Pensions at a Glance 2009

RETIREMENT-INCOME SYSTEMS IN OECD COUNTRIES

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Foreword

This third edition of Pensions at a Glance *provides a range of indicators for comparing pension policies between OECD countries. Four special chapters provide deeper analysis that should help inform debates about the design of retirement-income systems and pension reforms.*

With the economic and financial situation ever changing, and frequent changes to pension systems as a response, please note that this report reflects the position as at the end of May 2009.

The report was prepared by a team, led by Edward Whitehouse, in the Social Policy Division of the OECD's Directorate for Employment, Labour and Social Affairs. Anna Cristina D'Addio and Andrew Reilly were responsible for maintaining and updating the OECD pension models and for drafting the discussion of the main indicators. National officials supplied active and invaluable help in modelling information on their countries' pension and tax systems. The results of the OECD pension models have been confirmed and validated by national authorities.

The special chapters on "Pension systems during the financial and economic crisis" and "The pension gap and voluntary retirement savings" were written by Edward Whitehouse, with contributions from colleagues in the Directorate for Employment, Labour and Social Affairs and from Pablo Antolín, André Laboul, Robert Ley, Jean-Marc Salou, Fiona Stewart and Juan Yermo of the OECD's Directorate for Financial and Enterprise Affairs. Delegates to the OECD Working Party on Social Policy provided useful input to earlier drafts of these chapters. Edward Whitehouse wrote the special chapter on "Recent pension reforms". Edward Whitehouse and Asghar Zaidi of the Social Policy Division of OECD were responsible for "Incomes and poverty of older people". This chapter draws heavily on the database collected for the OECD report published in 2008, Growing Unequal?*.*

The report has also benefited from guidance and commentary of numerous colleagues in the OECD, notably Martine Durand, Michael Förster, John P. Martin, Mark Pearson and Monika Queisser.

The report is a product of a joint project co-financed by the European Commission and the OECD. The OECD pension models, that underpin most of the indicators presented, use the APEX (Analysis of Pension Entitlements across Countries) infrastructure, which was developed by Axia Economics with the help of funding from the OECD and the World Bank.

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Editorial
Pension Policy: Weathering the Storm

The headline figures are frightening. The financial crisis has meant that private pension funds lost 23% of their investment's value, or some USD 5.4 trillion on aggregate in the OECD, in 2008. Stock markets fell further in 2009 before recovering to reach a level 6.4% higher on 21 May 2009 than at the start of the year. Across the OECD, economic output is expected to fall by 4.3% in 2009 and growth is not expected to return until 2011. Projections of unemployment rates show an increase from a trough of 5.6% in 2007 to 9.9% in 2010 in the OECD area. Thus, what started as a financial crisis has become an economic and social crisis.

Private pension schemes face the most immediate and visible problems from the fall in equity and property prices. The impact is obviously greatest in those countries where private pensions already play an important role in providing old-age incomes, such as Australia, the Netherlands and the United States. But no country and no pension system is immune from the crisis. Public pension systems will also encounter financial trouble as contribution revenues dwindle and benefit expenditures increase in the wake of higher unemployment and lower earnings. In addition, their reserves too have faced investment losses and pressure is mounting to use pension reserves for crisis mitigation, as witnessed most recently in Ireland and Norway where reserves are being tapped for bank recapitalisation and public works programmes.

Many people have lost a substantial amount of their retirement savings, in pension plans and other assets. The situation is particularly traumatic for older workers. Not only is it much harder for them to find a new job if they become unemployed but they also have little time to wait for the value of their pension savings to recover, before they have to start drawing down their assets. Income from savings, including private pensions, on average makes up a quarter of retirees' incomes in OECD countries. In seven of them, it accounts for more than 40%.

Will these losses lead to a resurgence of poverty among retirees? Many OECD countries have programmes that act as "automatic stabilisers" buffering the impact of investment losses on overall retirement incomes. Means-tested benefits, for example, will provide for people whose pensions fall below critical thresholds. But in some countries, old-age safety nets are, or will be, insufficient during times when the income from private savings drops. A temporary strengthening of safety nets, to weather the current crisis, is appropriate in these cases. But some countries had weak safety nets and high rates of old-age poverty before the crisis hit.

