ECONOMIC AND BUDGETARY EFFECTS OF PENSION REFORMS IN EU MEMBER STATES

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1   Introduction

The key challenge for policy-makers in the EU over the medium-term will be to transform the European social models such that the implications arising from an ageing population will become manageable for the European societies. There are many examples in the recent past of successful reforms that deliver in terms of enhancing fiscal sustainability without any major sacrifice in terms of deteriorating standards of living or access to basic necessities provided for by the society. Notwithstanding these encouraging policy steps in the right direction in the EU, more remains to be done on the structural reform front.

On top of this, the financial and economic crisis taking hold since last year has drastically changes the economic and fiscal landscape in the EU – and, indeed, globally. At the current juncture characterized by very subdued economic activity and exceptional uncertainty as to the prospects, there is a strong need to put in place all necessary policies to avoid that the financial and economic crisis will have a lasting adverse impact on the supply side. It will be particularly important to firstly ensure that there is no backtrack of the recent progress on the structural reform front and secondly to not only maintain, but to intensify the reform agenda in view of the longer-term challenges so as to come out stronger from the current economic crisis, and get the European economies back on the path of decent and stable long-term growth. For this to materialize, a comprehensive exit strategy built on structural reforms across the board will be necessary to restore credibility and confidence in the public finances. This will provide the best possible chances for successfully resuming on the path towards more sustainable public finances.

The revision of the joint European Commission and Economic Policy Committee (Ageing Working Group) (henceforth EC-EPC) budgetary projection exercise carried out in 2009 provides the opportunity for assessing the economic and budgetary impact of recent pension reforms.[1] For these projections, national pension models have been used given their capacity to capture important institutional characteristics of national pension systems. In order to make sure that the degree of the challenge posed by population ageing is comparable across the EU Member States, a commonly agreed set of underlying macroeconomic assumptions is used.[2] Moreover, the different approaches to modelling pension spending have been scrutinized in a series of peer reviews, so as to ensure a high degree of comparability of the projection results.

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[1]   The results reported in the paper are preliminary results. The final results are released in May 2009. See European Commission – Economic Policy Committee (2009), "2009 Ageing Report", *European Economy*.

[2]   The core of the projection exercise is government expenditure on pensions for both the private and public sectors, as in the 2006 pension projection exercise. The EPC agreed to provide pension projections for the following items: gross pension expenditure, number of pensions/pensioners, number of contributors, contributions to public pension schemes, assets accumulated by public pension schemes. In addition, Member States covered, as in the 2006 exercise, on a voluntary basis: occupational and private (mandatory) pension expenditures. Moreover, the EPC decided that for the 2009 pension projection exercise Member States can provide projections on a voluntary basis on the following items: replacement rates and benefit ratios, taxes on pensions and net pension expenditures, private (non-mandatory) pension expenditures.

2   Pension systems in the EU: current setup and recent trends

Pension arrangements are very diverse in the EU Member States, due to both different traditions historically on how to provide retirement income, and Member States being in different phases of the reform process of pension systems.

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

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

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

Furthermore, pension systems differ across countries regarding the financing method of the schemes. Most social security schemes are financed on a pay-as-you-go (PAYG) basis, indicating that the contribution revenues are used for the payments of current pensions. In addition, there is a considerable variation between countries regarding the extent to which the contribution revenues cover all pension expenditure. In most countries, minimum guarantee pensions are covered by general taxes.

However, it is also common that earnings-related schemes are subsidised to varying degrees from general government funds or some specific schemes (notably public sector employees' pensions) do not constitute a clear scheme but, instead, pensions appear directly as expenditure in the government budget. On the other hand, some predominantly PAYG pension schemes have statutory requirements for partial pre-funding and, in view of the increasing pension expenditure, many governments have started to collect reserve funds for their public pension schemes. Occupational and private pension schemes are usually funded. However, the degree of funding relative to the pension promises may differ due to the fact that benefits can be defined either on the basis of benefit rights linked to the salary and career length (DC) or of paid contributions (DB).

Statutory Retirement Age and Average Exit Age in EU Member States

Country	Exit Age						Statutory Retirement Age	
	Total		Male		Female		Male	Female
	2001	2007	2001	2007	2001	2007	2008	2008
BE	56.8	61.6	57.8	61.2	55.9	61.9	65	64
BG	58.4	61.2	62.5	64.1	56.8	59.7	63	59y 6m
CZ	58.9	60.7	60.7	62	57.3	59.4	61y 10m	56-60
DK	61.6	60.6	62.1	61.4	61	59.7	65	65
DE	60.6	62	60.9	62.6	60.4	61.5	65	65
EE	61.1	62.5					63	60y 6m
IE	63.2	64.1*	63.4	63.5*	63	64.7*	66	66
EL		61		61.6		60.5	65	60
ES	60.3	62.1	60.6	61.8	60	62.4	65	65
FR	58.1	59.4	58.2	59.5	58	59.4	60	60
IT	59.8	60.4	59.9	61	59.8	59.8	65	60
CY	62.3	63.5					65	65
LV	62.4	63.3					62	62
LT	58.9	59.9*					62y 6m	60
LU	56.8						65	65
HU	57.6	59.8**	58.4	61.2**	57	58.7**	62	62
MT	57.6	58.5*					61	60
NL	60.9	63.9	61.1	64.2	60.8	63.6	65	65
AT	59.2	60.9	59.9	62.6	58.5	59.4	65	60
PL	56.6	59.3	57.8	61.4	55.5	57.5	65	60
PT	61.9	62.6	62.3	62.9	61.6	62.3	65	65
RO	59.8	64.3*	60.5	65.5*	59.2	63.2*	63	58
SI		59.8*					63	61
SK	57.5	58.7	59.3	59.7	56	57.8	62	55-59
FI	61.4	61.6	61.5	62	61.3	61.3	62-68	62-68
SE	62.1	63.9	62.3	64.2	61.9	63.6	61-67	61-67
UK	62	62.6	63	63.6	61	61.7	65	60
NO	63.3	64.4	63	64.1	63.6	64.7	62	62
EU27	59.9	61.2	60.4	61.9	59.4	60.5	:	:
EA	59.9	61.3	60.2	61.6	59.6	60.9	:	:
EA12	59.9	61.3	60.2	61.6	59.6	60.9	:	:
EU15	60.3	61.5	60.7	62	59.9	61.1	:	:
EU10	57.6	59.6	58.8	61.3	56.6	58.3	:	:
EU25	59.9	61.2	60.4	61.9	59.4	60.6	:	:

Source: Average Exit age (Eurostat), information provided by AWG delegates.
Joint Commission-Council report on SPSI (2009).
Note: * represents 2006 and ** represents 2005.

Figure 1

Average Wage and Average Pension Benefit in 2007
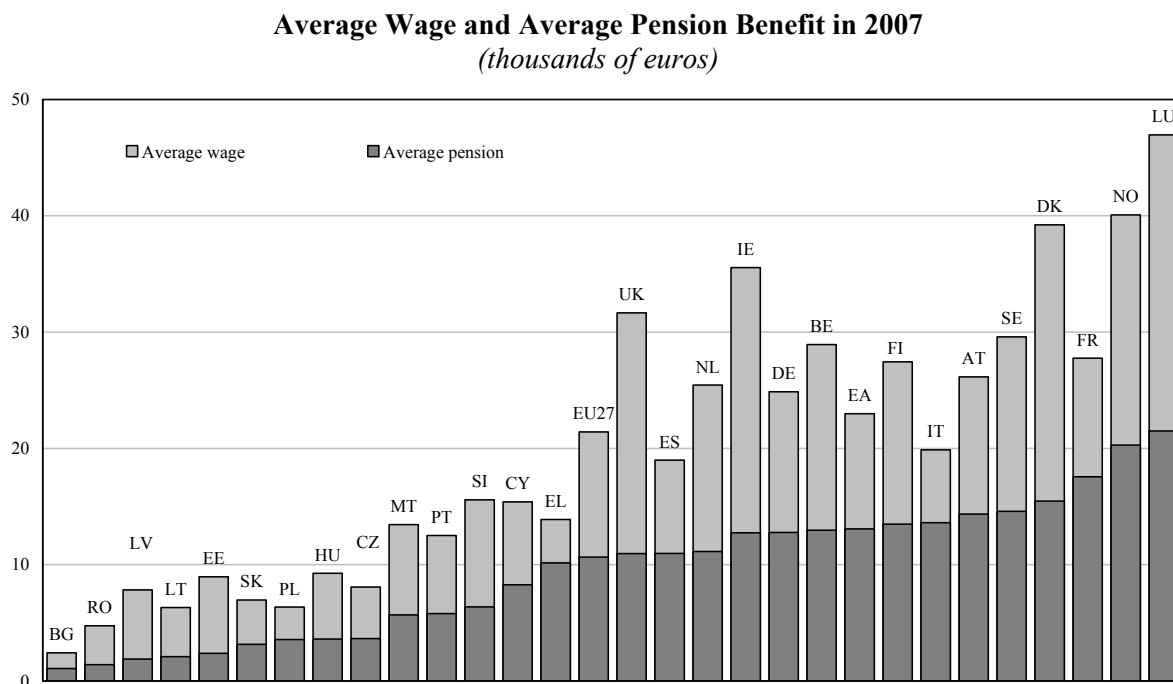*(thousands of euros)*

Table 1 shows the statutory retirement age in 2008 and the effective exit age from the labour market in 2001 and in 2007. In the large majority of countries, the average exit age is lower than the statutory retirement age. In many cases, this is due to the existence of early retirement schemes and/or other government programmes that provide income support to older people before they reach the official retirement age. Also, in a number of countries (like FI, SE) the retirement age is flexible, with built-in incentives to remain active in the labour market. For instance, retiring at say age 62 would lead to a reduction of a certain amount compared with a typical case of 65, while continuing working until say 68 would lead to an increase of a certain amount. The comparison between the average exit age in 2001 and 2007 already shows one of the main effects of recent pension reforms in many MSs: people retire relatively later than they used to do.

In 2007, there was a wide difference in the average public pension benefit, ranging from less than 3,000 euros or less per year (BG, RO, LV, LT and EE) to 14,000 euros or more per year (AT, SE, DK, FR, NO and LU). These wide differences reflect that average wage income levels are very different, ranging from less than 5,000 euros per year to more than 25,000 euros per year (see Figure 1).

Also at the aggregate level, a very large difference in the level of pension spending can be observed in 2007 among MSs. It ranges from 6 per cent of GDP or below in IE, LV and EE to 14 per cent in IT. In many MSs (DK, FR, HU, IT, MT, NO, PT, RO and SE), pension expenditure has increased faster than GDP, but in some others (BE, BG, CZ, DE, ES, FI, LT, LU, LV, NL, PL, SI) it has increased at a slower pace (see Figure 2).

Despite the generally higher effective retirement age in 2007 as compared with 2001, the public pension expenditure has continued to grow unabated during 2000 and 2007 in many countries (RO, NO, MT, PT, DK, SE, FR and IT) over this period, but there are also countries that have succeeded to keep it under control, or slightly reduce pension expenditure as percentage points of GDP (NL, LT, LV, CZ, ES, BG, DE, SL), as shown in Figure 2.

