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COMMISSION STAFF WORKING DOCUMENT

Employment and Social Developments in Europe 2017

Chapter 4

**Securing good living standards in retirement
also in the future**

EN   **EN**

Securing good living standards in retirement also in the future

1. INTRODUCTION ([1])

At present the welfare situation of people aged over 65 in the EU is relatively favourable but it is likely to worsen in the coming decades. Their income has been steadily increasing over the last decade while poverty rates have declined. The majority of older people in the EU are homeowners and they have relatively good access to essential services. However there are important differences between Member States and even in those Member States where older people's overall situation is generally favourable, significant variations can be found at subnational level or for different groups of older people. And due to demographic change, those who are currently young are likely to see their welfare affected by far-reaching changes to social protection systems by the time they reach old age. In particular, they can expect a higher retirement age, a less adequate pension and higher contribution rates to support the increased number of retirees.

Demographic dependency is expected almost to double by 2060. Increasing longevity will bring fast-increasing numbers of elderly people. The size of the working age population, here defined as those aged 20-64, has been declining since 2010 and will continue to decline over the coming decades. Chapter 2 has shown that this future decline in the labour supply is likely to limit the EU's potential growth and thus the resources available for distribution across the generations, which is highly relevant to the issue of intergenerational fairness. This chapter addresses a different question: how to make sure that the distribution of (limited) resources across the generations will be fair or, in other words, how to ensure the socio-economic basis for a better deal for all generations. Clearly, fair distribution will become an increasingly urgent question as the number of people aged 65+ per 100 people aged 20-64 rises from today's 32 to 57 by 2060, according to the latest Eurostat projections.

Higher demographic dependency will render distribution of resources more difficult. Social security schemes are central to the question of fairness in the resource distribution from one generation to another. Higher demographic dependency constitutes a challenge to the implicit generational contract in social security systems which distribute resources from younger to older generations. Projections in the

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([1]) This chapter was written by Jörg Peschner and Katarina Jaksic with contributions from Alessia Fulvimari, and Fritz Von Nordheim.

2015 Ageing Report show that, without the reforms already adopted, demographic change would have increased social security expenditure considerably by the year 2060 – a rise of 7 % of GDP for pensions only. Without effective reforms, sustaining pension systems would require significantly higher contribution rates and/or higher government transfers to the pension system and, therefore, higher taxes. Both would have to be borne by the current working-age population. As a result, take-home pay would be reduced and/or progress in terms of productivity and employment growth would be undermined by increased labour costs. This is why measures to achieve a generationally fair distribution of resources affect not only the current incomes of younger workers but also their labour market prospects. Undermining these prospects could put the solidarity of young contributors with older dependents (which is at the heart of the generational contract) at serious risk in the future.

Future generations will face a double burden. It is likely that reforms will reduce pension levels in the future so as to keep contribution rates from climbing too strongly. As a result, future workers may face a double burden. On the one hand, they may have to pay higher contribution rates than today's workers. This may raise labour costs and thus crowd them out of the labour market or reduce their net income. On the other hand, if their labour market prospects worsen and the general pension level declines, they may also receive a lower pension after retirement.

Member States have engaged in various reforms that are projected to limit pension expenditure significantly. Most importantly, pensionable ages have been raised almost everywhere and will be increased further in the future. The general trend has been to introduce penalties in cases of early retirement and to pay supplements if someone postpones taking up their pension after they have reached official retirement age. At the same time, annual indexation of pensions has been cut significantly and will be cut further, so as to curb expenditure increases that come as a result of wage growth and inflation. However, the full impact of many of these reforms will only be felt in the future, affecting today's young people as they age rather than today's pensioners.

While ageing affects all social security schemes, this chapter focuses on reforms that promote intergenerational fairness by curbing future pension expenditure and/or encouraging older people to remain or become active in the labour market [2]. It starts with a look at the current level of pensions as the most important source of older people's income and briefly addresses other elements that play a role in the welfare of older people. It reviews current projections of pension expenditure and the impact of reforms. And it simulates exemplary reforms from selected countries to show how these could impact on all generations' income and the labour market situation of both young and older workers.

2. THE CURRENT SITUATION OF OLDER PEOPLE

The welfare of older people is primarily determined by their income, accumulated wealth and access to essential services. The main source of income in old age is pensions, which are the focus of this chapter (*Chart 4.1*). The level of pension benefit a person receives after retirement is affected both by their working history and by the features of the pension system. Working histories are mostly determined by the length of the working career, career interruptions and the level of income from work. In terms of pension system characteristics, the key elements that affect pension benefits relate to the generosity of the system in terms of the calculation of benefits, official retirement ages, bonuses and penalties, pension credits and derived pension rights. However, to get a comprehensive picture of the current situation of older people, it is important also to look at income other than pensions, such as that generated from employment after reaching retirement age and accumulated wealth (housing). Provision of services, primarily healthcare, which differs considerably across Member States, also contributes to the overall welfare of this age group compared with younger groups.

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[2] Other social security systems, e.g. the health care system, also represent an important challenge in terms of sustainability and intergenerational fairness but are beyond the scope of this chapter. For further reading on projected developments in those, see European Commission (2015b).

2.1. Pensions protect those aged over 65 rather well against poverty

Income developments for the population aged 65 and over are to a very large extent driven by pensions. The income from pensions constituted over 80 % of the disposable household income ([3]) of those aged 65+ ([4]) in 2014 (*Chart 4.1*). There are great variations between Member States: the proportion of pensions in disposable household income ranges from 67 % in Bulgaria to over 100 % in Sweden and Germany ([5]). Pensioners relied more on income from pensions in 2014 than they did in 2007, except in a few Member States such as France, Poland, Slovakia, the Netherlands and Spain.

Other sources of income represent a small proportion of the total income of those aged over 65. In addition to pensions, the most important sources of income are income from renting out property, labour and self-employment. The share of income from labour represented 1.8 % of total disposable income in the EU in 2014 for this age group (up to 7.1 % in Latvia) and income from self-employment 1.5 % (up to 3.3 % in Ireland). Income from renting out property represented 2.1 % of income (up to 5.1 % in Luxembourg).

Chart 4.1
Pensioners rely on pensions as the main source of income
Equivalised income from pensions as a proportion of equivalised disposable household income for those aged over 65, 2007 and 2014

% of equivalised disposable income
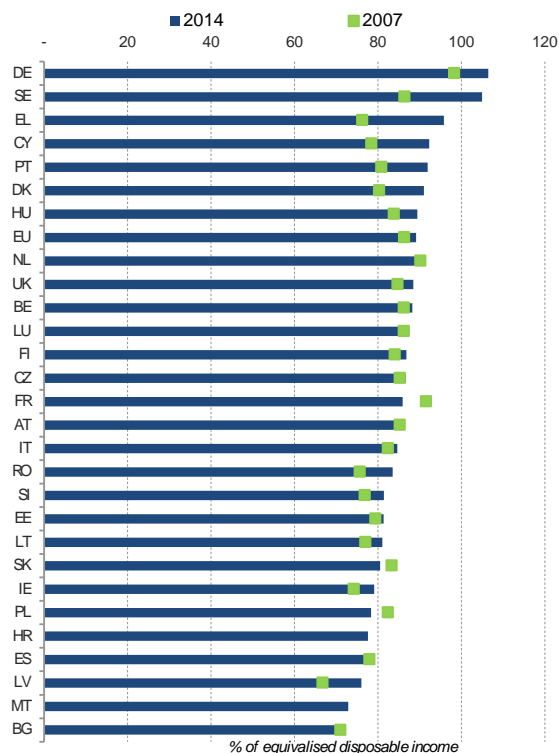
Source: DG EMPL calculations based on EU-SILC cross-sectional data 2007 and 2014 (UDB).
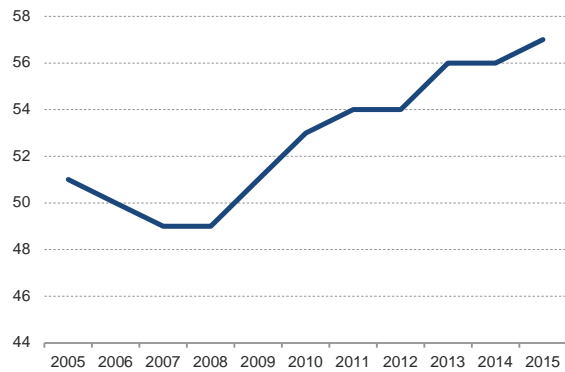
Click here to download chart.

Increases in real median pensions have contributed to the improvement in older people's relative income in the EU over the last decade. Between 2007 and 2014, the real median net pension increased by 6.5 % at the EU level, contributing to the improvement in the situation of older people relative to other

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([3]) Incomes are equivalised. Equivalised income is a measure of household income that takes account of the differences in a household's size and composition, and thus is equivalised or made equivalent for all household sizes and compositions. It is calculated by dividing the household's total income from all sources by its equivalent size, which is calculated using the modified OECD equivalence scale. This scale attributes a weight to all members of the household: 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14. The equivalent size is the sum of the weights of all the members of a given household. Income from pensions is also equivalised as total household income and refers to net pensions (old-age benefits and survival's benefit).

([4]) Due to major differences in the proportions of older people not living in private households across Member States, the results for older people's relative situation in different Member States should be interpreted with caution, see Box 4.1.

([5]) Negative income is being taken into account (such as losses), which is why the pension share can exceed 100 %.

age groups. Pensions grew the most in some Member States that joined the EU in the 2000s, Sweden, Denmark, Spain and Ireland, while they decreased in Hungary and the UK. The increase observed at EU level is in line with favourable changes since the beginning of the crisis in the aggregate replacement ratio ([6]), which relates the gross pensions of those recently retired (aged 65-74) to the gross earnings of those approaching the end of their working lives (aged 50-59) (*Chart 4.2*).

Chart 4.2
Gross pensions of young pensioners have increased
compared with gross earnings of older workers
Aggregate replacement ratio EU28, in %, 2005-2015

Note: EU27 instead of EU28 in 2005-2009.
Source: Eurostat [tsdde310]
Click here to download chart.

Higher educational attainment translates into higher pensions. Not surprisingly, pensions increase with the educational level of pensioners. At EU28 level, the median income from the pensions of those with higher education is almost double that for those with a low level of educational attainment. The difference is even greater in several Member States which joined the EU in the 2000s and in the Southern Member States. The current wage premium from higher education - both during and after working age - strengthens the case for investing in education, not only to boost labour market prospects and earnings from work but also to secure good living standards after retirement. This is particularly important as the wage premium from higher education has been increasing, despite the increasing proportion of those with higher educational attainment ([7]).

([6]) The aggregate replacement ratio covers old age benefits, survivor benefits and individual private pension plans. It is limited in the age ranges that it covers to 65-74 and 50-59. It is calculated on individual gross incomes; therefore it does not take into account the household composition and taxes/social benefits, which can have a considerable impact on the income situation. Lastly, it is limited in the sense that it compares the income situation of two different cohorts.

([7]) See OECD (2011).

Chart 4.3

Pensions protect well against poverty in the EU

Relative poverty gap of income from pensions, 2014
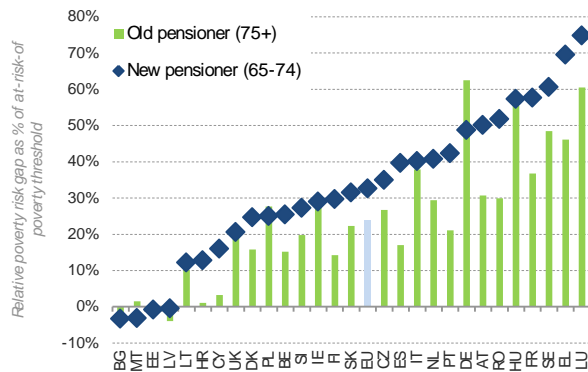
Note: The relative poverty risk gap of income from pensions represents the difference between the median equivalised income from (net) pensions and the at-risk-of-poverty threshold, expressed as a percentage of the latter. Negative values indicate that the median pension is below the poverty threshold. EU unweighted average.

Source: DG EMPL calculations based on EU-SILC cross-sectional data 2014 (UDB)

Click here to download chart.

Pensions provide considerable protection against poverty in the EU. While pensions make up a high proportion of pensioners' disposable income, testifying to the importance of social protection systems for older people's living standards, adequate pension levels protect older people from poverty ([8]). In the majority of Member States, the median income from pensions is above the national at-risk-of-poverty threshold, both for younger pensioners (65-74) and those aged 75 and older (*Chart 4.3*). While pensions provide especially strong protection against poverty in Luxembourg for all pensioners and in Sweden and Greece for younger pensioners, this protection is considerably lower in other Member States (e.g. Bulgaria, Malta, Estonia and Latvia). Income from pensions is generally higher for younger pensioners except in Germany and Malta ([9]).

The income poverty risk for people over 65 is lower than for the rest of the population in the EU. In 2015, this was the case in almost two thirds of the Member States. Nevertheless, cross-country variation in levels was substantial, with more than 20 % of older people being at risk of poverty in the Baltics, Croatia, Bulgaria and Malta. In all these Member States the proportion of older people at risk of poverty is higher than that of the rest of the population and the proportion of older women at risk is substantially higher than that of older men.

The reduction in old age poverty partly reflects the fact that the crisis had a stronger impact on income from work than on pension income. Over the past decade, the income poverty risk has decreased substantially for the population aged over 65, while it has increased for younger people. The underlying measure of poverty is a relative one and main income sources vary with age. As shown above, pensions are older people's main source of income, whereas income from work represents the highest share of total income for the younger, active population (see Chapter 3). While income from work was adversely affected by the crisis, median pensions increased in both nominal and real terms in 2007-2014, mainly due to the indexation mechanism in place to protect the living standards of pensioners ([10]).

Pensions have been relatively well protected despite crisis-related fiscal adjustment needs. In response to the need for budgetary adjustments, some Member States tried to lower pension expenditure through various measures: direct pension cuts, temporary or permanent freezes/reductions in pension indexation or higher taxes/contributions for pensioners. These measures were generally adopted in the Member States hardest hit by the crisis, i.e. in Southern Europe, the Baltics, some Central and Eastern European countries and Ireland, in order to spread the burden of the crisis more equally across the different age groups. However, to the extent that these measures reduced the acquired rights of current


([8]) See note under Chart 4.3

([9]) One reason in Germany could be that Eastern German pensions tend to decline as long spells of unemployment after the reunification reduce new pensions.

([10]) See European Commission (2017),

pensioners, they were often challenged in national courts and subsequently reversed ([11]). Overall, income from pensions was relatively well protected during the crisis.

Chart 4.4
Income inequality remained stable at a low level for those aged over 65 while it increased for younger people
Income quintile share ratio (S20/S80), EU28
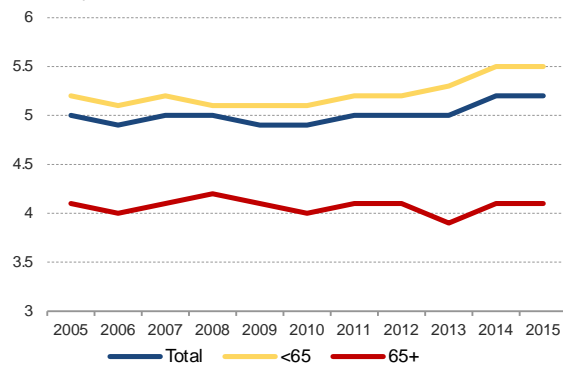
Note: EU27 instead of EU28 in 2005-2009
Source: Eurostat [tessi180]
Click here to download chart.

Moreover, income inequality among the elderly is lower than at younger ages, which may have contributed to the drop in the poverty rate for older people. Since 2010 the incomes of the elderly remained less dispersed than incomes among younger age groups, for whom inequality increased (*Chart 4.4*). This means that the relative improvement for the elderly was widely shared among this relatively homogeneous group, allowing many to 'step over' the stagnant national poverty thresholds. Income inequality among those aged over 65 is highest in some Southern and Member States that joined the EU in 2010s.

2.2. Accumulated wealth contributes to the favourable relative situation of older people

Material welfare does not depend only on income but also on wealth. Wealth accumulation is important because on the one hand it affects current income flows and on the other hand, accumulated assets affect households' ability to adjust consumption in the face of income shocks. Consumers who aim to preserve their living standards accumulate assets during their working lives and use up the wealth they have accumulated during their retirement years ([12]). They also accumulate wealth because health in old age is particularly uncertain or in order to pass it on to their children. Such private transfers can play a significant role in smoothing intergenerational inequalities within families, but can reduce social mobility and increase inequalities within generations if wealthier individuals are also more likely to receive (higher) private transfers from their parents or grandparents.

([11]) See European Commission (2015a), page 175-8.

([12]) Modigliani's life-cycle hypothesis (see Deaton (2005)).

