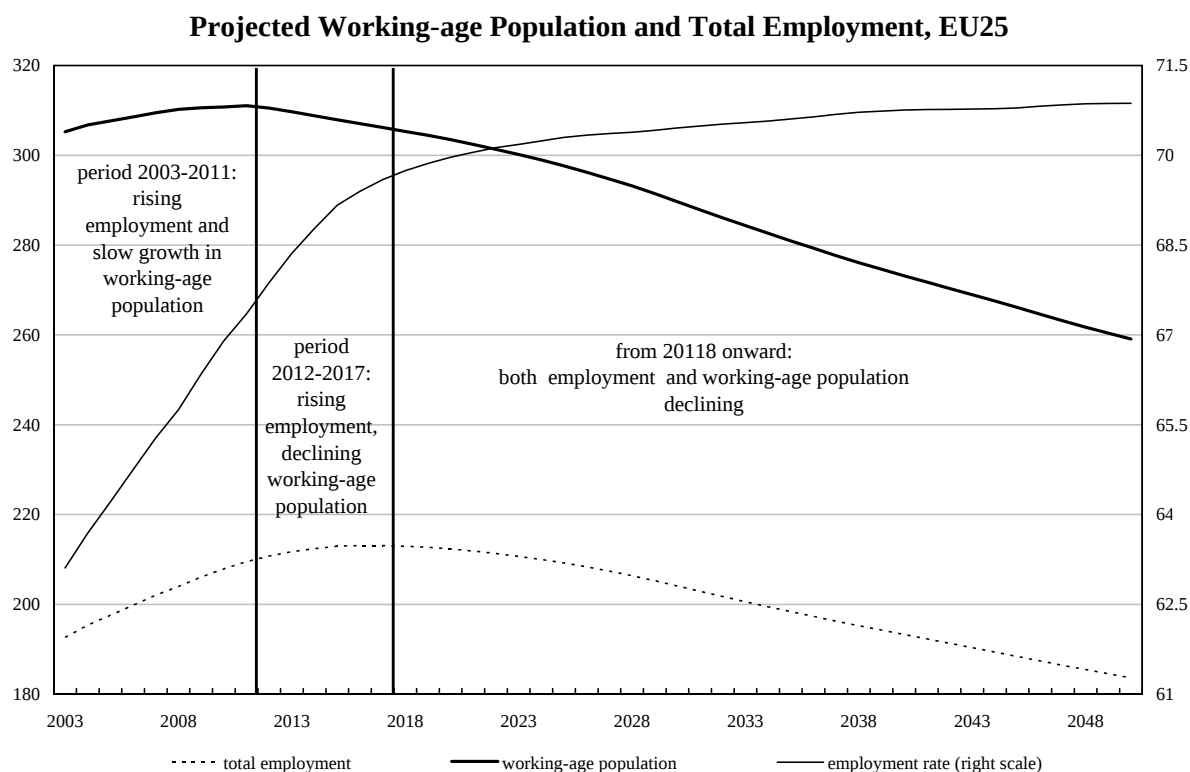
2.3.4 Assumptions on unemployment

Unemployment rates are assumed to 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. In aggregate terms, unemployment rates in the EU25 are assumed to fall from 9.3 in 2003 to 7.8 per cent in 2010 and to 6.1 per cent by 2025. A much bigger fall is projected for the EU10 countries, from 14.8 in 2003 to 6.6 per cent in 2025 (see Table 3).

2.3.5 Employment projections

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 per cent in 2025, and to stabilise at 70.7 per cent at the end of the projection

Figure 4



Source: EPC and European Commission (2006).

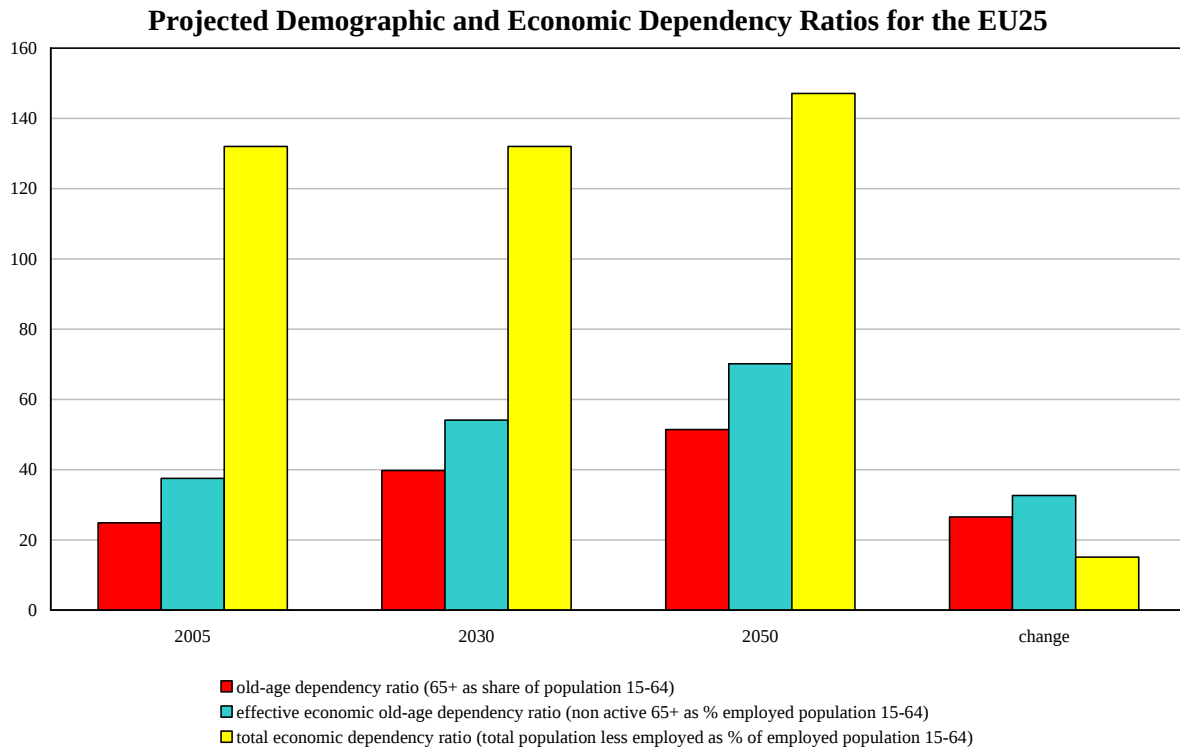
period.⁸ The female employment rate is projected to increase by some 10 percentage points to 65.5 per cent by 2050, above the Lisbon employment target of 60 per cent. The employment rate of older workers is projected to increase by some 18 percentage points over the projection period to reach 60.4 per cent in 2050, and the Lisbon employment target of 50 per cent is projected to be reached by 2013.

The number of persons employed in the EU25 (according to the European Labour Force Survey definition) is expected to grow over the period 2003-17 and then to decrease in the subsequent period (2018-50). 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).

The projected increases in the employment rates of women and older workers will, as illustrated in Figure 4, only temporarily cushion the effects of ageing on the labour force. Indeed, the ageing effect is projected to dominate from 2018. 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 enter a downward trajectory.

⁸ 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.

Figure 5



Source: EPC and European Commission (2006).

2.4 Economic dependency ratios underlying budgetary projections

2.4.1 Significant policy challenges lie ahead

The population and labour force assumptions suggest that 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 population scenario) with the economic dependency ratios (that result from the employment projections), see Figure 5 and Table 4.

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 and reach 51 per cent in 2050. This means that 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, which is the number of non-active persons aged 65 and above as a percentage of employed persons aged 15 to 64, is also presented in Table 4 and Figure 5. 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 per cent in 2025 and 70 per cent 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.

Table 4

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	26.0	36.3	47.2	21.2	43.1	55.3	71.3	28.1	155.8	149.6	163.7	7.9
DK	22.3	34.2	41.9	19.5	28.5	42.2	52.0	23.5	101.1	106.4	115.6	14.5
DE	25.9	38.1	51.7	25.8	38.7	50.3	68.7	30.0	126.6	117.3	135.3	8.6
GR	25.8	35.8	60.4	34.6	41.1	52.0	88.5	47.4	150.2	141.2	180.8	30.6
ES	24.6	33.2	65.6	41.0	39.9	44.9	88.4	48.5	144.0	117.9	162.4	18.3
FR	25.1	36.5	46.4	21.3	39.1	53.2	66.3	27.2	143.6	145.8	156.0	12.4
IE	16.4	25.2	45.2	28.8	23.4	31.4	56.3	32.9	125.0	108.1	132.0	6.9
IT	28.5	39.2	62.2	33.7	48.7	60.0	92.7	44.0	161.7	149.4	179.0	17.3
LU	20.9	27.7	36.1	15.2	32.9	42.1	54.7	21.7	138.0	137.3	149.5	11.5
NL	20.3	32.8	40.6	20.4	26.7	41.2	50.6	24.0	100.8	106.7	114.1	13.3
AT	22.8	34.4	52.4	29.6	32.5	44.8	67.4	34.9	113.1	107.7	127.7	14.6
PT	22.5	34.8	58.5	36.0	29.6	42.9	73.0	43.4	118.3	115.5	148.5	30.2
FI	22.9	41.3	46.7	23.7	33.0	53.5	60.2	27.2	121.1	128.2	132.6	11.6
SE	26.5	36.4	40.9	14.4	35.0	44.8	50.5	15.4	111.2	112.7	116.9	5.7
UK	24.3	33.1	45.0	20.7	32.0	42.0	57.2	25.2	113.3	113.7	127.5	14.3
CY	13.7	29.3	43.2	29.5	18.4	34.8	51.9	33.4	119.6	96.0	113.6	-5.9
CZ	19.7	35.0	54.8	35.1	29.4	46.5	75.8	46.4	118.9	116.4	154.0	35.1
EE	23.5	31.3	43.1	19.7	35.1	40.7	57.3	22.2	135.4	117.7	137.1	1.7
HU	22.4	34.5	48.3	25.9	39.1	51.1	74.2	35.1	156.5	140.4	172.1	15.6
LT	22.0	29.2	44.9	22.9	34.8	37.9	60.2	25.4	143.9	107.3	134.1	-9.8
LV	23.3	30.7	44.1	20.8	35.3	39.1	57.8	22.5	136.9	113.3	136.9	-0.1
MT	18.7	33.8	40.6	21.9	34.1	53.5	65.6	31.6	169.9	153.7	168.3	-1.6
PL	18.4	32.8	51.0	32.5	34.7	46.2	74.5	39.7	182.7	127.1	162.7	-20.0
SK	16.5	28.1	50.6	34.2	28.3	38.2	73.0	44.7	145.9	104.9	151.5	5.5
SI	21.0	35.8	55.6	34.6	32.4	48.5	76.9	44.5	126.9	124.4	157.5	30.6
EU25	24.2	35.4	51.4	27.2	37.2	48.4	70.2	33.0	136.0	125.3	147.1	11.1
EU15	25.2	35.9	51.6	26.4	37.8	48.9	69.8	32.0	132.0	125.6	145.3	13.3
EU10	19.4	32.7	50.4	31.0	33.7	45.5	72.6	38.8	159.0	123.6	158.2	-0.7

* Calculated as the ratio of the population aged 65 and above over the population aged 15 to 64.
Source: EPC and European Commission (2006).