The short-term political pressure on governments to deliver immediate solace is immense and goes beyond simple prevention of old-age poverty. One clear danger in the present situation is that policy makers may be tempted to reduce the numbers of older unemployed by transferring them to long-term sickness or disability benefits or by

reopening early retirement schemes. Past experience shows that such schemes are very difficult to close down and measures intended for the short term tend to persist, imposing a very heavy cost on the public purse. Such measures should be avoided: they give the wrong signal and divert from the needs to increase effective retirement ages to offset the impact of population ageing. Nevertheless, countries have so far resisted.

The crisis has reinforced our view that further reform is needed in both public and private pension schemes. Among the top priorities are careful reviews of public retirement-income programmes to ensure that they provide effective protection against poverty, both now and in the future. But another look also needs to be taken at the automatic pension adjustment mechanisms which many countries have introduced to link pension expenditures with life expectancy, wage growth or the level of assets in reserve funds. These mechanisms were designed during times of sustained economic growth. In some countries, applying the rules during the recession would mean cutting benefits, in some cases even in nominal terms. Governments will have to consider carefully whether the rules should be applied now, whether they should be suspended temporarily until economic recovery starts, or if they may be best applied selectively by exempting the most vulnerable groups of retirees.

Confidence in private pensions is at an all-time low. In a number of OECD countries, there have been calls to move away from mixed pension systems back to an exclusive reliance on public pay-as-you-go schemes. In the Slovak Republic, for example, workers covered by the new defined-contribution plans have been allowed to switch back to the public system and similar roll-backs of reform have been proposed elsewhere in eastern Europe. This is the wrong way to go. The financial and economic crisis has moved the centre of attention away from the demographic challenges that pension system are facing. But these challenges have not disappeared nor have they become less urgent to address.

To prevent a backlash and the reversal of past reforms, it will be important to restore people's faith in private pension saving. The crisis has made the need for changes in the way private-pension schemes operate painfully clear. These include better regulation, more efficient administration, clearer information about the risks and rewards of different options and an automatic switch to less risky investments as people near retirement. If policy makers do not succeed in making a convincing case for diversified retirement income systems, combining public and private, pay-as-you-go and funded, individual and collective elements, they will be thrown back to square one in their efforts to maintain prosperity in ageing societies.

John P. Martin
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Directorate for Employment,
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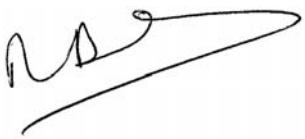

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Executive Summary

The financial crisis and the deep economic crisis that it spawned have dominated the news for over a year. The first of the special chapters in Part I of this third edition of *Pensions at a Glance* looks at the implications of the crisis for retirement-income systems. The *financial* crisis has hit pension funds in OECD countries hard, with their investments losing on average 23% of their value during 2008, worth a heady USD 5.4 trillion. Looking at individual countries, the impact depends on the importance of private pensions in the overall retirement-income package, which is especially large in Australia, Denmark, the Netherlands, the United Kingdom and the United States.

The *economic* and *social* crisis is already apparent in the form of declining output, rising unemployment and slower growth (or even declines) in wages. This means that public pension plans will also be hit, with lower revenues from contributions and greater pressure from benefit expenditure.

The individuals most affected by the financial and economic crisis are older workers, who have little time before retirement to wait for their pension savings to recover and encounter greater problems finding a new job if they become unemployed. The special chapter on the crisis and pensions includes new calculations of the impact of being long-term unemployed late-in-life on people's incomes in retirement. Younger workers feel much less of an impact as they typically save less at this stage in their career and have a much longer expected working life over which to recoup any losses in retirement savings and pension entitlements. People who are already retired and drawing their pension also tend to suffer less.

Using the OECD pension models, the chapter shows how the negative effect of the crisis on retirement incomes is muted in many countries by public safety-net benefits and the tax system. More than 75% of older people in Australia and around 65% in Denmark, for example, receive at least some benefit from resource-tested schemes. The value of these entitlements increases as private pensions deliver lower returns, protecting much of the incomes of low- and middle-earners. In Australia, each extra dollar of private pensions results in a 40 cent reduction in public pension. Conversely, a dollar less in private pensions results in 60 cents more in public pension benefit. But in some countries, the old-age safety nets are or will be insufficient during times when private savings cannot supplement low retirement incomes.

The actions that governments have already taken to mitigate the impact of the crisis are discussed and evaluated. The chapter shows that pension systems have been affected in two main ways by the economic-stimulus packages that many governments have introduced: increased payments to older people and the use of public pension reserves to finance crisis mitigation. Further responses for pension policy are also assessed, covering the labour market, public safety-nets, regulation of private pension funds and investment

choice. Despite huge short-term political pressures, it is imperative that governments resist expedient reactions threatening the stability and sustainability of retirement-income provision. The long-term challenges of demographic change and population ageing have not gone away and will still have to be faced once the crisis is passed and economies start to recover.