Figure 2

Gross Social Security Pension Expenditure in 2000 and 2007
(percent of GDP)
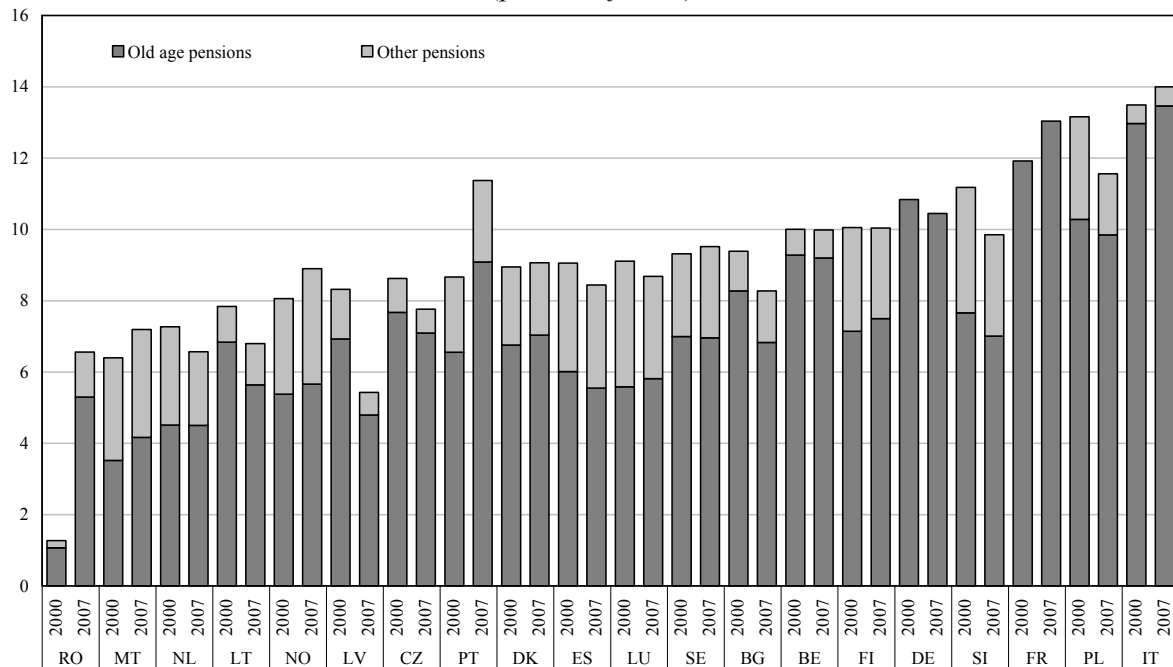
Note: The figure presents only the countries which provided information in both years.

A number of countries have implemented systemic pension reforms, shifting part of the previously public pillar to a mandatory funded private pillar (BG, EE, LV, LT, HU, PL, SK and SE). At present, these private pillars are making very small disbursements, but their importance will increase in the future. Private pensions are generally small today.

3   Assessing the economic impact of recent pension reforms

3.1   *Recent pension reforms in some EU Member States*

An important feature of the EC-EPC (AWG) projections is that they take into account the potential effects of recently enacted pension reforms (in the 20 EU Member States that have implemented it since 2000), including measures to be phased in gradually, on the participation rates of older workers. Some countries have enacted legislation to increase the statutory retirement age for females or for both males and females. Others have changed some provisions of social security programmes (and sometimes of other transfer programmes used as alternative early retirement paths) that provided strong incentives to leave the labour force at an early age. The findings of a recent international research project based on micro-estimation results (based on a sample of individuals and the matching of individual retirement decisions and retirement incentives) are clear: changing pension plan provisions would have large effects on the labour force participation of older workers.[3]

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[3]   See Gruber and Wise (2005).

The following pension reforms[4] are incorporated in the baseline scenario:

Box 1
Pension reforms enacted in the Member States

Belgium

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

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

Czech Republic

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

Denmark

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

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[4]   The information was provided by the Members of the EPC and AWG. Detailed information on the national pension models are envisaged to be published in European Economy (2009), "2009 Ageing Report: Pension Models in EU Member States and Projection Results" (forthcoming).

Germany

Since the early nineties a series of major reforms have been passed, aiming at the financial and social sustainability of the public pension scheme. Highlighting the most important reform steps, the reform process began in the mid of the nineties with the increase of the statutory retirement age to the age of 65 years and the introduction of deductions on early retirement (3.6 per cent per year) accompanied with a bonus for deferred retirement (6.0 per cent per year). Secondly, at the beginning of this decade, a comprehensive promotion of second and third pillar pension schemes (Riester pension) by subsidising voluntary contributions was introduced. The aim of those reforms was to compensate the envisaged reduction of benefits in the statutory pension scheme by second and third pillar pensions. Thirdly, in 2005 the pension adjustment formula was augmented by a sustainability factor, which adjusts statutory pension payments to population dynamics, whereby the extent of the adjustment is determined by the change in the relation of the workforce to the number of retirees.

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

Estonia

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

Spain

The latest reform of the pension system in 2002 (Law 35/2002) abolished mandatory retirement age (65) in the private sector. Workers remaining active after 65 will increase their pension benefit by 2 per cent per year, and both employers and employees' are exempted from paying most social security contributions. For workers age at least 60, social contributions are reduced by 50 per cent, and this amount is increased by 10 per cent to reach 100 per cent for those aged 65. Early retirement is possible from 61 year old, with at least 30 years of paid contributions and registered as unemployed for at least 6 months, but with a high penalty, from 6 to 8 per cent per year (8 per cent for those with only 30 years of contribution, 6 per cent for those with at least 40 years of contribution). Pensions became compatible with part-time work (but the pension benefit was reduced according to the length of the working day).

A new law on Social Security measures was enacted in 2007. This package of reforms contains as main measures: increase in the effective contribution period to be eligible for a

retirement pension; partial retirement from age 61 instead of 60 for people entering the system after 1967 (and a minimum of 30 years of contribution instead of 15); incentives for people working after age 65; more restrictive rules to get an invalidity pension.

France

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

Italy

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

A. Law 127/2007: increase of lower amount pensions through an additional lump sum of 420 euros per year from 2008 (327 euro in 2007) acknowledged to pensioners of 64 and over with an income lower than 1.5 times the minimum pension (8,504.73 euros per year in 2007). Such an increase is reduced or augmented by 20 per cent for contribution careers inferior to 15 years or superior to 25, respectively (18 and 28, for the self-employed). Additional increases are also foreseen for social assistance pensions, starting from 2008, by way of the so-called "social assistance additional lump sums" ("*maggiorazioni sociali*").

B. Law 247/2007 foresees the following:

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

- an increase of the contribution rate of the atypical workers by 3 percentage points (up to 26 per cent in 2010) in order to improve pension adequacy for this category of workers.

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

Latvia

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

Lithuania

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

Hungary

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

In 2006-07, the Hungarian Parliament adopted (by two regulations) a package of reforms which specifies that the early retirement is allowed only 2 years before normal retirement instead of 3 before. Thus from 2013 the early retirement is possible from age 60 both for women and men. From 2013 all early pensions will be subject to a reduction. The rate of reduction, depending on the time remaining until retirement age, would be 0.3 per cent per month for the 61-62 age group and 0.4 per cent per month below the age of 61. It introduces also changes in the calculation of the benefits, a minimum contribution from 40-41 for early retirement and some favourable retirement conditions for those working in potentially health-damaging occupations. Finally, it includes also: a new pension benefits system that will reduce the replacement rate; the retirement benefits will be available only for the difference between earnings of the year and minimum wage for the first year of an early retirement; the pension contribution increases for early retirees; some measures to increase employment of persons with reduced working capacity; pensions and earnings are no more cumulated in early retirement if earnings > minimum wage; changes in contribution levels payable by the employer and by the employee.

Malta

In December 2006, the Maltese Government completed the legislative process associated with the enactment of the pensions reform bill. Among the most important elements of the reform there is a staggered rise in pension age from 60 years for females and 61 years for males to 65 years for both by 2026 and the gradual lengthening of the contribution period for full entitlement to the two-thirds pension from 30 years to 40 years. Meanwhile, the calculation of pensionable income will reflect the yearly average income during the best 10 calendar years within the last forty years, as opposed to the previous

regime which consisted of the best 3 years of the last ten years for employed persons and the average of the best ten years for self-employed persons. In addition, prior to the reform, the maximum pensionable income was fixed by the law though in recent years it was revised in line with the cost of living adjustment. Following the reform, maximum pensionable income will evolve in a more dynamic fashion and will be increased annually by 70 per cent of the national average wage and 30 per cent of the inflation rate as from 1 January 2014 for persons born after 1 January 1962.

Austria

The minimum retirement age for men will increase from 61.5 years to 65 years; for women the age will rise from 56.5 to 60 years. The increase will be phased in gradually beginning in July 2004 and by 2017 early retirement will be eliminated. Meanwhile, larger penalties are imposed on early retirement (4.2 per cent of reduction per year instead of the former 3.75 per cent, up to a maximum of 15 per cent), within the age of 62-65. The statutory retirement age for women will be increased gradually between 2019 and 2034 to reach the retirement age for men at 65. A bonus for later retirement up to the age of 68 years (4.2 per cent per year, up to a maximum of 10 per cent) is introduced. From January 2005, harmonised guaranteed pension accounts is established (Act on the harmonisation of pension system, approved in November 2004). In the new system of individual, transparent pension accounts (with a clear reporting of benefits accrued from contributions paid in and other credits acquired, such as from active child and elderly care) the key rule will be: 45-65-80 (45 contribution years, retirement age of 65 and a gross replacement rate of 80 per cent of average life earnings). Pension benefits will be adjusted to consumer price index, starting in 2006.

Poland

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

Portugal

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

Slovenia

Under the new Pension and Disability Insurance Act entered into force on 1 January 2000 (a three-pillar modernised defined benefit PAYG system plus compulsory and voluntary supplementary funded schemes), the standard retirement age has been increased. It

is now possible to retire between 58 and 63 for men and 61 for women (the minimum retirement age was 53 for women and 58 for men before the reform). Women that worked before the age of 18 can retire earlier (but not before the age of 55). Special regulations reduce the age of retirement to 55 in certain cases (before the reform it was possible even below 50). The minimum retirement age is raised from 53 to 58 for women (the same level for men). The accrual rate was reduced by 2 to 1.5 per cent since 2000. Later retirement has been encouraged: a person who fulfils the requirement for pension but continues to work beyond the age 63/61 will receive an additional pension increase (3.6 per cent the first additional year, 2.4 per cent the second year and 1.2 per cent in the third, plus the normal rate of accrual, 1.5 per cent per year).

Slovakia

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

Finland

Since 2005, flexible old-age retirement (63 to 68 years) with an increase of the accrual rate to 4.5 per cent for those continuing to work beyond the age of 63. The ceiling on the maximum pension is abolished. A new early retirement scheme is introduced with a minimum age of 62 and an actuarial reduction of 0.6 per cent per month prior to 63. Those borne after 1949 are not eligible for the unemployment pension scheme, which is replaced by an extended period of unemployment benefit (the so-called "unemployment pipeline to retirement" (currently 57-65).

Sweden

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

United Kingdom

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

3.2   Impact of pension reforms in the baseline labour force projection

Pension reforms are modelled by considering the likely impact of reforms on the probability of withdrawing from the labour market when ageing due to changes in the statutory "normal" age of retirement, or "early-retirement age" (that is the age at which benefits are first available), or in the rules governing pension rights. This likely impact is incorporated in the baseline labour force projection by means of the probabilistic model already used by the European Commission for the calculation of the *average exit age* from the labour force, using estimated cumulative probabilities of exit from the labour market.[5]

More specifically, the analysis of the distribution of the probability of retiring at different ages (from age 50 to 71, separately for males and females) is done for the period 1998 to 2007 for the 20 EU Member States concerned. Then, the relationship between changes in the parameters of the pension systems and the retiring behaviour of older workers is examined. Existing empirical evidence is also taken into account, such as econometric estimates of the impact of changes in the implicit tax rate on continuing to work and retirement behaviour.[6]

As a starting point, the probability of retirement and the cumulative distribution function (the cumulated distribution of probability of retirement) observed in 2007 are analysed, along with the calculated average exit age, see Figure 4. While the age profiles of the probability of retirement vary across countries, because of differences in the pension system, a common feature is that the distribution is clearly skewed towards the earliest possible retirement age. The distribution of the retirement age presents evidence of spikes at both the minimum age for an early retirement and the normal/ average retirement age, which is either 60 (especially for women) or 65.