Chart 4.5
Wealth decreases slowly after retirement
Net wealth by age, EUR thousands (PPP), 2016
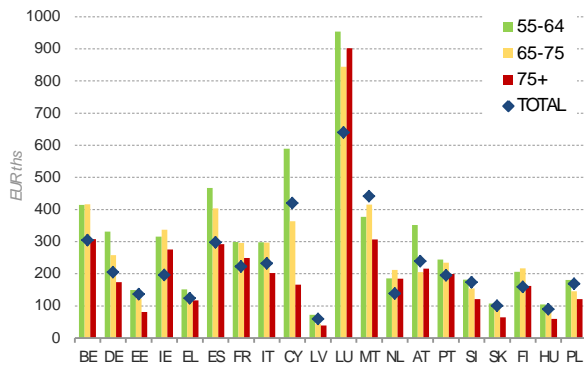
Note: Net wealth is the difference between total household assets and total household liabilities. Data collected during different periods between October 2011 and June 2015.

Source: European Central Bank, The household finance and consumption survey, Wave II.

Click here to download chart.

Wealth decreases slowly after retirement. After the age of 65, younger pensioners in EU countries ([13]) tend to hold at least as much wealth as the total population, except in Austria, Cyprus and Malta (*Chart 4.5*). Overall, net wealth decreases somewhat from the age of 75, except in Luxembourg where the oldest age group owns the most wealth. While available data do not allow longer-term trends in asset holdings across age groups to be measured, in 2013 - 2016 ([14]) the net wealth of the two oldest groups decreased less than that of the working age population.

Ownership of a home, the most common form of household asset, is widespread among older Europeans. In the EU, where 61.2 % of the total population are homeowners, 71.9 % of those aged 65-74 and 68.0 % of those aged 75+ own their own homes. The differences across Member States are substantial: home ownership by those aged 65+ is particularly low in Germany and Austria ([15]), and high in some Eastern and Southern Member States ([16]). This reflects the overall home ownership pattern in the Member States.

Older people's homes are also in better condition than those of the rest of the adult population. The proportion of older people living in households subject to severe housing deprivation, which measures poor amenities ([17]), is lower than the proportion of the population aged 18-64 subject to the same deprivation. This is true throughout the EU, but the levels of deprivation across Member States vary considerably for this age group – from 0.3 % in Cyprus to 8.9 % in Romania. In almost all Member States, the proportion of men over 65 living in severely deprived households is equal to or lower than the proportion of women ([18]). Severe housing deprivation decreased slightly more after 2005 for the population aged 18-64 than for those aged 65+ (3.5 pps compared with 2.4 pps in the EU overall) but the proportion of the population aged 65+ experiencing severe housing deprivation is still smaller. This trend was particularly evident in the Member States that joined the EU in 2000s, where housing deprivation overall (including for the population aged 65+) is higher than in most other Member States.

Many older people are 'overburdened' with housing costs but the proportion affected is slightly lower than for the working age population. 'Overburdened' here means that more than 40 % of their

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([13]) Data only available for Member States presented in the graph.

([14]) Data published but collected at different points in time prior to 2013.

([15]) This also reflects the levels of total wealth of older people in these countries as property ownership stimulates accumulation of wealth.

([16]) The comparison between age groups in relation to housing has to be interpreted with caution as the cohort effect might bias the results to some degree. The observed age groups differ not only in mortality rates, resources and institutional arrangements but also in preferences regarding renting or owning. Nevertheless, previous studies, taking the cohort effect into account, have reached similar conclusions on declining homeownership after 75. See Chiuri et al (2010).

([17]) Households are said to suffer housing deprivation if their dwelling is overcrowded, has a leaking roof, has no bath/shower or indoor toilet, or is too dark.

([18]) This may be linked to the fact that on the whole women tend to have accumulated lower pension rights and to live longer.

disposable household income ([19]) is spent on housing. However, there are significant variations between Member States; older people are the least overburdened with housing costs in Malta and Cyprus, where the overall levels of housing cost overburden are low. In all Member States women are more likely to be overburdened than men. Older people are more overburdened with housing costs than the rest of the population in some Member States that joined the EU in 2000s and also in Germany, Denmark, Sweden and Belgium.

Taking housing costs into account further improves the relative position of older people. When housing costs are reflected in the calculation of old age poverty and severe material deprivation, the situation of older people improves further compared with the rest of the population. This is partly due to older people's high level of home ownership. Taking into account imputed rents ([20]) lifts a significant proportion of those aged 50 and over out of poverty, while increasing the poverty rates of those under 50.

2.3. The length of working lives has been increasing

Longer careers can make an important contribution to older people's welfare and to intergenerational fairness. While the incidence of fragmented careers and atypical employment has been increasing, especially for young people (see Chapter 3), longer and complete work histories as well as full time employment contribute to the sustainability of the pension systems while ensuring the adequacy of the individual's pension (see Section 3.4 in this chapter). Employment after pensionable age can assist social inclusion while also creating opportunities to diversify incomes beyond pensions.

The average number of years spent in retirement stopped increasing only recently. Today women spend 22 years in retirement on average. For men the period is slightly shorter (18 years). The average length of retirement has increased by seven years since 1970 across all OECD countries ([21]). This increase is the result of a long-term decrease in the effective exit age from the labour force on the one hand and increased longevity on the other. However, in the last decade the average length of working lives in the EU-28 has increased by about two years, which is close to the increase in life expectancy at birth over the same period, thus stabilising the time retirees are entitled to pension benefits. The duration of working lives has increased, notably for women. However, women in the EU still have considerably shorter careers than men (32.8 years compared with 37.9 years), which has a negative impact on their pension benefits ([22]).

In a context of increasing longevity and demographic change, the prolongation of working lives is a crucial factor from an intergenerational fairness perspective as it generates higher income and expands the base from which contributions to the pension systems are paid. Thereby it not only finances a higher pension bill for the increasing number of people in retirement in the coming years but will also help to maintain a certain level of pension adequacy for today's younger people when they retire.

As workers age, their attachment to the labour market gradually weakens. The proportion of workers in the age group 55-64 who are employed remains substantially lower than for the working population overall (55.3 % vs. 71 % in 2016). Employment rates in the EU are much lower for the age group 65-74 (9.3 % in 2016) and lower still for those older than 75 (1.4 %). The differences across Member States are considerable for younger pensioners aged 65-69 (from 31.8 % in Estonia to 3.2 % in Luxembourg).

Yet older workers tend to be more satisfied with their job than prime-agers. *Box 4.1* reveals that people's overall job satisfaction in the EU tends to be very high when they start their job at a young age, but then declines. However, it starts increasing strongly as people pass their mid-40s and especially after the age of 55. At the same time, job quality ([23]) seems to have improved over the last decade, as shown in

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([19]) The income is equivalised (see Footnote 3).

([20]) See European Commission (2013).

([21]) See OECD (2015), pp 164-165.

([22]) Additional factors that contribute to women's lower pension benefits include more career breaks, gender wage gaps and pension system design.

([23]) Eurofound measures job quality on the basis of a composite indicator as explained in Chapter 3.

Box 4.1: Workers seem to re-gain job satisfaction when getting older: a regression analysis on Eurofound's 6th European Working Conditions Survey

Micro data on the 6th Working Conditions Survey (2015) by Eurofound allow an analysis of the factors driving job satisfaction. Answers to the survey's question on overall job satisfaction, ranging from 'not at all satisfied' to 'very satisfied', were regressed against major individual determinants of job satisfaction. In addition to age, the following variables were taken into consideration as control variables: gender, education, work sector, occupation, being self-employed or not, country. This means that in order to analyse the impact age has on job satisfaction, the analysis assumes no difference in those control variables between people.

As regards the age variable, a U-shaped curve of job satisfaction (blue bars) can be identified. People tend to be most satisfied when starting their job at a young age. As age increases, job satisfaction tends to decline until the mid-40s and then increase again. The odds of being more satisfied with one's job are significantly higher for workers beyond the age of 55, compared with workers between 35 and 54 years of age.

The difference becomes even more significant if the health effect is neutralised, i.e. the fact that older workers tend to feel less healthy than their younger peers is taken into account (red bars).

Chart 1
Older workers tend to be satisfied with their job.
Statistical odds of having a higher job satisfaction, taking into account important individual control variables (see note)
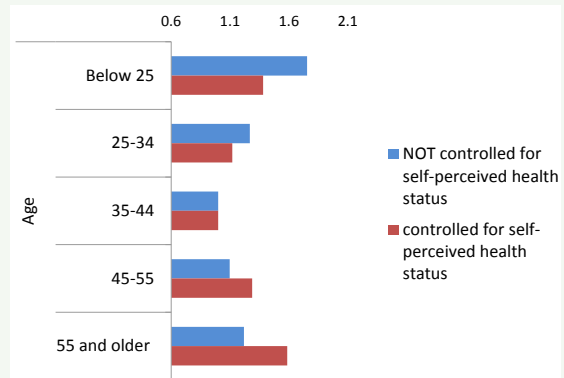
Note: Controlled for gender, education, occupation, economic sector, employment status (self-employed, employee), country.
Source: DG EMPL calculations based on Eurofound's 6th European Working Conditions Survey (micro data)


Chapter 3. Both findings together are strong arguments for keeping workers older than 55 years in the labour market.

The employment rate of older workers has increased considerably, but not yet for those aged 65 and over. Higher job-satisfaction at older ages may have contributed to a strong increase in the employment rate of people aged between 55 and 64 years since 2000 (see Chapters 1 and 3). However, only moderate increases have been recorded for those aged 65-74 (*Chart 4.6*). Almost half of those who stay in the labour market after the age of 65 are self-employed.

Chart 4.6
The employment rate of older workers (aged 55-64) has been increasing the fastest
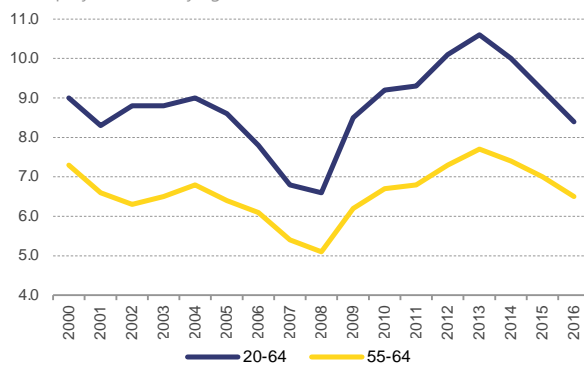Employment rate by age, 2000-2016
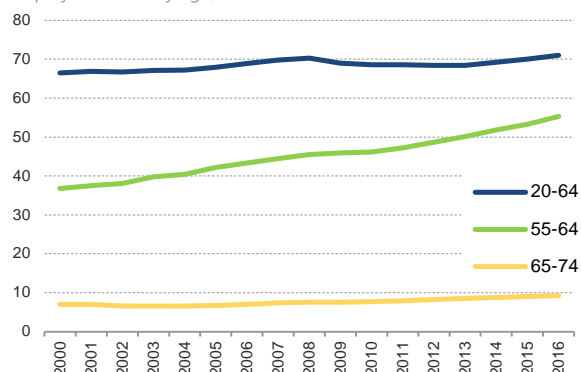
Note: EU27 instead of EU28 in 2000-2001
Source: Eurostat, LFS (lfsa_ergan)
Click here to download chart.

Chart 4.7

Unemployment of older workers is lower than that of the total working age population

Unemployment rate by age, 2000-2016

Note: EU27 instead of EU28 in 2000-2001

Source: Eurostat, LFS (lfsa_urgan)

Click here to download chart.

The proportion of unemployed older workers is lower than the proportion of unemployed in the total working population. This is the case in all Member States except the Netherlands and Estonia. Since 2000 the unemployment rate of older workers has been following the same trend as that for the total working age population but at a lower level (*Chart 4.7*). The relatively low unemployment rate of older people, combined with the increasing employment rate and longer working lives, reinforces the intergenerational contract.

## 2.4. Access to healthcare decreases only slowly with age

Access to services such as healthcare matters for older people's living standards. The living standard of the elderly is not determined only by their income, wealth and employment opportunities but also by their access to services. The most relevant services for this age group are healthcare and long-term care. Therefore it is important to consider the extent to which older people have access to these services.

Despite potentially higher needs, older people report only slightly worse access to healthcare than the rest of the population. At the EU level the proportion of older people who find access difficult is somewhat higher than for the rest of the adult population, but it remains at a relatively low level (*Chart 4.8*). The age-related difference may be partly because the needs of older people are higher as health deteriorates with age. The difference between the two age groups of older people is relatively small, except in Romania, where older people's access to medical care is substantially lower than elsewhere. From an intergenerational perspective it has been argued that in Europe the cost structure of healthcare insurance systems has been tilted towards the increasingly expensive care for older people ([24]). However, in the Baltics and some Southern and Eastern Member States older people face more significant challenges in accessing these services because they are too expensive, too difficult to reach or there are delays as a result of long waiting lists. Older people's access to healthcare services has worsened slightly since the crisis, albeit less so than access for those aged 16-64. The situation has deteriorated most for older people in Greece, Estonia and Finland, while improving considerably in Bulgaria.

([24]) See European Economic Advisory Group (EEAG) at Cesifo (2016), p. 57.

Chart 4.8
Unmet need for medical care increases slowly after 65 with
differences between Member States
Self-reported unmet needs for medical examination as it is too
expensive, too difficult to reach or delayed due to waiting lists: by age
and MS, 2015

% of population
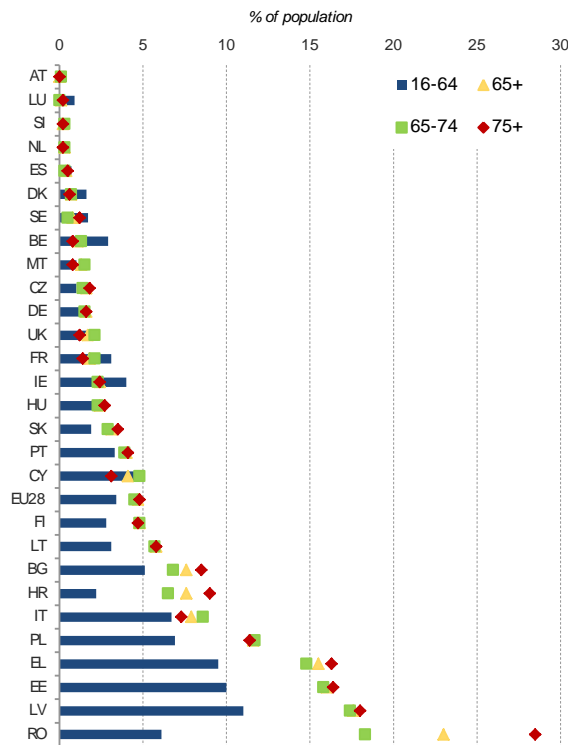
Source: Eurostat, (hlth_silc_21)
Click here to download chart.

Access to long-term care services is important **to the wellbeing of the elderly.** The extent to which needs for long-term care are met is more **crucial** to wellbeing for older people than for other age groups, as the old are the primary users of such services. Long-term care services cover a wide range of support measures provided for those who depend on the help of others in their daily living. These support measures can entail healthcare services and/or social services such as preparation of meals, dressing or housekeeping. Given the demographic trends (see Chapter 1), the need for integrated long-term care services is expected to rise. However, data on access to long-term care services are rather limited. Focussing on the age group 65+, one study concludes that one third of those in need do not receive adequate care in the 12 EU Member States examined ([25]). For those with high levels of need, the unmet need declines considerably, but is still significant.

3. GENERATIONAL FAIRNESS TODAY AND TOMORROW

As shown in the previous section, from a micro perspective, today's pensioners are, on the whole, relatively well protected and their public pensions are and will remain their main source of income in old age. From a macro perspective, public pension systems will thus continue to play a major role when it comes to distributing resources fairly across generations. This section looks at the share of social spending devoted to pensioners today; it outlines the potential impact of future pension and labour market reforms inspired by demographic developments; and it identifies risks for future generations from the cost pension systems will impose on them and the less adequate income they will provide.

([25]) See Laferrère and Van den Bosch SHARE (2015), p. 338. Countries covered: SE, DK, DE, NL, BE, FR, CH, AT, ES, IT, SI, SE.

3.1. The EU's public pension systems redistribute from today's workers to today's pensioners

Pay-As-You-Go pension schemes are dominant in the EU, and are likely to remain so. In contrast with pre-funded pension schemes where contributors' money is being invested with a view to paying the contributors pensions in the future, pay-as-you-go systems collect from the contributors and pay out to pensioners immediately. By contributing to a pay-as-you-go pension scheme today, people acquire an entitlement to pension payments in the future - payments which typically depend on today's level of compensation. Pay-as-you-go systems thus promise future pension payments to today's contributors. Despite pre-funded pension schemes becoming more important, all EU Member States rely on pay-as-you-go public pension systems as the main providers of pensions. This situation is projected to continue at least until the 2050s – even if by then in 15 rather than the current 6 Member States the proportion of pre-funded pensions in the total pension income of an average income earner will be 20 % or more ([26]).

In recent decades, implementation of this 'generational contract' has been facilitated by supportive demographics and steady growth. In 1960 there were 17 people aged 65 and over per 100 people of working age (20-64) in today's EU-28 countries. Since then, this demographic dependency rate has almost doubled. As indicated in Chapter 2, in absolute terms, the working-age population steadily increased until 2009 (by one third in total) and the EU's economies grew relatively fast. The average annual real GDP growth for the EU-15 has been almost 3 % over the entire period 1960 to 2015. These conditions made it possible to redistribute higher shares of national income to pensioners and to grant workers generous conditions for retirement. From 1970 until the late 1990s (the peak time for early retirement) the average effective age of retirement decreased by more than six years, down to 62 years for men, 60 years for women ([27]). It has increased by two years since, thanks to action taken by the Member States to end costly early retirement practices. In 2009 in 13 Member States the official pensionable age was still no higher than 60 years (for women). Today there is only one such case ([28]).