The incomes and poverty of today's older people are examined in the second special chapter of Part I. In the mid-2000s, net incomes of people aged over 65 were worth 82% of those of the population as a whole on average in OECD countries (taking account of differences in household size). But there is a large difference between countries. Old-age poverty is practically non-existent in some countries, but over 40% of the old live in income poverty in Korea, for example. Poverty rates average 13.2% for older people in the OECD, compared with 10.6% for the population. The chapter also discusses how incomes and poverty of older people are likely to evolve in the future as a result of pension reform, and social and economic change.

Recent pension reforms are the topic of the third special chapter of Part I. Updating the analysis in the second edition of *Pensions at a Glance*, this chapter shows that OECD countries have continued to reform their pension systems in the period since 2004; indeed, in only five of them was there little or no change. These recent reforms are grouped around key objectives for the pension system: coverage of workers, adequacy of retirement benefits, financial sustainability, economic efficiency (minimising distortions to labour-supply and savings incentives), administrative efficiency and security of retirement incomes in the face of different risks and uncertainties.

The assessment of reforms shows that the period from 2004 to May 2009 has been one of evolution rather than revolution. There was none of the wide-ranging, systemic reforms that took place in the decade up to 2004. In some countries, such as the United States, Norway, Austria and Ireland, the reform process has now stalled. In other countries, the reform process has slowed or even gone into reverse. Legislated changes to the pension system in Italy, for example, were postponed. In the Slovak Republic, workers covered by the new defined-contribution plans have been allowed to switch back to the public system and similar roll-backs of reform are being discussed elsewhere. The crisis may lead to further changes that are not consistent with the long-term strategy needed for a sustainable pension policy.

The final special chapter of Part I, again updating and extending work from the previous edition of *Pensions at a Glance*, looks at the coverage of private pensions. It focuses on countries where public pensions are low and so individuals bear a greater responsibility for providing for their own old age. Yet again, the financial crisis is a real concern, particularly if it undermines people's confidence in private pensions. Nevertheless, fiscal constraints mean that private pensions must remain part of the equation in providing for old age. Policies to ensure that people do save for retirement, including automatic enrolment and tax incentives, are evaluated.

A range of pension indicators is presented in Part II of this report. The first nine indicators look at individual pension entitlements, calculated with the OECD pension models. The values of the parameters reflect the situation in 2006. The calculations are designed to show future entitlements for workers who entered the labour market in 2006 and spend their entire working lives under the same set of rules. For workers on average earnings, the *gross replacement rate* – pension benefits relative to earnings when

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working – averaged 59% in the 30 OECD countries. However, many countries offer concessions in their incomes taxes to older people and most pensioners do not pay any social security contributions. Thus, for average earners, the *net replacement rate* (taking taxes and contributions into account) is 70% on average. Replacement rates are shown separately for men and women and at different levels of earnings. A new indicator showing replacement rates including typical voluntary private pension schemes has been added in this edition.

What matters for governments is not just the replacement rate but the overall pension promise. This is measured by the indicators of *pension wealth*, which show the lifetime value of benefits taking account of differences between countries in pension age, life expectancy and indexation of pensions in payment. On average, men in Luxembourg will receive around USD 825 000 in pensions over their lifetimes and women, around USD 1 million. Luxembourg may be an extreme example, but lifetime pensions from mandatory schemes are worth USD 400 000 for men and USD 475 000 for women on average in OECD countries.

A second set of four indicators, again new to this edition of *Pensions at a Glance*, explores broader elements of retirement-income systems. It presents information on contributions, and how pension contribution rates have changed over time. In fact, contribution rates have been remarkably stable given the demographic pressures on pension systems, increasing from an average of 20% in 1994 to 21% in 2007. However, these pressures are apparent when looking at public pension spending, the second of these indicators, which increased 17% faster than national income between 1990 and 2005, from 6.2% to 7.2% of gross domestic product. The indicator of pension spending also includes information for mandatory private pensions and in-kind benefits, such as housing benefits and subsidies. Two further indicators of retirement-income systems concern private pensions, with data on coverage of voluntary private pensions and the value of assets in pension funds.

The final set of four indicators looks at the background and context in which pension systems operate. Three are demographic: life expectancy, fertility and the dependency ratio (the number of pensioners per person of working age). Data on average earnings, which underlie much of the other indicators, can also be found here.