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 EU25, this ratio actually falls from 136 in 2003 to 125 per cent in 2025, but thereafter increases to 147 per cent 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.

2.5 *Macroeconomic assumptions: labour productivity and potential growth rates*⁹

2.5.1 *Assumptions on productivity based on a “production-function approach”*

A production-function approach has been used 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.

The following main assumptions have been used:¹⁰

- for the EU15 countries, the growth rate of Total Factor Productivity (TFP) will converge to 1.1 per cent (*i.e.*, the US trend labour productivity growth) by 2030, with different speeds of convergence across Member States;¹¹
- for the EU10, TFP will converge to 1.75 per cent by 2030 and thereafter converge at the same pace so as to reach 1.1 per cent in 2050.

Table 5 presents the outcome of these assumptions in terms of the projections for potential GDP 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 per cent in the period 2031-50. The projected fall in potential growth rates is much higher in the EU10. For the EU10, potential GDP growth rates of 4.5 per cent between 2004 and 2010 are projected to fall to 0.9 per cent 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.

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 per cent 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 per cent, while a few larger countries (DE, GR, IT and PT) are expected to grow at a rate lower than 1.5 per cent over the whole period.

⁹ 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 *et al.* (2006).

¹⁰ See EPC and European Commission (2005).

¹¹ Some countries underwent specific adjustments in their TFP profile in the period 2010-30 such as GR, IT, PT and ES, in order to allow for stronger real convergence in productivity level.

Table 5

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 (2006).

Table 6

GDP Growth and Its Sources, 2004-50

	Average 2004-50			
	EU25	EU15	Euro area	EU10
GDP growth	1.7	1.6	1.5	2.4
due to percent change in:				
Productivity (GDP/per employee)	1.8	1.7	1.6	2.7
<i>of which :</i>				
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
<i>of which :</i>				
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	-0.3

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 (2006).

2.5.2 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 2011-30 and turn significantly negative thereafter. Over time, productivity will become the dominant source of growth.

In order to assess the relative contribution to GDP growth of its two main components, labour productivity and labour utilisation, Table 6 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).

2.6 Other macroeconomic assumptions

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

Inflation: projections were 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 per cent 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.¹²

On the basis of these demographic and macro-economic assumptions, the projections of age-related government expenditure items were made, which will be analysed in the next section of this paper.

3 Budgetary developments and fiscal sustainability

3.1 The overall impact of ageing population on public spending

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 (see Table 7). For the EU15 and the euro area as a whole, age-related public spending is projected to increase by almost 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.

Since the completion of the common long-term budgetary projections (EPC and European Commission (2006), henceforth referred to as the *2006 Ageing Report*), a number of countries have implemented pension reforms. In order to ensure that the impact of these reforms is comparable with the previous results, they have been subject to a peer review by the AWG and the EPC. Table 8 shows the budgetary impact of these reforms.

3.1.1 The projection results regarding pensions¹³

For the EU15 Member States, public pension spending is projected to increase in all countries, except Austria, on account of its reforms since 2000.¹⁴ 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 percentage points), Spain (7.1 percentage points), Luxembourg (7.4 percentage points) (see Table 7). 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.¹⁵

¹² 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.

¹³ It should be noted that the above-mentioned impact of the recent pension reforms in DK, HU and PT are not taken into consideration in this section.

¹⁴ Pension projections have been carried out by Member States, based on national models.

¹⁵ More detailed information about the impacts of enacted reforms is given in Economic Policy Committee and the Directorate-General for Economic and Financial affairs (2007).

Table 7

**Projected Age-related Expenditure Increases up to 2030 and 2050
Change in Public Spending from 2004 to 2030 and 2050**

	Pensions			Health Care			Long-term Care			Unemployment Benefits			Education			Total Age-related Expenditure		
	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:	
	2004	0	0	2004	0	0	2004	0	0	2004	0	0	2004	0	0	0	0	
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	4.5	6.3	BE
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	1.8	7.2	CZ
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	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	1.0	2.7	DE
EE	6.7	-1.9	-2.5	5.4	0.8	1.1	0.3	0.1	0.3	0.1	-0.0	-0.0	5.0	-1.1	-1.3	-2.2	-2.5	EE
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	8.5	ES
FR	12.8	1.5	2.0	7.7	1.2	1.8	0.3	0.1	0.2	1.2	-0.3	-0.3	5.0	-0.5	-0.5	2.0	3.2	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	3.3	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	1.0	1.7	IT
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	CY
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	-1.5	-1.3	LV
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	0.3	1.4	LT
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	5.4	8.2	LU
HU	10.4	3.1	6.7	5.5	0.8	1.0	0.6	0.3	0.6	0.2	-0.0	-0.0	4.5	-1.0	-0.7	3.1	7.6	HU
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	1.8	0.3	MT
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	3.8	5.0	NL
AT	13.4	0.6	-1.2	5.3	1.0	1.6	0.6	0.4	0.9	0.8	-0.1	-0.1	5.1	-0.9	-1.0	0.9	0.2	AT
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	-6.7	PL
PT	11.1	4.9	9.7	6.7	-0.1	0.5	0.5	0.1	0.4	1.0	-0.1	-0.1	5.1	-0.6	-0.4	4.3	10.1	PT
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	4.4	9.7	SI
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	0.3	2.9	SK
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	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	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	2.2	4.0	UK
EU25	10.6	1.3	2.2	6.4	1.0	1.6	0.9	0.3	0.7	0.9	-0.3	-0.3	4.6	-0.7	-0.6	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	1.9	3.7	EU15
EU12	11.5	1.6	2.6	6.3	1.0	1.5	0.8	0.2	0.6	1.0	-0.3	-0.3	4.4	-0.7	-0.6	1.9	3.8	EU12
EU10	10.9	-1.0	0.3	4.9	0.9	1.3	0.4	0.1	0.3	0.4	-0.2	-0.2	4.7	-1.5	-1.3	-1.7	0.3	EU10

Source: EPC and European Commission (2006) and European Commission (2006).

Table 8

The Impact of Recent Pension Reforms
Total Age-related Expenditure
(percent of GDP)

Country	Change from 2004 to:			
	2030	2050	2030	2050
	Before reform		After reform	
DK	4.0	4.8	1.7	1.4
CY	3.1	7.6	2.7	7.3
PT	4.3	10.1	2.2	5.9

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 percentage points of GDP and thereafter to increase by 1.3 percentage points, resulting in an overall increase of 0.3 percentage points of GDP on average between 2004 and 2050. However, the trends are very diverse across countries, ranging from a decrease of 5.9 percentage points of GDP in Poland and to an increase of 6.7 percentage points in Hungary, 7.3 in Slovenia and 12.9 percentage points in Cyprus (see Table 7). 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.

3.1.2 Decomposing the drivers of public 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, using the following equation:

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

This equation enables to distinguish the following effects:

- 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*,¹⁶ 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;
- 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.

Table 9 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.¹⁷
- 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 per cent 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. The level of pensions relative to wages (approximated by output per worker) 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.

¹⁶ This effect is also commonly referred to as the “*eligibility effect*” in the literature.

¹⁷ 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 9

The Contribution of the Decomposed Factors to the Change in All Public Pensions
(percent of GDP)

Country	Public Pensions, Gross (percent of GDP)		Due to Growth in:				Interaction Effect (residual)
	start level	p.p. change	Dependency Ratio	Employment Rate	Take up Ratio	Benefit Ratio	
	2005 ²⁾	2005-50	$\frac{\text{Pop}(65+)}{\text{Pop}(15-64)}$	$\frac{\text{Employed}}{\text{Pop}(15-64)}$	$\frac{\text{Pensioners}}{\text{Pop}(65+)}$	$\frac{\text{Average pension}}{\text{GDP per worker}}$	
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 (instead of 2004 in other tables) because the changes have been measured as the sum of changes over 5-year periods.

Note: The impact of the pension reforms in DK, HU and PT are not included in this table.

Source: EPC and European Commission (2006).

- 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.

One of the most striking results is the projected decline in “benefit ratio” of public pensions relative to wages, 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. In most countries, private pension arrangements can cover part of the shortfall, but would require higher contributions, *i.e.* more private pre-funding. Providing financial incentives for this to materialize might entail a budgetary cost in the medium-term.

3.1.3 The projection results for health care spending

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 (see Table 6).

