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# Workshop

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## **Sustainable Ageing Societies: Indicators for Effective Policy-Making**

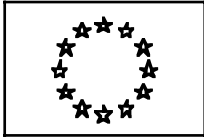
### **Thematic session 2**

Sustainability of social security schemes  
and pension systems

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## Current and Prospectives Pension Replacement Rates

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# Current and Prospective Pension Replacement Rates

## Report on Work in Progress

Indicators Sub-Group (ISG) of the Social Protection Committee

- 23 February 2004 -

### 1. BACKGROUND

An important mandate for the Indicators Sub-Group (ISG) of the Social Protection Committee is to develop indicators that can be used in the 'Open Method of Coordination' applied to pensions. The 'Open Method of Coordination' was defined at the European Council in Lisbon in March 2000 as a tool for coordinating Member States' policies in areas that remain a primary responsibility of the Member States. It involves the definition of common objectives and the monitoring of national policies in the light of these objectives. This requires notably the use of common indicators. The Open Method of Co-ordination in the area of pensions was defined at the December 2001 Laeken European Council, which endorsed 11 common objectives covering the broad areas of social adequacy, financial sustainability and modernisation of pension systems.

The ISG has focused much of its attention on the issue of pension adequacy for which three common objectives were adopted by the Laeken European Council, namely that *Member States should safeguard the capacity of pension systems to meet their social objectives. To this end, against the background of their specific national circumstances, they should:*

1. *Ensure that older people are not placed at risk of poverty and can enjoy a decent standard of living; that they share in the economic well-being of their country and can accordingly participate actively in public, social and cultural life<sup>1</sup>;*

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<sup>1</sup> In this respect, benefits and tax advantages other than pensions should also be taken into account where appropriate.

2. *Provide access for all individuals to appropriate pension arrangements, public and/or private, which allow them to earn pension entitlements enabling them to maintain, to a reasonable degree, their living standard after retirement; and*
3. *Promote solidarity within and between generations.*

In this context, the ISG has already defined a first set of common pension adequacy indicators based on income data from household surveys (namely the European Community Household Panel). These allow an assessment of the poverty risk and income conditions of older people relative to those of people below retirement age. However, such indicators comprise other sources of income on which elderly people can draw, either through their own entitlement or through sharing of resources with other household members. The specific contribution of pension schemes to the income situation of the elderly cannot be gauged. Moreover, income provided today by current pension systems does not necessarily inform us about the income situation of future generations of elderly people, since pension systems are being reformed in many countries.

In the light of the above considerations, the ISG concluded that these indicators needed to be complemented by another type of information, more specifically focused on the pension systems themselves and their future evolution, i.e. theoretical replacement rates. The present report shows the results of the work the ISG has carried out to date in this area.

The ISG believes that it has developed a powerful framework that facilitates an understanding of how pension systems as currently legislated in different Member States operate now and in the future. It shows the contributions of different pension schemes – public and private – to the make-up of individual pensions. This framework is sufficiently flexible to accommodate different system designs including differences in objectives as well as the different emphases on private and public provision. This work can potentially build a bridge between considerations of adequacy and financial sustainability.<sup>2</sup> The framework does not, however, allow straightforward comparisons of replacement rates between countries.

In addition to this work on theoretical replacement rates, the ISG has defined a measure to evaluate individual pensions for a cohort of people over the retirement age relative to individual earnings using household survey data. This measure takes individual median earnings of people aged 50-59 years as the denominator. Individual median pensions (including and excluding other benefits) received by people aged 65-74 are the numerator.

The theoretical replacement rates and the empirical measures of pension adequacy based on income data (both at the household and the individual level) are complementary and should be looked at together for a better understanding of a national pension system. In

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<sup>2</sup> Financial sustainability is an issue for the overall pension system, including public and private schemes. In this regard, the ISG draws attention to the difference in scope between its work, which also covers private schemes, and the pension expenditure projections of the Economic Policy Committee's Ageing Working Group (AWG), which so far has focused on public expenditure only. The financial sustainability of private pensions requires further investigation.

particular, the empirical measure of individual pensions relative to individual earnings can give, for some countries, an indication on how representative the current theoretical replacement rates are in respect of current generations of pensioners.

## **2. REPLACEMENT RATES: ANALYTICAL CONSIDERATIONS**

Replacement rates express the level of pensions as a percentage of previous individual earnings at the moment of take-up of pensions. They are calculated with reference to a hypothetical worker with a given earnings and career profile (and a corresponding affiliation to pension schemes) and by making specific assumptions on the key policy, economic and demographic parameters that may be relevant for the calculation of future earnings and benefit entitlements. As such, replacement rates can be used to describe the mechanisms by which pension systems work.

Given the primary focus of the ISG on pension adequacy issues, replacement rates have been developed in particular with a view to shedding more light on the second social adequacy EU objective agreed in Laeken, that is, to measure the extent to which pension systems enable workers to preserve their previous personal living standard when moving from employment to retirement. In accordance with this objective, public pension schemes and, where appropriate, private pension arrangements have been included in the replacement rate calculations, as well as the impact of taxes, social contributions and non pension benefits that are typically available to pensioners.

It is important to note here that there cannot be an unequivocal normative interpretation of the level of replacement rates when looking in particular at the second social adequacy objective. Countries vary in the ways in which their pension systems address the goals of preventing poverty and maintaining the previous in-work income and in the ways in which these social goals are reconciled with the imperative of financial sustainability. Moreover, the parameters used for calculating the theoretical replacement rate may not be sufficiently representative. Replacement rates should therefore be seen as one of a wider set of statistics that are required to assess the adequacy of a pension system.

Replacement rates allow nevertheless to monitor, for a given country and a specific hypothetical worker, the effects of pension reforms on pension entitlements. In the present exercise, an attempt has been made to reflect as closely as possible the pension outcomes for hypothetical workers who started their careers 40 years ago and are retiring today. This provides a baseline result to which other calculations, notably of future replacement rates for the same hypothetical workers, can be compared.

Depending on the specific characteristics of the hypothetical workers, replacement rates provide a tool for comparing some key aspects of widely different national pension systems. Furthermore, replacement rates can incorporate a prospective dimension, since they can be used to assess pension entitlements of future hypothetical pensioners by taking account of the current and programmed (i.e. already legislated) pension system parameters and assumptions on the future evolution of the key economic and demographic parameters.

While being aware of the advantages noted above, some shortcomings of the theoretical approach underlying the calculation of replacement rates need to be borne in mind. As

mentioned above, by ignoring other income resources on which the elderly can live, as well as sharing of resources with other household members, replacement rates alone are not meant to assess the overall living standards of the retired population. Moreover, the diversity of pension systems operating within Member States is such that cross-country comparability is very difficult to achieve.

Finally, assumptions about the hypothetical worker are inevitably arbitrary and are not necessarily representative of a large number of real workers as they reach retirement age. In fact, given the diversity of real-life situations, very few actual workers may present a profile that closely resembles the hypothetical worker to whom the calculations apply. As such, theoretical replacement rate calculations are not meant to provide a picture of the average effective replacement rate guaranteed by pension systems.

Replacement rates need therefore to be analysed in the light of background information aimed at showing in particular how "representative" the hypothetical worker is. Sensitivity analysis concerning the common assumptions is also useful, particularly on the basis of alternative (pessimistic or optimistic) scenarios with regard to future demographic and economic developments, although it should be noted that pension schemes of the defined-benefit type (the most common among those considered in this exercise) are assumed not to adjust in response to demographic and economic changes – which is not a realistic assumption over the long projection horizon.

With regard to prospective replacement rates, it also needs to be borne in mind that the results presented here just indicate the pension outcome under current legislation (which may of course include changes to the pension system that will be implemented gradually in the future). Some countries have designed their pension system in such a way that benefits are adjusted automatically in response to changes in life expectancy and/or contribution income.

Thus, financial sustainability is, to some extent, built into the scheme. In most Member States, however, the parameters of the pension system have to be adjusted through discretionary policy decisions in order to maintain financial sustainability. If such decisions have yet to be taken to ensure long-term financial sustainability, then the replacement rates reported here are likely to be reduced in the future.

A similar issue arises with regard to private pension provision. The agreed common framework results in automatic adjustments of benefits in defined-contribution schemes as life expectancy rises. By contrast, where a private defined-benefit arrangement has been assumed, the level of benefits does not reflect such changes. The implicit assumption is that contributions will rise. It should also be noted that the rate of return to be used for defined-contribution schemes within this common framework (2%) is lower than the one typically used by actuaries to establish whether a defined-benefit scheme is adequately funded. This rate of return used by actuaries reflects past experience with asset performance. If future rates of return are lower than those currently used by actuaries (as is expected by some economists) then benefits under defined-benefit schemes would also have to fall – or contributions would have to be higher.

International comparability of gross replacement rates is also limited by the way in which pension contributions are shared between employers and employees. For a given total

labour cost, a higher share of contributions paid by the employer implies lower gross earnings of the employee and hence a higher gross replacement rate. This is an issue that could be addressed in further work of the ISG on replacement rates.

Thus, in order to assess the success of current and future pension systems in ensuring that the elderly have the resources to support adequate standards of living, theoretical replacement rates are to be used only as a complement to empirical, survey data on living standards. A full assessment of future pension systems would need a technique that projects work histories, patterns of household formation and sources of income in retirement other than those considered in replacement rates. This would require sophisticated dynamic micro-simulation models that, at present, are only available in very few Member States. Moreover, some adjustment of pension systems to expected demographic and financial challenges would have to be included in the modelling; this would, however, have to be highly speculative.

### **3. THE METHODOLOGICAL FRAMEWORK**

The ISG has made significant progress in defining a clear and reasonably comparable framework for Member States to follow in the calculation of current and prospective replacement rates. It has done so on the basis of a scenario which is consistent, as far as possible, with the timeframe and assumptions about demography and the economy as used in the 2001 public pension expenditure projections carried out by the Ageing Working Group (AWG) of the Economic Policy Committee.