3.3   Simulating the impact of the pension reforms on the participation rate of older workers

The impact of pension reforms on the participation rate of older workers is simulated by calculating the impact of reforms that have either increased the statutory retirement age or removed early retirement schemes on the participation rates. This is made as follows:

• first, by changing the probability of retiring according to our considered judgement about the factors that affect the retirement decision.[7] More specifically, the distribution of the frequency (density function and cumulative distribution function) observed in 2007 is shifted. For example, let us assume that in a given country a concentration of the probability of retiring is observed at age 58 over the last 5 to 6 years, while a reform removes early retirement schemes or increases the minimum years of contribution. To calculate the impact of this reform, we shift the peak of the retirement probability away from the previously observed peak at 58 years and closer to the statutory average age (usually 65 for men and 60 for women).[8] Within the same
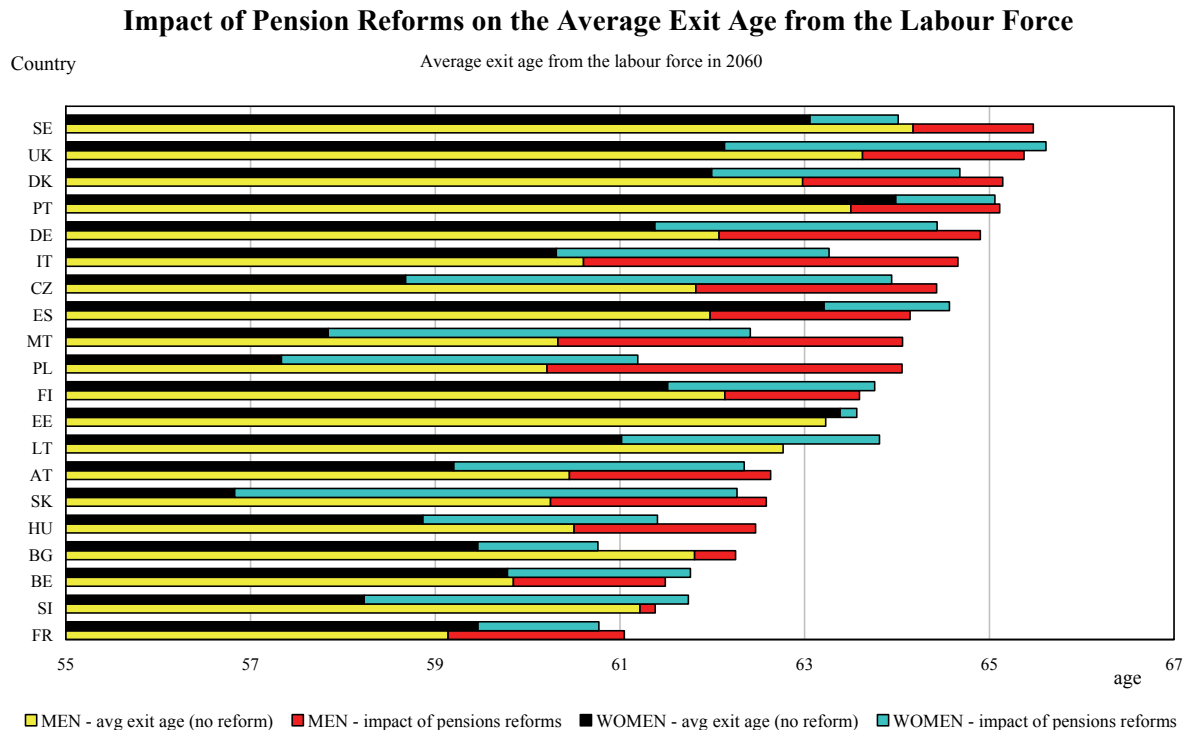
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[5]   For details on the methodology used, see Carone (2005).

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

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

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

Figure 3

Impact of Pension Reforms on the Average Exit Age from the Labour Force

Country   Average exit age from the labour force in 2060

☐ MEN - avg exit age (no reform)   ■ MEN - impact of pensions reforms   ■ WOMEN - avg exit age (no reform)   ☐ WOMEN - impact of pensions reforms

Source: Commission services, EPC.

methodological framework, another simulation is done, by applying a progressive shift of the probability distribution of retiring for females. This is done for Member States that have recently legislated a progressive increase of the statutory retirement age of females to that of males (usually from 60 to 65), such as Belgium, the United Kingdom and some others, especially among the new Member States;

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

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

3.4   *Estimates of the impact of pension reforms*

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

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

Table 7 shows the estimated impact of pension reforms on participation rates. Pension reforms are projected to have a sizeable impact on the labour market participation of older workers (aged 55 to 64) in most of the EU Member States in which future implementation of already enacted pension reforms is planned. A stronger impact is expected from changes in the parameters affecting the statutory age of retirement. For example, the labour participation in the group aged 55 to 64 in Italy is projected to record an additional increase of 14 percentage points by 2030. This is the estimated impact of the recent reform postponing the statutory age of retirement and the gradual move towards a notional defined contribution pension system.[9] In Germany, Finland, Hungary, Slovenia the impact is estimated to be more than 10 per cent by 2020. In the Czech Republic and Slovakia, the impact is estimated to be higher than 15 per cent by 2020. Overall, in the EU, the participation rate of older people (55-64) is estimated to be about 8 percentage points higher in 2020 and 13 percentage points higher in 2060 due to the estimated impact of pension reforms. In the euro area, the impact is estimated to be slightly larger, at about 9 percentage points in 2020 and 13.5 percentage points 2060, respectively.

4 Pension expenditure projections: 2009 results

The updated projections suggest that considerable 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 becoming apparent already during the next decade in the EU (see Figure 4). Overall, on the basis of current policies, pension expenditures are projected to increase on average by about 2¾ percentage points of GDP by 2060 in the EU and by about 2¾ percentage points in the euro area.[10]

There is a very large diversity across Member States as regards the projected change in public pension expenditure, ranging from a decline of –3.5 per cent of GDP (PL) to an increase of 15.2 per cent of GDP (LU):

• The projected increase in public pension spending is very significant in seven EU Member States (IE, EL, ES, CY, LU, MT, RO and SI) with a projected increase of 5 per cent of GDP or more (and of more than 10 per cent of GDP in EL, CY and LU). These countries have so far made only limited progress in reforming their pension systems or are experiencing maturing pension systems. For them there is an urgent need for a modernisation of pension to start to bend the curve of long-term costs.

• For a second group of countries – BE, BG, CZ, DE, LT, HU, NL, PT, SK, FI and the UK – the cost of ageing is more limited, but still high, ranging from 2 to 5 per cent of GDP. Several of

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

[10] See European Commission DG ECFIN (2009), "2009 Ageing Report", *European Economy*, No. 1.

Figure 4

Old-age and Other Public Pension Expenditure in 2007 and 2060
(percent of GDP)
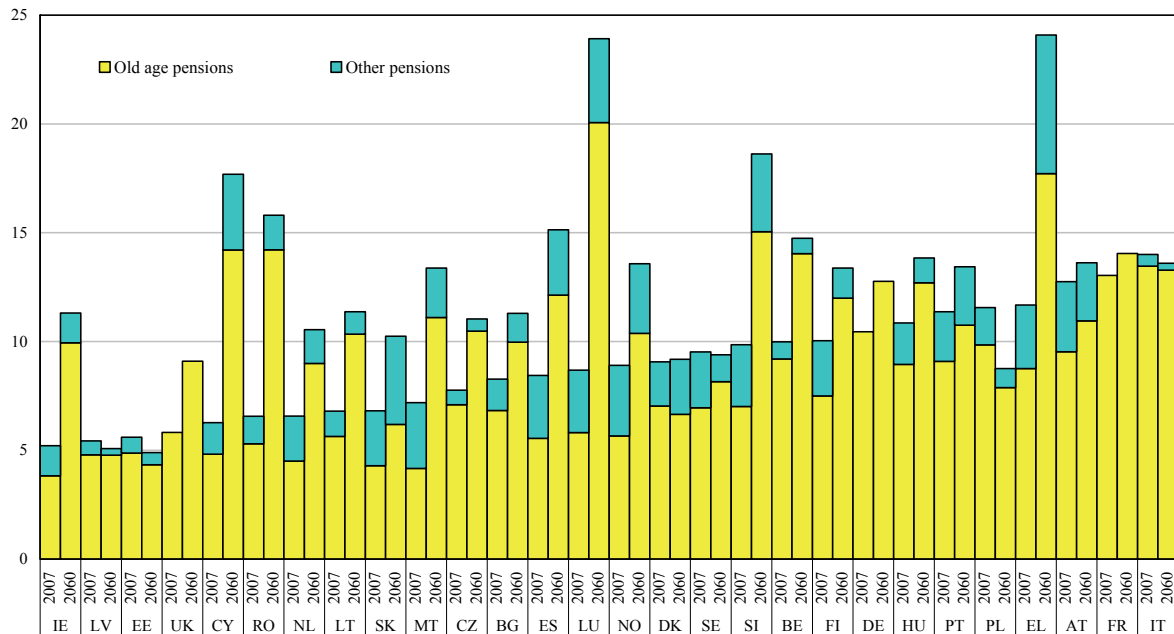
Note: HU: the projection of old-age and early pensions include an estimation of the old-age allowance (a minimum pension in HU), which is not a part of Hungarian authorities pension model at this stage. This projection contributes with 0.4 per cent of GDP to the increase in old-age and early pensions ratio over the period 2007-60.

these countries have taken some steps in reforming pensions that contribute to limit the increase in public expenditure, but much more needs to be done.

• Finally, the increase is more moderate, 2 per cent of GDP or less, in DK, EE, FR, IT, LV, AT, PL and SE. Most of these countries have implemented substantial pension reforms, in several cases also involving a partial switch to private pension schemes (BG, EE, LV, HU, PL, SK and SE).

Old-age and early pensions are projected to increase by 2.4 per cent of GDP between 2007 and 2060 in the EU. In the euro area, the increase is projected to be slightly higher at 2.6 per cent of GDP. A smaller increase is projected for other pension expenditure, mainly disability and survivor pensions, increasing only slightly by 0.1. per cent of GDP in the euro area.

It should be stressed that the ratio has been pushed downwards due to a shift from public scheme towards private mandatory scheme in BG, EE, LV, LT, HU, PL, SK and SE.[11]

As regards spending on disability and survivor pensions, they are projected to decrease in the majority of countries. Only in 8 Member States (PT, RO, SI, SK, FI, SE, UK and NO) is it projected to increase, although only slightly.

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[11] In the case of LU, the pension projection is affected by the considerable number of cross border workers who will in the future years receive a pension from the LU social security scheme, but at the same time will not be registered as LU inhabitants. Due to this peculiar circumstance, LU can not be, in same cases, strictly compared with other MS. Thus, in some of our analysis LU is treated as an outlier.

Figure 5

Occupational, Private Mandatory and Non-mandatory Pension Expenditure
(percent of GDP)
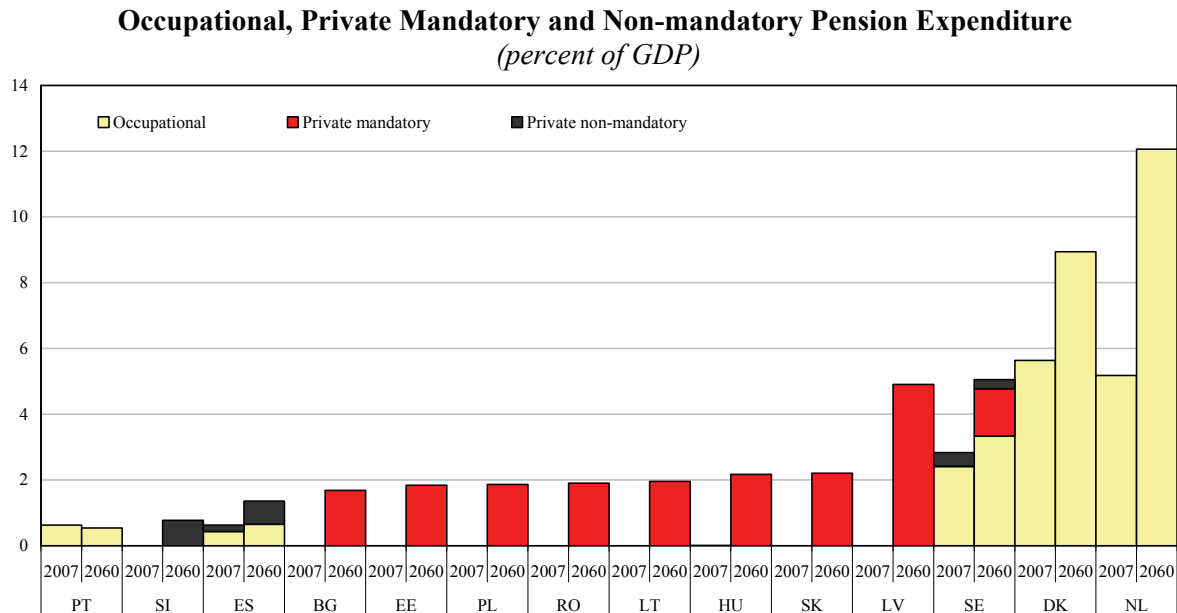
Note: The figure presents only the countries which provided data for other pension schemes and its value is non-zero.