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) evolved broadly in line with changes 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.¹⁸

3.1.4 *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. 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 (see Table 7). 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 likely upward pressure on the public finances, as future policy changes in favour of more formal care provision – and higher expenditure – may be required in the future.¹⁹

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 per cent and 60 per cent 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.

3.1.5 *The projection results for public spending on education and unemployment transfers*

Education spending

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

¹⁸ See Przywara and Costello (2008) for a more detailed analysis of health-care expenditure projections.

¹⁹ A policy scenario was carried out in the Ageing Report, attempting at capturing the budgetary effects of more formal care being provided/financed by the public sector. It revealed that expenditure on long-term care would increase by 1.5 per cent of GDP up to 2050 as compared with 0.6 per cent of GDP in the baseline scenario, i.e. an additional increase of 1 percentage point of GDP. See Section 5.5.4 “Increase in formal care provision scenario” in EPC and the European Commission (2006) for further details.

savings are only projected for some countries (see Table 7). The results of the projections indicate that the reduced ratio of students to working-age population will lead to a reduction in the ratio of total education expenditure to GDP that is projected to be 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.

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.

Unemployment benefits

Unemployment benefit spending in the EU25 is projected to fall from about 1 per cent of GDP in 2002-03 to 0.6 per cent in 2025-50 (see Table 8). 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.

3.2 The impact of ageing populations on the public finances

3.2.1 Measuring the size of the fiscal challenge

The issue of debt or fiscal sustainability is a complex and multi-faceted issue, for which there is widely and generally accepted definition on what a sustainable debt position actually is. Blanchard *et al.* (1990) succinctly puts it as “*it is essentially about whether, based on the policy currently on the books, a government is headed towards excessive debt accumulation*”.

The time horizon over which one analyses debt sustainability is highly dependent on the purpose of the analysis. In some cases, it might be relatively short and the purpose is to evaluate *short- to medium-term* dynamics of debt, e.g. to analyse the dynamics of debt servicing, including in many cases external debt service (e.g. the IMF’s assessment of default risks). In the short to medium-term context, the assessment of the sustainability is conditional upon several factors, such as the structure of debt according to maturity, currency of denomination and average terms of new commitments. If the sustainability of external debt is considered, additional factors such as exchange rate dynamics, exports and imports of goods and services in foreign currency and net foreign direct investment are taken into account. Such type of sustainability analysis is mostly used for emerging markets or low-income countries.²⁰

In the case of the assessment of the long-term sustainability of public finances in view of ageing populations, the time horizon needs to be considerably longer to assess the budgetary impact of government commitments, notably regarding pensions, being dependent on the population structure.

²⁰ Medium-term debt sustainability assessment underpins the IMF’s decisions in the context of the Fund-supported programmes, in particular by helping to determine when financing is appropriate, what might be a sensible level of access, and whether a debt restructuring may be needed (see IMF, 2002 and 2004).

For the purposes of assessing sustainability of public finances over the long term in view of the budgetary challenge posed by ageing populations, debt sustainability may be defined in two alternative ways:

- A first definition of sustainability is derived from the government's *intertemporal budget constraint*. It imposes that current total liabilities of the government, *i.e.* the current public debt and the discounted value of all future expenditure, should be covered by the discounted value of all future government revenue over an infinite horizon. In other words, the government must run sufficiently large primary surpluses in the future to cover the increasing cost of ageing and to pay off interest on outstanding debt. If current policies ensure that the government's intertemporal budget constraint is fulfilled, current policies are financially sustainable. However, since the government's intertemporal budget constraint is defined over an infinite horizon, it does not specify *when* the adjustment of revenues or expenditures, if any, has to be made: the required adjustment may be made today or at any point in the future. Furthermore, this condition does not imply that debt should reach a specific level (whether it is zero or not).²¹
- The abovementioned condition over an infinite horizon can be approximated by looking over a *finite* period and to assess if current policies ensure a specific *debt target* to be reached at a given date. While this finite condition does not ensure the sustainability of public finances after the target year, it gives a clearer policy objective than the intertemporal budget constraint. Given that there are as many possible conditions as there are debt concepts, debt targets and target years, the EU adopted an approach of this second definition, which draws on the compliance with the EMU debt requirement in 2050.²²

The assessment of long-term sustainability of public finances goes beyond answering the question whether current policies are sustainable or not. An estimation of the size of the budgetary imbalances is also needed. This is provided by *sustainability gap indicators* that measure the size of a permanent budgetary adjustment (e.g., a constant reduction of non age-related public expenditure as a share of GDP or a constant increase in public revenue as a share of GDP) that enables to meet one of the following conditions:²³

- reaching a target of 60 per cent of GDP for the Maastricht debt in 2050 (the *S1 indicator*);
- fulfilling the inter-temporal budget constraint over an infinite horizon (the *S2 indicator*).

The two sustainability indicators translate current and future budgetary imbalances into synthetic measures that can be simply expressed as a sum of three different components:

- the first component relates to the relative position of the current primary balance compared to the primary balance that stabilises the level of debt as a share of GDP over the long term, further recalled as the *debt-stabilizing primary balance*. If the initial primary balance is not large enough, the government debt will be on an explosive path even before considering the impact of ageing;²⁴

²¹ In fact, the intertemporal budget constraint only requires that the debt does not increase too fast; more precisely, that nominal debt does not increase faster than the nominal interest rate.

²² Blanchard *et al.* (1990) uses as a target the initial level of debt as a share of GDP over a 40 years period. A former target of the EU was the initial nominal debt level (the T1 indicator, see for example Public finances in EMU, 2005, p. 121). The UK uses a net debt target of 40 per cent in the long term. This small sample shows the diversity of targets that can be envisaged.

²³ A comprehensive analysis of fiscal sustainability and the detailed properties of the sustainability gap indicators are provided in European Commission (2006).

²⁴ The notion of long-term debt-stabilizing primary balance refers to the primary balance that, if reached, would stabilize the debt *in the long run* at its current level. It therefore depends on the long-term prospects of GDP growth and interest rates. It can differ from the short-term debt-stabilizing primary balance that can be calculated with current nominal GDP growth and nominal interest rates.

Table 10

Summarizing the Sustainability Indicators

	Impact of		
	Initial Budgetary Position	Debt Requirement in 2050	Long-term Changes in the Primary Balance
$S_1 =$	Gap to the debt-stabilizing primary balance	Additional adjustment required to reach a debt target of 60 per cent of GDP in 2050	Additional adjustment required to finance the increase in public expenditure up to 2050
$S_1 =$	$\underbrace{rD_{t_0} - PB_{t_0}}_A$	$+$ $\underbrace{\frac{r(D_{t_0} - D_T)}{(1+r)^{T-t_0} - 1}}_B$	$+$ $\underbrace{-\frac{\sum_{i=t_0+1}^T \frac{\Delta PB_i}{(1+r)^{i-t_0}}}{\sum_{i=t_0+1}^T \frac{1}{(1+r)^{i-t_0}}}}_C$
$S_2 =$	Gap to the debt-stabilizing primary balance	0	Additional adjustment required to finance the increase in public expenditure over an infinite horizon
$S_2 =$	$\underbrace{rD_{t_0} - PB_{t_0}}_D$	$+$ 0	$+$ $\underbrace{-r \sum_{t=t_0+1}^{\infty} \frac{\Delta PB_t}{(1+r)^{t-t_0}}}_E$

- the second component is *specific* to the S1 indicator and relates to the initial level of debt. If a country has an initial level of debt larger than 60 per cent of GDP, reaching the debt-stabilizing primary balance will not be sufficient to ensure that the debt reference value is achieved in 2050 and an additional adjustment is therefore necessary;
- the third component relates to the *increase in age-related expenditure* in the future due to ageing populations. Fulfilling the first two conditions will not be enough to avoid excessive debt accumulation if expenditure are expected to increase (or equivalently if the primary balance is expected to deteriorate) as a share of GDP in the future. An additional adjustment is therefore necessary to cover the increase in expenditure up to 2050 (in the case of S1) or over an infinite horizon (in the case of S2).

This decomposition (see Table 10) gives additional insight to understand the numerical results of the indicators. It also enables to determine for each country whether the risks to the sustainability of public finances stem from the initial budgetary position and/or a large increase in age-related expenditure over the long term.

3.2.2 Sustainability gap indicators

Table 11 presents the results of the quantitative indicators, which have been calculated on the basis of the estimated structural budgetary position in 2007 and the projected change in age-related expenditure in the period up to 2050.

A decomposition of the indicators is made in order to determine whether the risks to public finance sustainability can be attributed to the current budgetary position and/or to the long-term

Table 11

Sustainability Gap Indicators, “2007” Scenario
(percent of GDP)