With this methodology, replacement rates are calculated at the moment of pension take-up by dividing the pension income during the first year of retirement by the income during the year preceding retirement. The calculations refer to pension outcomes of people retiring today and who will retire at up to three points in time in the future (i.e., 2010, 2030 and 2050), assuming that only the rules already legislated today will apply.

Pension income to be included in the calculations includes pension benefits that are relevant in the national framework, which may include statutory ('first pillar') and private (typically occupational or 'second pillar') pension schemes,<sup>3</sup> but also, in some cases, other social benefits as applicable to the selected case (e.g. housing benefits). Ireland also included in the post-retirement income an estimation of the value of free services that are only available to pensioners. Pre-retirement income comprises all earned income (including overtime pay, bonuses, 13th month, etc.) and social benefits as applicable to the selected case.

It was agreed that, in order to explain the national calculations and to make them more useful for policy making, the replacement rates should be clearly broken down into individual components of retirement income: means-tested benefits, public and private provision. This will also make it easier to establish how similar the theoretical case is to typical real-life situations. Also, it was stipulated that context information aimed at

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<sup>3</sup> First pillar: statutory pension schemes, regardless of whether they are funded or pay-as-you-go financed. Second pillar: occupational schemes, i.e. pension schemes linked to the employment status. Third pillar: individual retirement provision through insurance and retirement savings.

showing how representative the hypothetical worker is should accompany the results. In particular, this requires information on the following elements: the average actual career length and retirement age; the coverage/membership by scheme or pillar; and the contribution rates to each pillar or scheme considered in the hypothetical case.

Member States were asked to provide all elements that entered the calculations of gross and net replacement rates. Apart from pre-retirement and pension income, these include statutory social security contributions, contributions to supplementary pension schemes or funds, taxes and means-tested social benefits. This makes it possible to gauge the contributions to pensioner's relative living standards of the different pillars of the pension system, of the tax system and of other social benefits.

The base case to be used by all Member States for the first round of calculations of replacement rates was defined as follows:

### Specification of the base case

<b>Professional status:</b>	<b>Workers covered by the most general scheme</b> (i.e. private sector scheme, if there are different schemes by professions/sectors. If considered relevant, Member States may also calculate replacement rates for public sector employees, self-employed or other professional groups.)
<b>Career length:</b>	<b>40 years</b> If relevant, other career lengths may be calculated in addition to 40 years.
<b>Age at retirement:</b>	<b>65</b> If relevant, other retirement ages may be calculated in addition to 65 years.
<b>Type of employment:</b>	<b>Full-time work</b>
<b>Marital status :</b>	<b>Single person (male, if sex is relevant)</b> Member States were asked to explain any difference between men and women.
<b>Pillars in pension income:</b>	<b>First pillar, supplementary (occupational or personal) provision and means-tested supplements as applicable to the selected case.</b> The contribution of each pillar/type of scheme should be indicated and the underlying assumptions should be explicit (including level of contributions and duration of membership. The pensioner is assumed to have no other significant income or property that would diminish the entitlement to any means-tested benefits.
<b>Earnings level:</b>	<b>100% of average earnings</b> (see below)
<b>Earnings profile:</b>	<b>Constant relation to current average earnings (100%) over the whole period of employment</b>

In addition to the base case, countries agreed to calculate replacement rates for alternative hypothetical cases of a worker characterised by a flat low earnings profile (2/3 of average earnings) and two cases with rising earnings: one starting at 100% of average earnings, rising to 200% at the end of the 40-years career, the other one with earnings rising from 80% to 120% of the average. Moreover, Member States were asked to show how well the relative income level of a base case pensioner is maintained during his time of retirement

which is currently likely to last for more than 15 years for men. This was to be done by calculating the retirement income entitlement 10 years after take up divided by average earnings during the previous year (i.e. the year beginning nine years after retirement). This is referred to as '10-years indexed replacement rate' in the country sections below. Depending on how benefits are index-linked to prices, earnings (or a combination of both) or just fixed in nominal terms and depending on the evolution of prices and earnings over time, pension entitlements may decline significantly relative to average wages over the retirement period.

### **Earnings data**

A data series on "national compensation per wage and salary employee" was provided by the Commission based on National Accounts definitions (ESA 95). It was obtained by dividing nominal compensation of employees by the number of employees, and drawn from a database maintained by DG ECFIN. This database contains long time series going back to the 1970s or even earlier.

It should be noted that "national compensation per wage and salary employee" includes employers' social security contributions, which were to be deducted before calculating replacement rates.<sup>4</sup> The Member States were asked to check whether the data series "national compensation per wage and salary employee" was consistent with data from national sources. If deemed necessary, they could opt for national data series of wages and salaries net of employers' contributions.

In a number of Member States, there are several statutory pension schemes covering different groups of employees. It was agreed to carry out the calculation for the most prevalent scheme, i.e. typically the general scheme for private sector employees. This gave rise to a question about the average wage to be used: should it be for the economy as a whole or for the specific group covered by the scheme for which the replacement rate is calculated? It was agreed that there was, in principle, no need to have a precise match of the group covered by the relevant pension scheme and the group for which average earnings are measured as long as this average is reasonably representative and absolute figures are also provided. However, Member States were left free to use a data series for the specific group covered under the pension scheme.

Another issue that arose in relation to earnings data to be used is part-time working. The data series based on national accounts provided by the Commission includes both full-time and part-time workers. In countries with a high share of part-time employment this series would underestimate the average earnings of a full-time worker, implying a departure from the assumption of a 40-years full-time career. Member States were therefore allowed to use an earnings series for full-time employees, where these are available.

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<sup>4</sup> A more appropriate data series for the calculation of gross replacement rates would have been "wages and salaries" which does not include employers' social contributions. However, data on "wages and salaries" are only available for a limited number of countries before 1995 in the Eurostat database.

Finally, it was agreed to annuitise any lump sum paid at the moment of retirement whose aim is, according to national circumstances, of providing resources for the old age and to include this annuity in the pension income. However, it is not always clear what purpose a lump sum serves. In the case of the Italian *Trattamento di fine rapporto (TFR)*, a cash payment that is due at the end of an employment contract, regardless of the employees age, it was decided to consider this neither as income from work (because it is not sufficiently regular), nor as a pension (because most of the TFR payments may be received long before retirement).

### **Assumptions for prospective replacement rates**

For the base case, it was agreed to calculate not only current replacement rates, but also prospective replacement rates in 2010, 2030 and 2050 as they would result under the hypothesis that the current state of legislation/reforms is maintained. It was also agreed to calculate prospective replacement rates for other earnings levels and profiles, but only for 2050. This required a number of additional assumptions, particularly for defined contribution schemes.

#### *1. Future growth in earnings*

In line with the assumptions used by the Economic Policy Committee's (EPC) Working Group on Ageing, it was agreed to use the following values for both productivity growth and real earnings growth over the period 2000-2050:

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU
1.8	1.6	1.8	2.0	2.1	1.7	2.1	1.8	2.1	1.7	1.8	1.9	1.9	1.8	1.8	1.8

Departures from these assumptions had to be duly justified.

#### *2. GDP growth*

Again, the assumptions made by the Ageing Working Group were to be used (constant growth rate over the entire period):

B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU
1.7	1.5	1.4	2.0	1.8	1.7	2.6	1.4	4.0	1.8	1.6	1.9	1.6	1.8	1.7	1.6

Departures from these assumptions had to be duly justified.

#### *3. Inflation*

An inflation rate of 2% was assumed; if this value differs significantly from a national inflation target, this might justify the use of a different value.

#### *4. Real rates of return*

A real rate of return on capital of 2%, net of administration costs and taxes, was assumed, but Member States were allowed to do calculations based on other rates in addition. This is a very cautious assumption about future rates of return which acknowledges that demographic change might also affect the performance of financial markets. In some countries, pension schemes have achieved significantly higher rates of return in the past, and actuaries would still calculate the required reserves in defined benefit schemes on the

basis of higher rates of return. In the present exercise, the rate of return is important for defined-contribution schemes, whereas in defined benefit schemes it matters only insofar as contributions are supposed to rise if the rate of return is not high enough to avoid the danger of under-funding.

#### 5. *Future labour force participation*

The assumptions agreed by the EPC's Working Group on Ageing for the current policy scenario of pension expenditure had to be used (see page 18 of the report Budgetary challenges posed by ageing populations). Departures from these assumptions had to be duly justified.

#### 6. *Life expectancy*

Eurostat's demographic projections should be used, as was the case for the projections by the EPC's Working Group on Ageing. Departures from these assumptions had to be duly justified. It should be noted that new long-term demographic projections are to be presented by EUROSTAT in 2004.

#### 7. *Tax and social insurance thresholds*

In the absence of a clear legislative commitment to conduct a different policy, Member States should raise income tax and social insurance thresholds in line with earnings so as to avoid a reduction in net replacement rates resulting from an increasing tax burden or a gradual reduction in the scope of social insurance. Departures from this assumption had to be duly justified.

### **Presentation of results**

The Member States were asked to present results according to the following structure:

<b>CALCULATION OF THE REPLACEMENT RATE</b>			
Country: Year: Specific assumptions:		Full year before retirement	Full year after retirement
	Compensation per employee	A	
–	Employer contributions to pension schemes	B <sub>1</sub>	
	Other employer contributions	B <sub>2</sub>	
=	Gross earnings/pension (first – J <sub>1</sub> , second - J <sub>2</sub> , third pillar - J <sub>3</sub> schemes)	C	J <sub>1</sub> J <sub>2</sub> J <sub>3</sub>
%	Gross replacement rate		J/C
–	Employee/pensioner contributions to pension schemes (first - D <sub>1</sub> , second - D <sub>2</sub> , third pillar schemes - D <sub>3</sub> )	D <sub>1</sub> D <sub>2</sub> D <sub>3</sub>	K
=	Income net of contributions to pension schemes	E	L
%	Pension scheme replacement rate		L/E
–	Social insurance contributions other than for pension schemes	F	M
–	Taxes	G	N
+	Means-tested benefits	H	O
=	Net income	I	P
%	Net replacement rate		P/I

In addition to the figures on replacement rates, background information was requested on conditions for receipt of means-tested supplements and other social benefits and on how representative in particular any assumed 2nd and 3rd pillar arrangements are in practice.