Finally, the country profiles in Part III give key indicators for national pension systems, set out the parameters and rules in a consistent way and give the main results for individual pension entitlements: replacement rates and pension wealth. At the beginning of Part III, a handy summary table of key parameters and rules for all 30 OECD countries can be found.

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The Framework of *Pensions at a Glance*

This third edition of *Pensions at a Glance* again offers analysis of current pension-policy issues and a useful point of reference on retirement-income systems in the 30 OECD countries. This section sets out the structure of the report. It is divided into three main parts: policy issues, indicators and country profiles. After these have been discussed, this section turns to the details of the methodology for calculating individual pension entitlements. A brief overview of the many different types of pension schemes is then set out, followed by a summary of the architecture of national systems.

Structure of the report

The four special chapters in ***Part I*** provide an in-depth look at important issues in pension policy. The first of these looks at the implications of the financial and economic crisis on pension systems. Which countries and which individuals are most affected? What can governments do to help and which policies should they avoid?

The second special chapter examines incomes and poverty of older people, looking at trends over the past two decades. In many countries, the position of pensioners has improved relative to the population as a whole, but there remain pockets of old-age poverty.

The third updates the analysis of pension reforms in the 2007 edition of *Pensions at a Glance*. How have pension systems changed in the period between 2004 and May 2009?

The final special chapter looks at coverage of voluntary private pensions, extending the analysis in the 2007 edition of *Pensions at a Glance* to look at how this varies with age and earnings. The analysis is built around the concept of the "pension gap": the amount that different individuals will need to pay into voluntary retirement savings to reach a particular level of retirement income. The chapter evaluates five different policies to expand coverage of voluntary private pensions, including tax incentives and automatic enrolment.

The remaining two parts of the report provide comparable indicators and information about retirement-income provision in OECD countries.

Part II updates the important indicators of retirement-income systems developed for the first and second editions. It also offers an expanded range of indicators. These include measures of the assets held in private pension funds and national pension reserves and coverage of private pensions. Other new indicators look at public pension spending and the demographic context and outlook for retirement-income systems. The information needed to compare pension policies is presented in a clear, "at a glance" style.

The first nine indicators in Part II examine pension entitlements. The general approach adopted is a "microeconomic" one, looking at prospective individual retirement benefits under all 30 of OECD member countries' pension regimes. The first three of these are the measure most familiar to pension analysts. Both are replacement rates, *i.e.*, the

ratio of pension benefits when retired to individual earnings when working. The first looks at gross – before tax – replacement rates from all *mandatory* sources, including compulsory private pensions. The second presents gross replacement rates that show separately the role of public and private pension schemes. It also includes data on *voluntary* private pensions for countries where data on the "typical" design of such plans is collected. The third indicator of replacement rates is in net terms, taking account of taxes and contributions paid on earnings and on retirement incomes.

The measures of replacement rates are followed by two indicators of "pension wealth", again given in gross and net terms. Pension wealth shows the lifetime value of the flow of retirement benefits. It is a more comprehensive measure of pension entitlements than replacement rates because it takes account of differences between countries in pension ages, indexation of pensions to changes in wages or prices and life expectancy.

The subsequent pair of indicators examines the different balances that OECD countries strike between the objective of providing an adequate income in old age and that of replacing a target share of pre-retirement income. The first of these summarises the progressivity of the pension benefit formula and the second, the link between pension in retirement and earnings when working.

The final two indicators of pension entitlements aim to summarise the pension system as it affects individuals across the earnings distribution, showing the average pension level, pension wealth and the contribution of each component of the retirement-income system to overall benefits.

While the first nine indicators focused mainly on individual pension entitlements, the next four look at retirement-income systems as a whole. For example, two of them look at how pensions are financed. First, what are the contribution rates for public pensions and how have they changed over time? Secondly, how large are the assets of private pension funds and national pension reserves?

Expenditure on pension benefits is another of this set of indicators. This shows how much of national income is needed to pay for pensions and the importance of public pensions in the overall government budget. It also examines the proportion of national income paid by mandatory private pension schemes and expenditure on "in-kind" benefits for retirees.

This group of indicators also includes data on coverage of private pensions, which cover a greater number of OECD countries than the detailed analysis provided in the special chapter on "The pension gap and voluntary retirement savings" in Part I.