3.2. Much of today's social spending is on pensions

Higher longevity and relatively generous retirement conditions, including early retirement options, have contributed to today's high level of spending on pensions. *Chart 4.9* reveals that today, on average, the EU's public social expenditure amounts to 29 % of GDP and that almost 13 % of GDP is spent on old age and survivor pensions. The proportion of total social expenditure which is pension expenditure differs across Member States, as do the living standards of older people (see Section 2). 'Other expenditure' includes those functions which can be classified (at least to some extent) as 'spending on present and future workforce'. This includes healthcare, disability, family and child-related spending, unemployment benefits and spending on housing.

Social spending is often criticised for being skewed towards old age. Pension systems, by generating the generous pensions being paid today, could be said to be protecting current pensioners at the expense of investment in the present and future workforce and this under-investment comes at the cost of lower future productivity. It has thus been argued that "the socialisation of old age provision [was] backward-looking and [ran] counter to investing in young people" ([29]). At the same time, there was "a risk of substantial under-spending on the forward-looking aspect of the socialised contract [that could] be seen as investment in future generations". Similarly, the view that EU Member States are spending "a lot for old age, yet little for education" ([30]) has gained traction in recent years.

In nine EU countries, expenditure on pensions accounts for more than half of social expenditure. In Greece the proportion is almost two thirds. The striking dominance of pension expenditure in Greece

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([26]) See European Commission / Social Protection Committee (2015), pp. 17, 28. The share will be 40 % or more in DK, IE, NL, RO, UK.

([27]) OECD estimates based on the results of national labour force surveys, the European Union Labour Force Survey and, for earlier years in some countries, national censuses. See http://www.oecd.org/els/emp/average-effective-age-of-retirement.htm.

([28]) See European Commission / Social Protection Committee (2015), p. 184.

([29]) See European Economic Advisory Group (2016), p. 54.

([30]) See Frankfurter Allgemeine Zeitung, March 6, 2017.

"leaves very little room for other expenditure, particularly those that protect the poorest" ([31]). Recent reforms implemented under the Economic Adjustment Programme for Greece have started to address this imbalance: a major pension reform adopted in 2016 is expected effectively to curb pension expenditure, while the system of social benefits is being restructured and enhanced. In particular, a universal means-tested social assistance benefit has been introduced for the first time in Greece. Eight other countries (Cyprus, Hungary, Italy, Latvia, Malta, Poland, Portugal, Romania) allocate well over 50 % of their social expenditure to public pensions. Several of these countries also tend to have rather meagre unemployment schemes with very low spending on active labour market policies (ALMP). In contrast, ALMP spending is many times greater in the four countries where the proportion of spending on pensions is the lowest (Belgium, Germany, Luxembourg, the Netherlands), even after controlling for differences in purchasing power ([32]). The same correlation holds for the Southern Member States in relation to their (very low) spending on education. In the future such under-investment in the present and future workforce may prevent future working cohorts from being able to contribute to social security and become productive workers – though they are needed to cope with the future workforce decline, as demonstrated in Chapter 2.

Chart 4.9
Much of social expenditure is on pensions
Social expenditure in % of GDP, 2014
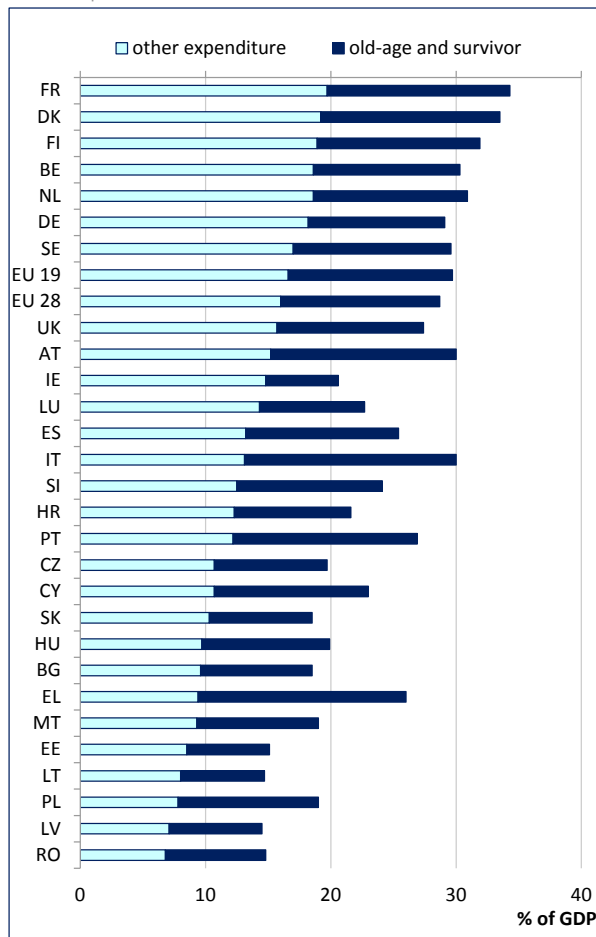
Source: Eurostat ESSPROS
Click here to download chart.

The share of social expenditure dedicated to pensions has been increasing recently. Since 2006 public pension expenditure as a proportion of GDP has risen in all Member States except Germany and Poland. In most Member States the share of resources going to pensioners grew by more than would have been justified by the change in the proportion of people aged 65+ (*Chart 4.10*).


([31]) See World Bank, Greece Social Welfare Review (2016).

([32]) Source: European Commission, Labour Market Policy database (http://ec.europa.eu/eurostat/web/labour-market/labour-market-policy/database).

Chart 4.10
An increasing share of the pie goes to pensioners
Change from 2006 to 2014 in the proportion of expenditure on old age
and survivor pensions in GDP

■ Change (pps)

■ Change, but controlled for the share of people aged
   65+ (pps)
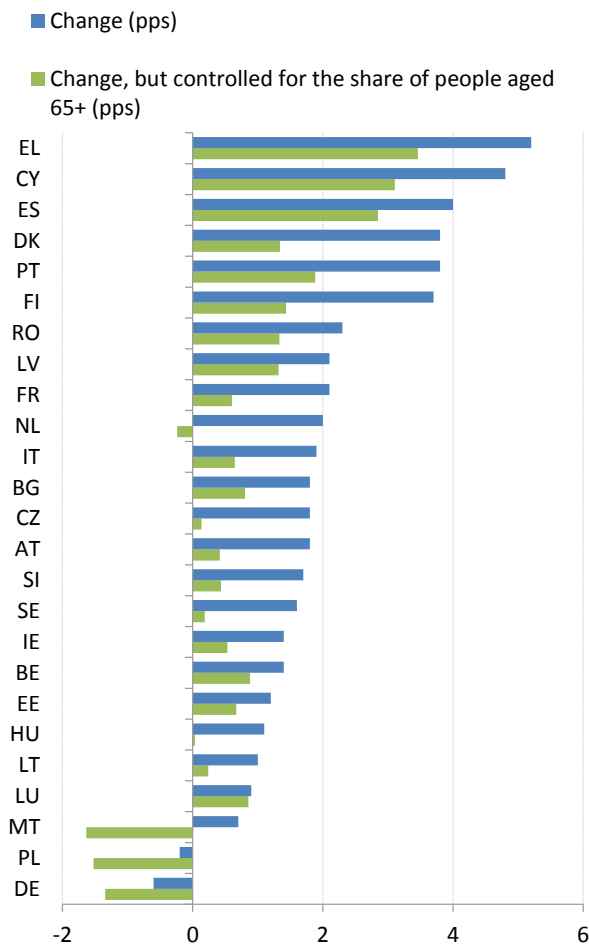
Note: No data for Croatia

Source: DG EMPL calculations based on Eurostat ESSPROS

Click here to download chart.

The crisis has thus led to a considerable further redistribution of social expenditure towards pensions, confirming the finding above that the safety mechanisms in place protected pensions from negative changes ([33]) while wage growth decelerated ([34]) due to fast-deteriorating labour market conditions. Moreover, as the crisis dragged on, entitlements to unemployment benefit and social assistance schemes expired and/or benefit levels were reduced ([35]).

In addition, the crisis resulted in a substantial rise in public debt (from 58 % to 85 % of GDP in the EU and 65 % to 90 % in the euro area), because of crisis-related higher fiscal deficits and the need to support the financial sector. The increase in the debt level restrains the fiscal space for current and future spending, while investment remains low. It has thus added to the burden on younger and future generations.

High expenditure on pensions is leading increasingly to questions about the adequacy of future pensions and the generational contract. By 2060, demographic dependency is projected to have almost doubled, from today's 32 people aged 65+ per 100 aged 20-64 to 57 people, raising the number of pensioners per contributor as discussed in Chapter 2. At the same time, the working-age population will decline in absolute terms.

([33]) See Section 2.1 above for details.

([34]) During the period 2009 - 2011, nominal compensation actually declined year-on-year in Ireland, Romania, the Czech Republic, Greece and, in particular, the Baltics (Eurostat National Accounts).

([35]) See European Commission (2016), Chapter 1.

The EU's pension systems would, in the absence of cost-containing reforms, have to raise contribution rates considerably in the next few decades to cover additional expenses. *Box 4.2* presents a simple illustration of this trade-off between pension system sustainability and adequate pensions. Assuming a freeze of today's pension benefit ratio [36], in this simplistic model [37] pension contributions would rise to 25 % of gross wages to accommodate expenditure increases resulting from demographic change in the absence of subsidies from the general government budget. Assuming on the other hand a freeze of contribution rates, the pension benefit ratio would drop from 47 % today to 25 % due to ageing. This shows the trade-offs policy-makers today would face if the pension age were not increased in parallel. The middle scenario similar to the one shown in *Box 4.2* is likely to become reality: Governments limiting the increase in the contribution rate to a certain extent through the implementation of reforms that reduce pension levels. In practice, keeping in mind that contribution rates reduce net income and lower incentives to work and hire, cost-containing measures tend also to include an increase in retirement age (which happens only very gradually) as well as a lowering of future pension levels which can in turn cause adequacy problems in the longer run.

Today's young workers and future cohorts are likely to face a double burden. According to the middle scenario in *Box 4.2* they would have to pay higher contributions than today's workers throughout their working lives. Yet their pension level would be lower than for today's pensioners as a result of reforms that will reduce pension levels in the future. This situation will extend through the entire transition period of demographic change. It will thus affect all future cohorts, who will be part of a declining workforce. Bearing in mind that the working-age population is expected to decline after 2080, this implies that the transition period for future cohorts facing the double burden will reach far into the next century.

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[36]   The pension benefit ratio relates average pension benefits to average wages.

[37]   The model looks at demographic change as the only driver of pension expenditure and contributions to the EU's pension systems. To the extent that increases in the contribution rate are curbed, the model implicitly takes on board pension reforms that cut expenditure.

## Box 4.2: Double burden for today's young and future generations

The following simplified illustration demonstrates that the current workforce and future cohorts will be exposed to a double burden resulting from demographic change, consisting of higher pension contributions and lower pensions.

For the EU as a whole, it is assumed that people aged 20 to 65 years contribute to a single pension system. At the same time, people older than 65 years receive a pension. The model is calibrated so that the income from which the pension contribution is taken is equal to the EU's annual average gross wage and salary (some 33.000 euro). The EU's actual pension systems pay a pension equal to 47 % of that income (today's average benefit ratio). A balanced budget of the EU's pension systems then implies an (average) contribution rate of some 14 % in 2015.

In this simplified illustration, the only driver of the pension system's expenses and revenues is demographics; pension reforms are not *explicitly* taken into account. One can look into the future by taking on board Eurostat's demographic projections by age up to the year 2080. The increase in the number of people aged 65 and over will push pension systems' expenses up, while the decline in the number of people aged up to 65 will depress revenues. If governments decide to freeze pension benefit ratios at today's 47 %, the entire pressure stemming from demographic ageing will rest on the contribution rate.

Chart 1

Freezing today's pension level would let contribution rates soar.

Average contribution rate by year and by birth cohort over the life course, assuming a freezing of pension level at 47% of gross wages, EU-28 average
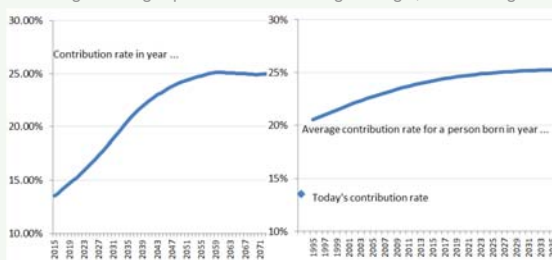
Note: For the cohort-specific average contribution rate it is assumed that the person will survive until age 65 and contribute all the time.

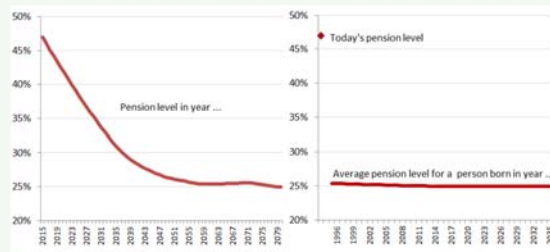*Source:* DG EMPL calculations based on Eurostat 2015 population projection

In the absence of further subsidies paid to the pension systems from state budgets, the contribution rate would have to rise to around 25 % by 2060, i.e. more than 10 percentage points above today's levels. The right-hand side of the chart shows how differently age cohorts would be affected by this shift. A young person turning 20 today (born in 1995) would already see their

average lifetime contribution rate increase beyond 20 % if they contribute fully until they are 65.

Likewise, if the pressure from demographic change rested on the pension level in the case of unchanged contribution rates, today's pension level of 47 % of gross wages would fall to some 25 % by 2035, pulling down the average lifetime pension of a person turning 20 today to close to what the level would be if it is assumed that he or she worked until age 65 and then received a pension for 20 years.

Chart 2

Freezing today's contribution rate will let pension levels fall sharply.

Average pension benefit level as % of gross wages by year and birth cohorts, assuming a freezing of the contribution rate at 13.6% of gross wages, EU-28 average


Note: For the cohort-specific average pension level it is assumed that the pensioner considered will retire aged 66 and will receive a pension for 20 years.

Source: DG EMPL calculation based on Eurostat 2015 population projection

To avoid such extreme outcomes, governments may decide to accept a limited increase in the contribution rate but cap it at, say, 20 % so as to avoid the detrimental impact of further increases on both net wages and labour costs. In that case, the average pension level would come down to just below 40 % in the late 2040s. Chart 3 illustrates the situation.

Chart 3

Limiting the increase in the contribution rate means dampening the decline of future pension levels.

Pension systems' average pension benefit level and contribution rates (capped at 20 %), EU-28
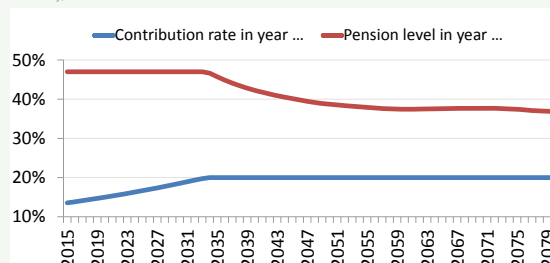
Source: DG EMPL calculations based on Eurostat 2015 population projection

As a result, the current workforce and future cohorts bear a double burden as they will have to accept both much higher contribution rates
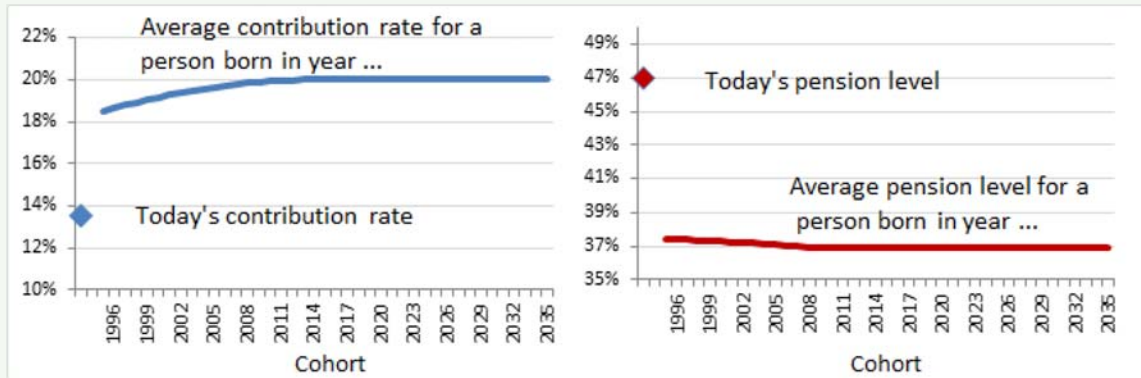
(Continued on the next page)

Box (continued)

Chart 4
Future cohorts are likely to bear a double burden.
Average lifetime contribution rates and average lifetime pension levels by cohort if contribution rates were not to increase beyond 20%, EU-28

Source: DG EMPL calculations based on Eurostat 2015 population projections (baseline)

throughout their working lives *and* pension levels significantly below today's when they retire.