Country	S1				S1 in SR	S2			S2 in SR
	Total	IBP	DR	LTC		Total	IBP	LTC	
BE	1.4	-2.6	0.3	3.7	0.4	2.8	-2.5	5.3	1.8
CZ	5.6	3.5	-0.5	2.6	2.5	8.5	3.7	4.8	5.5
DK	-3.7	-4.3	-0.9	1.4	-4.2	-2.6	-3.9	1.3	-2.2
DE	0.5	-1.4	-0.0	2.0	3.5	1.8	-1.3	3.1	4.4
EE	-3.6	-1.2	-1.1	-1.3	-4.4	-2.6	-1.1	-1.4	-3.4
GR	1.2	0.4	0.5	0.4	3.2	1.4	0.5	0.9	3.0
ES	-0.3	-3.3	-0.5	3.5	0.2	2.7	-3.2	5.9	3.2
FR	2.2	0.3	-0.0	1.9	3.2	3.0	0.4	2.6	4.0
IE	1.3	-1.2	-0.9	3.5	-0.8	4.9	-1.1	6.0	2.9
IT	1.3	-0.9	0.7	1.5	3.4	1.1	-0.8	2.0	3.1
CY	-0.9	-4.7	-0.6	4.4	4.0	4.1	-4.4	8.5	8.5
LV	0.2	0.2	-0.9	0.9	-0.6	1.5	0.3	1.2	0.8
LT	0.5	0.6	-0.8	0.7	0.3	2.0	0.7	1.3	1.8
LU	3.1	-0.5	-1.6	5.2	4.6	8.1	-0.2	8.3	9.5
HU	4.7	1.7	0.2	2.8	7.9	6.9	2.0	4.9	9.8
MT	-0.2	-0.8	-0.1	0.6	0.4	-0.6	-0.5	-0.1	-0.3
NL	2.2	-0.8	-0.3	3.3	-0.2	3.9	-0.5	4.4	1.3
AT	-0.1	-1.0	-0.1	1.0	0.1	0.3	-0.8	1.1	0.3
PL	-1.0	2.2	-0.1	-3.1	-0.4	-0.7	2.7	-3.4	-0.2
PT	1.9	0.2	-0.0	1.7	7.9	3.6	0.4	3.2	10.5
SI	3.5	-0.2	-0.7	4.4	3.9	7.0	-0.0	7.1	7.3
SK	2.6	2.0	-0.5	1.1	1.3	4.4	2.2	2.1	3.0
FI	-3.1	-4.9	-1.5	3.3	-3.3	-0.5	-4.6	4.2	-0.9
SE	-3.1	-3.5	-1.0	1.5	-2.7	-1.2	-3.2	2.0	-1.1
UK	3.3	1.5	-0.2	2.0	3.4	4.8	1.6	3.2	4.9
EA	1.0	-1.2	-0.0	2.2	2.3	2.3	-1.1	3.4	3.5
EU27	1.2	-0.7	-0.1	2.0	2.1	2.5	-0.6	3.1	3.4

Notes: IBP = the initial budgetary position, DR = the debt requirement in 2050, LTC = the long-term changes in the primary balance. A positive value of S1 and S2 indicates that a budgetary improvement would close the gap, while a negative value indicates that a budgetary weakening would close the gap. In the “2007” scenario, it is assumed that the structural primary balance will remain unchanged from 2007 throughout the programme period, usually until 2010. Debt projections in this scenario start in 2007. SR = the Sustainability Report. Note that pension projections were not available for Greece and the rise in age-related expenditure is therefore underestimated. Pension expenditure was projected to rise between 2005 and 2050 by 10.2 per cent in the 2002 update of the Greek stability programme. The aggregate results for the Euro-area exclude Greece and for the European Union (EU27) additionally exclude Romania and Bulgaria. Note that for BE and PL the figures refer to the 2006 SCP assessment, since no 2007 updated stability/convergence programmes were available.

budgetary impact of ageing. In particular, this decomposition distinguishes between the impact on the sustainability indicators (S1 and S2) from:

- the *initial budgetary position* – i.e. the gap between the structural primary balance in 2005 and the long-term debt-stabilizing primary balance,²⁵ and
- the *long-term change in the budgetary position* – i.e. the impact of the rise in age-related expenditure on the indicators.²⁶

The analysis reveals that there is a large variety in terms of the size of the sustainability gaps as well as of the relative importance of the initial budgetary position (IBP) and the pure impact of ageing (LTC) (see Table 11). In the EU as a whole and in the euro-area, the sustainability gap is about 1 per cent of GDP according to the S1 indicator and about 2½ per cent of GDP according to the S2 indicator. In both cases, the long-term budgetary impact of ageing is the main factor behind the sustainability gaps. The EU aggregates however mask considerable variety between the Member States.

Overall, a majority of Member States have positive sustainability gaps; 16 Member States according to the S1 indicator, and 19 Member States according to the S2 indicator. This implies that based on the current budgetary position and with no changes in policies, an adjustment is necessary so as to render the public financed sustainable over the long-term for most Member States. In about half of the Member States, a considerable adjustment, of more than 2 per cent of GDP, is required (according to the S2 indicator).

The long-term budgetary impact of ageing

The indicator reflects the large differences of the budgetary impact of ageing on public finances and notably the large differences between countries with regard to the change in pension expenditure to 2050 – ranging from a reduction in Estonia and Poland to an increase of more than 10 per cent of GDP in Cyprus. It reflects the diversity in public pension arrangements, their degree of maturity and the effects of pension reforms enacted so far. Differences in other age-related expenditure items projections are smaller; the difference between the projected highest and lowest increase is respectively 1.7 and 1.9 per cent of GDP for expenditure on long-term care and education; around 1 per cent of GDP for health-care expenditure and 0.5 per cent of GDP for unemployment benefits.

The decomposition of the sustainability gap indicators provides information on the pure budgetary impact of ageing, the *long-term change in the budgetary position (LTC)*. The size of the contribution of the LTC for the S2 indicator is in general higher than for the S1 indicator, as the latter only takes into account budgetary developments up to 2050. Considering the S2 indicator, the following points can be made:

- The long-term budgetary impact of ageing (LTC) is very significant in BE, CZ, ES, IE, CY, LU, HU, SI, with an increase of close to 5 per cent of GDP or more. These countries have so far made only limited progress in reforming their pension systems or are experiencing maturing pension systems.
- For a second group of countries – DE, FR, NL, PT, SK, FI, UK – the long-term budgetary impact of ageing is more limited, ranging from 2 to 5 per cent of GDP. Several of these

²⁵ See footnote 22.

²⁶ In the case of S1, the decomposition also separates the impact of the debt position (60 per cent of GDP in 2050). In particular, if the current debt/GDP ratio is below 60 per cent of GDP debt is allowed to rise and this component reduces the sustainability gap as measured by the S1 indicator, and vice versa.

countries have implemented pension reforms that contribute to limit the increase in pension expenditure (Slovakia, Finland, France, Germany, and Portugal). The projected increase in public pension expenditure is also limited in the UK and NL, influenced by their historically stronger reliance on private pension arrangements.

- Finally, the increase is more moderate, 2 per cent of GDP or less, in DK, EE, IT, LV, LT, MT, AT, PL, SE. Most of these countries have implemented comprehensive pension reforms, in several cases also involving a partial switch to private pension schemes (Sweden, Lithuania, Latvia, Estonia and Poland).²⁷ For most of the countries with a relatively limited long-term budgetary impact of ageing mentioned above, the projected increase in expenditure on health-care and generally on long-term care rises more than on pensions.

It should be noted that for Greece and Cyprus projections for expenditure on long-term care were not available in time for the completion of this report and the budgetary cost of ageing and the sustainability gaps are thus underestimated for these countries. The projected increase in expenditure of long-term care is however quite small on average in the EU, although it shows significant variation across the Member States.

Finally, concerning Greece, pension projections were not available in time for the finalisation of the common projections. The rise in age-related expenditure is therefore underestimated in the case of Greece. In the Greek 2002 stability programme, pension expenditure was projected to rise by 10.2 per cent of GDP between 2005 and 2050.

The impact of the initial budgetary position

In addition to the long-term budgetary impact of ageing, the current budgetary position and level of debt can also present a risk to public finance sustainability. The *initial budgetary position* (IBP) illustrates whether the public finances are sustainable, considering only the current budgetary position, *i.e.* the current structural primary balance and the current level of government debt.

Table 11 above shows that, given the initial budgetary position in 2007, the public finances are on an unsustainable path even before considering the long-term budgetary impact of an ageing population in more than a third of the Member States according to the S2 sustainability indicator.

In five MSs, (CZ, HU, PL, SK, UK), an adjustment of the structural primary balance of more than 1½ per cent of GDP is required to avoid an unsustainable path for the public finances.²⁸

Finally, for 14 countries (BE, DK, DE, EE, ES, IE, IT, CY, LU, MT, NL, AT, FI, SE), the current fiscal position would be sustainable if there was no cost of ageing. It can thus contribute to cover part of the budgetary impact of ageing over the long term by reducing public debt and/or accumulating assets in the public sector in the next decades.

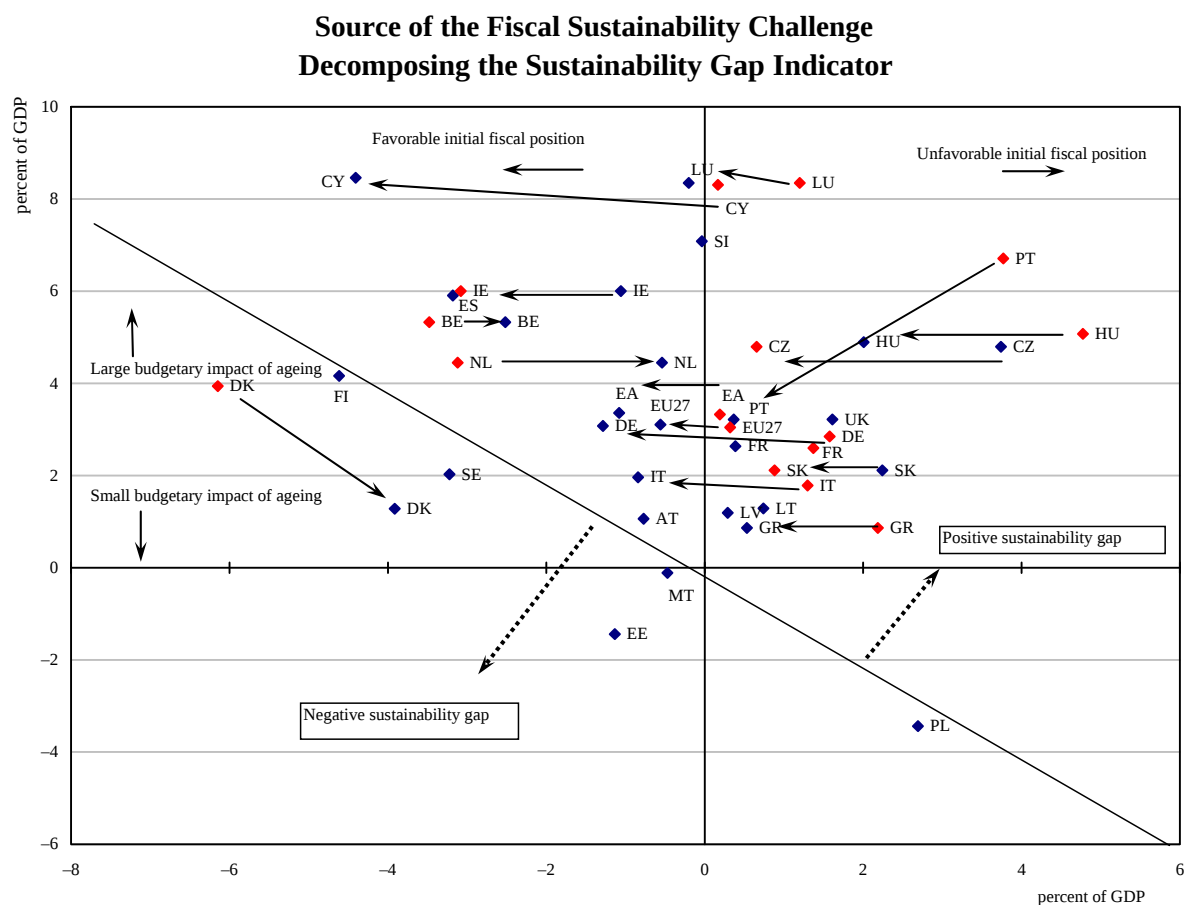
The progress made towards sustainability...