The final set of indicators capture the background to pension policies and the context in which retirement-income systems operate. In particular, three of them focus on the demographic constraints on pension-policy makers. Declining fertility and increased life expectancy are driving population ageing, which is measured with the dependency ratio: the number of people of pension age relative to the number of working age.

Finally, ***Part III*** of *Pensions at a Glance* provides country profiles. It begins with a cross-country analysis of the parameters and rules of the 30 OECD members' retirement-income arrangements. This also provides an introduction to the technical concepts used in the country-by-country profiles that follow. These include pension eligibility ages and other qualifying conditions; the rules for calculating benefit entitlements; and the treatment of early and late retirees. A new feature of this third edition of *Pensions at a Glance* is a detailed and comprehensive presentation of the pension treatment of people with

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career interruptions due to unemployment or caring for children. The country profiles also summarise the principal indicators from Part II in standard charts and tables.

Methodology

Future entitlements under today's parameter and rules

The pension entitlements that are presented are those that are currently legislated in OECD countries. Changes in rules that have already been legislated, but are being phased-in gradually, are assumed to be fully in place from the start. Reforms that have been legislated since 2006 are included where sufficient information is available.

The values of all pension system parameters reflect the situation in the year 2006. The calculations show the pension entitlements of a worker who enters the system today and retires after a full career. The results are shown for a single person.

Career length

A full career is defined here as entering the labour market at age 20 and working until the standard pension-eligibility age, which, of course, varies between countries. The implication is that the length of career varies with the statutory retirement age: 40 years for retirement at 60, 45 with retirement age at 65. (Sensitivity analysis for situations where workers entered the labour market at age 25 rather than age 20, and so had a five-year shorter career, were presented in the 2007 edition of *Pensions at a Glance*.)

Coverage

The results from pension models presented here include all *mandatory* pension schemes for private-sector workers, regardless of whether they are public (*i.e.* they involve payments from government or from social security institutions, as defined in the System of National Accounts) or private. For each country, the main national scheme for private-sector employees is modelled. Schemes for civil servants, public-sector workers and special professional groups are excluded.

Schemes with near-universal coverage are also included, provided that they cover at least 85% of employees. Such plans are called "quasi-mandatory" in this report. They are particularly significant in Denmark, the Netherlands and in Sweden.

An increasing number of OECD countries have broad coverage of voluntary, occupational or personal pensions and these often play an important role in providing retirement incomes. For these countries, a second set of results for gross replacement rates is shown with entitlements from the typical voluntary pension plans.

Resource-tested benefits for which retired people may be eligible are also modelled. These can be means-tested, where both assets and income are taken into account, purely income-tested or withdrawn only against pension income. The calculations assume that all entitled pensioners take up these benefits. Where there are broader means tests, taking account also of assets, the income test is taken as binding. It is assumed that the whole of income during retirement comes from the mandatory pension scheme (or from the mandatory plus voluntary pension schemes in those countries where the latter are modelled).

Pension entitlements are compared for workers with a range of different earnings levels: between 0.5 times and twice the economy-wide average. This range permits an analysis of future retirement benefits of both poorer and richer workers.

Economic variables

The comparisons are based on a single set of economic assumptions for all 30 countries. In practice, the level of pensions will be affected by economic growth, wage growth and inflation, and these will vary across countries. A single set of assumptions, however, ensures that the modelled outcomes of different countries pension regimes reflect differences in pension systems and policies alone.

The baseline assumptions are:

- real earnings growth: 2% per year (given the assumption for price inflation, this implies nominal wage growth of 4.55%);
- individual earnings: assumed to grow in line with the economy-wide average. (This means that the individual is assumed to remain at the same point in the earnings distribution, earning the same percentage of average earnings in every year of the working life.);
- price inflation: 2.5% per year;
- real rate of return after administrative charges on funded, defined-contribution pensions: 3.5% per year;
- discount rate (for actuarial calculations): 2% per year (see Queisser and Whitehouse, 2006 for a discussion of the importance of the discount rate in pensions analysis);
- mortality rates: country-specific projections from the United Nations/World Bank population database for the year 2040;
- earnings distribution: composite indicators use the OECD average earnings distribution (based on 18 countries), with country-specific data used where available.

Changes in these baseline assumptions will obviously affect the resulting pension entitlements. The impact of variations in economy-wide earnings growth, and for individual earnings growing faster or slower than the average, was shown in the first edition of *Pensions at a Glance* (OECD, 2005), while the impact of different rates of return was simulated in the second edition of *Pensions at a Glance* (OECD, 2007a). A new, more detailed analysis of the impact of uncertain investment returns on retirement incomes is provided in Whitehouse *et al.* (2009).