From the point of view of intergenerational fairness, Chart 3 reveals that in any given future year working-age contributors and pensioners share the burden of ageing. The first group has to pay higher contributions, while the latter has to accept lower pensions.

For example, the situation in Chart 3 may be brought about by sustainability factors in the pension formula that lower annual increases of pensions as demographic conditions tighten.

Such sustainability factors are already legislated for today in a number of Member States, explicitly aimed at achieving generational fairness in the long run.

However, Chart 4 demonstrates that the argument of burden sharing only holds between future pensioners and future contributors: It does not include current pensioners. From future cohorts' perspective, measures legislated today that will have an impact on pensions only in decades will not ease the double burden but rather add to it as future cohorts will be the ones feeling the impact while today's pensioners are spared from contributing to the cost of ageing.

3.3. Reforms will contain spending in times of demographic change

Continued reform efforts are thus necessary to reduce the double burden for today's young workers and future cohorts. In view of the challenge posed not only by the sustainability of the pension systems but also by the implications of the changes in demographics and the world of work, the need for reforms is pressing. Against this background, a majority of Member States have substantially reformed their public pension schemes and labour markets alike. The extent of reform efforts is illustrated by the fact that despite increasing demographic dependency, today's proportion of 11.3 % of GDP devoted to public pensions in the EU is projected by the 2015 Ageing Report ([38]) to decrease slightly to 11.2 % by 2060, with some variation across Member States (*Chart 4.11*). At the same time, the proportion of GDP devoted to other types of expenditure (notably health-care and long-term care) is set to increase. In this context, the need for investment in support to the disabled is likely to increase with the ageing of the population as older people are more often affected by disability than the young.

([38]) See European Commission / Economic Policy Committee (2015).

Chart 4.11
EU pension expenditure will not increase overall, relative to GDP
Public pension expenditure 2013 and (projected) 2060
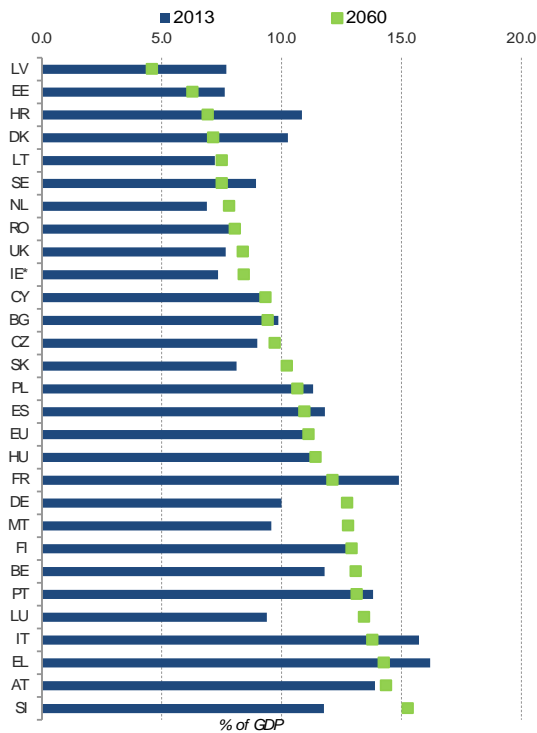
Source: 2015 Ageing report (European Commission / Economic Policy Committee)
Click here to download chart.

In order to understand better the reasons behind these projected changes in pension expenditure per Member State, the Ageing Report attempted to break down future expected growth of pension expenditure and to cluster the different reform activities into broad groups. The black dashes in *Chart 4.12* show how pension expenditure is expected to develop between 2014 and 2060. The bars show what contributes to the change.

Chart 4.12
Pension expenditure growth strongly curbed by reforms
Projected changes in public pension expenditure between 2014 and 2060 (pps of GDP)
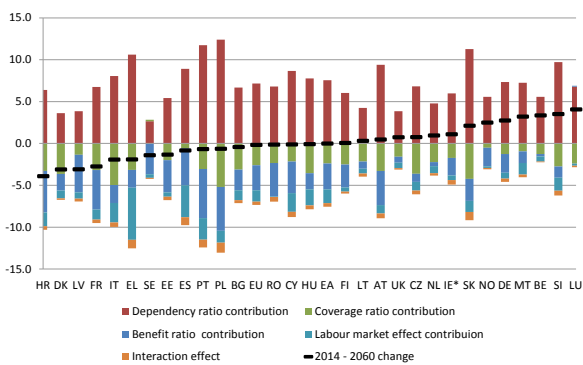
Source: 2015 Ageing Report (European Commission / EPC), p. 87.
Click here to download chart.

Box 4.3: Pension reforms in the Member States

Over the last two decades, pension systems in the EU have undergone considerable reforms ([1]).

Increasing pensionable age. Almost all Member States have increased their pensionable ages. The only countries that have not legislated further increases since 2008 were Luxembourg and Sweden, while the pensionable age in Poland decreased. In the period between 2008 and 2060, the pensionable age will increase the most in Denmark, the Czech Republic, Greece, Italy and Slovakia. Nevertheless, in 2060 pensionable ages will vary considerably across Member States, from 72.5 in Denmark (for both men and women) to 63 for women in Bulgaria.

Additional incentives to postpone retirement. As most people retire before reaching the pensionable age, most Member States also adopted additional incentives to postpone retirement. Some Member States restricted or completely abolished access to early retirement (e.g. Spain, France, Austria, Finland, Hungary). Most countries introduced or increased bonuses and penalties for retiring after and before the pensionable age. Such systems now exist in 18 Member States. Conditions for combining work and pensions have also been eased in some Member States (e.g Spain).

More representative contribution period taken into account. A number of reforms introduced measures that curtail the generosity of pension systems. These changes concern the calculation of the first pension and how pensions develop over time (indexation of pensions). Member States have increased the length of the contribution period taken into account when calculating a full pension (e.g. the Czech Republic, Ireland, Spain and France). As this period is lengthened, pension benefit levels decrease. This is because the basis of the calculation refers to more years of contribution, and not only those when the highest wages were earned.

Lower indexation. Indexation rules determine the annual adjustment of pension benefit. As a result of recent reforms, the majority of Member States apply an indexation rule that does not entirely reflect developments in nominal wages (e.g. Portugal, Spain, Poland, Croatia, Cyprus, Greece). Therefore, wage growth is not entirely translated into growth in pension benefits (see section 2).

Less favourable valorisation rules for past earnings. Valorisation of past earnings determines how pension contributions paid during working life are indexed before retirement. Member States curbed benefits by lowering the valuation of past earnings. They either moved to a pure valorisation based on prices (e.g. France, Belgium, Portugal) or a mix based on prices and wages (e.g. Greece, Croatia, Romania and Finland).

Systemic reforms. Over the last two decades, several Member States adopted systemic pension reforms for their public pension systems to link pension benefits more closely to contributions paid. The most prominent examples for such 'notional defined contribution schemes' are those introduced in Sweden, Latvia, Poland and Italy. In the same period, half of the EU Member States adopted automatic mechanisms that adjust the key parameters of the pension systems to the expected increase in life expectancy. These range from balancing mechanisms (adjusting indexation of benefits and contributions) introduced for example in Spain, Germany and Sweden, to sustainability factors introduced for example in Italy and Portugal (direct link between pension benefits and life expectancy) and automatic links between retirement age and life expectancy introduced for example in the Netherlands and Slovakia, or Finland.

([1]) Sources of the following information: 2015 Ageing Report; 2015 Pension Adequacy Report, Carone et al (2016).

The rise in pension expenditure due to demographic change (the dependency ratio contribution) is expected to be counter-balanced by reforms. According to the Report, the isolated effect of rising old-age dependency will bring strong expenditure increases: some seven percentage points, showing great variation across Member States. Yet reform activity in the Member States (covering both pension systems and labour market action) is expected to be a counter-weight that keeps pension expenditure as a proportion of GDP from rising despite this significant demographic change.

Reforms will reduce the generosity of the pension systems for today's young and future generations of workers (the benefit ratio contribution). *Box 4.3* gives an overview of the types of reforms that have been introduced in Member States during the last two decades. The annexed *Box 4.6* on Pension Reforms provides an overview of the major pension reforms carried out in Member States since 2008. These reforms include measures that curb the benefit ratio, i.e. the average pension relative to the average wage. In other words, the pension systems' generosity will be reduced. Further, almost all Member States' pension indexation rules by now foresee annual pension indexation below the level of

wage increases ([39]). In addition, Member States are reducing the assessment of earnings periods for pensions ([40]). The EU average impact of the benefit ratio effect is a decrease of expenditure by three percentage points.

Chart 4.13
Public pension benefit levels will decrease
Benefit ratio, relative to wages, 2013 and 2060
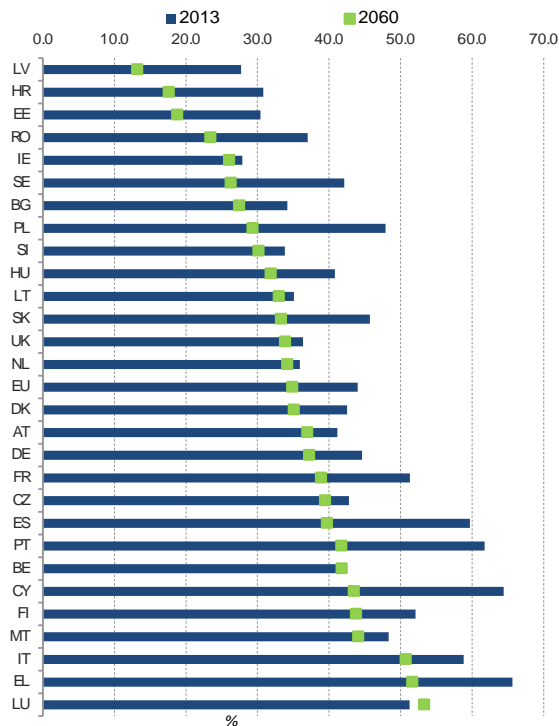
Source: European 2015 Ageing Report (EC/EPC)
Click here to download chart.

The projected decline in the benefit ratio implies deteriorating adequacy of public pensions for future pensioners. By 2060, the public pension benefit ratio in the EU is projected to decline on average by some 10 pps (*Chart 4.13*)**.** This decline tends to be more pronounced in Member States where public pensions are indexed not only to wage increases but also, or only, to (typically lower) price inflation (see Portugal, Spain, Poland, Croatia, Cyprus, Greece, Finland). Decreases in the benefit ratio could also result from the parallel introduction of private pension schemes (Romania and Latvia) ([41]). The benefit ratio is projected to be below the EU average in all Member States that joined the EU in the 2000s except Malta, Cyprus and the Czech Republic.

Examining replacement rates confirms a future decline in public pension adequacy. The trend towards lower public pension levels is confirmed when comparing the pension income of a hypothetical individual shortly after retirement with their earnings just before retirement. For an individual with average earnings retiring after a full career the gross public pension theoretical replacement rate ([42]) is projected to decrease by more than 5 pps in 16 Member States and by more than 15 pps in six Member States between 2013 and 2053. This decrease is expected to be partially compensated for by increasing entitlements from other pension schemes ([43]).

Reforms are expected to limit the proportion of those over the age of 65 who are eligible for public pensions (the coverage ratio contribution). Since the turn of the century all Member States have

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([39]) 16 Member States have recently reformed their pension system in that direction (since the onset of the crisis), see European Commission / Social Protection Committee (2015), p. 174.

([40]) Ibidem.

([41]) See Carone et al (2016).

([42]) See European Commission / Social Protection Committee (2015). Theoretical replacement rates are case-study-based calculations of the level of pension income of a hypothetical worker in the first year after retirement, measured as a percentage of individual earnings at the moment of retirement.

([43]) See European Commission / Social Protection Committee (2015), pp 222-225.

raised their statutory retirement age. For the period after 2020 half of the Member States now foresee increasing pensionable ages beyond 65. Incentives within the pension system usually consist of actuarial deductions (penalties) in case of retirement below a certain age or surpluses (bonuses) if retirement is delayed until after that age. Supported by active labour market measures which provide strong incentives for older workers to stay active for longer, this reduces the coverage ratio.

Action is being taken to improve the situation in the labour market. Bringing people back into jobs reduces public pension expenditure. For example, active labour market policies, in place today in all EU Member States, have already resulted in a rapid increase in the employment rate of older workers during the last 20 years (see Section 2.3) and are expected to be stepped up further in future. This should result in future older workers postponing their retirement, following the increased statutory retirement ages and reforms to incentivise staying longer in the labour market. More stringent general eligibility rules and further restrictions within the remaining early retirement provisions also play a role.

3.4. Some reforms will affect future pensioners only

The full effect of reforms will materialise mainly after 2030. The proportion of pension expenditure in GDP is not projected to be stable over time. The Ageing Report expects it first to rise from 11.3 % today to some 11.7 % by the end of the 2030s, before decreasing again to 11.2 % by 2060. Almost all Member States have legislated for increases in pensionable ages. However, most of these reforms will not affect those currently approaching pension age, nor current pensioners, but only those who are expected to accrue a pension after 2020 and far beyond that year ([44]). For example, the Belgian law foresees the gradual stepping up of the statutory retirement age for regular pensions from 65 to 67 years. However, the final step will be reached only in 2030. Assuming that some of those affected by the increase will accept actuarial deductions and claim their pension before they reach 67, the full financial relief to the pension system will not materialise before the beginning of the 2050s ([45]). Another example is the sustainability factors in the pension formula as they exist in Germany or Finland. Those tend to lower the growth of pension expenditure. The cuts tend to be more pronounced, the more the demographic constraints tighten ([46]). Therefore, the cuts will affect future pensioners more than current pensioners.

Current pensions are often protected from being cut. Almost all Member States' main statutory pension systems are insurance-based ([47]), implying that people become entitled to future pension payments by paying contributions to the system. The notion of simply reallocating pension expenditure to other purposes such as health or education is therefore problematic as there are "legal boundaries to how much reforms could infringe on the [constitutionally granted] 'acquired rights' of pensioners" ([48]). Cutting pension expenditure may thus take a long time.

Therefore, reforms may not remove the double burden on future workers. Today's older workers and pensioners will not feel the impact of such reforms, or will feel them only partially where the transition towards a higher pension age and lower replacement rate has started. On the other hand, the younger labour force today and those entering the labour market in the coming decades will face the double burden of high contributions when young and reduced pension levels when retired.

Tax subsidies to the pension system broaden the revenue base but may add to the burden for future generations. In many Member States the statutory pension system is being subsidised by the government ([49]). The rationale of government subsidies is generally to get the entire (tax-paying) public to contribute to the cost of ageing, not only those who are actually insured by the pension system. Other things being equal, higher tax subsidies keep the contribution rate lower than would otherwise be the case and could thus be used to limit future increases due to demographic change. From the point of view

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([44]) See European Commission / Social Protection Committee (2015), Table 4.5 (update as of end 2016).

([45]) The average life expectancy of a 65 year-old in Belgium is around 20 and 23 years for men and women respectively. See Eurostat 2015, main scenario, life expectancy by age and sex (Eurostat series proj_15nalexp).

([46]) For example, see section 4.2.2 below for Finland where the development of life expectancy is part of the pension formula.

([47]) Mutual Information System on Social Protection (MISSOC),
http://www.missoc.org/MISSOC/INFORMATIONBASE/informationBase.jsp.

([48]) European Commission / Social Protection Committee (2015), p. 177.

([49]) Mutual Information System on Social Protection (MISSOC).

of intergenerational fairness, tax subsidies may be problematic to the extent that governments incur deficits when current tax revenues are insufficient to cover current expenses. In that case, part of the financial burden of ageing is shifted from the current workforce to future generations.

In addition to demographics, fragmented working careers may aggravate future adequacy problems. Recent analysis by the OECD shows that for every year out of employment due to late entry or career interruptions related to childcare or unemployment, the level of an old age pension drops by slightly over 1 % for a person who entered the labour market in 2014. This finding underlines the fact that the crisis which left the EU with persistently high unemployment, especially amongst young people, will also leave its scars on the pension rights of future pensioners. A short career of 30 years is projected to result in relatively low pension entitlements, with the net theoretical replacement rate decreasing by more than 10 pps between 2013 and 2053 in 23 Member States ([50]). Poverty and insufficient old-age income may thus become more widespread amongst future pensioners than they are today. In this regard, the OECD also stresses the pivotal role of pension systems in alleviating these long-term social impacts: without redistributive elements in place, pension rights could fall by between 2 % and 2.5 % ([51]).

As for career breaks, the projections of future pensions in Eastern Germany illustrate the problem. The potential effect of fragmented careers on pension levels can be demonstrated on the basis of projections made for Germany, especially for old age and invalidity pensions in the New *Länder*. Before German reunification in 1991, careers in East Germany tended to be 'complete' in the sense that people worked full time, parenthood implied only short career breaks, and unemployment was officially non-existent. In 1991, pension rights based on those complete careers were transferred to the German Pension Insurance ([52]). As a result, today's statutory pensions in the New *Länder* are considerably higher than those in the Old *Länder*, especially for women ([53]).