Figure 6 shows the position of the EU Member States in terms of the initial budgetary position and the long-term cost of ageing, based on the latest (2007) updates of the SCPs. Countries

²⁷ There is one exception though, Malta has not significantly reformed its public pension system and the specific design of the Maltese pension system in effect puts a cap on both pension expenditure and contributions. As a result, pension expenditure (and contributions) as a share of GDP will start to fall between the 2020s and 2050.

²⁸ Poland is however in a very specific position. The projected decrease in age-related expenditure as a share of GDP results in a negative long-term budgetary impact of ageing. This almost exactly offsets the weak initial budgetary position.

Figure 6



Note: The horizontal axis shows the distance between the structural primary balance in 2007 and the one that would stabilize the debt ratio, *i.e.* the IBP. The vertical axis shows the size of the cost of ageing, *i.e.* the LTC. The situation in 2005 is only shown in the figure above for countries where the difference in the IBP or the LTC is greater than 1 percentage point of GDP between 2005 and 2007.

above the line in the figure have a positive sustainability gap and countries below the line have a negative sustainability gap. It illustrates that the fiscal sustainability challenge can take many forms.

For example, LU has a large sustainability gap, due to a very high projected cost-of-ageing but with a current structural budgetary position that is rather favourable, though not sufficient to offset the aforementioned cost of ageing. FI by contrast has a negative sustainability gap, due to a very strong structural budgetary position currently despite a relatively large cost-of-ageing. AT has a small sustainability gap, due to a very low cost-of-ageing, supplemented by a rather favourable structural budgetary position. The UK has a cost of ageing that is close to the EU average of some 3 per cent of GDP, but the rather weak structural budgetary position leads to a relatively large sustainability gap.

In addition, Figure 6 shows the change in the sustainability position using the latest available information from the 2007 SCP updates compared with the Commission's comprehensive assessment made in the 2006 Sustainability report (see also Table 11). The cost-of-ageing is

currently estimated to be largely the same as in the 2006 Sustainability Report.²⁹ The notable exceptions are those countries that have implemented significant pension reforms since mid-2006 (DK, PT).

What is more visible is the general improvement of the initial fiscal positions between 2005 and 2007 for a number of countries. For the EU, the sustainability gap has been reduced by 1 percentage point of GDP. This illustrates that fiscal consolidation strongly affect the sustainability of public finances.

...is surrounded by some uncertainty as to the structural component of the recent fiscal consolidation...

It should nonetheless be noted that there is some uncertainty as regards the size of the structural improvement in the budgetary positions in EU Member States in the recent past. The apparent tax elasticities have been high at the back of the (until recently) relatively robust economic growth. It cannot be excluded that this situation will reverse with less buoyant economic activity.³⁰

...and would be further enhanced if the budgetary targets in the SCPs were attained

As shown above, in addition to the long-term budgetary impact of ageing, the current budgetary position and level of debt can also present a risk to public finance sustainability. The *initial budgetary position* (IBP) illustrates whether the public finances are sustainable even when abstracting from the cost of ageing, *i.e.* considering only the current budgetary position (the current structural primary balance and the current level of government debt).

Table 12 shows that if the budgetary targets set down in the 2007 SCPs are reached, the S2 sustainability gap in the EU as a whole would be significantly reduced to 1¼ per cent of GDP; almost reduced by one half.

3.2.3 Government debt projections

The sustainability of public finances can alternatively be evaluated by looking at the evolution of the gross debt ratio. The debt/GDP ratio fell below 60 per cent of GDP in the EU in 2007. However, in the “2007” scenario it is projected to rise above 60 per cent of GDP again in about 20 years time and is projected to reach almost 130 per cent of GDP in 2050, revealing that the public finances are on an unsustainable path (see Figure 7).

The debt/GDP ratio is currently 60 per cent or more in nine countries (BE, DE, EL, FR, IT, CY, HU, MT and PT), which makes debt reduction a matter of urgency in these cases (see Table 13).

²⁹ Some differences can occur due to different time period covered, stemming from: (i) the debt/GDP ratios in the initial period; and, (ii) the cost-of-ageing over the (remainder of the) long-term.

³⁰ See European Commission (2007), Part II, Section 2.1 for a further discussion on measuring the structural fiscal position.

Table 12

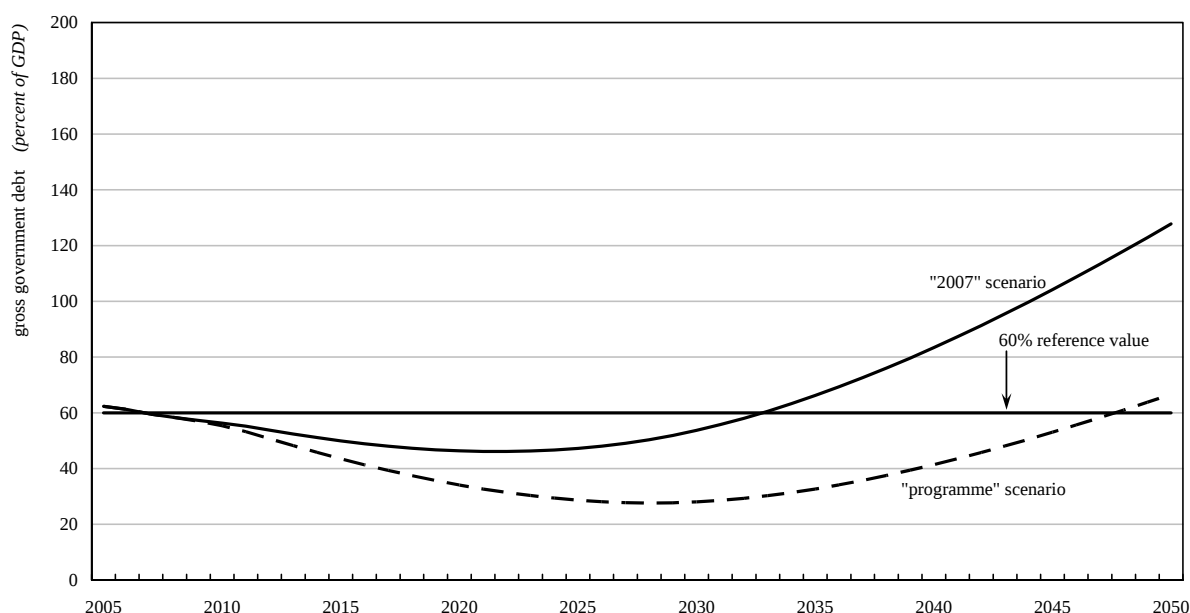
Sustainability Gaps Shrink if the Budgetary Targets Are Reached
Sustainability Gaps of the “Programme Scenario”
(percent of GDP)

Country	S1				S2		
	Total	IBP	DR	LTC	Total	IBP	LTC
BE	1.1	-2.9	0.3	3.7	2.5	-2.8	5.3
CZ	3.8	1.8	-0.5	2.6	6.8	2.0	4.8
DK	-2.1	-2.7	-0.8	1.4	-1.1	-2.4	1.3
DE	-0.4	-2.3	-0.0	2.0	0.9	-2.2	3.1
EE	-3.5	-1.1	-1.1	-1.3	-2.5	-1.0	-1.4
GR	-1.1	-1.9	0.4	0.4	-0.9	-1.7	0.9
ES	0.2	-2.8	-0.5	3.5	3.3	-2.7	5.9
FR	0.1	-1.7	-0.1	1.9	1.1	-1.6	2.6
IE	2.5	-0.1	-0.9	3.5	6.1	0.1	6.0
IT	-1.2	-3.3	0.6	1.5	-1.3	-3.2	2.0
CY	1.5	-2.5	-0.4	4.4	6.3	-2.1	8.5
LV	-2.0	-1.9	-1.0	0.9	-0.7	-1.9	1.2
LT	-1.7	-1.5	-0.8	0.7	-0.1	-1.4	1.3
LU	2.0	-1.5	-1.7	5.2	7.1	-1.2	8.3
HU	2.7	-0.2	0.0	2.8	5.0	0.1	4.9
MT	-2.1	-2.6	-0.1	0.6	-2.4	-2.3	-0.1
NL	1.0	-1.9	-0.4	3.3	2.8	-1.7	4.4
AT	-0.6	-1.5	-0.1	1.0	-0.3	-1.3	1.1
PL	-2.3	1.0	-0.2	-3.1	-2.0	1.4	-3.4
PT	0.2	-1.4	-0.1	1.7	2.0	-1.2	3.2
SI	3.0	-0.7	-0.7	4.4	6.5	-0.5	7.1
SK	0.9	0.4	-0.5	1.1	2.7	0.6	2.1
FI	-1.3	-3.2	-1.4	3.3	1.3	-2.8	4.2
SE	-3.7	-4.1	-1.1	1.5	-1.8	-3.8	2.0
UK	1.7	0.0	-0.3	2.0	3.4	0.1	3.2
EA	-0.1	-2.3	-0.1	2.2	1.2	-2.2	3.4
EU27	0.0	-1.8	-0.2	2.0	1.4	-1.7	3.1