#### **4. INTERPRETING THE FIRST RESULTS PRESENTED IN THIS REPORT**

Full sets of validated results are not yet available for all Member States. For this reason, and in view of the limitations to cross-country comparability, the ISG decided not to present a summary table of results in the present report. It is recommended to look at each country's results separately and to take full account of the background information that accompanies them.

One problem regarding current replacement rates is whether the base case is representative. In some countries, insured careers tend to be significantly shorter than 40 years, and in most countries the effective retirement age is well below 65. Information on actual career lengths and retirement ages, where available, is given in the country sections.

Eight Member States included pensions from private schemes in their calculations. These are quasi-mandatory in Denmark, the Netherlands and Sweden and voluntary in the remaining five countries (Belgium, Germany, Ireland, Italy and the UK). Particularly in the countries where such provision is voluntary, the scheme design and benefit levels can vary considerably from one scheme to another. Member States were therefore asked to justify their choice of private scheme to be included in the calculations by giving information on how representative such schemes are. This information is also given in the country sections below.

These issues about comparability became clear during the process of peer reviews that was carried out in order to examine whether national calculations complied with the common framework and how representative the base case actually is in each Member State. During this peer review, each country's calculations were examined by another Member State and the main issues were discussed during a meeting of the ISG in July 2003.

Cross-country comparisons on the basis of the replacement rates presented here are not meaningless, but they need to take into account the above considerations about comparability and the important contextual information presented in the country sections below.

#### **5. FURTHER DEVELOPMENTS**

The ISG insists on the need for more detailed analysis, aimed notably at testing the robustness of the results and at better exploiting the useful insights that replacement rates could provide on the broad goal of adequacy. Calculations could be carried out focusing on different types of workers, different retirement ages and lengths of contributions and different types of careers, including career profiles that would be more typical of women retiring today. Finally, the Group may consider calculating the replacement rate with

respect to a measure of gross earnings that incorporates employers' contributions in addition to employees' contributions, so as to take account of the different distribution of social contributions between employers and employees.

In addition to all of the above, replacement rates can be constructed in a way that allow examining the role of pension systems in preventing old-age poverty. This would require looking at the replacement rates of people on low earnings and/or incomplete careers (in this context, specific attention would need to be devoted to minimum pensions, guaranteed minimum income and other means-tested benefits). Also, the third adequacy objective, i.e. intra- and intergenerational solidarity, could be assessed by comparing replacement rates for people at different points of the earnings distribution.

The ISG also believes that the methodological framework it has developed provides a useful basis for the assessment of the broad common objectives of modernisation and financial sustainability. One objective under the heading 'modernisation' concerns equality between men and women. Pension systems can play an important role in ensuring an adequate income for older women with a very weak past labour market involvement, as is still common in most Member States. Pension systems protect these women through survivors' benefits and by awarding pension rights for certain types of career interruptions. Replacement rates can be designed to capture how well women with incomplete careers are protected by a pension system.

One very important objective with regard to the long-term financial sustainability is to raise the effective retirement age. By comparing replacement rates for normal, deferred and early retirement one can obtain a useful indication of whether a pension system provides good incentives for longer working lives.

Each of these questions obviously requires the use of different common parameters in the calculation of replacement rates. Such common parameters need to be defined, as was the case for the replacement rates already calculated, within the ISG. The calculation and assembling of new replacement rates could be simplified if each country's pension system could be modelled according to a common framework so that calculations would no longer have to be carried out by the national administrations. This would allow more flexibility in the testing of different assumptions and parameters and could speed up future work on replacement rates as ISG delegates could concentrate on agreeing the common parameters and validating the results rather than providing new sets of calculations. The ISG notes that the Commission intends to cooperate with the OECD on the development of such national models in a common framework.

Finally, the ISG invites the acceding countries, who have been participating in this work as observers, to submit their own calculations of these theoretical replacement rates for inclusion in a future version of this report.

## 6. RESULTS BY COUNTRY

### 6.1. Belgium

#### *Characteristics of the pension system and representativeness of the calculations*

The first-pillar considered in the calculations consists of an earnings-related pension scheme covering all salaried workers in the private sector. Some 70 % of pensioners receive a benefit from this scheme. Separate schemes exist for self-employed workers (liberal professions, farmers, traders, artisans) and for civil servants.

Pensions of workers in the private sector are calculated on the basis of two coefficients. The first one is the number of pensionable years to the full contributory career which, in 2002, equalled 45 years for men and 42 years for women (increasing to 43 years in 2003, 44 in 2006 and 45 in 2009). The second coefficient is identical for men and women and amounts to 60 % of the revenues earned in the whole contributory career for a single person or 75 % for a head of family).

Early retirement is possible from the age of 60, on the condition that the beneficiary has accumulated 35 years of contributions. There are also other arrangements, not linked to the old-age pension scheme, notably for the unemployed, which make it possible, de facto, to retire early. Currently, very few workers remain on the labour market until they reach age 65.

According to administrative records for the cohort of male workers born in 1937 and the cohort of female workers born in 1940 (i.e. the cohorts reaching the official retirement age in 2002, the average age at take-up of the retirement pension was around 64 years for men and just under 62 for women. The average career length was 42.5 years for men and 30.5 years for women (averages of men and women who were covered by the private sector scheme during their entire career). The figures for average career lengths include assimilated periods (e.g. unemployment) that can make up a significant part of the career. The common assumption of a career length of 40 years thus tends to understate actual replacement rates for men.

Second-pillar pension arrangements take the form of voluntary company pension funds set up in full autonomy at the initiative of the employer. However, new legislation of 28 April 2003 has created a framework which allows second pillar pension schemes also to be set up at the level of sectors. In 2002, between 12% and 20% of the new pensioners received a second pillar pension (including social security funds and individual pension funds), while 40% to 45% of the employees in the private sector were building up pension rights in the second pillar. Currently, replacement rates combining a

1st and a 2nd pillar therefore only concern a minority of employees in the private sector. The new legislation is expected to spur the development of second pillar schemes and their coverage. A significant rise in total coverage to between 55% and 60% by 2005 is expected.

### *Main results*

At just over 40% for people on 2/3 of average earnings, around 37% for average earners, 31% for people with earnings rising from 80 to 120% of the average and less than 25% for people with earnings rising to 200% of average earnings, gross replacement rates of the first pillar are comparatively low for an earnings-related scheme. This is due to the fact that pensions are calculated on the basis of earnings during the entire career. Minimum pension rules increase the replacement rate in the case of the hypothetical worker on 2/3 of average earnings and a ceiling on earnings taken into account for calculating the pension reduces it in the case of a hypothetical worker ending the career at 200% of average earnings.

Currently replacement rates differ somewhat between men and women due to the still lower pensionable age of women and their correspondingly shorter contribution career. Until 2009, the replacement rate for a single woman with a 40-years career on average earnings will be higher than that for a single man.

The contribution of second pillar schemes to total pension income is currently small. For average earners it represents less than one tenth of the gross pension. This result is based on the assumption of a 10-years contribution period in 2002 and a contribution rate of 4.25% of gross wages (90% paid by the employer, 10% by the employee).

The net pensioner income comes close to 2/3 of the pre-retirement net income for people on average earnings. It is slightly higher (69%) for people on 2/3 of average earnings, but significantly lower for people with rising earnings profiles (58% for people with earnings rising from 80 to 120% and 47% for people with earnings rising from 100 to 200% of the average). Pensions benefit from a tax reduction that is relatively important for low and average pensions.

Under current legislation, first pillar pensions of private sector employees are automatically raised in line with inflation. Additional adjustments, which may be targeted at certain categories of pensioners, have been made in the past on a discretionary basis. The calculation of the replacement rate ten years after retirement is based on the assumption that an additional pension increase of 0.3% on top of the expected inflation rate will be awarded. For second pillar schemes it is assumed that the accumulated capital is converted into an annuity at the moment of retirement and that this annuity remains constant in nominal terms, resulting in a loss of purchasing power. The 10-years indexed replacement rate (pension income ten years after retirement relative to projected earnings) is significantly lower than at the moment of retirement or compared to a newly retired person. For a pensioner on the

minimum pension, however, the 10-years indexed replacement rate remains unchanged.

Under the legislation currently in force and assuming that the minimum pension, social security (wage ceiling) and tax thresholds increase in line with earnings, replacement rates for people with a 40-years' career will remain roughly constant for the first pillar over the projection period 2002-2050. The contribution of the second pillar to the gross replacement rate is expected to rise significantly for all earnings profiles as a result of the assumption that the number of contribution years to second pillar pension schemes will rise from 10 to 40 years by 2032 when the contribution of the second pillar to the total gross pension income of the worker on average earnings will be around one quarter. After 2032, the gross replacement rate of the second pillar will decline as a result of rising life expectancy, as can be seen in the table below. The combined development of first and second pillar pensions implies that total gross and net replacement rates will increase significantly between today and 2050. On the basis of the assumptions used in this study, net replacement rates could be about ten percentage points higher in 2050 than in 2002 for the workers on average and 2/3 of average earnings, 8 percentage points higher for people on earnings rising from 80 to 120% of the average and 6 percentage points higher for people with earnings rising from 100 to 200% of the average.