However, unemployment soared in the New *Länder* after reunification and is still considerably higher than in Western Germany (8.6 % vs. 5.7 % in February 2017) ([54]). These unemployment-related career breaks for today's workers will reduce their future pensions. A 2005 sample of pension-insured people and their partners allows a comparison of the projected pension entitlements of people turning 65 between 2007 and 2026 ([55]). During these two decades Western German net pensions from the statutory pension insurance are projected to remain stable (men) or even slightly increase (women) in real terms. By contrast, reflecting the developments discussed above, those turning 65 in Eastern Germany in 2022-2026 would see their real net pension decline by 15 % (men) and 12 % (women), compared with those turning 65 in 2007-2011.

A recent study projecting the development of old-age poverty in Germany for the next 20 years confirms these findings. ([56]) It finds that households in Eastern Germany may be among the groups particularly exposed to the risk of old-age poverty in the future ([57]). For those retiring between 2031 and 2036 the risk in Eastern Germany is projected to rise particularly strongly, to 36 % of GDP compared to 17 % in the West, from currently 22 % and 15 %, respectively. According to the study, this is mainly linked to the changes on the Eastern German labour market that happened in the 1990s after re-unification. ([58])

([50]) See European Commission / Social Protection Committee (2015), p 221.

([51]) See OECD (2015), pp 73-100.

([52]) This was done by the Pension Transfer Law (Rentenüberleitungsgesetz).

([53]) Net statutory pensions in the New Länder are 43 % (6 %) higher than in the Old Länder for women (men). See Bundesministerium für Arbeit (2016), Übersicht 13.

([54]) According to the official statistics by Bundesagentur für Arbeit. In addition, the incidence of self-employment not subject to social insurance has increased (Heien et al (2008), p. 41).

([55]) See Heien et al (2008), p. 40, based on the AViD 2005 sample (Altersvorsorge in Deutschland).

([56]) Deutsches Institut für Wirtschaftsforschung and Zentrum für Europäische Wirtschaftsforschung (2017), study for the Bertelsmann Stiftung.

([57]) Other groups found to have a higher risk of old-age poverty are low-educated people, single women, those with a migrant background and those with low entitlement to a statutory pension (ibidem, p. 71). People are considered at risk of poverty if their equivalized disposable income is less than 60 % of the median income (p. 10).

([58]) See https://www.bertelsmann-stiftung.de/de/themen/aktuelle-meldungen/2017/juni/wandel-der-arbeitswelt-laesst-altersarmut-steigen. Correspondingly, the share of new pensioners that have to rely on basic assistance at old-age (a tax-financed minimum support for elderly people) will more than double between now and 2036 in Eastern Germany, from 5 % to

Unemployment fragments people's careers across the EU. A number of Member States are still affected by persistently high structural unemployment and their future pensioners may be affected in a similar manner. In addition, most Member States have seen unemployment soar in the aftermath of the crisis. Today the unemployment rate still exceeds 10 % in six Member States. Almost one in five young people (aged 15 to 24 years) are still unemployed and may be affected by the hysteresis phenomenon, whereby longer unemployment spells at a young age leave long-lasting scars on people's work biographies later on ([59]). Unemployment spells will inevitably reduce pension rights, making it ever more urgent to invest in people's employability.

In addition, the increased incidence of non-standard work in the younger population may have repercussions on its ability to acquire pension rights. Non-standard work is associated not only with more fragmented careers but also with lower earnings from work ([60]). In most Member States, a low-wage earner ([61]) is expected to receive a net pension below 50 % of the net average wage in 2053 ([62]). This may be compounded by lower wealth and housing stock at old age as rental housing is becoming more and more common among young people and they also face constraints in accessing credit (see Chapter 3).

4. MODEL-BASED EVIDENCE: IMPACT OF COMMON REFORM OPTIONS

In order to understand the full extent to which different age groups are affected by reforms it is necessary to take into account the broad range of the macro-economic side effects these reforms may have, especially on the labour market. In addition, a comprehensive picture requires a look into the long run, i.e. the time when reforms have made their full impact.

4.1. Introduction: reforms to reduce economic dependency

In times when demographic constraints tighten, a main focus of policies is to reduce 'economic dependency'. The aim is to prevent the number of economically dependent people per economically active person from increasing too strongly. *Chart 4.14* indicates the challenge. Eurostat's 2013 population projection (main scenario) sees the dependency ratio rise from today's 66 % to 88 % by 2040 and higher thereafter. However, this indicator, which measures the dependent part of the population (aged under 20 and over 64) in relation to the working-age population, does not take into account the fact that only a proportion of the working-age population actually contributes to producing the EU's GDP i.e. is actually in employment. Today around 30 % of EU residents in the age group 20-64 are not in employment, corresponding to some 90 million people who are either unemployed or inactive. A more meaningful indicator is therefore the economic dependency ratio, where the number of unemployed and inactive people is compared with the number of employed people ([63]).

In fact, dependency measured this way is significantly higher than suggested by pure demographics (*Chart 4.14*). At present, in the EU, 1.38 people are consuming the wealth produced (GDP) for each employed person who contributes to its production.

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11 %. In the West there will be only a slight increase from 5.5 % to 6 %. (Deutsches Institut für Wirtschaftsforschung and Zentrum für Europäische Wirtschaftsforschung (2017), p. 73)

([59]) For example, see Nilsen and Holm Reiso (2011).

([60]) See European Commission (2017), p 86.

([61]) The low-wage earner is defined as a person with a gross wage below two thirds of the average gross wage.

([62]) See European Commission / Social Protection Committee (2015), p 224.

([63]) Staying within the same age brackets and assuming no-one outside working-age would be employed, the dependent part would then be the young (age < 20), the old (age > 64), and the non-employed aged 20 to 64 years. Those would be related to the employed (20-64). See European Commission (2016), pp. 164/5.

Chart 4.14
Economic dependency higher than purely demographic
dependency - but policies may help contain it
Demographic dependency rate, economic dependency rate assuming
different employment paths, EU-28
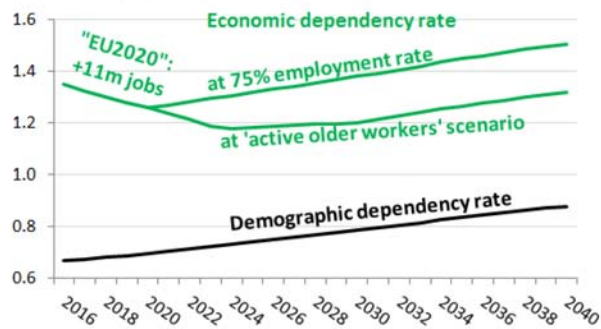
Note: Demographic dependency: (total popul.) / (popul. aged 20-64).
        Economic dependency: total population / (employed population aged 20-
        64).
Source: DG EMPL calculations based on Eurostat EU LFS and 2015 population
        projection
Click here to download chart.

The Economic Dependency Rate (EDR) is thus sensitive to what happens in the labour market. Over the next few years, the EDR has the potential to level down as the EU makes further progress towards its Europe 2020 target of 75 % of people aged 20-64 in employment. If another 11 million people were to be brought into employment between now and 2020, the EDR would decrease to around 1.3. In other words, even during times where demographic dependency is already increasing, economic dependency can be lowered by policy action.

However, if there is no further increase in the employment rate, the EDR will rise in parallel with demographic dependency in the longer term, reaching a level of 1.5 dependents per employed person by 2040 (and climbing further thereafter). This development will be a challenge to social security schemes, pensions in particular, which incorporate the implicit generational contract - unquestioned for more than a century - by which the working part of the population generates the dependent population's incomes. With the EDR climbing, acceptance of the generational contract by declining numbers of contributors may be at stake.

Policies designed to increase the participation rate of older workers may well succeed. Between 2000 and 2015, the EU managed to increase the labour market participation rate ([64]) for people aged 55-64 years from below 40 % to more than 57 %. If the EU could repeat this progress, an increase of a further 18 percentage points would be generated over the years until 2030. After such a sharp rise in older workers' activity, their participation rate by 2030 would be 75 %, i.e. close to today's participation rate for the whole population aged 20-64. Such an 'active older workers scenario' would alleviate the pressure on the EDR, limiting its increase by 2040 to around 1.3 per employed person (today's level) instead of 1.50, thereby contributing to a policy outcome that would ensure full use of available human resources and maintain older people's living standards even in times of higher demographic dependency, because they would generate income for longer.

The remainder of this section presents the results of a model simulating concrete policy measures designed for older people with a view to achieving this target. The model illustrates the potential long-term impact of such policies on the labour market for all age groups, on gross and net wages, on GDP and on the level of pensions. The Labour Market Model (LMM) of the Directorate General for Employment, Social Affairs and Inclusion (DG EMPL) is used: it is a general equilibrium model with a particular focus on labour-market institutions ([65]).

([64]) The participation rate relates the active population to total population in a given age group. The active population includes the unemployed.
([65]) For a model description see Berger et al (2009), Part II.

Section 4.2 focuses on the Finnish strategy to link longevity with both the pensionable age and the level of pensions. Section 4.3 discusses Germany's 'Perspektive 50 plus', which exemplifies active labour market policies tailored to older workers. Section 4.4 looks at tax cuts for both older workers and their employers, with Sweden as a prominent example.

These examples represent three broad types of reform targeted at older people. Further simulations show that the same reforms lead to similar results when applied in other countries. Therefore, the scope of the analysis should not be seen as restricted to only the three countries chosen as platforms for the simulations.

4.2. Tying pensions to longevity: evidence from Finland

Finland's three-tier public pension system consists of (1) earnings-related pensions (ERP), (2) a residence-based national pension (NP) and (3) a guaranteed pension to provide a minimum safety net ([66]). This country is a paradigm for reforms that have been carried out, particularly within the ERP system, to incentivise longer working lives.

The official retirement age of the ERP will increase. The 2017 pension reform introduces a 0.4 % supplement to an individual's pension for every month they postpone the take-up of their pension after the age of earliest eligibility, currently 63. Also, the reform gradually increases the lower (minimum) pension age from 63 to 65, starting with workers turning 63 in 2018. Later, for those turning 65 in 2030, the retirement age will be shifted further in line with increases in life expectancy, so as to freeze the time spent working relative to the time spent in retirement at the 2025 level.

Pension expenditure increases will be limited. Life expectancy also determines the amount of pension to be expected from a given number of earned credit points. A coefficient in the pension formula seeks to tie increases in life expectancy to the amount paid as a pension. In other words, pension entitlements decline as longevity increases.

Based on the Finnish example, this section seeks to explore the long-term labour market and economic impact of incentivising people to work longer through reforms to the pension system that explicitly link retirement ages and the level of pensions to increasing life expectancy. The Labour Market Model is used to simulate the long-term ('steady state') effect of (1) shifting the statutory retirement age of the ERP in line with (projected) life expectancy and (2) introducing a life-expectancy coefficient into the pension formula that provides the amount of a pension.

4.2.1. Linking life expectancy to the statutory retirement age

The LMM captures a detailed picture of the institutional settings in 14 EU Member States, including Finland. However, in the Finnish case, as the pensionable age shifts, the eligibility conditions for the take-up of a standard old age pension tighten correspondingly. In the LMM retirement is an endogenous decision of households ([67]), so it is assumed that the actuarial supplement of 0.4 % per month (4.8 % per year) for postponement of retirement beyond the pensionable age will also be applied in the case of retirement at an earlier age. A 4.8 % actuarial penalty for each year of retirement before the official age constitutes a strong incentive to defer retirement. As postponement is nevertheless not compulsory in the LMM, the model tends to underestimate the true effect on older workers' labour market participation compared with a situation where earlier retirement is excluded. This is because only if people are obliged to postpone retirement is it possible, in theory, to be sure that everyone postpones retirement to the new official age. In reality a significant number of people in Finland will still continue to draw their pension before the official pensionable age ([68]).

The following illustration is a long-term projection. It shows what could be the long-term impact on the pension system, the labour market and the economy of shifting the pensionable age in Finland by a total

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([66]) The Finnish pension scheme and recent reforms are described in European Commission / Social Protection Committee (2015), Volume II, pp. 327-338.

([67]) This implies that in principle no one is forced to postpone retirement.

([68]) This happens where workers 'escape' into invalidity pensions, take up partial old-age pensions (where 0.4 % deductions per month of earlier retirement become the reality), or in the case of arduous jobs for long-insured workers.

of five years: two years (up to age 65) as already decided, plus another three years based on what Eurostat projects will be the further increase in life expectancy in Finland of a person turning 65 from 2025 to 2060 (see details in the annexed *Box 4.4* on the Finnish reform) ([69]).

According to the model results, the reform will induce workers to retire later than would otherwise have been the case. Those who decide not to postpone their retirement will have to accept actuarial deductions. Those who defer their retirement will continue to pay contributions to the pension system and will start receiving their pension payments later.

As a result of delayed retirement and deductions applied if retirement is not postponed, a lower contribution rate would be possible. The pension system will make a saving. Expenditure on pensions will decline (as compared with a no-reform-scenario), and so will the average pension benefit, relative to average gross wages (the pension benefit ratio, which today is at 52 %) ([70]). It is assumed that the ERP contribution rate (currently 25.1 % of gross wages ([71])) is flexible. In other words, it can move so as to balance out the pension system's expenditure and its revenue. The financial relief resulting from the reform will thus allow the contribution rate to be lowered substantially, by more than 2 percentage points (*Chart 4.15*).

Chart 4.15
Relief to the pension system
Long-term impact on pension expenditure, benefit ratio and pension contribution rate, Finland
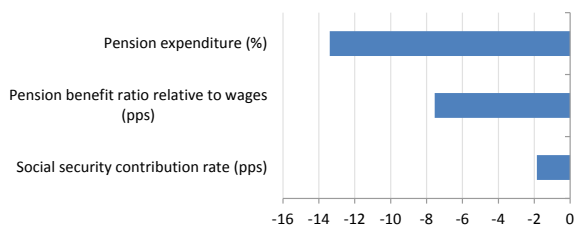
Source: DG EMPL calculations based on LMM

Click here to download chart.

Wages (net and gross) will be higher and labour costs lower. This outcome is extremely important for the long-term impact on both the labour market and the economy. Due to the lower social security contribution rate, workers will see their take-home pay (net wage) increase for any given gross wage. At the same time, firms will see their labour costs decline as they participate in workers' social security via the employers' contribution. This gives an incentive for workers to participate in the labour market *at any age* and for firms to recruit workers. The stronger labour demand will put workers in a better bargaining position and pull up the wage level (gross wages) so that net wages will be raised further (*Chart 4.16*).

([69]) Hence, by 2060 the retirement age is assumed to be 68 years. This corresponds quite well to the estimates of the Finnish Centre for Pensions (67 years, 3 months by the year 2050). See http://www.etk.fi/en/the-pension-system-2/the-pension-system/international-comparison/retirement-ages/.

([70]) See European Commission and Social Protection Committee (2015), p. 336. Note that the effect on the pension benefit ratio is likely to be stronger in the model than it would have been in Finnish reality. Unlike the Finnish system, LMM incentivises people not to retire early, but would not force people to defer retirement. The number of older workers postponing their pension take-up is therefore likely to be underestimated in the simulation. On the other hand, the reduction in the pension is overestimated as it stems from applying actuarial deductions penalising retirement before reaching pensionable age.

([71]) For employees and employers; see Finnish Centre for Pensions (2017), Supplement 2017, p. 5.

Chart 4.16
Wages go up, labour costs decline
Long-term impact on gross wages, net wages, and labour costs, Finland
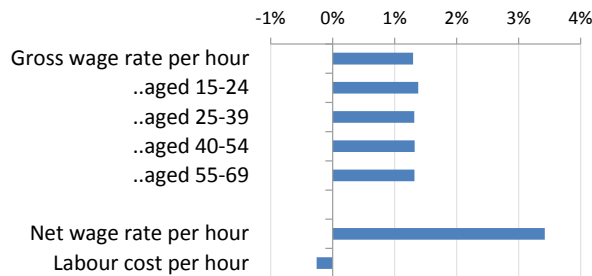
Source: DG EMPL calculations based on LMM

Click here to download chart.

The reform will have a strong impact on younger workers' employment. Both labour demand and supply increase. As a result, total employment rises by almost 0.8 %, the increase varying across age groups. This impact should be strongest for the youngest workers because, with their low wages, they are more reactive to changes in wage levels. In addition, younger workers are further away from their pensions. Therefore in the model it is assumed that the disincentive resulting from lower future pension payments is less important to them. Later on, as workers come closer to pensionable age, it becomes more important, so that the positive impact of lower labour costs and higher take-home pay is weaker.

Older workers will stay longer in the labour market than they would without the reform. However, the oldest group of workers (aged 55 to 69) who are eligible to claim a pension are in a different situation. Some of them will postpone retirement. As a result, the labour market effect on workers older than 55 years will be stronger than for their 40-54 year-old peers.

Higher investment will lead to higher GDP. Higher employment induces firms to endow the additional workers with additional physical capital, so that the capital stock also increases thanks to stronger investment. As a result, real GDP will in the long run be around 1 % higher than it would have been without the reform (*Chart 4.17*), which helps meet the material needs of all generations.