In brief, a majority of EU Member States have: (i) reduced the generosity of public pension schemes so as to make these programmes financially more sustainable in view of the demographic trends; (ii) pushed up the statutory retirement age in a gradually phased way over the long-term for old-age pensions; (iii) restricted the access to early retirement schemes by strengthening the incentives to prolong working lives, which leads to a containment of the increase in old-age and early pensions spending. Also, the projections show no increase in disability and survivor pensions, embodying an assumption of lower take-up rates of these transfers over the projection period.

4.1   Private pensions

A number of countries have implemented systemic pension reforms, shifting part of the previously public pillar to a mandatory funded private pillar (BG, EE, LV, LT, HU, PL, SK and SE). At present, these private pillars are making very small disbursements, but their importance will increase in the future. Some countries have provided projections of 2nd pillar occupational pension expenditure and 3rd pillar non-mandatory pensions.

Figure 5 shows the private pension projections by pillar (provided only by very few member States).[12] It should be pointed out that the figure is not comprehensive; private pensions may exist in a country, but it was not possible to provide a projection (see the note to the figure for detailed information). Indeed, for occupational pension expenditure, only 6 MSs (DK, IE, ES, NL, PT and SE) provided projections, while 13 MSs (DK, GR, IE, CZ, EE, HU, LT, LV, MT, PL, SK, BG and RO) have indicated that occupational pension does not exist. For private mandatory pension expenditure, 8 MSs (BG, EE, LV, LT, HU, PL, SK and SE) have provided projections and 9 MSs

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[12]   Annex: "Assets in All Pension Schemes as a Share of GDP" presents the current and projected value of assets in all public, occupational, private mandatory and voluntary pension schemes.

(BE, DK, GR, ES, IE, NL, PT, CZ and MT) report that such pension do not exist, while for private non-mandatory pension expenditure, only 3 MS (ES, SI and SE) have provided projections and 7 MSs (DK, DE, IE, LV, MT, PL and BG) report that they do not exist.

For only a few countries (LV, SK, HU, LT, PL, EE, BG and SE), the mandatory private pensions are projected to provide a considerable top-up of the public pensions. Also, the presence of a high coverage of 2nd pillar pensions since a long time (e.g., SE, DK, NL and IE) also provides for a sizable topping-up of the public pillar.

5 Drivers of pension expenditure trends over the period 2007-60

5.1 Main drivers of projected pension expenditure

In order to shed light on the main drivers behind these dynamics, a decomposition of pension expenditure to GDP into its main our components can be very helpful:[13]

- *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 coverage effect of pensions*,[14] 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 income; output per employed person.[15]

The decomposition of the overall change (see Figure 6) in the social security pension spending to GDP ratio over period 2007-60 is provided in Table 2. In particular, the table demonstrates the contribution of each of the four main factors to the change in the pension/GDP

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[13] In order to analyse dynamics and the factors of the pension spending to GDP ratio the following decomposition is used:

$$\frac{Pension\ Expenditure}{GDP} = \overbrace{\frac{Population\ 65+}{Population\ 15-64}}^{Dependency\ Ratio\ Effect} \times \overbrace{\frac{Number\ of\ Pensioners}{Population\ 65+}}^{Coverage\ Ratio\ Effect}$$

$$\times \overbrace{\frac{Population\ 15-64}{Working\ People\ 15-64}}^{Employment\ Rate\ Effect} \times \overbrace{\frac{\dfrac{Average\ Pension}{GDP}}{Hours\ Worked\ 15-71}}^{Benefit\ Ratio\ Effect}$$

$$\times \underbrace{\frac{Working\ People\ 15-64}{Hours\ Worked\ 15-71} \times Interaction\ Effect}_{residual}$$

In particular, we analyse the percentage change in the public pension expenditure-to-GDP ratio. The overall percentage change can be expressed as a sum of the contribution of the four main factors, *i.e.* the dependency ratio contribution, the coverage ratio contribution, the employment rate contribution and the benefit ratio contribution.

[14] This effect is also commonly referred to as the *"eligibility effect"* in the literature.

[15] 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.

Figure 6

Change in Public Pension Expenditure over the Period 2007-60
(percent of GDP)
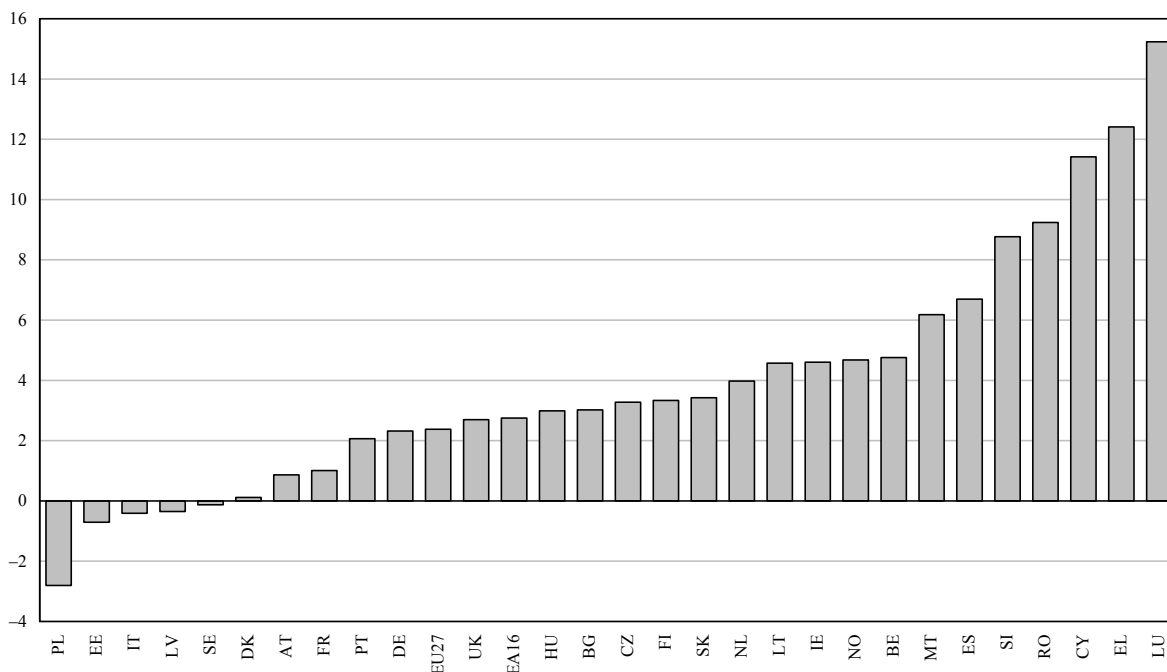
ratio. As already stressed, the main contributor to the increasing in the ratio of pension to GDP is represented by demographic factors (captured by the old age dependency ratio), ranging from +4.2 to +13.7 per cent in the case of UK and SI respectively. It is worthwhile stressing that for many MS, a significant worsening of demographic factors is only partly offset by higher employment, lower coverage rate and lower benefit rate. Indeed, the increase in the old age dependency ratio is the only factor pushing upward the pension to GDP ratio, while the evolution of the other three factors are expected to contribute to dampening, but only to a limited degree in the majority of MSs, the evolution in the pension/GDP ratio.

In general, the downward pressure on pension spending of the projected increase in the employment rate is very small in the majority of MSs,[16] being less that 1 per cent in absolute terms over the projection period (0.6 per cent for the EU27).

On the contrary, the contributions of the fall in both the coverage rate and the benefit rate are more pronounced, although generally not large enough to stabilise the pension to GDP ratio in the long run at the initial level. The overall EU27 effect of these two factors seems to be comparable, reaching about –2.5 per cent. But variation among countries tends to be noticeable. An increase in the coverage ratio will contribute to increase the pension/GDP ratio in LU (+5.2 per cent) and CY (+1.6 per cent). On the contrary, large falls are projected to contribute to put downward pressure on pension in PL (–6.2 per cent) and RO (–5.9 per cent).

Concerning the contribution of changes in the benefit ratio, one can observe both negative as well as positive values. Only in 5 MS (UK, IE, GR, LU and RO), the change in the benefit ratio is

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[16] This is mainly due to the assumptions behind the macroeconomic projection and a development of aggregate employment, in particular in the long run.

Table 2

Decomposition of the Public Pension Expenditure over the Period 2007-60
(percent of GDP)

Country	2007 Level	Dependency Ratio Contribution	Coverage Ratio Contribution	Employment Effect Contribution	Benefit Ratio Contribution	Interaction Effect	2060 Level
BE	10.0	7.4	–0.9	–0.5	–1.0	–0.3	14.7
BG	8.3	9.1	–3.0	–0.5	–1.8	–0.8	11.3
CZ	7.8	9.5	–3.5	–0.5	–1.2	–1.1	11.0
DK	9.1	6.5	–4.9	–0.1	–0.5	–0.7	9.2
DE	10.4	7.9	–1.9	–0.8	–2.2	–0.8	12.8
EE	5.6	4.6	–1.6	–0.2	–3.1	–0.4	4.9
IE	4.0	5.9	–1.5	–0.2	0.7	–0.3	8.6
EL	11.7	12.7	–0.4	–0.6	0.8	–0.1	24.1
ES	8.4	10.7	–0.9	–0.9	–1.7	–0.5	15.1
FR	13.0	8.4	–2.2	–0.5	–4.0	–0.7	14.0
IT	14.0	10.4	–3.2	–1.1	–5.5	–1.0	13.6
CY	6.3	10.8	1.6	–0.5	–0.3	–0.2	17.7
LV	5.4	5.7	–1.6	–0.2	–3.9	–0.4	5.1
LT	6.8	9.6	–2.4	–0.0	–1.8	–0.8	11.4
LU	8.7	8.4	5.2	0.0	1.2	0.3	23.9
HU	10.9	11.3	–5.4	–0.7	–1.1	–1.0	13.8
MT	7.2	11.3	–3.1	–0.7	–0.5	–0.8	13.4
NL	6.6	6.6	–1.5	–0.2	–0.6	–0.4	10.5
AT	12.8	9.9	–2.6	–0.5	–5.0	–1.0	13.6
PL	11.6	13.4	–6.3	–1.0	–7.1	–1.8	8.8
PT	11.4	9.8	–1.7	–0.6	–4.5	–0.9	13.4
RO	6.6	13.6	–4.9	0.3	1.7	–1.5	15.8
SI	9.9	13.7	–3.5	–0.1	–0.7	–0.7	18.6
SK	6.8	11.7	–3.9	–0.6	–2.4	–1.4	10.2
FI	10.0	8.7	–3.1	–0.6	–0.9	–0.7	13.4
SE	9.5	5.6	–0.4	–0.4	–4.3	–0.6	9.4
UK	6.6	4.2	–1.4	–0.3	0.5	–0.3	9.3
NO	8.8	8.2	–1.2	0.3	–2.3	–0.2	13.6
EU27	10.1	8.7	–2.6	–0.7	–2.5	–0.6	12.5
EA16	11.0	9.0	–2.0	–0.7	–2.9	–0.7	13.8
EA12	11.1	8.8	–1.9	–0.7	–2.9	–0.7	13.8
EU15	10.2	7.7	–1.8	–0.6	–2.3	–0.6	12.6
EU10	9.7	11.8	–4.9	–0.7	–3.9	–1.3	10.7
EU25	10.2	8.5	–2.4	–0.7	–2.5	–0.6	12.5

envisaged to be positive, thus contributing to push up pension spending. In the rest of the countries, a reduction in the relative value of social security benefits (compared to the gross average wage) is projected. In the following 8 MS (PL, IT, AT, PT, SE, FR, LV and EE) the contribution of a decreasing benefit ratio is in absolute terms quite significant (above 3 per cent). The mentioned differences among countries are mainly due to different degree of reforms affecting both access to pensions and generosity of future pension benefits.