<b>B</b> (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2002	2050
Amount of gross earnings before retirement	31045	35807	51160	73094	37108	20697	48730	62090	146189	37254	87713
Gross replacement rate 1 <sup>st</sup> pillar	36.5	37.1	36.8	36.6	31.4	42.1	40.8	24.4	22.6	31.3	30.8
Gross replacement rate 2 <sup>nd</sup> pillar	3.5	6.1	12.2	11.8	2.4	3.5	11.8	3.2	8.5	3.3	9.7
Total gross replacement rate	40.0	43.2	49.0	48.4	33.8	45.6	52.6	27.7	31.1	34.6	40.5
Total net replacement rate	66.1	68.2	77.2	76.3	57.3	68.9	79.0	47.1	53.3	57.7	66.4
Amount of net pension income	11986	14351	23203	32772	12505	9393	25246	14493	39323	12049	32810
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 6.2. Denmark

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar of the Danish pension system is a universal, residence-based and non-contributory statutory old-age pension scheme that is financed from general taxation. It provides a flat-rate benefit combined with an income-tested element. A full public old-age pension is conditional on 40 years' residence in Denmark. The benefit is indexed to private sector wages and is taxable. At present, the basic pension is paid to 99 % of residents above

retirement age. Of these, 99 % receive the full basic amount and 64 % the full supplement. For single pensioners, the basic pension constitutes currently 61 % of their income. A second tier of the first pillar consists of the statutory, working time-related ATP scheme which is a mandatory scheme covering all wage earners and certain groups of recipients of transfer payments, e.g. unemployed and persons on sick leave. It provides benefits at a moderate level equivalent to 20 % of the first-pillar pension.

The second pillar consists mainly of defined-contribution occupational schemes based on collective agreements at the level of sectors. These schemes have been expanded significantly since the 1980s. Currently more than 80% of full-time employees aged 15-59 are paying contributions into such schemes.

### *Main results*

At present, the largest contribution to retirement income comes from the first pillar schemes. For a single worker on average earnings it offers a gross replacement rate of nearly 42%; for a person on 2/3 of average earnings, first pillar pensions represent 63% of previous gross earnings. The current contribution of second pillar schemes remains very limited at 3.4%. The total gross replacement rate (including statutory and occupational schemes) amounts to 45%, resulting in a net replacement rate of 68.4% for the average earner. This comprises a means-tested housing allowance which represents about 11 percentage points of the net replacement rate.

Due to the importance of the flat-rate benefit and the means-tested elements in retirement income, net replacement rates are much higher for people on lower incomes (92% for people on 2/3 of average earnings) than for people on higher incomes (...). The current net pensioner income hardly differs between the different income profiles.

The first-pillar contribution to retirement income is expected to decline significantly falling from 36.5% today to 25.3% in 2050 for average wage earners. However, the rise in benefits paid from supplementary pension schemes is expected to be such that they should become the main source of income for people with average or higher earnings. The total replacement rate (net and gross) is expected to increase. Thus the net replacement rate for the average wage earner is projected to rise from 67% in 2002 to 84% in 2050.

<b>DK</b> (Danish Crowns)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	297636	324753	431174	563006		197814					
Gross replacement rate 1 <sup>st</sup> pillar	41.7	41.8	36.1	33.6		62.8					
Gross replacement rate 2 <sup>nd</sup> pillar	3.4	10.2	27.6	35.3		3.4					
Total gross replacement rate	45.1	52.0	63.7	68.9		66.1					
Total net	68.4	72.8	81.1	82.6		92.2					

replacement rate											
Amount of net pension income	114734	137703	210520	294678		113134					
Of which means-tested benefits	18815	19025	21357	28092		19255					

### 6.3. Germany

#### *Characteristics of the pension system and representativeness of the calculations*

The general pay-as-you-go, earnings-related pension scheme covers around 82% of the employed population in Germany (33 million people). Civil servants' pensions are paid directly from public budgets and special schemes exist notably for farmers and the liberal professions (e.g. for doctors, lawyers, architects). First-pillar schemes account for 78% of all incomes of people over 65. The general scheme alone provides 60% of all incomes in old age in West Germany and more than 90% in East Germany.

New retirees had on average 40 years of contributions in West Germany and 44 years in East Germany (women: 25 in the West and nearly 41 years in the East). The replacement rate calculation is based on worker from West Germany.

Second-pillar provision currently tends to be organised at company level in the private sector. It covers about half of the employees. The calculations are based on the average occupational pension benefit per pensioner (€124 per month in 1999), rather than the average amount per person covered by an occupational scheme. The 2001 reform promoted the development of second and third pillar schemes. This has already resulted in a significant increase in the coverage rate of occupational pension schemes.

#### *Main results*

The average earner can currently expect a gross replacement rate of 44.6% from the first pillar. Combined with a second pillar gross rate of 5.5% this yields a net replacement rate of 76.1%. This is higher than the net replacement rate of workers with earnings rising to 200% who also have a lower 2<sup>nd</sup> pillar replacement rate (due to the lower contributions paid at the beginning of the career and the effect of compound interest). Workers on 2/3 of average earnings have a slightly lower gross replacement rate caused by a lower 2<sup>nd</sup> pillar pension; the net replacement rate is significantly lower than for a hypothetical worker on average earnings due to the fact that the difference between pre- and after-tax earnings is larger on average earnings than on lower earnings.

Ten years after retirement, pensions relative to average earnings can be expected to fall by about 3 percentage points (gross replacement rate) which translates into a small decline of 1.5 percentage points in the net replacement rate.

Recent reforms will gradually reduce, for the average earner, the contribution of the first pillar by about 7 percentage points (of the gross rate) by the year 2050. However, these reforms also created better opportunities for increased occupational or personal provision. It is expected that for people availing themselves of these opportunities the gross replacement rate can roughly be maintained at a constant level. The net replacement rate, however, is expected to increase by nearly 6 percentage points between today and 2050, as a result of increased pension contributions which reduce net earnings and increase the net replacement rate relative to the gross rate.

<b>D</b> (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement (in current prices)	28342	36570	74933	157530	40724	18895	105020	56684	315060	34010	189036
Gross replacement rate 1 <sup>st</sup> pillar	44.6	42.3	39.2	37.8	42.1	45.0	38.1	33.4	28.3	37.2	31.6
Gross replacement rate 2 <sup>nd</sup> pillar	5.5	6.3	10.3	12.8	4.8	3.6	11.8	6.8	10.8	4.6	10.6
Total gross replacement rate	50.1	48.5	49.5	50.5	46.9	48.6	49.9	40.1	39.0	41.8	42.1
Total net replacement rate	76.1	77.2	80.2	83.6	74.6	66.8	74.2	72.6	77.5	66.7	73.4
Amount of net pension income (current prices)	13085	16396	34413	74342	17579	8461	48973	20951	114765	13114	74341
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

#### 1.4. Greece

##### *Characteristics of the pension system and representativeness of the calculations*

The first pillar consists of several schemes. The largest are IKA (private sector) and OGA (farmers); a separate scheme also exists for the self-employed. Employees' pensions are of the defined-benefit type and are based on the length of contribution periods and earnings of the final five years of the career. The first pillar comprises a second tier of occupation-based auxiliary funds which provide supplementary pensions. They cover all employees and a small percentage of the self-employed and typically offer benefits worth about one quarter of the basic pension. Finally, salaried workers in the private sector receive a lump sum upon retirement from the last employer. The lump sum amount depends on the length of service with the last employer and can reach a maximum of 9.6 times the final salary after 28 years of service. The assumed lump sum was annuitised (using a technical interest rate of 3% and the 1990 Greek mortality table for males) and included in the replacement rate calculation. It represents around 6 percentage points of the total gross replacement rate.

The calculations of replacement rates refer to IKA. Second-pillar occupational pensions do not exist yet in the Greek pension system, since

the legal frame for their establishment was set up in 2002/2003. They are therefore not included in the calculations. The average retirement age of IKA pensioners in 2002 was 61.74 years for men and 58.56 for women. The average length of contribution careers was 26.89 for men and 20.75 for women. In 2002 the proportion of new pensioners with more than 39 years of service was only 2.31%. Thus the age and career length assumptions used for calculating the hypothetical replacement rates are not very representative of current cohorts of new pensioners.

### *Main results*

Workers on average earnings can expect gross and net replacement rates in excess of 100% (108 gross and almost 120 net) after a career of 40 years. These contrast with low actual pensions which are due to generally much lower numbers of contribution years than assumed for the base case, contribution evasion and the fact that in many cases only part of an individual's earnings are insured.

Replacement rates for people on 2/3 of average earnings are slightly higher than those of people on average earnings. The minimum pension's safety net does not yet come into play at this level of pension income. Due to the fact that pensions are based on earnings during the final five years of the career, replacement rates are also high for people with rising earnings profiles. Net replacement rates for a 40-years career are currently above 100% and gross replacement rates are only below 100% (at 92%) for the hypothetical worker with earnings rising to 200%.

Pensions in the private sector are increased according to the indexing policy adopted for pensioners in the government sector. The past practice has been to adjust pensions taking into account the evolution of the consumer price index and overall economic growth. Over the past five years, different rates of increase were applied to different pension amounts with the highest pensions receiving the lowest increases. For the calculation of the 10-years indexed replacement rate (pension income ten years after retirement relative to projected earnings) it was assumed that pensions will increase by 50% of GDP growth on top of the inflation rate. This results in a drop of the gross replacement rate by 7 percentage points (4.4 for the net rate). With pension increases equal to the inflation rate only, the drop would be 16 percentage points for the gross rate and 13 for the net rate.

Under current legislation, theoretical replacement rates are expected to remain at their current high level until 2030 and to fall by about 15 percentage points until 2050 due to the fact that people who were first covered by social insurance after 1993 will be subject to new rules. Net replacement rates are expected to be still above 100% in 2050 for all cases except the hypothetical worker with earnings rising to 200% of the average. For the latter, the large fall in the net replacement rate in 2050 is due to the coming into force of the pension ceiling rule that was set in the pension reform of 1992.

GR (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	1056	1237	1839	2732	1508	704	1821	2112	5464	1267	3278
Gross replacement rate 1 <sup>st</sup> pillar	108.0	106.2	108.2	94.7	101.0	112.0	94.7	92.0	64.9	105.0	92.5
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	108.0	106.2	108.2	94.7	101.0	112.0	94.7	92.0	64.9	105.0	92.5
Total net replacement rate	118.0	116.8	118.5	107.2	113.6	123.9	107.1	101.9	78.7	115.2	104.3
Amount of net pension income	998	1157	1744	2343	1371	733	1640	1520	2986	1128	2643
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 1.5. Spain

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar of the Spanish pension system consists of a general earnings-related scheme for private sector workers. Special schemes exist for civil servants working for the central government or the justice system and for people working for the armed forces. Benefits are calculated as a percentage of a so-called ‘base pension’ which takes into consideration the earnings-related contributions paid during the 15 years before retirement. The percentage of the base pension that is paid out depends on the number of years a person contributed to the system and on the retirement age: a full pension is reached after 35 contribution years and retirement at age 65. The average career length of men retiring today is 40 years (women 30 years). The average retirement age for both men and women is just over 63.