Chart 4.17
Positive economic and labour market impact
Long-term impact on GDP, capital, and employment, Finland
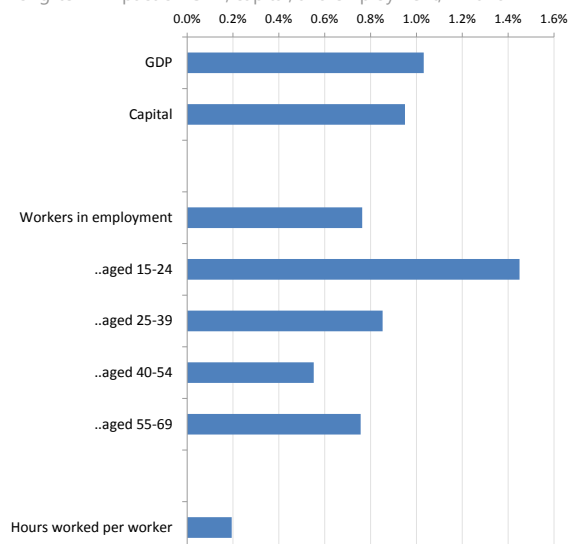
Note: Assumes that the pension system is financially balanced through its flexible contribution rate.

Source: DG EMPL calculations based on LMM

Click here to download chart.

Declining labour costs will drive the positive effect. Lower social security contributions will make the most powerful contribution to the overall positive employment and economic impact ([72]). Indeed, the most important positive trigger here is the reduction of the tax wedge as the pension system gets financial relief, enabling contribution rates to decline.

The reform helps future workers. These findings are obviously relevant to the intergenerational distribution of resources. Higher employment, higher wages and lower labour costs favour the working part of the population and their employers. What is more, given that these simulations describe long-term effects, one can see that it is future generations of workers that are favoured by these reforms, thanks to later retirement of workers and lower labour costs.

4.2.2. A life expectancy coefficient in the pension formula

As in many other EU countries, the Finnish formula implies that pension indexation is generally below the level of wage increases. After retirement, the level of pension is adjusted over time, taking into account wage increase levels (20 %) and price inflation (80 %). Hence, pensioners get some benefit from the higher wages that come with economic growth. But because pensioners' share of the gains from higher wage growth is lower than workers' share, there is an element of rebalancing the intergenerational contract to take account of the challenges the younger generations face.

Pension payments will be adjusted by a life expectancy coefficient. In addition, the Finnish pension formula applies a cohort-specific coefficient to one's pension level that takes account of the increasing life expectancy. The coefficient lowers pensions more the higher is the expected increase in life expectancy. *Box 4.4* shows the details ([73]). The labour market model allows for an analysis of the impact of such coefficient on pension level and expenditure, the labour market and the economy in the long run. According to the calculations illustrated in *Box 4.4*, it is assumed that pensions will be lowered by a total of 5 % in the long run. The reduction is much lower than would result from pure increase in life expectancy. This is because from 2027 onwards Finland's pension formula will take into account the further increase in the general retirement age ([74]) discussed in the previous section.

([72]) This can be demonstrated if one assumes that – contrary to Finland's plans - the pension budget will not be balanced through the (flexible) contribution rate, but through variations in the lump sum taxes imposed on all households in order to shift resources to the general government budget (Berger et al (2009), Part III, p. 9). Lump sum taxes (or transfers) are simply levied on (or given to) all households. There is no link to work nor to consumption (as would be the case with VAT), so that lump sum levies are assumed to leave the allocation of resources undisturbed, especially on the labour market. In that case no positive employment effects will show.

As a result, the impact of an ERP retirement age shift on gross wages, net wages, and labour costs stays negligible. What remains is the expected lower pension level, relative to wages. In other words: being employed will increase pension entitlements but not to the extent that it had done before the reform. This is in itself a negative employment incentive. The negative impact on employment is pronounced for those below the age of 55 but stays moderate in the case of older workers (55 to 69 years) as some of them postpone retirement due to the increased official retirement age.

([73]) See also Finnish Centre for Pensions (2017), pp. 17, 18.

([74]) Otherwise the rise in life-expectancy would be taken into account twice. See explanation in Box 4.4 and European Commission / Social Protection Committee (2015), Vol. II, p. 329.

Chart 4.18
Positive employment effects, but more for younger workers
Long-term impact on GDP, capital and the labour market, Finland
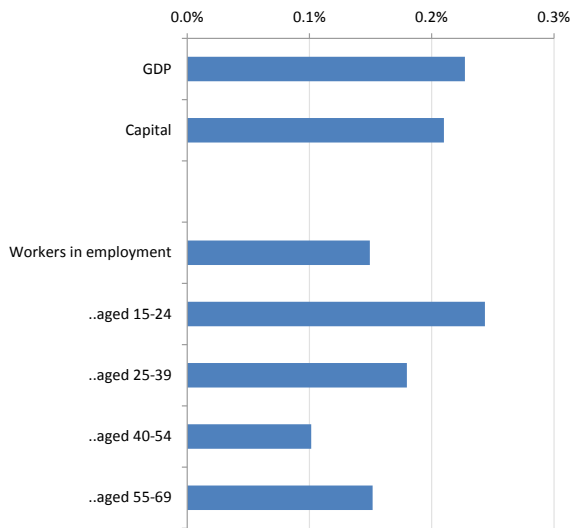
Note: Long-term impact of lowering pensions in Finland
Source: DG EMPL calculation based on LMM
Click here to download chart.

Employment will be boosted (*Chart 4.18*). Again, the main reason for the expansion of employment is that the pension scheme will be able to lower its contribution rate by more than half a percentage point as one pension point becomes cheaper as a result of the cut in pensions (*Chart 4.19*). As a result, take-home pay shifts up and labour costs decline at any given level of gross wages (*Chart 4.20*). Higher net wages will motivate workers to join the labour market, whereas lower labour costs will trigger demand for workers across all age groups. Employment thus expands as a result of both higher labour supply and higher labour demand.

Chart 4.19
Lower pension benefits, lower contribution rate
Long-term impact on pension expenditure, pension benefit ratio, social security contribution rate, Finland
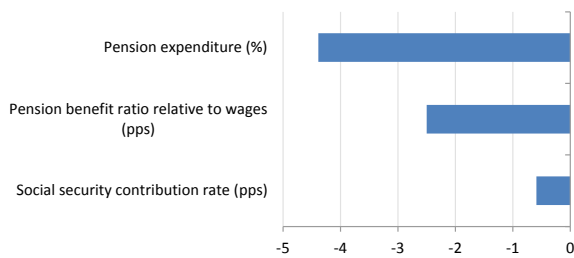
Source: DG EMPL calculation based on LMM
Click here to download chart.

Chart 4.20
Higher take-home pay, lower labour costs
Long-term impact on gross wages, net wages, labour costs, Finland
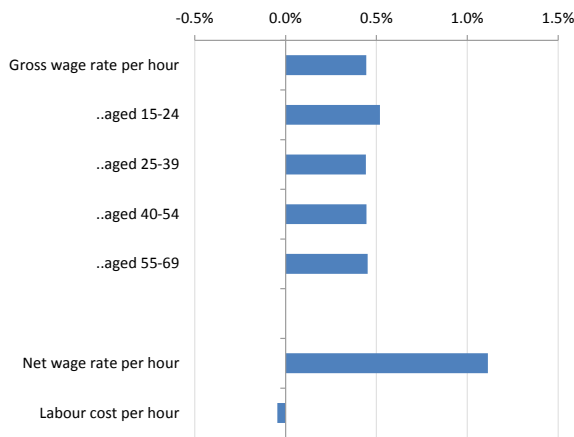

Note: Long-term impact of lowering pensions in Finland
Source: DG EMPL calculation based on LMM
Click here to download chart.

The impact on employment is relatively strong for young workers. The lowering of pensions will result in the average pension benefit ratio declining markedly in the long run, by more than two percentage points (*Chart 4.19*). The lowering of the contribution rate triggers employment, especially for young workers with their lower wages. Older workers (age group 55-69 years) see their employment shift mainly due to the direct effect of lower pensions, which motivates some of them to continue working for some time instead of applying for a pension.

In the long run the reform shifts resources from pensioners to the working generation. Linking pension levels to higher life expectancy may therefore reduce pension benefits relative to wages but may also allow room for lower social security contribution rates and thus make up for higher net wages and lower labour costs. Labour demand and supply will increase.

4.3. Labour market policies tailored to older people: the German example

In 2005 Germany inaugurated its federal-level ten-year programme 'Perspektive 50plus'. This initiative was an 'employment pact for older people' and its purpose was to reintegrate as many long-term-unemployed older workers into the labour market as possible. The main concept was to provide intensive, individualised and targeted support as well as counselling to long-term-unemployed workers aged 50 years and above, via 93 (voluntarily) participating regional support centres. The budget for the ten-year period from 2005 to 2015 was EUR 2.5 bn. The programme offered a wide variety of support measures for older people ([75]), all of them focused on labour market integration: from supporting mobility, through individual counselling when applying for a job, coaching and (language) training, to direct financial integration support ([76]).

Compared with the standard instruments offered to older workers through the job centres, the initiative was assessed as successful. Evaluations concluded that the cost per 'activated' and integrated person was significantly lower than in the case of standard support. The cost advantage was mainly due to a high proportion of successful integrations per participant ([77]), a result of the tailored services offered to the unemployed.

The programme 'activated' a total of 1.3 m people aged 50+ over the 10 years of its implementation. Activation meant that a person participated in one of the supported programmes for at least 25 hours. Of those activated, an estimated 420 000 people were integrated into the labour

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([75]) See Bundesministerium für Arbeit und Soziales (2015), p. 18.

([76]) See Knuth et al (2014), p. 8.

([77]) See Büttner et al (2008), p. 14, Büttner et al (2012), p. 262/3, Knuth et al (2014), p. 11.

market ([78]). The cost per activation was around EUR 2 200. Full integration required considerable extra effort. The cost per 'sustainably integrated' older worker (still in their job six months after the end of the programme) was estimated at EUR 9 300 ([79]).

For the simulation of such a programme with the LMM a number of assumptions have to be made.

The programme mainly focused on making the older unemployed workers' job search more efficient and facilitating job matching by providing individualised services and training. This can be reflected in the LMM as a training measure provided for older unemployed people with a view to improving the matching of demand and supply in the labour market (see details in the annexed *Box 4.5* on Germany).

In the model, which focuses on long-term change, a policy measure implemented for only a limited period of time will necessarily lead to a zero long run impact. It is therefore assumed that the match-enhancing training subsidy will be implemented for an unlimited period. This approach is also useful to see what long-term impact such resource-intensive integration support for older workers will have, taking into account the possibility of workers, once recruited, losing their jobs again at some point. ('Perspektive 50 plus' did not measure whether 'sustainably integrated' older workers remained in their new jobs beyond six months after the end of their support period.)

Significant employment gains in the age group 55-69 can be achieved. For the simulation it is assumed that the cost of the measure was an equivalent of 0.11 % of annual GDP (for the reasons see *Box 4.5*). *Chart 4.21* shows significant employment gains in the age group 55-69: +2.9 % or 230 000 older workers more than in the reference scenario. The implicit assumption here is that the additional employees come only from among the unemployed, not from inactive older people. This is because in LMM only the unemployed are assumed to search for a job and hence to be relevant to matching labour supply (vacancies) with labour demand (search units). Under this assumption, the unemployment rate in the age group 55-69 will decline significantly, by 2.5 percentage points. Over all age groups this implies a decline by 0.5 percentage points. Given the nature of the policy initiative (being tailored to older workers), the other age groups' employment profiles remain broadly unchanged. Due to the strong increase in older workers' employment, overall employment rises by 0.6 %. With employment up, firms will equip the new labour force with capital, stepping up investment. As a result of higher investment and higher employment, real GDP will be some 0.6 % higher than in the reference scenario without the initiative.

Overall (gross) wages will increase while labour costs will be reduced. As for wages, *Chart 4.22* shows that older workers see a marginal decline compared with the reference situation, due to the increased effective labour supply that results from better matching. However, *overall* wages increase by +0.1 %. This is mainly due to a composition effect: more older workers (with their higher wages) will be in employment. Other age groups' wages also shift. They are pulled up by higher GDP triggering more labour demand, and by better employment prospects improving the financial position of social security schemes.

Net wages rise while labour costs decline. The contribution rate declines by some 0.1 percentage point, making it possible that net wages shift more than gross wages and that labour costs can go down at any given gross wage (hence, overall labour costs remain unchanged despite the average gross wage increase). The reduced labour cost will add to labour demand that further pulls up employment.

([78]) See Bundesministerium für Arbeit und Soziales (2015), p. 18. An integrated person either took a job subject to social contributions or became self-employed.
([79]) See Knuth et al (2014), p. 13.

Chart 4.21
Strong employment gains through targeted policies designed to activate older workers
Long-term impact of a training offered to older unemployed with a view to improving labour market matching, Germany
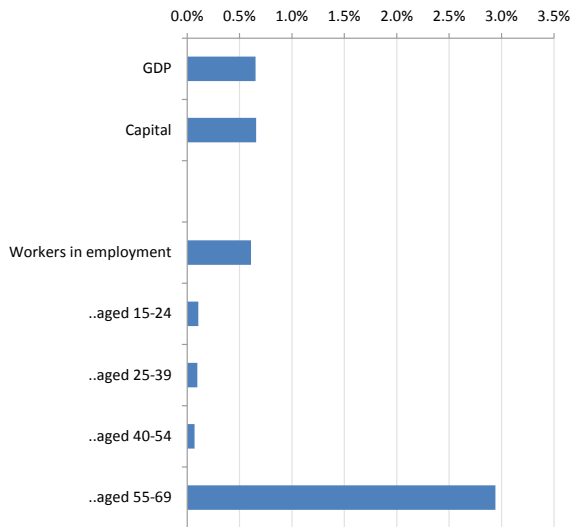
Note: Training measure financed by lump -sum taxes levied on all households
Source: DG EMPL calculations based on LMM
Click here to download chart.

Chart 4.22
Slight wage decline for the older workers, overall wages increase, especially net wages
Long-term impact on gross wages, net wages, labour costs, Germany
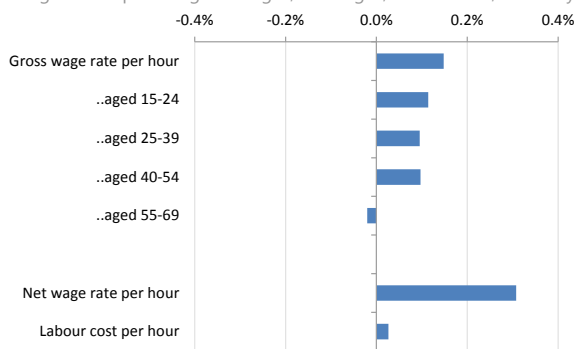
Note: Training measure financed by lump -sum taxes levied on all households
Source: DG EMPL calculation based on LMM
Click here to download chart.

Total pension expenditure increases and pension levels improve. This is because more workers eligible to claim a pension will postpone pension take-up. Higher employment leads to higher pension entitlements, so that the overall pension ratio, relative to (increased) gross wages, will edge up slightly, by 0.1 pp.

Chart 4.23
Pension benefits improve slightly, contribution rate can be lowered
Long-term impact on pension expenditure, pension benefit ratio and social security contribution rate, Germany

Note: Training measure financed by lump-sum taxes levied on all households
Source: DG EMPL calculation based on LMM
Click here to download chart.

A substantial financial effort is generally required to reintegrate long-term unemployed older workers into the labour market. However, activation policies specifically targeted to the needs of workers beyond the age of 50 will yield str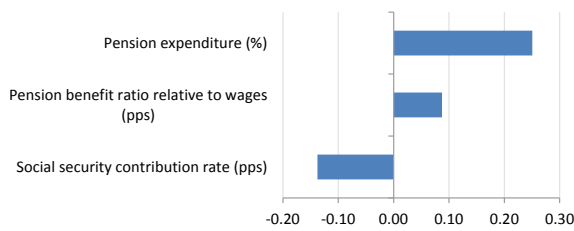ong employment gains to the extent that they achieve a better match between the labour supply older workers provide and the needs of firms posting vacancies. A medium-sized but tailored programme such as the one modelled here has the potential to increase significantly the employment rate of older people and to have positive repercussions for overall labour costs and take-home pay. It can help older workers back into gainful employment subject to social security. Workers will thus be able to contribute longer to the social security systems and help to share the demographic burden while also benefiting in terms of higher pension benefits, rather than being caught in long-term unemployment until retirement.

The German example shows the success such active labour market policies have had in the recent past. Those policies have been supported by reforms in the pension system. The regular retirement age has already been raised to 65 years and will continue to rise to 67 in a stepwise increase which will end with those who apply for an old-age pension in 2029 ([80]). Furthermore, the "Flexi-Rente" that is expected to be introduced in July 2017 is expected to provide a further incentive for older workers to stay in the labour market for longer (while receiving a pension) ([81]).

4.4. Tax credits for workers aged over 65: the Swedish way

In 2007, Sweden introduced a comprehensive tax reform with a view to supporting older workers' labour market performance ([82]).

First, to strengthen firms' demand for workers aged 65 years and older, a payroll tax cut was granted that substantially lowered employers' corresponding social security contributions by 16 pps, down to some 10 % ([83]). Secondly, on the labour supply side, to raise incentives for people aged 65 and older to take a job, an earned-income tax credit (a reduction of wage taxes) was introduced that was significantly larger for workers aged 65 and over than for other groups. For older workers at the 25th percentile of the earnings distribution the wage tax cut amounted to around 9 % of net earnings ([84]).