Notes: IBP = the initial budgetary position, DR = the debt requirement in 2050, LTC = the long-term changes in the primary balance. A positive value of S1 and S2 indicates that a budgetary improvement would close the gap, while a negative value indicates that a budgetary weakening would close the gap. In the “2007” scenario, it is assumed that the structural primary balance will remain unchanged from 2007 throughout the programme period, usually until 2010. Debt projections in this scenario start in 2007. Note that pension projections were not available for Greece and the rise in age-related expenditure is therefore underestimated. Pension expenditure was projected to rise between 2005 and 2050 by 10.2 per cent in the 2002 update of the Greek stability programme. The aggregate results for the Euro-area exclude Greece and for the European Union (EU27) additionally exclude Romania and Bulgaria. Note that for BE and PL the figures refer to the 2006 SCP assessment, since no 2007 updated stability/convergence programmes were available.

Figure 7

Debt Developments in the EU, 2005-50



Source: Commission services.

On the basis of the current fiscal position (2007 scenario), 10 countries will have a debt/GDP ratio above the 60 per cent of GDP reference value by 2030 and by 2050; another 7 countries will have been added to the list of “high-debt” countries, implying that about two thirds of the Member States will be breaching the 60 per cent threshold.

If the budgetary targets set are achieved in full, the outlook in terms of projected debt developments would also be considerably improved. The debt ratio in the EU would be below the 60 per cent reference value over the coming decades and would rise above it only in the late 2040s (see Figure 7).

3.2.4 The role of fiscal policy in making the public finances sustainable

An important decision for policy-makers in the EU is to determine how much of the “cost of ageing” fiscal policy should cover now, that is, over the coming 3-4 years. This was duly recognized in the reform of the Stability and Growth Pact in 2005, according to which medium-term budgetary objectives (MTOs) should ensure “*rapid progress towards sustainability*” including by taking into account implicit liabilities resulting from increasing expenditure in light of ageing populations.³¹ According to the ECOFIN Council conclusions of 9 October 2007, the criteria and modalities for taking into account the resulting implicit government liabilities in the

³¹ The Stability and Growth Pact (SGP) specifies that, in light of the increased economic and budgetary diversity in the EU, “the medium-term budgetary objectives (MTOs) should be differentiated for individual Member States to take into account the diversity of economic and budgetary positions and developments as well as the diversity of risks to the sustainability of public finances”.

Table 13

Debt Developments in the “2007” and “Programme” Scenarios
Projected Debt Developments in the EU Member States
(percent of GDP)

Country	Gross Debt	"2007" Scenario			"Programme" Scenario		
	2007	2010	2030	2050	2010	2030	2050
BE	86	75	54	135	74	46	117
CZ	30	34	116	386	30	76	282
DK	26	15	-64	-131	19	-26	-49
DE	65	59	43	89	60	22	38
EE	3	2	-43	-129	2	-41	-123
GR	93	87	90	136	83	33	-7
ES	36	29	-27	41	30	-14	75
FR	64	64	88	173	62	43	70
IE	25	26	33	139	29	58	198
IT	105	101	86	133	99	28	-9
CY	60	39	-31	20	44	18	130
LV	9	10	18	69	6	-29	-52
LT	18	18	27	88	14	-20	-32
LU	7	8	47	197	7	26	155
HU	65	68	113	312	63	70	205
MT	63	57	57	49	53	17	-41
NL	47	44	63	173	41	34	112
AT	60	56	37	57	55	24	25
PL	50	53	27	1	49	-1	-72
PT	64	63	70	168	60	33	74
SI	26	23	56	255	23	45	227
SK	31	31	66	212	30	32	116
FI	35	26	-45	-61	29	-2	36
SE	40	25	-43	-75	25	-57	-105
UK	44	47	92	223	45	59	147
EA	64	60	50	117	59	25	58
EU27	60	56	54	128	55	28	67

Notes: Pension projections were not available for Greece and the rise in age-related expenditure is therefore underestimated. Pension expenditure was projected to rise between 2005 and 2050 by 10.2 per cent in the 2002 update of the Greek stability programme. The aggregate results for the Euro-area exclude Greece and for the European Union (EU27) additionally exclude Romania and Bulgaria. Note that for BE and PL the figures refer to the 2006 SCP assessment, since no 2007 updated stability/convergence programmes were available.

definition of MTOs should be established and agreed in the course of 2008, so that Member States can present MTOs in accordance with the new arrangements with the 2009 updates of their SCPs.³²

Positions differ among EU Member States, where some takes as a guiding principle in fiscal policy-making that the full cost of ageing over an infinite horizon should be covered, while others stress that structural reforms, in many cases still to be defined, should eventually be implemented which will reduce the cost of ageing.

In order to assess the scale of coping with the budgetary impact of ageing, let's consider the extent to which the planned 'upfront' fiscal adjustment contributes to more sustainable public finances. First, the structural primary balance that stabilise the current level of debt equals the IBP (see Table 12) plus the structural primary balance at the end of the medium-term horizon.³³ Second, the cost of ageing equals the LTC, expressing the future budgetary developments in present-value terms (see Table 12). As noted above, the S2 sustainability gap is simply the distance between the current (planned) structural primary balance and the one that satisfies the intertemporal budget constraint (IBC) of the government over an infinite horizon. Put differently, if the S2 is negative or zero, the public finances are sustainable. If the S2 is positive and the IBP is negative, the structural primary balance contributes to cover the cost of ageing to a certain degree. If the IBP is positive, the public finances are unsustainable even before considering the cost of ageing.³⁴ The excess of the structural primary balance over the one that stabilizes the debt ratio can be expressed as the fraction of the cost of ageing that is being "frontloaded".

Table 14 shows the degree of frontloading implied by the planned budgetary positions by the EU Member States over the medium-term; being here the last year of the period covered by the 2007 updated stability and convergence programmes.

For nine countries (DK, EE, IT, LV, LT, MT, AT, PL, SE) the public finances are sustainable, subject to their budgetary plans being attained.³⁵ For another four countries (BE, DE, FR, FI) the planned budgetary positions would imply that at least 50 per cent of the cost of ageing is covered by fiscal policies. For another four countries (ES, CY, NL, PT) planned budgetary positions would cover between 25 and 50 per cent of the cost of ageing. Finally, in seven countries (CZ, IE, LU, HU, SI, SK, UK) the planned budgetary position would cover less than 25 per cent of the cost of ageing.

One aspect of evaluating fiscal sustainability against the IBC is that one does not have to define a specific value for debt ratio beyond which the public finances could be considered as being "unsustainable". It only requires that debt does not rise faster than interest rate, in other words, debt remains bounded. However, economic theory does not provide for a widely agreed specific level of debt beyond which it can be defined as unsustainable. In practice however considerable attention is paid to the debt ratio. This is notably the case in the EU fiscal framework, where the Treaty puts a limit on the debt ratio, the 60 per cent of GDP reference value. Hence, for EU countries, it is interesting to evaluate the extent to which the planned fiscal policies not only ensure fiscal sustainability over an infinite horizon, but also the extent to which it respects the debt threshold. Alternatively, some countries also have other debt targets. For instance, one part of the UK's fiscal

³² See the Council conclusions of 9 October 2007, available at:

http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ecofin/96375.pdf

³³ This formulation is slightly different from the "typical" debt-stabilizing (primary) deficit, (D/g) , where D is the debt ratio and g is the nominal GDP growth rate (plus interest expenditure/GDP).

³⁴ An exception is the case where the cost of ageing is negative, since a primary balance that leads to an increase in the debt ratio for a period of time could eventually improve as the non-cost of ageing the "gain of ageing" takes hold.

³⁵ As regards Poland, see footnote 26.

framework is the “sustainable debt rule”, which is commonly thought of as meaning that the debt ratio should not diverge from 40 per cent over the medium/long term. Hence, this debt level could be considered as a “prudent” debt ratio.

Table 15 shows at what point in time the EU Member States would (b) reach the 60 per cent debt threshold on current planned budgetary policies. In addition, it shows when the debt ratio would surpass 40 per cent. As could be expected, the exact specification of a debt ratio beyond which the public finances could be considered to be unsustainable influence strongly the conclusion reached. When evaluated against the 60 per cent threshold, 8 countries would be unsustainable in 2007 and 14 countries would be in unsustainable territory by 2050. By contrast, if fiscal “unsustainability” would be defined by a debt ratio larger than 40 per cent, 13 countries would fall in that group already in 2007 and 14 countries would be unsustainable by 2050.