Supplementary pension schemes of the second or third pillar cover nearly six million people, but only 10% of these (around 600 000 people) are members of an occupational scheme established by a collective agreement. Pension plans tend to be more often adhered to on an individual basis or through membership in a group (association, trade union, etc.). Occupational schemes were therefore not included in the replacement rate calculations.

### *Main results*

A full career on average earnings (base case) results in a gross replacement rate of just under 90% and a net replacement rate of around 95%. This would also hold for careers up to five years shorter than the 40 years assumed for the base case. Replacement rates at 2/3 of average earnings are identical to those at average earnings. An earnings profile rising from 80 to 120% of average earnings results in replacement rates that are about five percentage points below those for a flat career on average earnings. By contrast, earnings

rising to 200% of the average yield significantly lower replacement rates due to the ceiling that applies to pensions.

The 10-years indexed replacement rate (pension income ten years after retirement relative to projected earnings) has been calculated by index-linking pensions in payment to inflation, as is required by legislation. This results in a value of net pensions relative to net earnings that is around 12 percentage points lower than the net replacement rate at the moment of retirement.

Under current legislation, future gross replacement rates for people on flat average earnings are expected to fall by about 5.6 percentage points by 2030 and remain stable thereafter. This is simply due to the fact that between 2002 and 2017 the results depend on historic data up to 2002 and earnings calculated according to the assumptions in the remaining period up to 2017; from 2017, replacement rates depend completely on earnings calculated according to the assumptions about future earnings' real growth and inflation. The reduction in gross replacement rates will be somewhat smaller for the hypothetical workers on low earnings and on rising earnings profiles.

<b>E</b> (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	20533	28318	63252	141282	29479	13689	94188	41066	282565	24640	169539
Gross replacement rate 1 <sup>st</sup> pillar	88.6	85.8	83.0	83.0	77.3	88.6	83.0	66.6	62.5	83.2	78.0
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	88.6	85.8	83.0	83.0	77.3	88.6	83.0	66.6	62.5	83.2	78.0
Total net replacement rate	95.4	92.3	89.3	89.3	83.1	95.4	89.3	75.1	70.5	90.3	84.7
Amount of net pension income	15385	20531	44396	99164	19254	10775	69450	22123	142806	17209	111048
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 1.6. France

### *Characteristics of the pension system and representativeness of the calculations*

The French pension system is based on a mandatory pay-as-you-go scheme covering 98% of total pension expenditure. Pension schemes for private sector employees cover 63% of total pension expenditure. Alongside a basic, earnings-related general scheme with strong solidarity elements, mandatory supplementary pension schemes are established by collective agreements and financed on a pay-as-you-go basis (ARRCO and AGIRC in the table below). The benefit formula of these supplementary schemes is based on a point system and ensures a close link between contributions and benefits paid. Separate schemes exist for farmers and the liberal professions; they have a comparable two-tier structure. Civil servants and state enterprise employees are covered by a variety of special schemes that are organised in one pillar

only and cover 28 % of total pension expenditure. These special schemes are generally more generous than those for private sector employees. In the general scheme, 85% of retired men have a full insurance career of 40 years (39% of women, but more than 50% of the new retirees). The minimum legal age of retirement is 60 and not 65 as in most other Member States. The calculations are based on retirement at 60.

The extensive role of compulsory pay-as-you-go schemes in the French pension system leaves little room for the development of other occupational pension schemes which are therefore excluded from the scope of the replacement rate calculations.

### *Main results*

The calculations presented here do not yet take account of the latest pension reform for which some of the implementing legislation is not yet available.

The two layers of statutory pension schemes for the hypothetical base case (social security and the ARRCO schemes managed by the social partners) currently assure a gross replacement rate of 65% for a worker with a full career on average earnings. The net replacement rate amounts to 80%. Replacement rates are higher for people on low earnings (gross: 67.2%, net: 84.4%) and lower for people on high and rising earnings (gross: 50.6%, net: 65%).

The reforms of the mid-1990s will result in a gradual decline in replacement rates from the current 65% gross today to 56.8% in 2050 for workers on average earnings. Net replacement rates are expected to fall in a similar proportion from 78.8% to 66.2%. The impact of the 2003 pension reform could not yet be reflected in calculations as the implementing regulations are not yet adopted.

<b>F</b> (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	26724	33840	71424	147720	38515	17256	98976	53556	281796	31871	175791
Gross replacement rate 1 <sup>st</sup> pillar	64.97	61.93	57.43	56.8	42.6	67.2	56.7	50.6	42.7	55	49.2
Of which:				41.3							
Basic state pension	44.15	42.12	41.30	15.4	37.17	45.6	41.3	23.5	21.7	38.2	34.8
ARRCO	20.82	19.82	16.13	0	5.4	21.5	16.4	0	0	17.9	14.3
AGIRC	0	0	0		0	0	0	27	21	0	0
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	64.97	61.93	57.43	56.8	42.6	67.2	56.7	50.6	42.7	55	49.2
Total net replacement rate	78.8	76.5	71.6	66.2	48.3	84.4	74.3	65	57.7	72.2	58.8
Amount of net pension income	16140	21216	38148	78012	15291	10788	52272	25140	11712	16318	80481
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 1.7. Ireland

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar provides for flat rate payments although it is financed through pay-related contributions from employers, employees and the self-employed. Supplements are payable for dependants, for those living alone and to pensioners over 80.

The public pension scheme was progressively extended to higher income groups and other groups of workers (self-employed in 1988, part-time workers in 1991, public servants in 1995). This makes it difficult to present a meaningful average for career lengths. However, in 2002 66% of employees covered by the normal social insurance pension scheme could claim a 100 per cent pension (equivalent to a full career length) and a further 27% received a 98 per cent pension. The normal retirement age is 65 or 66 with no provision for early receipt of the social insurance pension.

The second pillar consists of voluntary occupational pensions usually provided by individual employers. About half of the employees are covered by an occupational scheme, two-thirds of them by a defined-benefit scheme. Private sector pension scheme members are split almost equally between defined-benefit and defined-contribution schemes, whereas the coverage level of defined-benefit schemes is significantly higher in the public sector. The typical retirement age in defined-benefit schemes is 65 years. Ireland assumed that the base case worker is enrolled in an integrated defined-benefit pension scheme with a 1/60<sup>th</sup> accrual rate, i.e. the best scheme that can still attract favourable tax treatment. 'Integrated' means that the scheme tops up the state pension to reach the 1/60<sup>th</sup> accrual rate. These assumptions result in a gross replacement rate of just over 2/3 and a net replacement rate of just over 80%.

Non-cash benefits-in-kind are substantial in Ireland. They include free travel for all persons above pension age. Free healthcare, telephone rental and TV licences, electricity/gas/fuel allowances are offered to all from age 70 and subject to a means-test before that age. The Irish replacement rate calculations include an estimation of the cash value of certain of these free services available to pensioners, notably the free television licence and the reduced costs telephone and electricity services. Ireland used gross average industrial earnings for the calculations rather than the data series based on national accounts provided by the Commission from which it would have been difficult to derive a reliable gross earnings series.

### *Main results*

The assumption of membership in an integrated defined-benefit scheme means that the total gross replacement rate remains 2/3 of final earnings for all earnings profiles. The 1<sup>st</sup> pillar gross replacement rate, which reflects the

flat-rate basic pension, decreases with income and ranges between just under 50% for people on 2/3 of average earnings and close to 16% for people ending their career at 200% of average earnings. The second pillar replacement rate adjusts so as to always yield a gross replacement rate of 66.7%.

This gross replacement rate will remain constant, although the composition will change slightly. The government set the target of raising the state pension to 34% of average industrial earnings (the Irish calculations also use industrial earnings). This is reflected in the rise of the first-pillar gross replacement rate between 2002 and 2010 (for average earners from 31.4 to 34%) and the corresponding decline in the second-pillar replacement rate. Net replacement rates will fall slightly due to the assumption that the value of free services for pensioners will remain constant rather than rise in line with earnings.

For the calculation of the 10-years indexed replacement rate (pension income ten years after retirement relative to projected earnings), indexation of occupational pensions is assumed to be based on prices. Under this assumption, pensions relative to average earnings can be expected to fall by almost 3 percentage points (gross replacement rate), which translates into a larger decline, of 4 percentage points, in the net replacement rate.

IRL (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	26088	30807	46684	70743	31454	17392	47162	52177	141486	31306	84892
Gross replacement rate 1 <sup>st</sup> pillar	31.4	34.0	34.0	34.0	34.7	47.0	51.0	15.7	17.0	26.1	28.3
Gross replacement rate 2 <sup>nd</sup> pillar	35.3	32.7	32.7	32.7	29.3	19.6	15.7	51.0	49.7	40.5	38.3
Total gross replacement rate	66.7	66.7	66.7	66.7	64.0	66.7	66.7	66.7	66.7	66.7	66.7
Total net replacement rate	81.4	80.7	79.9	79.4	77.2	79.7	76.5	84.0	82.6	81.4	79.4
Amount of net pension income	17021	19969	29887	44916	19763	12319	32165	29442	78598	19804	52462
Of which benefits in kind for pensioners	724	724	724	724	724	724	724	724	724	724	724

## 1.8. Italy

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar consists of separate schemes for the private sector (INPS) and the public sector (INPDAP). The 1995 reform of the first pillar is leading to a gradual shift from the current defined-benefit scheme to a notional defined-contribution scheme which applies to all new entrants to the labour market since 31 December 1995. This implies that pensions entirely calculated according to the defined-contribution formula will be paid out starting in the 2030s. For people with fewer than 18 contribution years at

the end of 1995, pensions will be calculated on the basis of a mix of the old and new system, with the new system being applied to a progressively increasing proportion of the working life. Workers with at least 18 years of contributions at the end of 1995 will continue to have their pension calculated on the basis of the defined-benefit formula.