This section models the Swedish example of tax-related demand and supply-side policies. To estimate their impact on the labour market, the following approach is taken.

For the payroll tax cut, it is assumed that the government lowers the employers' social security contribution rate by 16 percentage points for workers aged 65-69 years. Modelling the earned income tax credit is complicated by the fact that the extent of the tax cut for any individual depends strongly on their earned income. Therefore, the volume of the earned income tax cut is set so as to resemble the overall

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([80]) Altersgrenzenanpassungsgesetz 2007.

([81]) However, it remains to be seen how effective this instrument can be in counteracting the incentives for early retirement introduced in 2014 (people with a full insurance record being allowed to apply for a pension aged 63).

([82]) See OECD (2012), p. 3, Eurofound (2012), p. 8.

([83]) See Laun (2012), p. 9.

([84]) Ibidem, p. 8.

budgetary ex-post effect of the payroll tax cut. This approach facilitates comparison of labour- market-related and wider economic impacts.

For the budgetary effect, it is assumed that the government finances the cost of the policy measures through levying additional lump-sum taxes on all households. As a result, the policies exemplified in this section can also be seen as tools to divert part of the overall tax burden away from (older workers') labour.

The supply and the demand-side policy measures each lead to significant employment gains among older workers with few repercussions for other age groups (*Chart 4.24*). As employment increases, so does investment, since firms endow their new staff with capital. The favourable educational mix among older workers and their above-average productivity particularly encourages investment: the model realistically incorporates a complementarity between workers' qualifications and investment ([85]). As a result, the relative change in investment (and hence capital endowment) is slightly higher than the employment gains. The combined effect of increased employment and higher capital intensity boosts real GDP.

Chart 4.24
De-taxing older labour: Significant employment gains amongst older workers
Long-term impact on GDP, capital, and employment of an earned income tax credit and a payroll tax credit, Sweden
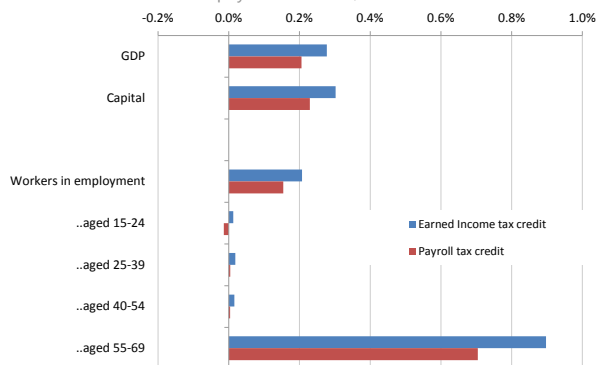
Note: Same ex-post budgetary impact of the two measures
Source: DG EMPL calculation based on LMM
Click here to download chart.

The difference between the supply- and demand-side measures lies in what happens to wages and labour costs (*Chart 4.25*). The payroll tax credit, by lowering employers' social contributions, reduces labour costs for older workers at any given gross wage level. This is an incentive for firms to step up the hiring of older workers. Given the additional demand, older workers' bargaining position improves, relative to their employers. As a result, they will be more successful than before when bargaining for higher wages. Their (gross) wage levels increase, pulling up net wages to the same extent. The earned income tax credit, in contrast, cuts direct taxes on older workers' wages. Their net wage rate goes up considerably. As workers can now take home more of their pay, the pressure to push hard for higher (gross) wages in the wage bargaining process will abate to some extent. As a result, their gross wage level declines, pulling down labour costs to the same extent.

([85]) The better workers are qualified, the higher the capital endowment. This feature holds for all 14 countries supported by the model, based on empirical evidence. For example, the policy scenario has been tested for Italy as a country where the labour market features lower employment and less high-skilled workers than is the case in Sweden. The finding that high gains in older workers' employment would not be at the expense of younger workers remains stable.

Chart 4.25

Income tax credit favours net wages, payroll tax favours labour cost

Long-term impact on gross wages, net wages, labour cost, Sweden
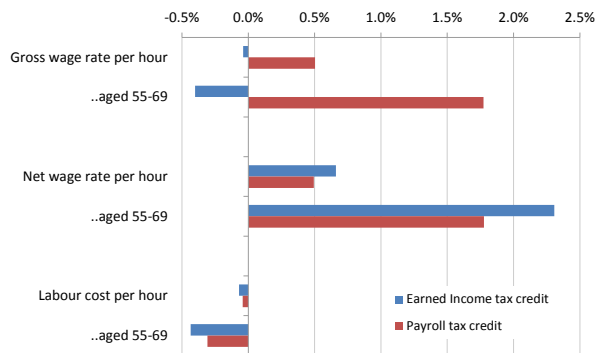
Note: Same ex-post budgetary impact of the two measures

Source: DG EMPL calculations based on LMM

Click here to download chart.

As a result of better employment prospects, the pension benefit ratio (54 % today relative to gross wages) will slightly increase (by 0.1 - 0.2 pps) in both scenarios. These findings correspond to Laun (2012) who finds that both policies combined have increased older workers' employment, but are not cost-neutral for the government's budget, despite significant employment gains. In the long run, each of the two policy measures will lead to the government having to levy lump-sum taxes on households to the extent of some 0.12 % of GDP.

Both a payroll tax credit and an earned income (wage) tax credit lead to significant employment gains. Those gains, however, come from different sources. The payroll tax credit reduces labour costs, strengthening demand for older workers. The income tax credit is an incentive for older workers to join the labour market and take up (or keep) a job. The demand-enhancing payroll tax credit will therefore tend to push up (gross) wage levels, whereas the supply-side wage tax credit tends to lower wages.

4.5. Summary

Since the peak of early retirement in the middle of the 1990s, EU countries have engaged in an array of reforms both in the pension system and in active labour market policies. Employment rates of older workers (aged 55-64) in the EU-15 ([86]) have risen from 36 % in 1995 to 55 % today. The main policy stimulus was the perceived need to halt the waste of older workers as human resources, especially against the backdrop of the forthcoming demographic shift.

This section has considered three broad types of reform, exemplified in three countries. These three types of action share the objective of strengthening solidarity between generations, and especially between workers and pensioners. All of them seek to bring older people back to work. Some focus on the level of pensions and tighten the conditions for retiring in order to improve the financial sustainability of the pension system and discourage early retirement. All seek to improve conditions for the working-age population so as to strengthen intergenerational fairness.

Reforms in the pension system

Higher pensionable ages, coupled with higher life expectancy, will lower future pension expenditure. Unless other pathways to early retirement exist, people will either postpone applying for a regular old-age pension until reaching the new pensionable age or have to accept actuarial deductions from their pension. Both options will provide financial relief to the pension system and allow contribution rates to decrease, benefiting the working age population.

Therefore, workers will see their take-home pay increase. This is good news for all workers, but especially for the young. As their level of skills is (still) low, so are their wages: higher net wages will

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([86])   The EU-15 are those countries that formed the EU before the 2004 eastward enlargement.

strongly motivate them to take up employment. And as pensionable age is still far away, they will be less worried than older workers by the prospect of a reduced future pension. For older workers nearing retirement, the shift in retirement age and higher take-home pay will lead to more people deferring pension take-up, so older workers aged 55+ should see their employment increase more than prime-agers (those aged 40-54).

Coupling higher life expectancy to the level of pensions will lead to lower pension levels relative to wages. Again, this allows the contribution rate to be lowered to support growth, which benefits all generations. Higher net wages and lower labour costs will trigger labour supply and demand, as just mentioned.

Targeted Labour Market Policy: better matching

Reforms to integrate older workers better into the labour market are not limited to pension reforms. Germany's 'Perspektive 50plus' is an example of active support provided to long-term unemployed older workers through individualised services, training and counselling. Though expensive, this strategy can yield a high return, with strong employment gains in the age group 55-69. This is because individualised support increases the probability of older workers' finding a match among the vacancies in the labour market posted by firms. As a result, more workers searching for a job will find one and more vacancies can be filled. Employment goes up, also pulling up investment and GDP.

Tax incentives

Tax cuts incentivise employment but can have different effects on gross wages. Since 2007 Sweden has been supporting both older workers and their employers through tax cuts with a view to improving older workers' employment record. A payroll tax cut (i.e. a reduction in employers' social contribution) gives firms suitable incentives; an earned income (wage) tax cut does the same for workers. In both cases employment goes up. However, the two approaches differ in what happens to (gross) wages. They will increase for older workers in the case of a payroll tax cut, pulled up by stronger demand from firms improving workers' bargaining position; but tend to decline in the case of an earned income tax cut.

5. CONCLUSIONS

In the EU, older people's current situation tends to be favourable. Compared with the working age population, people aged 65 and over generally do reasonably well in terms of income, wealth and access to services. Not only do those aged 65+ own their houses more frequently than the rest of the population, but also their housing conditions remain better than those of the population below the age of 65. However, there are important differences between Member States. Furthermore, living standards slowly deteriorate after the age of 75, particularly for women.

The relative situation of older people improved further over the last ten years. The main source of income for those aged 65+ is pensions, which have been increasing in real terms. The proportion of older people at risk of poverty has decreased, particularly for those aged 75+. Their total wealth has fallen less than that of the working age population since 2013. Since the onset of the crisis, their access to medical services has decreased slightly but not as much as for those of working age.

Bigger challenges lie ahead. Demographic shifts will bring higher economic dependency of the older on the younger generations in almost all EU countries, a challenge recognised already in the 2012 European Commission's White Paper on Pensions ([87]). In addition, since the 1970s, the number of years spent in retirement has increased considerably and stabilised only recently. The intergenerational contract and its central principle of intergenerational fairness is therefore being challenged by higher demographic dependency: declining numbers of workers have to feed and care for growing numbers of inactive pensioners.

Today's young workers and future cohorts are likely to face a double burden: in general, they will pay higher contributions than today's workers *and* receive a lower pension than today's pensioners when

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([87]) See European Commission (2012).

they retire. The adequacy of future pensions is likely to be negatively affected by both the impact of more fragmented work careers and the general lowering of pension generosity following increased demographic dependency. The double burden will persist at least as long as demographic change continues. It will affect all cohorts that will be part of a declining workforce and will thus reach into the next century. Policy-makers therefore face the challenge of reducing the double burden for future cohorts. Further reforms that would affect not only tomorrow's but also today's pensioners are needed, so as to distribute the burden more fairly across generations. These include not only reforms of pension systems but also labour market measures that will bring more people into more productive jobs, enabling them to bear the higher cost of demographic change.

Pension reforms can cut future pensions and pension expenditure significantly. This chapter focused on the redistributive systems into which fewer contributors will pay and on which more pensioners will depend. For pension systems the last 20 years have seen substantial reform activity in the EU that should prevent expenditure levels relative to GDP in 2060 from rising above today's, despite steeply increasing demographic dependency. These reforms will decrease pension entitlements, thus reducing the adequacy of pensions for future pensioners. They will also limit coverage, especially by raising effective retirement ages. In parallel, much of the reform activity targets better labour market prospects for older workers, combined with higher statutory retirement ages. These reforms have already had some success: the employment rate of older workers (55-64s) today is 55 %, 20 percentage points higher than 20 years ago.

But the effect of many reforms, and thus a large part of the planned savings to pension systems, will only materialise fully after 2040. This is true, for example, for further shifts in the retirement age beyond the age of 65. To that extent they will not affect today's older workers and pensioners, but they will affect today's young workers and future cohorts and will hence add to the double burden these cohorts are facing.

Reforms that improve employment prospects for all will help to improve intergenerational fairness. The model simulations of the long-term impact of three major reform options, exemplifying three broader types of reforms, have provided some insights into possible ways for policy-makers to contribute to improving intergenerational fairness. They include a lowering of pension contribution rates through linking both the retirement age and the level of pensions to changes in longevity, intense individualised training and counselling to help older unemployed workers back to the labour market, and using wage tax credits and payroll tax cuts to increase incentives for both older workers and employers and thus contribute to higher employment rates for older workers.

These reforms can lead to higher employment levels, and not just for older workers; they should inspire firms to invest and increase GDP. To the extent that they integrate workers into the labour market they can also contribute to social cohesion by creating better opportunities for all. As workers find their way back to work, the reforms also facilitate the sharing of costs incurred by demographic change. Such labour market measures are only a part of a more comprehensive reform strategy that would also support investment in skills and capital, promote innovation and improve the business environment. At the same time they ensure the sustainability of public finances, which is conducive to enhancing the opportunities of the younger generation and society as a whole. An array of measures could help improve the overall employment rate. Those include proper incentives for second earners through tax and benefit systems, minimum wage policies as well as comprehensive integration strategies.

The recently proposed European Pillar of Social Rights ([88]**) provides a particularly relevant framework for guiding future action by the participating Member States**. For pensioners, it establishes the principle of a right for women and men to receive a pension commensurate with the contributions paid and to have an adequate income in retirement, thus ensuring a decent life. For working age people, it puts forward a number of principles relating to equal opportunities, access to the labour market and fair working conditions that support the full realisation of their potential in active life. The Pillar calls for an adequate pension for both workers and the self-employed and for equal opportunities for both women and men to acquire old-age pension rights. It refers to adequate income in old age regardless of the type of pension system. Thus, it covers all three pillars of the pension system. The

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[88] http://ec.europa.eu/european-pillar-social-rights

implementation of these principles would contribute to reducing the burden of demographic change and improving employment prospects for all, and would help to secure good living standards in retirement, now and for future generations.

Box 4.4: Annex Finland - The Finnish life expectancy coefficient: higher life expectancy lowers pensions

In Finland, the level of pensions is linked to life expectancy through a life-expectancy coefficient. The current pension formula foresees a lowering of pensions in a given year, say 2017, if a 62 year-old person has a higher statistical life expectancy than a 62 year-old in the reference year 2009 ([1]). Pensions will thus be reduced more, the higher the respective age group's life expectancy is compared with the reference year. Using Eurostat's projected mortality tables for 2017 and 2060, it can be shown that based on the formula currently in place the starting pension in 2060 would be some 13 % lower than would be the case without the reform. The 2017 reform further modified the formula as from 2027, by also taking into account the fact that the pensionable age will be raised according to increasing life expectancy. This change would reduce the cut in pensions to just 5 % by 2060. This box explains how these cuts are calculated, based on the Finnish pension formula.

The rationale of the Finnish pension formula is best explained by the example of a 62 year-old person who calculated the value of their future pension payments back in 2009. That value depended on a hypothesised fixed discount rate ([2]) on future pension payments and on how long that person expected to live, starting from the age of 62 years in 2009. A fixed discount rate of 2 % per year, as assumed in the Finnish pension formula, implies that a euro in pension paid in, say, 10 years' time (when aged 72 in 2019) would have a present value of 81 cents in 2009. In addition, of 100 people aged 62 in 2009, only 86 will have survived 10 years later ([3]), Hence, from the perspective of a 62 year-old in 2009, the value of one euro paid in 2019 will be 0.70 euro (0.86 * 0.81) .

Assuming one euro paid at every age from 62 to 100, the present value in 2009 of these payments is 16.78 Euro. The 'longevity indicator' for 2009 takes into account an annual 2 % discount and the fact that a number of people who reach age x will not reach age x+1. Applying the same method for the longevity indicator in 2017 will deliver 17.41 Euro because life expectancy between those two years will have increased. The life expectancy coefficient for 2017, relative to 2009, is the ratio of the corresponding longevity indicators: 0.96344 (16.78 / 17.41) ([4]). In other words, today's value of one pension point for a 62 year-old in 2009 is almost 3.7 % lower ([5]).

Using Eurostat's mortality tables for the age groups 62 to 100 years for Finland, as they result from Eurostat's population projections ([6]), the life expectancy coefficient in 2060, relative to the current year 2017, will be an estimated 0.87. That means that, according to the currently valid method of calculating the life expectancy coefficient, the coefficient would lower the value of one pension point by 13 % in total between now and 2060.

The 2017 reform introduced another modification to estimating how the life expectancy coefficient will impact on the level of pensions as from 2027. A supplementary coefficient in the pension formula will take into account the fact that the pensionable age (65 years for people taking up their pension at that time) will be further increased to take account of rising life expectancy. The new coefficient will smoothen the reduction of pensions by 2060. This modification was introduced to keep higher life expectancy from eating into people's pension rights both through higher retirement ages *and* the life expectancy coefficient in the pension formula. The method applied when calculating the life-expectancy coefficient is detailed in the following paragraph.

In the Finnish pension formula, this coefficient reduces the amount of pension as life-expectancy increases over time. *Table 1* shows, from the perspective of a 62 year-old person in 2017, 2026 and 2060, what is the present value of one euro paid at every age, up to 100 years. It takes into account mortality rates (qx) at age x. Out of 1 000 people aged 62 in 2017, 7.64 will not survive the next year. Correspondingly, lx reflects survival rates: only 99.24 % of those aged 62 in 2017 (2026) will turn 63 a year later. As people aged, say, 62 are 62.5 years on average, Lx is [lx(62) + lx(63)]/2.

The formula $1.02^{-(x+0.5+62)} \cdot L_x/l_{62}$ in *Table 1* calculates the present value in a given year (2017, 2026 and 2060) of one euro paid at any age x. It takes into account an implicit interest rate (2 %) and mortality between the age x and the base age of 62. For example, take the year 2017. Looking at the last column for 2017 in *Table 1,* in order to calculate the longevity indicator for a 62 year-old in 2017 (E2017/62) one has to sum up over all ages from 62 to 100 years.