To sum up, in the upcoming decades, demographic factors are projected to be the main driver of the future pension expenditure. For all countries, except CY and LU, the contribution of the old-age dependency ratio is bigger that the total change in the social security pension to GDP. It is evident that envisaged demographic transition will affect future pensions to a remarkable extent. Hopefully, recent pension reforms have strengthened the counterbalancing impact of other factors (increase in employment rate, especially of older workers, decline in the coverage ratio, through postponement of retirement age, less generous public pension transfers). However, since the effect of population ageing is expected to be really a substantial one, additional appropriate reforms are needed in order for the other main determinants of pension spending to fully countervail its effect.

Contrary to the labour market reforms, changes of the pension schemes tend to have an impact on economic variables rather in the long run. Usually, the impact of the reforms affecting the value of pension benefits will become visible only in future years, as currently working individuals will retire under different conditions in the future. This circumstance is clearly visible in Table 3 where the contribution of falling benefit ratios at the EU27 level is the strongest from 2020 to 2050.

Focusing on development at the EU27 level, the first sub period 2007-20 is characterised by a relatively low contribution of a change in the benefit ratio (–0.1 per cent). Still, a large divergence is observed across countries, ranging from the largest positive contribution in RO (+3.3 per cent) and the largest negative contribution registered in SE (–1.5 per cent), LU and CZ (–1.4 per cent for both). As already noted, the effect of the pension system reforms is expected to materialise over longer horizon. Thus, not surprisingly, the EU27 average benefit contribution to keep pension spending under control increases over time, starting from 2020-30. The largest positive contribution falls down reaching 1.3 per cent in case of EL. The largest negative benefit contribution remains unchanged at –1.4 per cent this time registered by PT. As the current pension reforms adjusting adequacy of individual pension benefits will affect primarily individuals retiring in thirty to forty years, the largest contribution of the fall in benefit ratios is projected to show up over the period 2030-40 (–0.7 per cent in the EU27).

5.2   Is there a risk of pensions becoming "too small"?

We have seen that sizable decreases in benefit ratios are projected over coming decades. It is very difficult to assess to what extent future pension benefits will be "adequate" in the future. Comprehensive pension reforms have aimed at strengthening fiscal sustainability by generally including measures aimed at both tightening of eligibility for pension benefits and reducing the growth of the pension benefits in relation to income growth in the economy.

Table 4 shows the benefit ratio (the ratio between the average pension benefit and the economy-wide average wage) and the replacement rate (the average first pension as a share of the economy-wide average wage).

The decline in the public pension benefit ratio over the period 2008-60 is substantial, 20 per cent or more in 11 MSs (FR, IT, AT, PT, SE, EE, LV, LT, PL, SK, BG). However, taking into consideration also the projected support from pension benefits from the 2nd and 3rd pillars, the decline in the pension benefit ratio including also these private pensions is smaller in several of

Table 3

**Contribution of the Benefit Ratio to the Change
in the Ratio of Social Security Pension Expenditure**
(percent of GDP)

Country	2007-20	2020-30	2030-40	2040-50	2050-60	2007-60
BE	0.5	–0.1	–0.5	–0.5	–0.5	–1.0
BG	0.1	–0.8	–0.7	–0.4	0.0	–1.8
CZ	–1.4	–0.3	0.2	0.3	0.0	–1.2
DK	–0.4	0.0	–0.2	–0.1	0.1	–0.5
DE	–0.5	–0.9	–0.8	–0.1	0.0	–2.2
EE	0.1	–0.9	–0.7	–0.9	–0.8	–3.1
IE	0.3	0.1	0.1	0.1	0.0	0.7
EL	1.0	1.3	0.2	–0.8	–0.9	0.8
ES	1.0	–0.7	–0.7	–0.7	–0.7	–1.7
FR	–1.4	–1.1	–0.7	–0.5	–0.2	–4.0
IT	0.3	–1.3	–1.6	–1.5	–1.3	–5.5
CY	0.5	–0.4	0.3	–0.2	–0.5	–0.3
LV	–0.1	–0.4	–0.6	–1.6	–1.3	–3.9
LT	–0.3	–0.3	–0.4	–0.4	–0.5	–1.8
LU	–1.4	0.6	0.7	0.8	0.6	1.2
HU	0.5	–0.7	–0.3	–0.3	–0.3	–1.1
MT	–0.6	–0.6	0.6	0.3	–0.3	–0.5
NL	–0.5	–0.1	0.0	0.1	–0.0	–0.6
AT	–0.9	–0.6	–0.9	–1.1	–1.4	–5.0
PL	–0.8	–1.3	–1.6	–1.9	–1.5	–7.1
PT	0.0	–1.4	–1.7	–0.7	–0.7	–4.5
RO	2.8	0.1	–0.3	–0.5	–0.3	1.7
SI	–0.6	–0.3	0.1	0.1	0.1	–0.7
SK	–0.3	–0.4	–0.6	–0.7	–0.5	–2.4
FI	0.6	–0.1	–0.4	–0.5	–0.4	–0.9
SE	–1.5	–1.1	–0.8	–0.6	–0.4	–4.3
UK	0.0	–0.1	–0.0	0.4	0.3	0.5
NO	–0.1	–0.5	–0.7	–0.5	–0.5	–2.3
EU27	–0.1	–0.6	–0.7	–0.6	–0.4	–2.5
EA16	–0.2	–0.8	–0.8	–0.6	–0.5	–2.9
EA12	–0.2	–0.8	–0.8	–0.6	–0.5	–2.9
EU15	–0.2	–0.7	–0.7	–0.4	–0.3	–2.3
EU10	–0.6	–0.8	–0.8	–1.0	–0.8	–3.9
EU25	–0.2	–0.7	–0.7	–0.6	–0.4	–2.5

Table 4

Benefit Ratios and Replacement Rates
(percent)

Country	Benefit Ratio						Gross Average Replacement Rate					
	Public Pensions			Public and Private Pensions			Public Pensions			Public and Private Pensions		
	2007	2060	% Change	2007	2060	% Change	2007	2060	% Change	2007	2060	% Change
BE	45	43	–4	44	41	–8	45	42	–7			
BG	44	36	–20					36			49	
CZ	45	38	–17				33	27	–17	33	27	–17
DK	39	38	–4	64	75	17	33	33	0	71	84	18
DE	51	42	–17	51	42	–17						
EE	26	16	–40	26	22	–18	28	16	–41	28	31	9
IE	27	32	16									
EL	73	80	10				61	67	10			
ES	58	52	–10	62	57	–8						
FR	63	48	–25									
IT	68	47	–31				67	49	–26			
CY	54	57	5									
LV	24	13	–47	24	25	4	33	22	–33	33	33	2
LT	33	28	–16	33	32	–2	32	29	–10	32	37	15
LU	46	44	–4	46	44	–4	53	62	17			
HU	39	36	–8	39	38	–3	49	38	–23	49	43	–13
MT	42	40	–6									
NL	44	41	–7	74	81	10						
AT	55	39	–30				49	38	–22			
PL	56	26	–54	56	31	–44						
PT	46	33	–29	47	33	–31	58	56	–3			
RO	29	37	26	29	41	41	36	44	20	36	49	34
SI	41	39	–6	41	40	–2						
SK	45	33	–27	45	40	–11						
FI	49	47	–5									
SE	49	30	–39	64	46	–27	49	31	–36			
UK	35	37	7									
NO	51	47	–8									

Note: The "Benefit ratio" is the average pension benefit for social security and total, respectively, as a share of the economy-wide average wage, as calculated by the Commission. The "Gross Average Replacement Rate" as the average first pension as a share of the economy-wide average wage, as reported by the MSs in the pension questionnaire. Public pensions used to calculate the Benefit Ratio includes old-age and early pensions and other pensions, while public pensions used to calculate the Gross Average Replacement Rate only includes old-age and early pensions. In general, the old-age and early pensions are the major part of pension expenditure, so this difference is unlikely to affect the results substantially.

Decomposition of Public and Other Pension Spending over the Period 2007-60

Country	2007 Level	Dependency Ratio Contribution	Coverage Ratio Contribution	Employment Effect Contribution	Benefit Ratio Contribution	Interaction Effect	2060 Level
BG	8.3	9.1	−3.2	−0.5	−1.8	1.2	13.0
DK	14.7	6.5	−8.0	−0.2	−0.8	6.0	18.1
EE	5.6	4.6	−1.8	−0.2	−3.6	2.1	6.7
IE	5.2	5.9	−2.1	−0.3	0.9	1.6	11.3
ES	9.0	10.7	−0.9	−1.0	−1.9	0.5	16.4
LV	5.4	5.7	−2.0	−0.2	−5.2	6.3	10.0
LT	6.8	9.6	−2.7	−0.0	−2.0	1.7	13.3
HU	10.9	11.3	−4.5	−0.7	−2.4	1.5	16.0
NL	11.7	6.6	−2.7	−0.3	−1.2	8.4	22.6
PL	11.6	13.4	−6.5	−1.0	−7.6	0.7	10.6
PT	12.0	9.8	−1.6	−0.6	−4.9	-0.7	14.0
RO	6.6	13.6	−5.1	0.3	1.7	0.7	17.7
SI	9.9	13.7	−3.5	−0.1	−0.7	0.0	19.3
SK	6.8	11.7	−4.2	−0.6	−2.7	1.4	12.4
SE	12.2	5.6	−0.5	−0.5	−6.2	3.7	14.4

these countries (SE, EE, HU, LV, LT, PL, SK, BG), see also Table 5.[17] Notwithstanding this boost, it still declines by 20 per cent or more in FR, IT, AT, PT, SE, EE, PL.

In the case of a declining benefit ratio over time, the replacement rates at retirement provides information on whether the reduction in average pension benefit over time is due to a decline over time in newly awarded pensions (as reflected in the replacement rate at retirement), or due to a decline in previously awarded "old" pensions, the latter being influenced by the pension indexation rule employed.

Only about half of the EU MSs have reported replacement rates, which hampers a mapping of the situation across the EU. Nonetheless, in a number of countries, the decline in the public pension replacement rate between 2007 and 2060 is substantial, being 15 per cent or more in IT, AT, SE, EE, HU, LV, and PL. This suggests that the valorisation of the average first pension is lagging behind the average wage growth quite significantly (in some cases partly reflecting the impact of increases in life expectancy in the calculation of the pension benefit – through some kind of "adjustment coefficient" or "sustainability factor"). In a number of countries the decline in the

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[17] It should be noted that not all MSs were in a position to provide projection for 2nd and 3rd pillars even if they exist, indicating that the total benefit ratio is not fully comparable.

gross average replacement rate including the contribution from 2nd and 3rd pillar pensions is smaller than concerning public pensions.

A decline in the replacement rate over time may be an explicit policy target in some cases, where the initial replacement is very high and might act as a deterrent on the individual's attitude towards continuing working. Hence, it is informative to look not only at the change in the replacement rate over time, but also at the level, see Table 5. If the replacement rate at a future point in time is "low", there is a case for putting in place other sources of income in order to avoid potential future issues as regards adequacy of pensions. In countries where the public pension replacement rate is low in the future, the potential inadequacy of pensions from public sources may therefore be relatively larger and call for proper intervention by governments so as to realign contemporary income across different age groups.

However, as pointed out above, it must be borne in mind that other sources of income for older people can make up for the lower initial pension from social security. First, retirement income from other pillars can support purchasing power of pensioners (for instance, this is the case in SE, EE, HU, LT, LV, PL, SK, BG, who have provided projection of these privatized funded pillars). Second, other income sources can contribute to retirement income, like drawing down on accumulated assets and savings. Third, behavioural change among the population, beyond what is already assumed in the baseline projections, to further extend working lives and/or to increase their savings to enhance the future pension benefit and/or retirement incomes may occur on the assumption that individuals are well-informed of their future prospects and take a (long) forward-looking perspective. Clearly, structural reforms that fosters (or forces) the expansion of life spent working can affect this change.