Under the new system, benefits are calculated on the basis of the amount of contributions paid throughout the entire career and capitalised at the average growth rate of GDP over the previous five years. The value of accumulated contributions is translated into a pension on the basis of actuarial equivalence, taking into account the remaining life expectancy at the retirement age. Retirement will be possible between 57 and 65 for both men and women, but workers may not retire before they have reached a pension level of at least 1.2 times the minimum guaranteed pension guaranteed from age 65 (old age allowance). In order to counterbalance the impact of increased longevity, the coefficients used for converting contributions into a pension are reviewed every 10 years on an actuarial basis.

The effective retirement age is currently estimated at 60.2 years for men and 59.7 years for women. The average contribution length for people currently retiring is estimated at 31.3 years (33.8 years for men, 27.1 years for women).

The pension reforms of the 1990s introduced a new legal framework for supplementary pension provision. Participation in a pension fund is always voluntary for employees, and benefits are calculated on a defined-contribution basis. At present, only about 14% of private sector employees are active members of pension funds and only 120,000 pensions are in payment. It is the government's intention to increase participation in private pension funds, notably by diverting the mandatory deferred wage component payable at the end of an employment contract (*trattamento di fine rapporto*, *TFR*, to which about 6.91% of employees' earnings are contributed) into pension funds. The calculations assume that, starting in 2000, workers contribute 9.25% (the 6.91% for the *TFR* and an additional 2.34%) of their salary to a defined contribution pension scheme earning a real return of 2% pa. It should be noted that pension funds benefits have been calculated so as to increase, in nominal terms, in line with inflation (2%), thus remaining constant in real terms.

### *Main results*

A worker on average earnings retiring in Italy today can expect a gross replacement rate of 79.6% with all pension income arising from the statutory scheme. The corresponding net replacement rate is 88.9%. Replacement rates for the hypothetical workers at 66% of average earnings and with earnings rising from 80% to 120% of the average are roughly the same, while for the worker with earnings rising from 100% to 200% of the average they are lower at 74.5% (gross) and 84.7% (net).

Due to the index-linking of pensions in payment to prices only, the replacement ten years after retirement is lower than at the moment of retirement.

The gradual transition to the new notional defined contribution public pension scheme will lead to a progressive decline in the gross replacement rate from the statutory scheme. For the hypothetical worker on average earnings, the gross replacement rate will decline from 79.6% today to 64.6% in 2050. It will be of the same magnitude for people on 2/3 of average earnings and larger for people with rising earnings profiles.

Italy also calculated replacement rates for people retiring at 60 after a career of 35 years. Here, the decline in replacement rates is even more pronounced: for a worker on average earnings from 69.7% to 49% between 2003 and 2050. Another special case for which Italy calculated replacement rates are the self-employed. Due to the low level of pension contributions (19% of earnings as against 32.7% for the employees), the gross replacement rate for a self-employed worker with a full 40-years career and retiring at age 65 will decline from 78.4% to 39.2%).

The development of pension funds is expected to add to the public pension gross replacement rate a supplement increasing from 0 percentage points in 2003 to 5 points in 2010, 15 points in 2030 and nearly 20 points in 2050, due to the workers gradually rising seniority as members of the private funds. It is on such a rise of private pension provision, together with an increase of working life, that the policy effort focuses to continue guaranteeing the adequacy of pensions. This would allow an increase in both the gross and net rates (although workers will have in this perspective to forgo their TFR allowance) for employees on flat earnings profiles, whereas for workers retiring earlier than 65 or with rising earnings overall replacement rates should decline slightly.

I (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	22140	25536	36485	52128	32148	14612	34404	44280	101256	26568	62554
Gross replacement rate 1 <sup>st</sup> pillar	79.6	77.6	69.2	64.6	65.4	79.6	64.6	74.5	48.9	77.8	54.2
Gross replacement rate 2 <sup>nd</sup> pillar	0	5.0	14.9	19.5	0	0	19.5	0	14.6	0	16.2
Total gross replacement rate	79.6	82.6	84.1	84.1	65.4	79.6	64.6	74.5	63.5	77.8	70.4
Total net replacement rate	88.9	92.7	94.2	94.2	NA	88.7	93.7	84.7	75.1	87.7	82.0
Amount of net pension income	14100	16700	24300	34700	NA	NA	NA	NA	NA	NA	NA
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 1.9. Luxembourg

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar of the Luxembourg pension system consists of a general scheme for private sector employees and the self-employed and a special scheme for civil servants. Pension benefits are mainly related to the length of contribution periods and earnings and consist of a flat rate component, an accrual rate component and an 'end-of-year allowance'.

Occupational schemes are voluntary for employers. A regulatory framework for these schemes is only in place since 1999 and there is currently no reliable information about their coverage. Occupational schemes have therefore not been included in the calculation of replacement rates.

The representativeness of the common assumptions in the case of Luxembourg has been assessed on the basis of administrative data related to the period running from January 1st, 1998 to December 31st, 2000. A large proportion of married males retire between the ages of 57 and 59. A second wave of retirements for married males is observed between ages 60 and 62. The career length of 40 years of paid contributions assumed for the base case is almost identical to that actually observed for both male white collars (actual career length around 39 years on average) and male blue collars (41 years). There are, however, significant gender differences with women having an average career length of around 33 years.

Pension benefits do not depend on marital status or gender legislation in Luxembourg, but net pensioner income and net replacement rates depend on the marital status due to tax rules.

At 90%, the actual average gross replacement rate for blue collar workers (who earn around 80% of average earnings) are very close to the theoretical rates calculated for the base case worker. For white collar workers (whose earnings are around 120% of the average), the actual average gross replacement rate is around 84%.

### *Main results*

The theoretical gross replacement rate from the first pillar amounts to nearly 90% for the worker on average earnings. The corresponding net replacement rate is just over 97%. Replacement rates are higher for workers on 2/3 of average earnings (95% gross, 102% net) and lower for people with rising earnings during their careers (75% gross, 85% net for a hypothetical worker with earnings rising from 80 to 120% of the average and 64% gross, 73% net for a worker with earnings rising from 100 to 200% of the average).

Under current legislation, pensions in payment are automatically adjusted to price evolution each time prices increase by more than 2.5%. In addition, pensions are reviewed every two years in the light of the evolution of real

wages. Whereas price indexation is automatic, the indexing of pensions to wages has to be decided by government and approved by parliament. Index-linking to wages was common practice in the past and it has been assumed, in the calculation of the 10-years indexed replacement rate (pension income ten years after retirement relative to projected earnings), that this practice will be maintained in the future.

There are no decisions to change the current pension system and there is no automatic adjustment to demographic or economic factors. The implication of this is that future replacement rates are identical to current ones.

L (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	39786	46983	71196	107887	48977	26657	72284	79573	215774	47744	129464
Gross replacement rate 1 <sup>st</sup> pillar	89.5	89.5	89.5	89.5	89.5	94.7	94.7	64.4	64.4	74.5	74.5
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	89.5	89.5	89.5	89.5	89.5	94.7	94.7	64.4	64.4	74.5	74.5
Total net replacement rate	97.2	97.2	97.2	97.2	97.2	102.4	102.4	72.7	72.7	85.1	85.1
Amount of net pension income	29318	34621	52463	79501	36091	22395	60728	38679	104884	29318	79501
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## 1.10. Netherlands

### *Characteristics of the pension system and representativeness of the calculations*

The first pillar of the Dutch pension system consists of a basic state old-age pension scheme that provides flat-rate benefits to all residents over the age of 65. The entitlement to the basic pension accrues through residence in the Netherlands between the ages of 15 and 65. The amount of the basic pension is linked to the minimum wage which, in turn, follows average earnings.

The second pillar of occupational pension schemes is more developed than anywhere else in the EU, thanks to collective agreements that ensure mandatory coverage of at least 91% of all employees in 2001. The schemes are usually of the defined-benefit type. Only 4% of employees with a supplementary pension belong to a pure defined-contribution plan. In 2003 more than 54% of employees were either in pure final salary schemes or a schemes where benefits are based on earnings during the last three years of the career (with a cap to avoid pay increases at the end of the career for the sole reason of obtaining a higher pension). More than 36% of employees belong to a scheme in which pensions are based on average earnings during the career.

For the replacement rate calculations, it was assumed that the worker benefits from a final salary defined benefit scheme aiming to provide a total replacement level of 70% of final earnings (including the 1<sup>st</sup> pillar pension). For prospective replacement rate calculations a shift from final to career average earnings was assumed for pension rights accruing from 2004 onwards, resulting in a reduction in replacement rates for people with rising earnings profiles.

Specific data on the average age of people leaving the labour market into normal retirement rather than unemployment or invalidity are not available due to the large number of different occupational pension schemes with different early retirement rules. Most workers are covered by an occupational pension scheme allowing early retirement before the age of 65. The average retirement age in these schemes has been estimated at 61.3 years in 2003. However, the true average could be closer to 62 years, taking into account the 20% of workers who are not covered by an early retirement scheme. It should be noted that there is currently a clear tendency to increase the retirement age in occupational pension schemes. An estimation of the number of years of service that would be typical for single male workers is not available.

In view of the high prevalence of part-time working, national full-time equivalent gross earnings figures were used instead of national account data on national compensation per employee.

### *Main results*

For the worker on average earnings, the flat-rate public pension represents a gross replacement rate of nearly one third. It is of course higher for people on lower incomes, and lower for people on high earnings. The assumptions made about the occupational scheme and its integration with the public pension mean that the total gross replacement rate is in all cases 70%, with a higher contribution of the second pillar for people on higher earnings. The net replacement rate is around 89% for the worker on average earnings and only two percentage points lower for workers who end their career at twice average earnings.