As $E(2017/62)/E(2060/62) = 0.8713$, a pensioner aged 62 in 2060 will have a starting pension which is around 13 % lower than a same-aged new pensioner in 2017.

([1])   Calculated from the average age-specific mortality rates of the years 2003 to 2007.

([2])   The discount rate reflects time preference. People prefer one Euro paid today to one Euro paid tomorrow. The discount rate reflects how much stronger this preference is for today compared with tomorrow.

([3])   According to official Statistics Finland mortality table. Appelqvist (2016), p. 3.

([4])   The coefficient is published by the Finnish Centre for Pensions on http://www.etk.fi/en/the-pension-system-2/the-pension-system/pension-benefits/life-expectancy-coefficient/

([5])   The methodology of calculating the coefficient is outlined in Appelqvist (2016) and Annex 1 below.

([6])   See table [proj_15naasmr] on Eurostat's website http://ec.europa.eu/eurostat/data/database.

(Continued on the next page)

Box (continued)

However, following the 2017 reform, from 2027 another factor will alleviate the reduction of pensions as it takes into account the fact that the pensionable age (65 years by 2027) will be further raised according to increased life expectancy. Life expectancy is expected to increase on average by some three more years, hence to age 68. That is, assuming 2017 as the base year, from 2027 on, the reduction factor in 2060 will be:

$$\frac{E(2017/62)}{E(2026/62)} \cdot \frac{E(2026/65)}{E(2060/68)} = 0.9675 \cdot 0.9801 = 0.9483.$$

That is, the second (new) multiplier covers the period between 2026 to 2060, taking into account age specific mortality rates (as before), but also the fact that in 2060 the retirement age would be 68 years while it will still have been 65 years in 2026 – as shown in the last column for 2026 and 2060, respectively, in *Table 1*. This is because the life expectancy of a 65 year-old is expected to increase by around 3 years from 2026 to 2060, see *Chart 1*. Thus, the lowering of pensions would be cushioned a lot. **Compared with 2017, starting pensions in 2060 would be** (only) **some 5 % lower than in 2017**.

Chart 1
Life expectancy will further increase
Life-expectancy of a 65 year-old in a given year, Finland
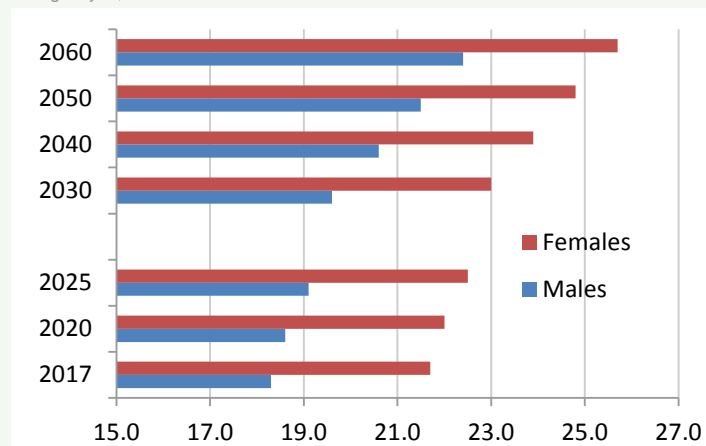
Source: Eurostat [proj_15nalexp]

The increase in life-expectancy is cohort-specific and it is expected to continue after 2060. However, for the purpose of better illustration the simulation with the Labour Market Model shown in section 4.2.2. assumes that in the long run the level of pensions will be lowered by 5 % through the application of a life expectancy coefficient..

(Continued on the next page)

Box (continued)

Table 1
Longevity indicator for Finland

x	\multicolumn{4}{c}{For the year 2017}				\multicolumn{5}{c}{For the year 2026}					\multicolumn{5}{c}{For the year 2060}				
	qx	lx	Lx	$1.02^{-(x+0.5-62)} \cdot Lx/l_{62}$	qx	lx	Lx	$1.02^{-(x+0.5-62)} \cdot Lx/l_{62}$	$1.02^{-(x+0.5-65)} \cdot Lx/l_{65}$	qx	lx	Lx	$1.02^{-(x+0.5-62)} \cdot Lx/l_{62}$	$1.02^{-(x+0.5-68)} \cdot Lx/l_{68}$
62	7.49	1.0000	0.9963	0.9864	6.40	1.0000	0.9968	0.9870		3.47	1.0000	0.9983	0.9884	
63	8.18	0.9925	0.9885	0.9595	6.98	0.9936	0.9901	0.9612		3.79	0.9965	0.9946	0.9655	
64	8.91	0.9844	0.9800	0.9327	7.57	0.9867	0.9829	0.9355		4.14	0.9928	0.9907	0.9429	
65	9.69	0.9756	0.9709	0.9059	8.24	0.9792	0.9752	0.9099	0.9861	4.52	0.9887	0.9864	0.9204	
66	10.52	0.9662	0.9611	0.8791	8.97	0.9711	0.9668	0.8843	0.9584	4.95	0.9842	0.9817	0.8980	
67	11.43	0.9560	0.9505	0.8525	9.75	0.9624	0.9577	0.8589	0.9308	5.42	0.9793	0.9767	0.8759	
68	12.40	0.9451	0.9392	0.8258	10.61	0.9530	0.9480	0.8335	0.9033	5.91	0.9740	0.9711	0.8538	0.9872
69	13.47	0.9334	0.9271	0.7991	11.54	0.9429	0.9375	0.8081	0.8758	6.46	0.9682	0.9651	0.8319	0.9619
70	14.67	0.9208	0.9140	0.7724	12.57	0.9320	0.9262	0.7827	0.8483	7.05	0.9620	0.9586	0.8101	0.9366
71	16.05	0.9073	0.9000	0.7457	13.68	0.9203	0.9140	0.7573	0.8207	7.73	0.9552	0.9515	0.7883	0.9115
72	17.52	0.8927	0.8849	0.7188	15.06	0.9077	0.9009	0.7318	0.7931	8.51	0.9478	0.9438	0.7666	0.8864
73	19.31	0.8771	0.8686	0.6917	16.61	0.8941	0.8866	0.7061	0.7652	9.41	0.9398	0.9353	0.7448	0.8612
74	21.30	0.8601	0.8510	0.6644	18.39	0.8792	0.8711	0.6801	0.7371	10.45	0.9309	0.9261	0.7230	0.8359
75	23.63	0.8418	0.8319	0.6367	20.42	0.8631	0.8542	0.6538	0.7086	11.67	0.9212	0.9158	0.7010	0.8105
76	26.19	0.8219	0.8112	0.6087	22.78	0.8454	0.8358	0.6272	0.6797	13.10	0.9104	0.9045	0.6787	0.7848
77	29.14	0.8004	0.7887	0.5803	25.45	0.8262	0.8157	0.6001	0.6503	14.79	0.8985	0.8919	0.6561	0.7586
78	32.77	0.7771	0.7644	0.5513	28.55	0.8051	0.7936	0.5724	0.6204	16.70	0.8852	0.8778	0.6332	0.7321
79	36.67	0.7516	0.7378	0.5217	32.12	0.7822	0.7696	0.5442	0.5898	19.02	0.8704	0.8622	0.6097	0.7049
80	41.31	0.7241	0.7091	0.4916	36.36	0.7570	0.7433	0.5153	0.5584	21.71	0.8539	0.8446	0.5855	0.6770
81	46.69	0.6941	0.6779	0.4608	41.10	0.7295	0.7145	0.4856	0.5263	25.06	0.8353	0.8249	0.5606	0.6482
82	52.80	0.6617	0.6443	0.4293	46.86	0.6995	0.6831	0.4552	0.4933	28.97	0.8144	0.8026	0.5348	0.6184
83	60.13	0.6268	0.6079	0.3972	53.50	0.6667	0.6489	0.4239	0.4594	33.78	0.7908	0.7775	0.5079	0.5872
84	68.37	0.5891	0.5690	0.3644	61.40	0.6311	0.6117	0.3918	0.4246	39.57	0.7641	0.7490	0.4797	0.5546
85	78.46	0.5488	0.5273	0.3311	70.41	0.5923	0.5715	0.3588	0.3889	46.32	0.7339	0.7169	0.4501	0.5205
86	89.28	0.5058	0.4832	0.2974	80.89	0.5506	0.5283	0.3252	0.3525	54.52	0.6999	0.6808	0.4191	0.4846
87	101.97	0.4606	0.4371	0.2638	93.32	0.5061	0.4825	0.2912	0.3156	63.90	0.6617	0.6406	0.3866	0.4470
88	116.81	0.4136	0.3895	0.2305	106.91	0.4588	0.4343	0.2570	0.2785	74.43	0.6194	0.5964	0.3529	0.4080
89	132.89	0.3653	0.3411	0.1978	122.14	0.4098	0.3848	0.2232	0.2419	86.07	0.5733	0.5487	0.3183	0.3680
90	150.91	0.3168	0.2929	0.1666	139.38	0.3597	0.3347	0.1903	0.2063	100.04	0.5240	0.4978	0.2831	0.3273
91	170.44	0.2690	0.2460	0.1372	158.17	0.3096	0.2851	0.1590	0.1723	115.64	0.4716	0.4443	0.2477	0.2864
92	192.44	0.2231	0.2017	0.1102	179.15	0.2606	0.2373	0.1297	0.1406	133.38	0.4170	0.3892	0.2128	0.2460
93	215.17	0.1802	0.1608	0.0862	201.70	0.2139	0.1924	0.1031	0.1117	153.27	0.3614	0.3337	0.1788	0.2068
94	240.78	0.1414	0.1244	0.0654	227.18	0.1708	0.1514	0.0795	0.0862	175.59	0.3060	0.2792	0.1467	0.1696
95	269.33	0.1074	0.0929	0.0479	254.10	0.1320	0.1152	0.0593	0.0643	200.68	0.2523	0.2270	0.1169	0.1352
96	300.29	0.0785	0.0667	0.0337	284.24	0.0984	0.0845	0.0427	0.0462	228.71	0.2017	0.1786	0.0902	0.1043
97	335.68	0.0549	0.0457	0.0226	318.12	0.0705	0.0593	0.0293	0.0318	260.18	0.1555	0.1353	0.0670	0.0775
98	373.08	0.0365	0.0297	0.0144	355.21	0.0480	0.0395	0.0192	0.0208	295.18	0.1151	0.0981	0.0476	0.0550
99	414.18	0.0229	0.0181	0.0086	396.51	0.0310	0.0248	0.0118	0.0128	334.33	0.0811	0.0675	0.0321	0.0372
100	1000.00	0.0134	0.0067	0.0031	1000.00	0.0187	0.0093	0.0044	0.0047	376.93	0.0540	0.0270	0.0126	0.0146

E2017/62 Sum 17.792446 E2062/62 18.3895 E2060/62 20.4195
E2062/65 16.8046 E2060/68 17.1449

Source: DG EMPL calculations based on Eurostat 2015 population projections (baseline) and Appleqvist (2016)

Box 4.5: Annex Germany - Modelling improved matching in the Labour Market Model

The Initiative 'Perspektive 50plus' aims at improving the prospects of unemployed older workers for finding a match on the labour market. The Labour Market Model incorporates such matching function. The effort workers make to find a job (search intensity) is a determinant of labour supply, whereas the number of vacancies posted by firms reflects the demand side. Frictions in the market imply that only a certain proportion of the vacancies posted and of the search units supplied will actually lead to a match. The proportion obviously depends on the tightness of the labour market: the smaller the number of vacancies per job-searching older worker, the more difficult it will be for job searchers to find a match. The modelled reform hence seeks to improve the efficiency of job matching, especially for older people [1].

The improved matching efficiency is technically built into the model as follows.

It is assumed that the cost of EUR 9 300, as spent per 'sustainable integration' of older workers through the initiative, will be spent on all unemployed workers aged 55 to 69 years [2]. In 2015 there were some 370 000 unemployed workers in that age group, hence the total cost will be an annual EUR 3.44 billion, or 0.11% of GDP.

The question how can much the number of matches be improved through spending EUR 3.44 bn on training older workers, at a given level of labour supply and labour demand? Following Berger et al [3], the elasticities found by Bassassini and Duval [4] are applied to the Labour Market Model's matching efficiency: If the government spends an amount equalling 4% of GDP per capita on every unemployed person, the result will be that unemployment declines by 0.4 percentage points. Applying the same elasticity to older unemployed workers, EUR 3.44 bn spent on their training will reduce their unemployment by 2.5 percentage points. The matching efficiency parameter in the model is set so as to match this benchmark.

[1] See Berger et al (2009:2), pp. 11-13, providing a similar simulation.
[2] The real policy measure is focussed on those aged 50 and above..
[3] Berger et al (2009:2), p. 12.
[4] Ibidem.

Box 4.6: Annex Pension Reforms

Major pension reforms carried out by the Member States since 2008

MS	Year	Access to early retirement (incl. disability) restricted	Age for early retirement raised	Pensionable age increased	Women's pensionable age brought up to men's	Length of contribution period increased	Automatic indexation to life expectancy	Limit to combine work and pension eased
BE	2012/2015	✓	✓	✓				✓
BG					✓			
CZ	2011			✓	✓	✓		
DK	2011	✓	✓	✓			✓	✓
DE	2014			✓				
EE	2010			✓	✓			
IE	2012-2014			✓		✓		✓
EL	2010/2012	✓	✓	✓	✓	✓	✓	
ES	2013	✓	✓	✓		✓		✓
FR	2010-2012	✓		✓		✓	[✓]	
HR	2013		✓	✓	✓			✓
IT	2011	✓	✓	✓	✓	✓	✓	
CY	2012	✓		✓		✓	✓	
LV	2011			✓		✓		
LT	2011			✓	✓			
LU	2012	✓						
HU	2010/2012	✓		✓				
MT	2008-2013	✓		✓	✓	✓		
NL	2012	✓		✓			✓	
AT	2013	✓	✓		✓			
PL	2008-2010	✓		✓	✓	✓		
PT	2012-2014	✓		✓			✓	
RO	2011			✓				
SI	2012	✓		✓	✓	✓		
SK	2011-2012			✓	✓		✓	
FI	2010-2014	✓	✓					✓
SE								
UK	2011-2014			✓	✓			

Source: Update of the 2015 Pensions Adequacy Report - Information provided by the Member States (for details see Volume II of the Pension Adequacy Report)

Box 4.7: Older people not living in private households

People living in collective households and in institutions are generally excluded from the target population of EU-SILC, which includes all private households and their current members residing in the territory of the countries at the time of data collection. Approximately 1 % of the resident population of the EU does not live in a private household (with missing data for Bulgaria and Greece). This proportion is highest among older people (3 % of the population aged 65+), with substantial differences between Member States (Chart 1). In Luxembourg, more than 7 % of older people do not live in private households, while this is less than 1 % in Romania (where older people are more likely to live in multi-generational private households). Among the eldest (aged 85+) the overall proportion not living in private households is higher (13% across the EU), and the differences between countries are even more pronounced (from one third in Luxembourg to less than one in twenty in Romania, Poland, Latvia and Lithuania). These differences have to be taken into account when interpreting results about older people's relative situation across Member States.

Chart 1
Major national differences in the household situation of older people
Older people not living in private households, by age and Member State, 2011
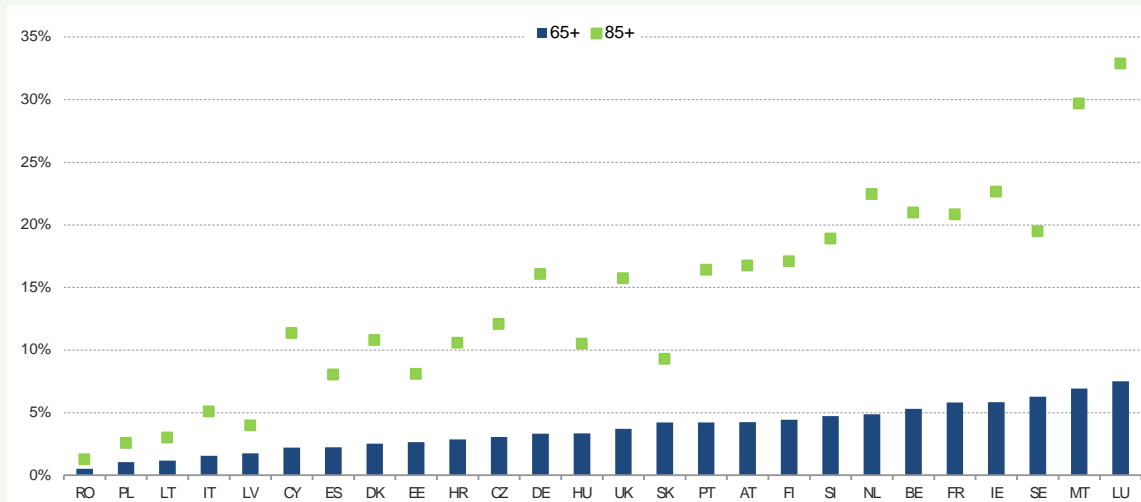
Note: Missing data for BG and EL
Source: Eurostat, Census Hub, HC48