In addition to issues regarding the level of the first pension awarded, as captured by the average replacement rate, indexation rules governing the evolution of the pension after retirement is an important determinant of the pension income after retirement. As noted above, pinpointing a level below which a pension may be "too low", is a difficult task. Nonetheless, the lower the first pension benefit, the higher the reliance of price indexation (as opposed to wage indexation) after retirement is, the higher is the probability that the pension benefit for an individual risks becoming inadequate over time. This applies in particular to individuals with the lowest, or minimum, pension benefits.

6   Assessing the potential impact of future changes in some of the main drivers of pension spending

In order to verify how sensitive are the different national pension models to changes in key variables, and thus to possible future changes in the parameters of the pension schemes, a series of sensitivity tests were carried out. Specifically, changes to the demographic (assumptions on life expectancy and migration flows) and macroeconomic (productivity growth, employment rates and the interest rate) variables were applied in the projection exercise of the EC-EPC.[18]

In particular, given the high uncertainty surrounding assumptions regarding demographic and economic outlook over the long-term, it is important to know the impact of changes in these factor on pension spending. In order to take such uncertainties into account, a set of projections under alternative assumptions is carried out in addition to the baseline scenario (labour productivity growth, employment rate, interest rate and life expectancy).

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[18]   For details on the specification of the sensitivity tests, please see European Commission – Economic Policy Committee (2008), "2009 Ageing Report: Underlying Assumptions and Projection Methodologies (2007-2060)", *European Economy*, No. 7.

6.1 Pension spending is especially sensitive to life expectancy and assumptions on migration

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

6.1.1 Life expectancy

Higher life expectancy leads to increased public spending in countries with defined-benefit schemes, whereas defined-contribution schemes inherently takes into account the length of retirement. As part of recent pension reforms, some Member States have introduced a link between life expectancy at retirement and pension benefits: the projection results indicate that these measures appear to achieve a better sharing of demographic risk. A higher life expectancy (of 1 year at birth by 2060) would lead to an increase of the pension to GDP ratio in the EU27 of about +0.2 per cent. The impact is however not uniform across countries, ranging from +0.1 per cent by LV to +0.8 per cent by PL.

The extent to which the pension schemes react to a change in life expectancy depends on the design of the schemes. The impact of longer life expectancy appears to be smaller in countries where the annuity explicitly depends on life expectancy at retirement or in countries where automatic stabilizers of spending are built into the system to compensate for some fiscal imbalances (e.g., the sustainability factors in DE, SI, FI, PT and SE). This type of features increases the resilience of pension schemes to longevity risk. By contrast, the impact is larger in countries with a large level of pension expenditure in 2050 and where no such automatic stabilizer of the pension spending has been put in place (e.g., BE and FR).

6.1.2 Higher labour productivity growth

A permanent increase of 0.25 per cent in the productivity growth rate would reduce the increase in the pension to GDP ratio in the EU27 by –0.5 per cent up to 2060. A larger reduction would be the case in GR (–2.0 per cent), AT (–1.1 per cent) and ES (–1.0 per cent), while an increase is projected in SI (+0.2 per cent), NO (+0.2 per cent) and PL (+0.3 per cent) thanks to indexation of pensions to wages or larger accumulation of pension rights.

Higher productivity growth increases income, also in per capita terms, and leads to improved living standards (also for pensioners) at the aggregate level. However, the main mechanism behind the lower increase in pension expenditure as a share of GDP is that higher productivity growth leads to a faster growth of GDP and hence a faster increase in income than in pensions (a fall in benefit ratio). As discussed in above, this change in relative income position between the working-age population and the retired may put pressure on governments to adjust retirement income policies to avoid potential risks related to relatively inadequate pensions.

Higher labour productivity growth has a different impact on pension expenditure across countries. It will have virtually no impact in countries where the public pension scheme provides a flat rate pension whose level is indexed to wage growth. By contrast, it will lead to lower increases where pension expenditure trail GDP growth. This will be the case if pensions are not fully indexed to wages after retirement. The higher the productivity growth, the higher the gap between the average pension and the average wage. If pensions are earnings-related and are calculated over a long period of the career, a more dynamic productivity growth will lead to higher wages and therefore accumulate higher pension rights.

6.1.3 Higher employment of older workers

An increase of the total employment rates by 1 percentage point or an increase of the employment rates of older workers by 5 percentage points compared to the baseline would reduce the upward dynamic in pension expenditure as a share of GDP by 0.2 per cent over 2007-60. This would materialize through higher employment growth raising GDP growth in a first phase. However, in a second phase it would enable workers to accumulate further pension rights, having a moderating upward impact on the pension-to-GDP ratio in the longer term. The employment effect is slightly stronger in reducing the increase in the pension ratio if it results from higher employment of older workers, since it will mechanically reduce the number of retirees. The impact of a higher total employment will depend on the extent to which extending working lives will translate into higher pension entitlements.

6.1.4 Higher total employment

The impact of a higher employment for the entire workforce (assuming a reduction of the unemployment rate) leads to a reduction of –0.2 per cent in the EU. A stronger impact would occur in BG, NO, AT all reaching (–0.3 per cent). On the other hand, in IT, HU, LV, LU, EE with zero impact on pension to GDP ratio and PL (+0.6 per cent), the effect is smaller, reflecting in some cases the flat-rate character of the public pension scheme. The effect is limited as higher/longer employment results in the accumulation of greater pension entitlements. Notwithstanding the apparently small impact on public spending, raising the employment rate is welfare enhancing. It leads to an improved economic performance, and on the budgetary side it delays somewhat the onset of increased public spending on pensions. Moreover, higher employment generates increased contributions to pension schemes, and if it is the result of lower unemployment, additional budgetary savings may emerge. Finally, longer working lives enable workers to acquire greater pension entitlements offsetting some of the impact of less generous public pensions.

6.1.5 Interest rates

Interest rates affect the pension spending only in countries where funding is important. Moreover, Changing the assumption on the interest rate has an impact on public expenditure only in a few countries with funded components in the public pension schemes such as SE (–0.02 per cent) and FI (+0.14 per cent). The effect comes through a higher rate of return and its impact will depend on the extent to which assets have been accumulated. The effect of this test is generally stronger for private pension and in particular for countries that have large pensions scheme funds, such as NL, DK, FI and SE.

Changes in interest rates affects the contribution rate and asset accumulation of funded schemes, albeit in opposite directions in defined-benefit and defined-contribution schemes. In defined-benefit schemes, with a higher interest rate, the contribution rate can be lowered to cover the targeted benefit, whereas in a defined-contribution scheme, the contribution rate remains unchanged but results in a higher accumulation of assets.

6.1.6 Zero migration

The zero migration scenario assumes the absence of both immigration and emigration between domestic economy and the rest of the world. The assumptions of this scenario seem to be very strong and even unrealistic for some of the countries. As a result, the outcomes of this scenario have to be interpreted only as indication of the potentially very different role that migration is expected to play in MSs. Indeed the difference between the baseline and the zero
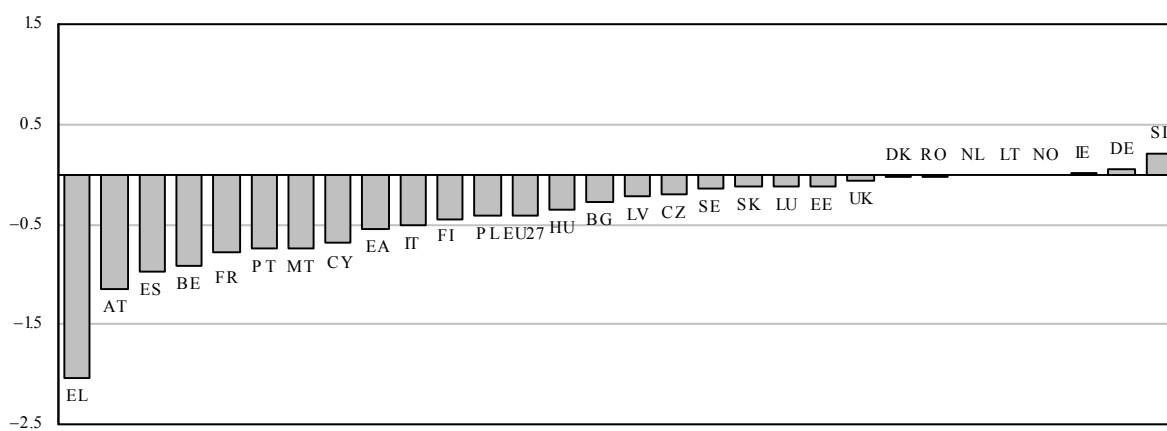
Figure 7

Sensitivity Tests:
Difference between Pension Spending in the Alternative and the Baseline Scenarios
(percent of GDP)

Higher Life Expectancy
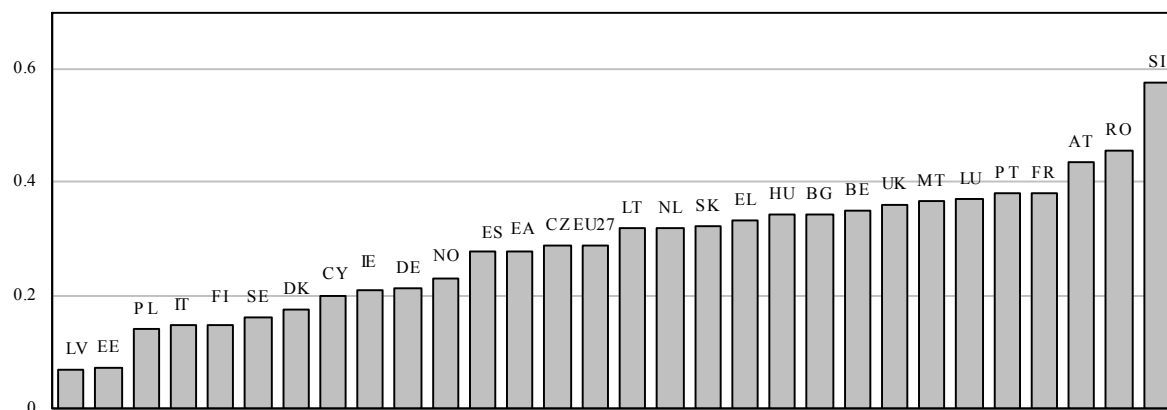
Higher Labour Productivity
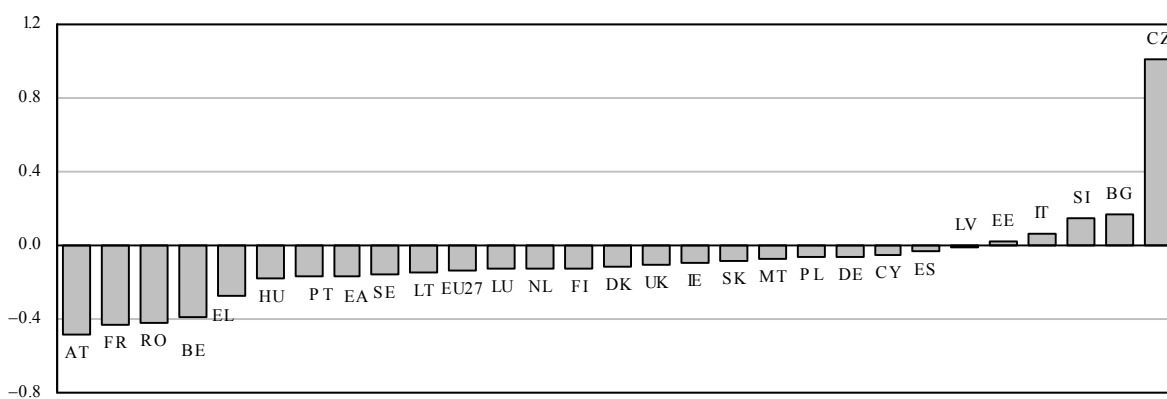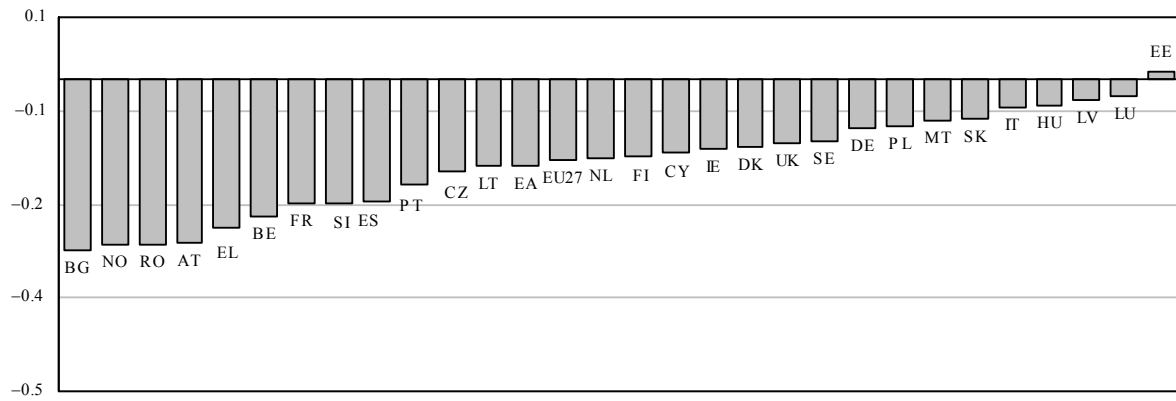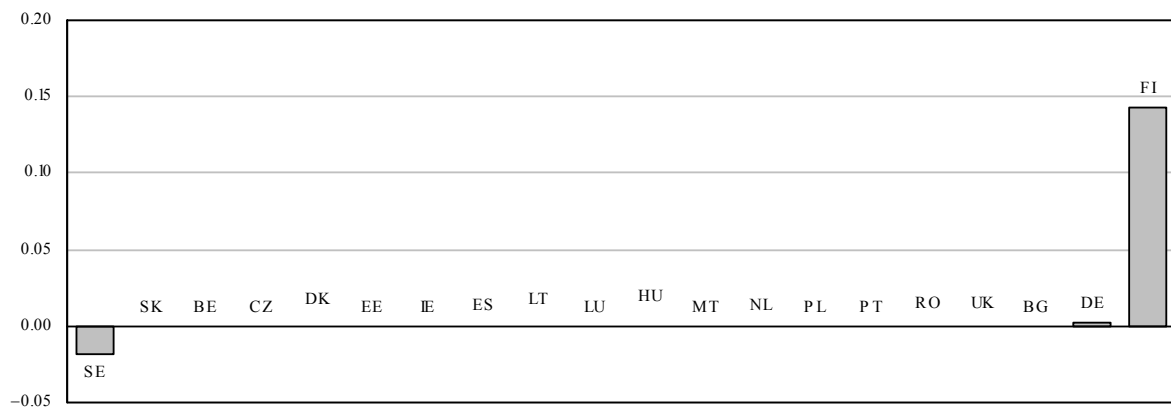