The relative value of pensions ten years after retirement will only be affected by second pillar pensions; the state pension is linked to earnings. Occupational pension schemes tend to index-link their benefits to prices or wages, but this is not guaranteed and the adjustment of pensions in payment can be suspended or lag behind inflation or earnings if this is required by the financial situation of the scheme. For the calculation of the replacement rates 10 years after retirement it was assumed that occupational pension schemes will adjust pensions by an index that represents the average of price and earnings changes. This implies an increase in the real value of the second pillar pension, but a decline relative to earnings. Gross and net replacement rates 10 years after retirement are therefore slightly lower than at the moment of retirement.

The flat-rate first pillar pension is linked to earnings and represents 70% of the minimum wage for a single pensioner. This implies constant first pillar gross replacement rates. The assumption that occupational pension schemes will switch from benefit based on final earnings to benefits based on career average earnings will not affect hypothetical workers with flat earnings profiles, but it will lead to lower replacement rates for people with rising earnings profiles. The effect of this change is a 10 percentage point drop in the gross replacement rate for workers on earnings rising from 100 to 200% of the average.

NL (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	33800	38680	54188	75914	40006	22533	50609	67600	151828	40560	91097
Gross replacement rate 1 <sup>st</sup> pillar	32.6	32.6	32.6	32.6	32.6	48.9	48.9	16.3	16.3	27.2	27.2
Gross replacement rate 2 <sup>nd</sup> pillar	37.4	37.4	37.4	37.4	35.3	21.1	21.1	53.7	43.5	42.8	39.3
Total gross replacement rate	70.0	70.0	70.0	70.0	67.9	70.0	70.0	70.0	59.9	70.0	66.5
Total net replacement rate	89.0	89.4	89.4	89.4	86.6	87.4	87.9	86.9	77.2	90.9	87.5
Amount of net pension income	21071	24113	33781	47325	24252	14841	33333	35170	78991	24736	55557
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

### 1.11. Austria

#### *Characteristics of the pension system and representativeness of the calculations*

The first pillar consists of a general scheme for private sector employees and special schemes for the self-employed, for farmers and for civil servants. In 2001, around 95% of the active population were covered by compulsory pension insurance.

The standard retirement age is 65 for men and 60 for women. The pension depends on the length of the insurance career and on the level of insured earnings (which are limited by a ceiling of €3360 per month in 2003). The pension is based on the average earnings of the 15 best years of the entire insurance career (to be extended gradually to 40 years by 2028). A full pension of 80% of the assessment base (which is slightly lower than the ceiling for insured earnings) currently requires 40 insurance years; this rises to 45 as a result of the 2003 pension reform. The assessment basis was €2956 in 2003. Pensions are paid 14 times per year.

The extension of the assessment period from 15 to 40 years and the increase in insurance years required for a full pension from 40 to 45 years will result in a significant decrease in pensions of up to one quarter by 2030. The decrease has, however, been limited to 10% and it is not yet clear when this limit will be lifted for existing workers or new labour market entrants.

The average career length (including periods assimilated to insured employment) of white collar workers is 43.5 years for men and 35.1 years for women. The average retirement age is currently 61 years for men and 57.6 years for women.

The second pillar is voluntary. It is estimated that 300 000 people have already acquired pension entitlements under occupational schemes, although this figure does not include the more traditional direct benefit promises by employers (book reserves). Occupational schemes are not included in the replacement rate calculations.

### *Main results*

Austria's earnings-related first pillar scheme provides, for a worker on average earnings, a gross replacement rate of nearly 75%, equivalent to a net rate of 88%. Current replacement rates for other earnings profiles are at the same level.

As pensions in payment are not index-linked to earnings, net replacement rates ten years after retirement are over 12 percentage points lower than at the moment of retirement. In the calculation, an inflation adjustment of 1.5% per year was assumed.

As a result of the 2003 pension reform, replacement rates will decline significantly until 2010. They will be more than 7 percentage points lower for gross rates, and nearly 9 points lower for net rates, and this for all earnings levels and profiles considered here. Thereafter, they should stay constant as long as the cap of 10% on the decrease in pensions is maintained.

<b>A</b> (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	32690	37038	52918	75607	44272	21793	50404	65380	151213	39228	90728
Gross replacement rate 1 <sup>st</sup> pillar	74.3	66.9	66.9	66.9	63.7	74.3	66.9	67.8	61.0	70.0	63.0
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	74.3	66.9	66.9	66.9	63.7	74.3	66.9	67.8	61.0	70.0	63.0
Total net replacement rate	88.3	79.4	79.4	79.4	75.6	88.7	79.8	78.8	70.9	82.9	74.6
Amount of net pension income	18814	19188	27411	39159	21834	13769	28652	28801	59945	20102	41839
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

## **1.12. Portugal**

*Characteristics of the pension system and representativeness of the calculations*

The first pillar of the Portuguese pension system consists of an earnings-related general scheme that is mandatory for all employed and self-employed in the private sector. A special scheme exists for civil servants, police and military force. In the banking and telecommunications sector, occupational schemes exist as a substitute for the general scheme.

Since 2000, the retirement age is 65 for both men and women. To be entitled to an old-age pension, beneficiaries need to have completed a qualifying period of 15 years of insurance, with at least 120 days per year of registered earnings. Since 1994, old-age and invalidity pensions are calculated on the basis of the average income of the best 10 years over the last 15 (instead of the average monthly income of the best five years over the past 10 years, which applied before). The rate of accrual of pension rights is 2 % (previously 2.2 %) for each insurance year.

Currently, new pensioners retire with a contribution career of just under 28 years. Thus actual pensions today are well below the theoretical levels indicated by the replacement rates.

Occupational schemes are not very common; membership in such schemes has even declined slightly over recent years. Therefore they have not been included in the calculation.

#### *Main results*

The Portuguese first pillar scheme currently provides a gross replacement rate of 72% for a worker on average earnings. This yields a net rate of 89%. Workers on 2/3 of average earnings have the same gross replacement rate as hypothetical workers on average earnings, but a significantly lower net replacement rate, due to the fact that the difference between pre- and after-tax earnings is larger on average earnings than on lower earnings. This is also why the net replacement rate for workers on average earnings in 2003 is lower than for workers on a rising wage profile, from 100% to 200% of average earnings.

Whereas today's pensions are calculated on the basis of the best 10 years of the last 15, the system will gradually take into account earnings over the entire career. As these will be adjusted mainly in line with inflation rather than earnings, future gross replacement rates will decline by 7.4 percentage points to 64.9% in 2050 for the worker on average earnings (the temporary increase of gross replacement rate between 2003 and 2010 is explained by the earnings series used in this period – a mix of historical data and calculated figures based on the common assumptions). This will, however, only slightly affect net replacement rates.

P (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	716	915	1980	4288	1027	478	2858	1433	8575	860	5145
Gross replacement rate 1 <sup>st</sup> pillar	72.3	74.7	67.8	64.9	61.6	72.3	65.3	68.2	50.3	69.5	55.4
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	72.3	74.7	67.8	64.9	61.6	72.3	65.3	68.2	50.3	69.5	55.4
Total net replacement rate	88.7	92.8	90.1	87.5	77.5	83.6	85.3	91.6	69.4	87.5	78.8
Amount of net pension income	518	683	1329	2645	633	345	1865	967	3839	598	2738
Of which means-tested benefits	0	0	0	0	0	0	0	0	0	0	0

### 1.13. Finland

#### *Characteristics of the pension system and representativeness of the calculations*

The mandatory statutory pension provision comprises a basic national pension scheme that aims at guaranteeing a minimum income for all pensioners and an earnings-related pension scheme that enables workers to maintain their standard of living to a reasonable degree after retirement. The two schemes form the first pillar. The national pension scheme provides a residence-based minimum pension that can reach EUR 488 per month in 2002 (subject to 40 years' residence). The national pension decreases as the person's other pension income increases. In 2002, a full national pension was paid to 8% of all pensioners, while a means-tested portion supplemented the earnings-related pension of 47% of pensioners. The share of pensioners receiving only the national basic pension is on a declining trend.

The earnings-related pension provides insurance-based pensions and covers all wage and salary earners and self-employed persons without any income ceiling. At present, old-age pensions for private sector employees currently accrue during a maximum of 40 years starting from the age of 23 at the rate of 1.5% per year up to the age of 60; after that age, the accrual rate rises to 2.5% per annum. These rules will change in 2005: 1.5% per year from the age of 18 to the age of 52, 1.9% from the age of 53 to the age of 62 and 4.5% per year from the age of 63 up to the age of 68. The target (maximum) gross replacement rate is 60% at the moment but that will be abolished as from 2005. The pension is now calculated on the basis of average earnings over the last 10 years in each different employment relationship. It will be based on the entire working career as of 2005.

In 2002 the average career length for men was 31.7 years for men and 25.9 years for women. The average retirement age for old-age pensions was 63.7

years for men and 63.6 for women (57.4 and 58.4 years respectively if disability pensions are taken into account as well).

Due to the comprehensive coverage of the statutory scheme, the demand for voluntary supplementary pension provision is small. In 2000, the benefits paid out from second and third-pillar schemes amounted to 4.4% of all pension benefits, and the contributions to these schemes to 5.6% of all pension contributions. The second pillar schemes were therefore not included in the calculations.

### *Main results*

The most general statutory pension scheme in Finland, TEL, provides a gross replacement rate for a worker on average earnings of 57.6%, equivalent to a net rate of 66.2%. Replacement rates are higher for people on 2/3 of average earnings: the gross replacement rate is 63.7% and the net rate 84.4. Net income of pensioners who had earned 2/3 of average earnings includes a significant amount of means-tested benefits.

After 10 years of retirement the net replacement rate for a worker on average earnings will have decreased significantly from 66.2% in 2002 to 59.8% in 2012 while new pensioners in 2010 can expect a net replacement rate of 71.8%. This results from pension adjustments in line with an index which is the weighted average of the price (80% weight) and real earnings (20% weight) indices.