Table 14
Degree of Frontloading of the Cost of Ageing
Implied by the Medium-term Budgetary Plans

Country	S2	IBP	LTC	Degree of Frontloading
	(1)	(2)	(3)	(4) = $-(2)/(3)*100$
BE	2.5	-2.8	5.3	53
CZ	6.8	2.0	4.8	zero
DK	-1.1	-2.4	1.3	full
DE	0.9	-2.2	3.1	71
EE	-2.5	-1.0	-1.4	full
GR	-	-	-	-
ES	3.3	-2.7	5.9	45
FR	1.1	-1.6	2.6	60
IE	6.1	0.1	6.0	zero
IT	-1.3	-3.2	2.0	full
CY	6.3	-2.1	8.5	25
LV	-0.7	-1.9	1.2	full
LT	-0.1	-1.4	1.3	full
LU	7.1	-1.2	8.3	14
HU	5.0	0.1	4.9	zero
MT	-2.4	-2.3	-0.1	full
NL	2.8	-1.7	4.4	38
AT	-0.3	-1.3	1.1	full
PL	-2.0	1.4	-3.4	full
PT	2.0	-1.2	3.2	38
SI	6.5	-0.5	7.1	8
SK	2.7	0.6	2.1	zero
FI	1.3	-2.8	4.2	68
SE	-1.8	-3.8	2.0	full
UK	3.4	0.1	3.2	zero
EA	1.2	-2.2	3.4	66
EU27	1.4	-1.7	3.1	55

Table 15

Timing of Reaching a Specific Debt Level

Country	Debt in 2007	Reaching 60% in year:	Reaching 60% in year:	Debt in 2007	Reaching 40% in year:	Reaching 40% in year:
BE	85.6	2015	<i>2036</i>	85.6		
CZ	30.4	<i>2027</i>		30.4	<i>2019</i>	
DK	25.6			25.6		
DE	64.9	2010		64.9	2018	
EE	2.7			2.7		
GR	93.4	-	-	93.4	-	-
ES	36.2	<i>2048</i>		36.2	<i>2046</i>	
FR	64.2	2012	<i>2045</i>	64.2		
IE	25.1	<i>2031</i>		25.1	<i>2025</i>	
IT	105	2020		105	2026	
CY	60	<i>2042</i>		60	2012	<i>2038</i>
LV	9.4			9.4		
LT	17.6			17.6		
LU	6.9	<i>2037</i>		6.9	<i>2033</i>	
HU	65.4	2013	<i>2025</i>	65.4		
MT	62.9	2009		62.9	2016	
NL	46.8	<i>2038</i>		46.8	2011	<i>2033</i>
AT	59.9			59.9	2017	
PL	50			50	2014	
PT	64.4	2010	<i>2047</i>	64.4	2022	<i>2040</i>
SI	25.6	<i>2033</i>		25.6	<i>2029</i>	
SK	30.6	<i>2040</i>		30.6	<i>2035</i>	
FI	35.3			35.3		
SE	39.7			39.7		
UK	43.9	<i>2031</i>		43.9		
EA	64	2010		64	2018	<i>2043</i>
EU27	59.5	<i>2048</i>		59.5	2017	<i>2040</i>

Note: a year in **bold** indicates that the debt ratio is reduced to below 60 per cent (40 per cent) of GDP. A year in italics indicates that the debt ratio rises above 60 per cent (40 per cent) of GDP.

3.2.5 Uncertainty with long-term projections

Progress made in the EU both concerning fiscal consolidation and structural reforms, notably pension reforms, suggest that sustainable public finances may be within reach for a number of countries. However, this optimistic outlook rests on the assumption that age-related expenditure evolves as projected by the Commission and the AWG/EPC. Long-term budgetary projections are sensitive to a number of necessary underlying assumptions. Given the uncertainties surrounding the assumptions it is important to test the robustness of the results. In the Ageing Report and in the Sustainability Report,³⁶ the sensitivity to assumptions for the demographic and economic outlook over the long-term and main drivers of some public expenditure items such as health-care and long-term care were shown, highlighting that the projections are sensitive to the assumptions made concerning, *i.e.*, life expectancy, employment performance and the main drivers of health-care and long-term care. The sensitivity tests do not have a uniform impact on the EU Member States. For instance, the impact of changes in life expectancy on pension expenditure is affected by the design of the pension schemes. However, the relative position of countries in terms of the projected increase in age-related expenditure appears to be relatively robust. Hence, the uncertainty mainly concerns the exact size of the long-term sustainability challenge. Moreover, as highlighted in Section 3.1 above, ensuring that the pension reforms carried out over the last decade in the EU will enjoy lasting support might require additional measures, such as putting into place measures that increase employment rates of older workers or promote private pension arrangements that lead to higher retirement incomes relative to the working-age population.

Will the projected savings on education expenditure materialize?

The common long-term projections show that there could be some limited budgetary savings stemming from a projected reduction in education expenditure on account of ageing populations.³⁷ However, in view of the need to enhance productivity in the future, Member States might consider using those savings for modernising their education systems, including the development of life long learning, investing to raise educational attainment levels and improving the functioning of the educational systems, in line with the Lisbon commitments to build a knowledge-based economy and society. Moreover, the projected reduction in unemployment benefits is not related to ageing populations as such but rather to the assumption of reaching the estimated structural unemployment rates beyond the medium-term for a number of Member States. Subtracting the potential savings stemming from reduced spending on education and unemployment benefits, a “gross” age-related expenditure increase can be calculated.

Table 16 reveals that the increase in age-related expenditure excluding education expenditure and unemployment benefits (“gross” age-related expenditure) would be 1 percentage points of GDP higher than the total age-related expenditure (“net” age-related expenditure) increase in the EU as whole.³⁸ This would correspond to a worsening of about $\frac{3}{4}$ percentage points of GDP in terms of the S2 sustainability gap indicator. There are however considerable differences across countries; for instance, the increase for the EU10 countries would be $1\frac{1}{2}$ percentage points of GDP higher when education and unemployment benefits are excluded. Hence, if these projected declines in public expenditure do not materialize, budgetary adjustments – either on other expenditure items or on the revenue side – will become necessary.

³⁶ See EPC and European Commission (2006) and European Commission (2006).

³⁷ Some reduction in expenditure on unemployment benefits is also projected.

³⁸ The projected reduction in unemployment benefits as a share of GDP is much smaller than for education expenditure, see Table 6.

Will the dynamics in health-care expenditure observed in recent decades fade?

Over the last decades, health-care expenditures have been increasing at a faster pace than economic growth (see Table 17). As shown in the table, health care expenditure has been more dynamic than income (GDP per capita) in the last decades on average, although slightly less so in the period since the 1990s. 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.

Changes in per capita income could have an important impact on health-care spending, especially if it is viewed as a luxury good.

Table 16
Projected Net and Gross Age-related Expenditure Increase to 2030/50
(percent of GDP)

Country	Total Age-related Expenditure		Age-related Expenditure excluding Education and Unemployment Benefits	
	Change from 2004 to:		Change from 2004 to:	
	2030	2050	2030	2050
BE	4.5	6.3	5.6	7.5
CZ	1.8	7.2	2.7	7.9
DK	1.7	1.4	2.4	2.0
DE	1.0	2.7	2.2	4.0
EE	-2.2	-2.5	-1.0	-1.1
GR	-	-	-	-
ES	3.3	8.5	4.4	9.6
FR	2.0	3.2	2.8	4.0
IE	3.3	7.8	4.4	8.9
IT	1.0	1.7	1.9	2.4
CY	4.1	11.8	6.0	14.1
LV	-1.5	-1.3	-0.3	0.2
LT	0.3	1.4	2.0	3.1
LU	5.4	8.2	6.0	9.2
HU	2.7	7.3	3.7	8.0
MT	1.8	0.3	3.2	1.7
NL	3.8	5.0	4.2	5.4
AT	0.9	0.2	1.9	1.3
PL	-6.1	-6.7	-3.7	-4.4
PT	2.2	5.9	2.9	6.3
SI	4.4	9.7	5.1	10.1
SK	0.3	2.9	1.9	4.3
FI	4.7	5.2	5.7	6.3
SE	1.3	2.2	2.2	3.3
UK	2.2	4.0	2.7	4.7
EU25	1.6	3.4	2.6	4.4
EU15	1.9	3.7	2.8	4.6
EU12	1.9	3.8	2.9	4.7
EU10	-1.7	0.3	0.0	1.9

Source: EPC and European Commission (2006) and European Commission (2006).

Note that the impact of the recent pension reforms in DK, HU, and PT are included in this table (see Table 7 above).

Note that pension projections were not available for Greece and the rise in age-related expenditure excluding pensions is not shown here.

Table 17

Elasticity of Health Care Spending Per Capita with Respect to GDP Per Capita

Country	Total Health Care Spending			Public Health Care Spending		
	2002-1992	2002-1982	2002-1972	2002-1992	2002-1982	2002-1972
AT	1.88	1.28	1.56	0.55	1.15	1.73
BE	3.34	1.45	2.34	-	-	-
CZ	1.70	-	-	-	-	-
DK	1.40	0.92	1.11	1.37	0.84	1.09
FI	-0.40	1.14	1.25	-0.62	1.05	1.35
FR	3.20	1.76	2002-1980 1.91	2002-1970 2.99	1.62	2002-1980 1.93
DE	-1.79	1.43	1.70	-0.93	1.44	1.78
GR	2.13	1.80	2002-1980 1.68	2002-1970 1.79	1.63	2002-1980 2.08
HU	1.03	-	-	0.55	-	-
IE	1.08	0.93	1.21	1.19	0.85	1.21
IT	0.38	1.32	2002-1998 -	0.84	1.22	2002-1998 -
LU	0.97	1.02	1.77	2002-1970 0.70	0.92	1.70
NL	1.65	1.28	1.41	0.65	1.07	1.46
PL	0.96	-	-	0.85	-	-
PT	3.15	1.77	2.93	4.72	2.29	3.49
SK	0.78	2002-1997 -	-	0.56	2002-1997 -	-
ES	2.01	1.47	1.86	0.26	1.28	1.99
SE	0.13	0.98	1.34	0.32	0.85	1.32
UK	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: EPC and European Commission (2006).