Higher Employment of Older Workers

Figure 7 (continued)

Sensitivity Tests:
Difference between Pension Spending in the Alternative and the Baseline Scenarios
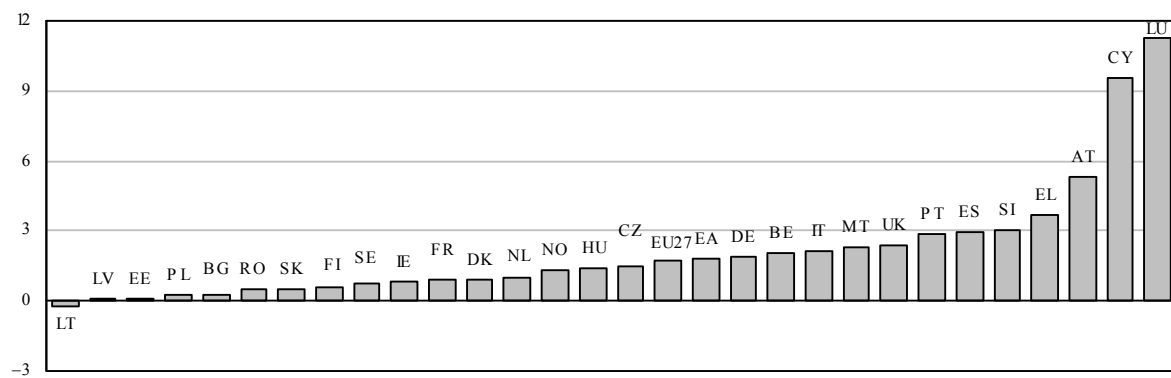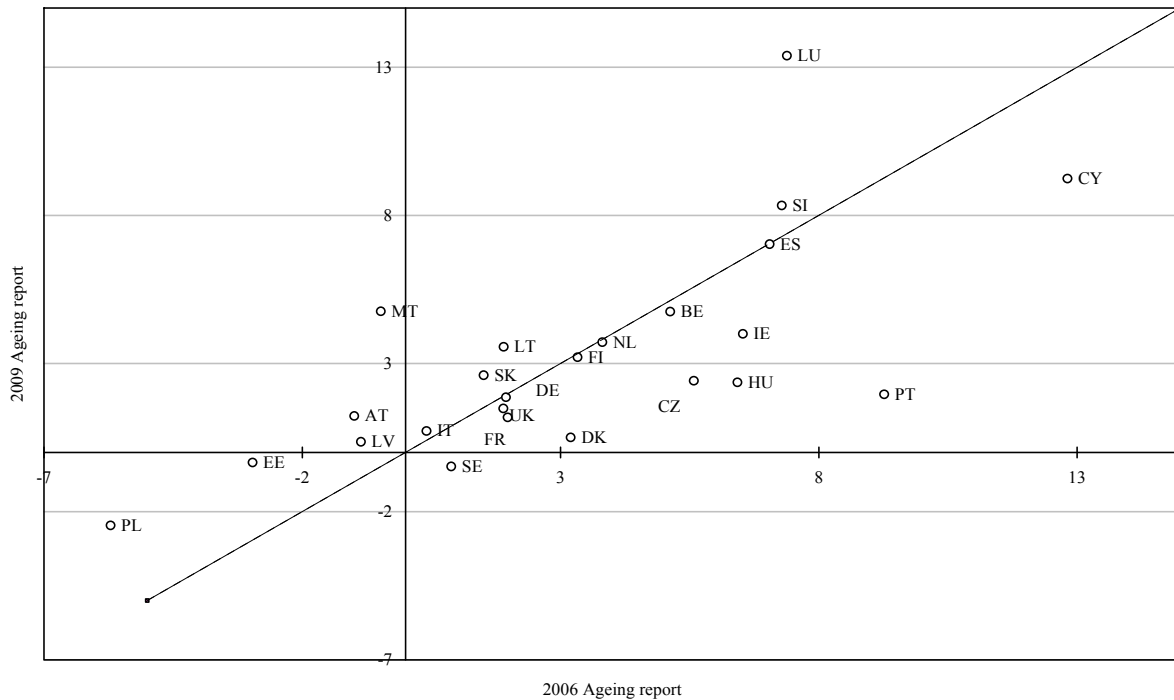*(percent of GDP)*

Higher Employment

Higher Interest Rate

Zero Migration

Figure 8

**Change in the Public Pension to GDP up to 2050 Compared:
2006 Ageing Report and Latest Projection**

2006 Ageing report

migration scenarios is the largest one among all of the sensitivity tests for majority of the Member States. In general, due to the net zero migration assumption, the pension to GDP ratio increases. This is the case in all of the MSs except a very limited negative change in case of LT. The EU27 average increase in pension to GDP ratio is projected to be +1.7 per cent above the baseline change over the projection horizon. An increase in the pension to GDP ratio mainly results from an impact of the smaller labour force and lower GDP over the projection period. At the same time, the number of pensioners is generally less affected by the net zero migration assumption over the projection horizon, *i.e.* 2007-60.[19]

7 Assessing the budgetary impact of pension reforms: comparison with the previous pension projection exercise

An additional way to assess the budgetary impact of recent pension reforms is to compare the changes in public pension expenditure as a share of GDP up to 2050 in the current projection exercises with those projected in 2006 (see Figure 8). For most countries, the change in pension expenditure as a share of GDP has been revised over time, sometimes significantly (as reflected by the distance from the 45 degree line in Figure 8). Compared with the 2006 pension projection

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[19] Beyond 2060, the number of pensioners will be affected by the assumptions of the net zero migration scenario. As the current and future (up to 2060) level of employment is lower due to lower inflow of immigrants, the number of pensioner is expected to fall in the long horizon (beyond 2060) as well.

exercise, pension expenditure is now projected to be fairly similar for the EU25 (rising by 2.3 per cent of GDP, compared with 2.2 per cent of GDP in the 2006 Ageing Report).[20]

Pension expenditure is now projected to increase more (or decrease less) in EE, IT, LV, LT, LU, MT, AT, PL, SI, SK, with large upward revisions of 1.5 per cent of GDP or more in EE, LV, LT, LU, MT, AT, PL. By contrast, a lower increase (or higher decrease) is now projected in BE, CZ, DK, IE, FR, CY, HU, NL, PT, FI, SE, UK, with significant downward revisions of 1.5 per cent of GDP or more in CZ, DK, IE, CY, HU, PT, SE.

The revisions of projected changes in pension expenditure over the long-term are due to several factors, notably but not exclusively due to reforms of pension systems. Also other factors are playing a role, such as changes in the demographic and macroeconomic assumptions, changes in modelling pension expenditure over the long-term and changes in the coverage of the projection (data on pension schemes covered in the projection).

In order to shed light on the reasons behind these revisions, a comparison of a decomposition of the change in public pension expenditure between the 2006 Ageing Report and the current projection exercise into four factors is conducted. This decomposition comparison was also used in the country fiches on the pension projections when analyzing the reasons behind the change in the projection results.

Table 6 presents a decomposition of the public pension to GDP ratio in 2006 and 2009 projections.[21] An in-depth analysis of the reasons behind the revisions for each country is provided in the country fiches on the pension projection and results envisaged for release in the latter half of 2009.

The main points may be summarized as follows:

- the main factor behind the projected increase in pension expenditure is the demographic transition to an older population. The dependency effect has decreased in a majority of countries PT, IE, CY, CZ, AT, ES, UK, IT, HU, DK, BE, FI, FR, SI, DE and SE, and it has increase only in few NL, LU, SK, EE, PL, LV, LT and MT;

- the other factors are in general offsetting the increase that follows from the larger number and share of older people. In the 2009 projection exercise, the fall in coverage is more accentuated, thus offsetting the dependency effect to a greater extent in a majority of countries. 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. Compared with the 2006 projection exercise, the largest reductions in the coverage ratio are projected in PT, IE and CY. By contrast, it slightly increases in ES, LU and AT. An increase in the coverage effect may be due to a higher take-up of pensions by women thanks to their increasing participation in the labour market even if there is a lower take-up of pensions by men due to reforms undertaken;

- the employment effect contributes to offset the dependency effect too. As already seen before, the effect is rather small in most countries and it generally offsets less in the current exercise compared with the 2006 projection. This partly follows from the fact that employment rates have generally risen in the period since the previous projection was carried out and that the structural unemployment rates have not been reduced to the same extent. This leads to lower

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[20]   It should be noted that the projection for Greece is included in the current projection exercise, which was not the case in the 2006 Ageing Report. Excluding Greece from the EU25, the aggregate would lead to a lower increase in the current projection, of 1.9 percentage points of GDP.

[21]   A small discrepancy between the changes in the consecutive projection exercises may be due to different starting year used; for the 2006 projection, the change is calculated over the period 2004-50 and in the current projection it is calculated over the period 2007-50.