The future evolution of replacement rates will be determined by the fact that from 2005 onwards earnings during the entire career will be taken into account for the calculation of pension benefits and the accrual rates will be changed. Moreover, pension benefits will also be affected by a newly introduced life expectancy coefficient. Pensioners retiring after 2005 will no longer be affected by the rule that limits pensions to 60% of final earnings. This results, for a worker on average earnings, in an increase in gross replacement rates from 57.6% (net: 66.2%) in 2002 to 63.2% (net: 71.8%) in 2010. Thereafter, gross replacement rates will decline to 53.8% (net: 66.6%) by 2050. For people on 2/3 of average earnings, the gross replacement rate is expected to rise by 1.7 percentage points. By contrast, hypothetical workers with a rising earnings profile will experience significant drops in their gross replacement rates by more than ten percentage points. This drop is not reflected in the net replacement rates for hypothetical workers on 100% and 2/3 of average earnings because the employee contribution to the pension scheme is due to rise from 4.4% to 10% of earnings. This reduces net earnings, the denominator of the replacement rate.

FIN (Euro)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	25296	29407	42848	62433	30540	16860	41612	50592	124866	30360	74931
Gross replacement rate 1 <sup>st</sup> pillar	57.6	63.2	58.1	53.8	49.5	63.7	65.4	56	39.4	57	44
Gross replacement rate 2 <sup>nd</sup> pillar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Total gross replacement rate	57.6	63.2	58.1	53.8	49.5	63.7	65.4	56	39.4	57	44
Total net replacement rate (in brackets: at constant life expectancy of today)	66.2	71.8	70.0	66.6	59.8	84.4	88.6	69.2	52.3	64.9	57.3
Amount of net pension income	11292	13992	19310	26685	11616	10488	25826	19152	35718	12792	26418
Of which means-tested benefits	0	0	0	0	0	1176	2666	0	0	0	0

## 1.14. Sweden

### *Characteristics of the pension system and representativeness of the calculations*

The new first-pillar scheme introduced in 1999 consists of an earnings-related (contributory) scheme and an old-age guarantee pension (non-contributory). The income-related scheme is contribution-defined. Sixteen percentage points of the contribution of 18.5% of earnings are used for pay-as-you-go financing and are accumulated at a given interest rate as a notional pension capital (which accumulates roughly in line with the growth of average earnings); 2.5 percentage points are invested in one or several funds chosen by the scheme member (the so-called premium pension scheme). The notional pay-as-you-go capital and the capital accumulated under the premium pension scheme are converted at the time of retirement into a pension the amount of which depends on the average life expectancy at the age of retirement.

The average retirement age under the 1<sup>st</sup> pillar scheme is around 65 years and the career length close to 40 years.

The old defined-benefit pay-as-you-go system is currently being phased out and will continue to apply, on a diminishing scale, to persons retiring until 2017. For a base case worker, the gross replacement rate from the first pillar amounts to 57% in 2003 of which 20% accrued under the new system and 80% under the old.

The second pillar consists of large occupational pension schemes based on collective agreements and covering around 90% of employees. Contributions are typically between 2 and 5% of wages. Traditionally, these pensions were

of the defined-benefit type, but are becoming increasingly defined-contribution schemes. In 2000, pensions paid out of these schemes accounted for 17% of total pension disbursements.

### *Main results*

For the worker on average earnings, the gross replacement rate from the two-tiered first pillar amounts to 57%. Occupational pension schemes based on collective agreements and covering most employees add another 13.9 percentage points to the gross replacement rate which reaches at total of 70.9%. This is equivalent to a net replacement rate of 74.6%. Workers on 2/3 of average earnings can currently expect a gross replacement rate of just over 80%, resulting in a net rate of around 100%. It is interesting to note that people with earnings rising from 100 to 200% of average earnings can expect higher replacement rates than people with the lower rising earnings profile (80 to 120%). This is due to the large amount that second pillar pensions contribute to the income of people on high incomes.

Ten years after retirement, the total gross replacement rate can be expected to have fallen by around ten percentage points resulting from a relative decline in both 1st and 2nd pillar pensions. This is due to the fact that 1<sup>st</sup> pillar pensions are index-linked to average earnings reduced by 1.6 percentage points per year, whereas 2<sup>nd</sup> pillar pensions are assumed to be linked to inflation.

Future replacement rates from the first pillar schemes can be expected to decline. Due to the projected rise in life expectancy alone, the net replacement rate for the hypothetical worker on average earnings will be 7 percentage points lower in 2050 than it is today. By 2050, the gross rate under the first pillar could be down to 40.1% for a person on average earnings, a decline by around 17 percentage points. The fall in the 1<sup>st</sup> pillar gross replacement rate is particularly dramatic for people on 2/3 of average earnings: from 67.1% to 40.1%, more than 25 points. This appears to be amplified at the level of net replacement rates which, for the hypothetical worker on 2/3 of average earnings, falls from around 100 to 56.7% (mainly due to the loss of the guarantee pension and the means-tested housing benefit which, in accordance with current legislation, are assumed to be linked to prices only). Occupational pension schemes are assumed to continue to provide around 14 percentage points of the total gross replacement rate, except in the case of rising earnings from 100 to 200% of the average where occupational pensions become the main source of pension income and stabilise the total replacement rate of this high-income group. This is due to the design of the 2nd pillar pension which covers a larger proportion of the income above the ceiling of the 1st pillar system.

<b>S</b> (Swedish Crowns)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2003	2010	2030	2050	In 10 years	2003	2050	2003	2050	2003	2050
Amount of gross earnings before retirement	236023	271195	387470	553597	282119	157349	369065	472046	1107194	283227	664315
Gross replacement rate 1 <sup>st</sup> pillar	57.0	49.7	42.7	40.1	48.6	67.1	40.1	39.3	25.5	52.1	33.4
Gross replacement rate 2 <sup>nd</sup> pillar	13.9	14.2	14.5	14.2	11.6	13.9	14.2	32.4	33.0	13.4	13.6
Total gross replacement rate	70.9	63.8	57.2	54.4	60.2	80.9	54.4	71.7	58.5	65.5	47.0
Total net replacement rate (in brackets: at constant life expectancy of today)	74.6	67.2 (68.9)	59.3 (64.1)	55.7 (62.8)	63.5	100.7	56.7 (63.5)	79.6	66.7 (71.8)	68.5	48.2 (54.1)
Amount of net pension income	121521	125348	157401	210550	123302	113205	143531	227718	449462	133502	218224
Of which means- tested housing benefit	0	0	0	0	0	17944	0	0	0	0	0

### 1.15. UK

#### *Characteristics of the pension system and representativeness of the calculations*

The first pillar of the UK pension system consists of a flat-rate basic pension and an earnings-related additional pension, the State second pension that replaces the previous State earnings-related pension scheme (SERPS, introduced in 1978). The pensionable age is 65 for men and 60 for women. Legislation is in place to equalise the state pension age at 65 by 2020. A full flat-rate pension requires 44 years of national insurance contributions for men and 39 for women. The average working career for a man or woman is likely to be slightly less than this; however, credits are available for the unemployed, those with home-care responsibilities, and those aged 16-18 in full-time education. A new income related benefit (Pension Credit) has recently been introduced to target extra spending on the poorest pensioners. Earnings data used for the calculations are based on a national data source (New Earnings Survey) and are for full-time employees only.

A unique feature of the UK pension system is the possibility to contract out of the earnings-related tier of the pay-as-you-go financed first pillar. This requires coverage by an occupational or personal pension scheme providing equivalent or better benefits than the earnings-related component of the statutory scheme. Of those at work, 57% are currently contributing to a private pension, most of them to an occupational scheme (41% of the population in employment). The likelihood of someone being a member of a private pension scheme increases with earnings. In 2001/02 three quarters

(78%) of full-time male employees with average earnings were contributing to a private pension.

Occupational pension schemes tend to be established by a single employer and are generally of the defined-benefit type, providing pensions based on years of service and final pay. However, there is a trend towards defined-contribution schemes. In 2000/01 60% of pensioner households had income from an occupational pension scheme. The calculations assume that workers have contributed to a contracted out defined-benefit scheme based on final salary for 30 years and accrued a gross replacement rate of 50% from that scheme.

### *Main results*

The worker on average earnings would currently receive a gross replacement rate of 16.6% from the first pillar and 50% from the second pillar, adding up to a total gross rate of 66.6% or 81.9% net. As it is assumed that workers contracted out of the earnings-related state scheme, they would largely receive the flat-rate state pension, plus any entitlement they accrued to the state second pension prior to contracting out into an occupational scheme. The first-pillar replacement rate is therefore noticeably higher for people on 2/3 of average earnings and much lower for people on earnings rising to 200% of the average.

For the replacement rate ten years after retirement it has been assumed that all sources of state and private pension incomes are uprated in line with price inflation. This is consistent with current legislation regarding the up-rating of state pension benefits and current practice within defined-benefit occupational pension schemes. The total gross replacement rate declines by around 10 percentage points.

Future gross replacement rates will decline as the basic state pension is not linked to earnings, but to prices. The decline amounts to 5.2 percentage points between 2002 and 2050 for the worker on average earnings and to 8.3 points for the worker on 2/3 of average earnings.

<b>UK</b> (Pound Sterling)	100% of average earnings (last column: 10 years after retirement; relative to projected average earnings)					2/3 of average earnings		Rising earnings from 100% to 200% of average		Rising earnings from 80% to 120% of average	
	2002	2010	2030	2050	In 10 years	2002	2050	2002	2050	2003	2050
Amount of gross earnings before retirement	24603	28377	40544	57927	NA	16402	38618	49206	115854	29524	69512
Gross replacement rate 1 <sup>st</sup> pillar	16.6	16.1	13.9	11.4	14.1	24.4	16.1	8.3	5.7	13.7	9.3
Gross replacement rate 2 <sup>nd</sup> pillar	50.0	50.0	50.0	50.0	42.6	50.0	50.0	50.0	50.0	50.0	50.0
Total gross replacement rate	66.6	66.1	63.9	61.4	56.7	74.4	66.1	58.3	55.7	63.7	59.3
Total net replacement rate	81.9	81.4	78.9	76.2	71.2	90.7	89.2	74.0	70.9	78.5	73.5
Amount of net pension income	14349	16449	22789	31427	14656	11095	23838	23955	54024	16249	35835
Of which means-tested benefits	0	0	0	0	0	0	214	0	0	0	0

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