Table 18

Implications of a Continuation of the Trend Increase in Health-care Spending

Country	AWG Reference Scenario	Income Elasticity 1.1 up to 2050	Income Elasticity 1.2 up to 2050	Additional Increase (1.1)	Additional Increase (1.2)
	(1)	(2)	(3)	(4)=(2)-(1)	(5)=(3)-(1)
BE	1.4	1.7	2.3	0.3	0.9
CZ	1.9	2.2	3.1	0.3	1.2
DK	0.9	1.2	1.9	0.3	0.9
DE	1.2	1.4	1.9	0.2	0.7
EE	1.0	1.3	2.3	0.3	1.3
IE	1.9	2.2	2.9	0.3	1.0
GR	1.7	1.9	2.3	0.2	0.6
ES	2.2	2.4	3.0	0.2	0.8
FR	1.7	2.1	2.8	0.3	1.1
IT	1.3	1.5	2.0	0.2	0.7
CY	1.1	1.3	1.7	0.2	0.6
LV	1.0	1.3	2.3	0.3	1.3
LT	0.8	1.0	1.8	0.2	0.9
LU	1.2	1.5	2.3	0.3	1.1
HU	1.0	1.2	2.0	0.3	1.0
MT	1.9	2.1	2.7	0.3	0.8
NL	1.3	1.6	2.1	0.3	0.8
AT	1.6	1.8	2.3	0.2	0.7
PL	1.3	1.5	2.3	0.2	1.0
PT	0.4	0.6	1.1	0.2	0.7
SI	1.5	1.8	2.6	0.3	1.2
FI	1.4	1.7	2.3	0.3	0.9
SE	1.0	1.4	2.1	0.3	1.1
UK	1.9	2.2	3.0	0.3	1.1
EA	1.5	1.8	2.4	0.3	0.8
EU25	1.5	1.8	2.4	0.3	0.9

The Ageing Report³⁹ showed that an above-unity income elasticity eventually fading to unity would further contribute to the projected increase in health-care expenditure as a share of GDP. 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. It can however not be excluded that the observed trend increase would continue also over the coming decades, in which case health-care expenditures would rise at a brisker pace. Table 18 shows the results of assuming an income elasticity of demand for health-care of the magnitude historically observed (1.2) up to 2050 in the Member States. The health-care expenditure ratio would rise by nearly 1 GDP point more than projected in the baseline scenario of the common long-term projections on average in the EU up to 2050. This would correspond to roughly $\frac{3}{4}$ percentage points of GDP in present value terms.

³⁹ EPC and European Commission (2006), see Table 4-11 "Projection Results for Scenario IV", capturing a positive income elasticity of demand for health care spending.

Although this example shows an increase in *public* expenditure on health-care, it should be noted that this is just one option out of many. For countries with high expenditure ratios, such as most EU-15 countries, it is likely that such an expansion of public health-care expenditure is not possible in view of the need to finance it by taxes or charges. Those countries might instead opt for developing other arrangements for the provision of health-care services, including reviewing the role and the scale of publicly provided health-care services. Coping with competing pressures on public expenditure is therefore likely to increasingly become a challenge.

4 Conclusions

The age-related expenditure projections presented in this paper provide valuable insights on both the risks to the long-term sustainability of Member States' public finances and the budgetary impact of structural reforms. Ageing will at the same time reduce economic growth (mainly through a shrinking workforce) and intensify demand for public services, mainly pension, health care and long-term care. The long-term projections contribute to the policy debate by illustrating where, (in which countries), when and to what extent ageing pressures will accelerate as the baby-boom generation retires. In doing so, the projections provide very helpful insights into the immediate as well as the future challenges for governments posed by latest available projections of the demographic outlook over the long term.

The long-term budgetary projections indeed have a bearing on the conduct of fiscal policies in the EU. In the reformed SGP, they are used for the purposes of assessing the long-term sustainability of public finances in the context of the EU's multilateral budgetary surveillance. Having comparable and robust long-term projections is crucial in order to ensure fair and comparable assessment and drawing policy conclusions for the EU Member States.

The analysis in this paper shows that securing sustainable public finances is a key policy challenge that requires steadfast policy responses by the EU Member States along three prongs. First, reducing debt at a fast pace; second, raising employment rates and productivity; third, reforming pension, health care and long-term care systems.⁴⁰ The appropriate combination of policies in these three areas will depend on the main reasons behind the sustainability challenge and the policy priorities that the Member States have set for themselves. Several countries have made progress down these three routes, by resolutely implementing often difficult policy choices. They have shown that reforms and ambitious fiscal policies pay off. However, more needs to be done, and done soon: postponing these inevitable policy choices will not make them easier, but more difficult.

First, EU members need to consolidate the public finances so as to run down public debt rapidly before the full impact of ageing unfolds. Indeed, the analysis shows that consolidating public finances towards the MTOs will significantly contribute to alleviating part of the long-term budgetary costs of ageing and will prevent a rapid rise of the debt/GDP ratio. Moreover, sound public finances allow for low interest rates and high and stable economic growth which in turn improve the sustainability of public finances. In this context, there are several examples of countries that have put into place fiscal rules and medium-term budgetary frameworks have been able to exercise better control of the budgets and have achieved better fiscal results. Strengthening the fiscal framework can therefore be a useful way to improve fiscal performance.⁴¹

⁴⁰ The three-pronged strategy was decided by the Stockholm European Council in March 2001.

⁴¹ See European Commission (2007).

The sustainability challenge would be significantly reduced, though not disappear, if Member States made progress towards the MTOs and reached the budgetary targets outlined in the most recent updates of the SCPs. For the EU as a whole, the sustainability gap would be reduced (nearly halved), to some 1½ per cent of GDP. In this case, the debt-to-GDP ratio will decline more markedly up to the early 2030s. This trend would, however, start to reverse once the budgetary impact of ageing starts to take hold more firmly and the debt-to-GDP ratio would again start rising thereafter and it would be higher than 60 per cent of GDP in 2050. Hence fiscal consolidation over the medium-term will be necessary, but it will not be enough to ensure sustainability. Moreover, as noted above, the diversity as regards the size of the implicit liabilities affecting the sustainability position varies greatly among the Member States. As a result, it will be necessary for a number of countries to pursue more ambitious fiscal policies.

As envisaged in the reform of the Stability and Growth Pact, medium-term budgetary targets, the MTOs, should incorporate implicit liabilities related to ageing populations once a method for doing so has been established and agreed with the Member States. Such MTOs need to be defined so that a part of the implicit liabilities – projected cost of ageing – is accounted for by fiscal consolidation today. Moreover, they need to be set in such a way that they become useful targets for fiscal policies at the national level. This would contribute to ensuring that implicit debt does not turn into explicit debt over time. The new MTOs would effectively introduce a greater degree of time consistency of policies by explicitly linking longer-term concerns to the medium-term budgetary policy making process.

Second, successfully implementing policy measures that increase employment and enhance productivity, in line with the goals of the Lisbon strategy, would raise potential GDP growth rates, improve future living standards and provide more room for budgetary reallocation in the future. In particular, the employment rate needs to be raised in the EU, especially amongst older workers. It should be noted that considerable progress has already been made in the EU, with employment rates having increased in recent years and continued increases are projected over the long-term as a result of enacted structural reforms. The overall employment rate in the EU is projected to increase from 63 per cent in 2004 to reach 70 per cent - the Lisbon target - by 2020. Nonetheless, pursuing policies that lead to employment rates increasing more than assumed in the common long-term projections would considerably contribute to fiscal sustainability.

Third, Member States need to consider appropriate reforms of pension, health-care and long-term care systems to ensure that they are financially viable in the face of ageing while at the same time securing core policy goals of adequacy and access. Recent pension reforms in several countries have reduced the budgetary impact of ageing and are helping to raise the effective retirement age. In many cases, reforms of public pension systems have made them less generous by reducing average public pensions in relation to average wages over time. But it is important that retirement income can be maintained at an adequate level for reforms to enjoy lasting support. This means raising employment rates and in particular giving older workers incentives to extend their working lives and hence accrue more pension benefits. In fact, the average exit age from the labour market is projected to rise less than the increase in life expectancy for both men and women in the EU. In order to keep the share of adult life spent in retirement constant at its 2003 level, the average exit age would need to rise by an additional 2 years for both males and females, *i.e.* an increase which is considerably larger than projected. A priori, there is no economic rationale for favouring a constant share of adult life spent in retirement, and indeed a preference for a longer period of leisure time in retirement could be justified on the basis of rising living standards. However, retirement decisions need to be economically and financially viable. Moreover, in order for people to be able to plan for their retirement and retirement income, policy-makers need to ensure that appropriate conditions are in place for private pension arrangements. This will put

people in the position to affect their future income by choosing whether they want to extend working lives, increase pension savings or accept a lower retirement income.

Achieving the necessary extension in working lives will prove challenging, as adjustments will have to be made in people's expectations and behaviour. It not only requires ensuring that tax/benefit and wage systems provide financial incentives to remain economically active and to invest in human capital, it is also necessary to enhance job opportunities for older persons who possess appropriate skill sets. Policies to tackle age discrimination and to promote life-long learning, flexible retirement pathways and healthy work conditions warrant careful consideration. Flexible retirement ages adapting to higher life expectancy could be an efficient policy response to this challenge. Hence, in order to ensure the 'political sustainability' of social security reform introduced to ensure fiscal sustainability, notably for pension, other reforms that contribute to limit the difference, in many cases increasing, between pensioners and the wage-earners incomes (the benefit ratio) would become necessary.

Finally, there is some uncertainty as to the key drivers of public health-care expenditure since the population may continue to demand an increasing share of public health-care services, as has been observed in the past decades. Hence, there is a distinct possibility that demand for higher provision of health-care services will put upward pressure on public spending as a share of GDP over and above that motivated solely by demographic change. Coping with the observed trend increases in public spending on health care is currently under debate in several countries and finding sustainable and adequate ways for how healthcare should be provided and financed in the coming decades will be challenging but necessary.

Furthermore, some countries rely relatively little on formal public long-term care systems today. For these countries, the baseline projected increase in public spending on long-term care under a no-policy change scenario may not fully capture the likely upward pressure on the public finances. 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. Hence, future policy changes in favour of more formal care provision – and higher expenditure – may be required in the future.

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