Table 6

Decomposition of the Public Pension in 2006 and 2009 Projections
(percent of GDP)

Country	Projection Year	Dependency Ratio	Coverage Ratio	Employment Rate	Benefit Ratio	Change 2007-50 *(percent)*
BE	2006	7.7	–0.4	–0.9	–1.2	5.1
	2009	6.7	–0.7	–0.5	–0.6	4.8
BG	2006					
	2009	7.5	–2.2	–0.3	–1.8	2.5
CZ	2006	10.5	–3.5	–0.3	–0.6	5.6
	2009	8.3	–3.2	–0.5	–1.2	2.4
DK	2006	7.2	–2.8	–0.4	–0.5	3.2
	2009	6.2	–4.2	–0.2	–0.6	0.5
DE	2006	7.5	–0.6	–1.1	–3.5	1.9
	2009	7.3	–1.8	–0.7	–2.2	1.9
EE	2006	3.1	–1.5	–0.6	–3.8	–3.0
	2009	3.7	–1.3	–0.1	–2.3	–0.3
IE	2006	7.9	–1.4	–0.5	0.8	6.5
	2009	5.3	–1.4	–0.2	0.6	4.0
EL	2006					
	2009	12.7	–1.2	–0.7	1.8	12.3
ES	2006	12.4	–2.3	–1.8	–0.8	7.0
	2009	10.6	–1.0	–0.9	–1.1	7.0
FR	2006	8.7	–1.8	–0.9	–3.5	2.0
	2009	8.2	–2.1	–0.5	–3.8	1.2
IT	2006	11.5	–3.2	–2.0	–5.3	0.4
	2009	10.4	–3.3	–1.2	–4.2	0.7
CY	2006	10.2	1.2	–1.2	2.5	12.8
	2009	8.0	1.6	–0.5	0.2	9.2
LV	2006	3.4	–1.3	–0.7	–2.3	–0.9
	2009	4.3	–1.1	0.0	–2.6	0.4
LT	2006	5.4	–2.1	–1.0	–0.2	1.9
	2009	6.8	–1.4	0.1	–1.3	3.6
LU	2006	7.2	2.5	–4.4	2.1	7.4
	2009	7.6	4.9	–0.0	0.6	13.4
HU	2006	10.5	–4.5	–1.1	2.0	6.4
	2009	9.5	–4.7	–0.7	–0.8	2.4
MT	2006	7.3	–1.0	–1.2	–5.0	–0.5
	2009	9.1	–2.8	–0.7	–0.2	4.8
NL	2006	6.3	–1.6	–0.2	–0.4	3.8
	2009	6.3	–1.5	–0.2	–0.5	3.7
AT	2006	11.3	–5.8	–1.3	–4.3	–1.0
	2009	9.3	–3.1	–0.5	–3.6	1.2
PL	2006	10.4	–5.7	–3.2	–6.3	–5.7
	2009	11.3	–5.7	–0.9	–5.6	–2.5
PT	2006	13.7	–0.9	–0.2	–3.0	9.3
	2009	9.4	–1.9	–0.7	–3.8	2.0
RO	2006					
	2009	10.6	–3.5	0.5	2.0	8.3
SI	2006	13.3	–3.6	–1.0	–0.9	7.3
	2009	12.9	–3.0	–0.1	–0.7	8.3
SK	2006	9.0	–2.5	–1.3	–3.1	1.5
	2009	9.6	–3.3	–0.4	–1.9	2.6
FI	2006	8.8	–3.1	–0.9	–0.8	3.3
	2009	7.9	–2.9	–0.6	–0.5	3.2
SE	2006	4.8	–0.2	–0.6	–2.8	0.9
	2009	4.6	–0.2	–0.4	–4.0	–0.5
UK	2006	4.7	0.0	–0.1	0.0	1.9
	2009	3.4	–1.5	–0.3	0.2	1.5
NO	2006					
	2009	7.4	–1.3	0.2	–1.7	4.5

- gains in employment rates over the projection period compared with the situation at the time of the previous projection;

- the benefit effect shows the extent to which average pensions increase at a different pace than average income (proxied by output per worker). The benefit effect can offset the dependency effect if: (i) the determination of the value of (future) accrued pension rights – eventually becoming pension benefits – is changed; (ii) the evolution of the pension after retirement is slower than average income (pension indexation below wage growth). It helps to offset the dependency effect in almost all countries, reflecting in many cases reforms that have been introduced so as to make the public pension systems more robust to demographic changes. In CZ, DK, IE, ES, FR, CY, LV, LT, LU, HU, NL, PT, SE, the offsetting impact of the relative benefit reduction has increased compared with the previous 2006 projection and in particular for HU, CY, LU, SE, LT, PT and CZ. A common feature for some of these latter set of countries (HU, PT, CZ) is that they have introduced strong pension reforms since the completion of the 2006 Ageing Report. As a result, the overall increase in the public pension ratio is now projected to be considerably smaller.

This decomposition comparison was also used in the country fiches on the pension projections when analyzing the reasons behind the change in the projection results. For countries where pension reforms have been implemented since the completion of the 2006 projections (e.g., DK, CZ, HU and PT), the effect of these reforms primarily comes via the coverage effect and the benefit effect, as shown above.[22]

8   Conclusions

The analysis of reforms in the Member States shows that the role of public pension benefits in overall pension provision is being reduced. This will happen gradually and through many mechanisms, including changes in the indexation of benefits which in some countries cause benefits to rise slower than wages.

The EC-EPC2009 projections show that, while the main driver behind the expected increase in pension spending to GDP ratio is the *transition to an older population*. This effect alone would push up expenditures very significantly in all Member States. However, there are several mitigating factors counteracting these daunting developments owing to important reforms steps taken by EU Member States.

A tightening of the eligibility to receiving a public pension (higher retirement age, reduced access to early retirement) is expected to act as a constraint on public pension expenditure in nearly every MS. This reflects implemented pension reforms, often phased-in over a long period, that lead to higher participation rates of older workers during the projection period. Pension reforms as well as trend increases in female labour force participation are assumed to lead to an increase in the effective retirement age in a large majority of countries. For instance, pension reforms that have strengthened the link between pension benefits and pension contributions (or raised the threshold for qualifying for a "full" pension) will also contribute to raising the retirement age. Achieving the necessary extension in working lives will prove challenging as adjustment will also be needed in the expectations and behaviour of citizens.

There are currently many hard and soft barriers that limit the extent to which the older generations can participate in society, and notably so in working life. Despite considerable

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[22]   See European Economy (2009), "2009 Ageing Report: Pension Models and Projection Results in EU Member States" (forthcoming).

progress, e.g., pension reforms implemented in recent years in some Member States (most recently in CZ, HU, DK and PT), more policy action is necessary. In some countries, the scale of reforms to public pension systems has been insufficient and there is a critical need for ensuring that retirement behaviour takes due account of future increases in life expectancy, otherwise the pension bill will simply become unbearable.

Higher participation and employment rates are projected to occur as structural unemployment rates in a number of countries are projected to fall, brought about by reforms, including the flexicurity approach, that provide stronger work incentives. High unemployment rates are an enormous waste of potential resources, acting as a drag on the prosperity for society as a whole and especially for the individuals concerned as it adds to social exclusion. Also, high unemployment clearly constitutes a burden on public budgets. There is therefore a need to not only achieve the Lisbon targets, but also to surpass them and to work in a longer time horizon. The employment rate for women still lags behind that of men, despite recent progress. This represents a huge untapped resource for the European economy, and reflects an unacceptable level of inequality in terms of participation. Higher employment rates can lead to very large welfare gains. Higher employment does not, *per se*, lead to lower public spending on pensions as a share of GDP over the long run as higher/longer employment can result in the accumulation of greater and more adequate pension entitlements, thus contributing to social sustainability. However, measures which raise employment do strengthen the financial sustainability of pension systems by delaying the onset of expenditure rises and through increased contributions.

Increasing the employment rate of older workers is another area where progress has been made, but where much more can and needs be done. Employment of older workers has increased considerably in recent years. Yet, only around 50 per cent of people are still in employment by the age of 60. This represents a huge untapped potential and raising the employment rates of older workers, including those aged over 65 in the future, will remain a key policy objective for EU Member States.

Achieving the necessary extension in working lives will not be easy. It not only requires that tax/benefit and wage systems provide financial incentives for people to remain economically active and invest in building their own human capital, but it also means that there must be job opportunities for older people with appropriate skill sets. Policies to tackle age-discrimination and to promote life-long learning, flexible retirement pathways and healthy work conditions also need to be considered. Perhaps the most challenging aspect of efforts to rise effective retirement ages is the need to change the expectations and behaviour of employers and employees alike. Moreover, the concept of ageing is evolving, and with life expectancy projected to continue rising, retirement behaviour may also need to adjust continuously.

Reduced generosity of public pensions is also expected to contribute to keeping pension spending under control. The analysis shows that in the EU public pension benefits are rising slower than wages, implying that on average pensioners will experience a relative deterioration in living standards *vis-à-vis* workers in the future. The recent EC-EPC projections along with analysis carried out within the framework of Open Method of Coordination in Social Protection and Social Inclusion suggests that future relative pensioners' income will decline substantially in the number of Member States.[23] The 2006 report on sustainability of public finances considers the risk of inadequate pensions which may result in unforeseen pressure for ad hoc increases of pensions or higher demand for other benefits.[24] Thus the issues of pension adequacy, sustainability and modernisation need to be considered jointly.

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[23]   COM (2009) 58 final.

[24]   COM (2006) 574 final.

Table 7

Estimated Impact of Pension Reform on Participation Rates (2020, 2060)
Comparison of Projections with and without Incorporating Recent Pension Reforms
(percent)

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

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

Age	EA 2020	EA 2060	EA12 2020	EA12 2060	EU15 2020	EU15 2060	EU10 2020	EU10 2060	EU12 2020	EU12 2060	EU25 2020	EU25 2060
Males												
15-64	2.4	3.4	2.4	3.4	2.0	2.9	1.8	2.9	2.0	3.0	1.8	2.9
15-71	2.5	3.9	2.5	3.9	2.1	3.6	1.8	3.7	2.1	3.7	1.9	3.5
55-64	10.7	15.5	10.7	15.6	9.0	13.8	8.0	14.1	8.8	14.1	8.5	13.5
Females												
15-64	1.7	2.4	1.6	2.4	1.6	2.5	2.9	2.8	1.8	2.8	1.8	2.8
15-71	1.8	2.9	1.8	2.9	1.7	3.3	3.1	3.6	2.0	3.6	1.9	3.6
55-64	7.5	11.6	7.5	11.6	7.4	12.3	12.0	13.3	8.1	13.3	7.9	12.8
Total												
15-64	2.0	2.9	2.0	2.9	1.8	2.7	2.4	2.9	1.9	2.9	1.8	2.8
15-71	2.2	3.4	2.2	3.4	1.9	3.5	2.5	3.7	2.0	3.7	1.9	3.5
55-64	9.1	13.5	9.1	13.6	8.2	13.1	10.1	13.7	8.4	13.7	8.2	13.1

Source: Commission services, EPC.

Trends differ widely across the EU. In a few Member Sates (DK, IE, EL, CY, RO, UK), average pensions relative to wages remain unchanged or even increase over the projection period, while in most others (especially in BG, EE, FR, IT, LV, AT, PL, PT, SK, SE) it is projected to decrease up to 2060. The decrease in the generosity of public pensions is due to necessary pension reforms introduced in the majority of Member Sates in order to contribute to the sustainability of public finances over the long-term. In order to secure that retirement income is also adequate, many countries have introduced supplementary (private) pension schemes.

Additional pensions from private pillars, to compensate for the relatively lower pension income from public sources, are expected in a number of Member States. A number of countries have implemented systemic pension reforms, shifting part of the previously public pillar to a mandatory funded private pillar (BG, EE, LV, LT, HU, PL, SK and SE). At present, these private pillars are making very small disbursements since they have been set up mainly during the previous decade, but their importance will increase in the future. Some countries (e.g., SE, DK, and NL) also rely on 2nd pillar occupational pensions to a certain extent. Also, 3rd pillar non-mandatory pension schemes are increasingly being introduced, but their importance is generally small.

"Privatizing pensions" also entail important policy issues, as exemplified by the current financial crisis where assets invested in stock markets worldwide have tumbled. While moving towards more private sector pension provision can help reduce explicit public finance liabilities and improve (potentially) the sustainability of public finances, it also creates new challenges and forms of risks for policy makers. In particular, the importance of appropriate regulation of private pension funds and of careful surveillance of their performance for securing adequate retirement income need to be addressed, as the current financial and economic crisis have made adamantly clear.

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