The calculations assume the following for the pay-out of pension benefits: when the benefits from defined-contribution plans are received on retirement, they are paid in the form of a price-indexed life annuity at an actuarially fair price. This is calculated from mortality data. Similarly, the notional annuity rate in notional accounts schemes is (in most cases) calculated from mortality data using the indexation rules and discounting assumptions employed by the respective country.

Taxes and social security contributions

Information on personal income tax and social security contributions paid by pensioners, which were used to calculate pension entitlements, are available on the internet at *www.oecd.org/els/social/workincentives*.

The modelling assumes that tax systems and social-security contributions remain unchanged in the future. This implicitly means that "value" parameters, such as tax allowances or contribution ceilings, are adjusted annually in line with average earnings, while "rate" parameters, such as the personal income tax schedule and social security

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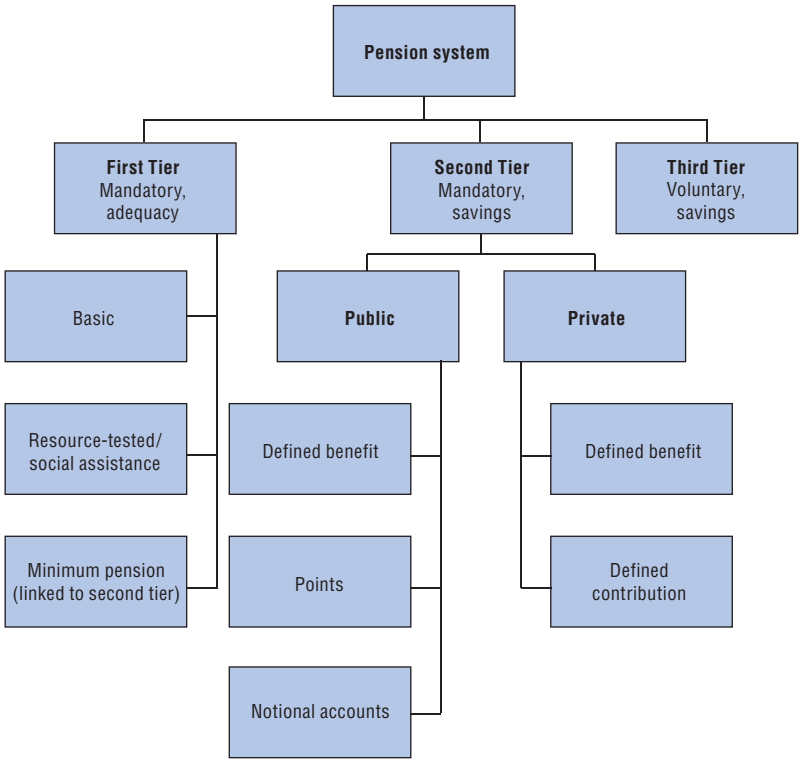
contribution rates, remain unchanged. General provisions and the tax treatment of workers for 2006 can be found in the OECD 2007 report *Taxing Wages*. The conventions used in that report, such as which payments are considered taxes, are followed here.

Overview of retirement-income provision

OECD countries' retirement-income regimes are diverse and often involve a number of different programmes. As a result, classifying pension systems and different retirement-income schemes is difficult. The taxonomy used here, building on earlier work (OECD, 2004, 2005a and 2007), is based on the role and objective of each part of the pension system. It is illustrated in Figure 0.1.

Figure 0.1. **Different types of retirement-income provision**



The framework consists of two mandatory "tiers": a redistributive part and a savings part. Redistributive components of pension systems are designed to ensure that pensioners achieve some absolute, minimum standard of living. Savings components are designed to achieve some target standard of living in retirement compared with that when working. Voluntary provision, be it individual or employer-provided, makes up a third tier. Within these tiers, schemes are classified further by their provider (public or private) and the way benefits are determined (defined benefit or defined contribution, for example).

Architecture of national pension systems

Table 0.1 shows the structure of retirement-income provision, divided between the two mandatory tiers and further into different types of scheme.

Table 0.1. **Structure of retirement-income provision in OECD countries**

	First tier			Second tier	
	Universal coverage, redistributive			Mandatory, savings	
	Public			Public	Private
	Resource-tested	Basic	Minimum	Type	
Australia	✓				DC
Austria				DB	
Belgium	✓		✓	DB	
Canada	✓	✓		DB	
Czech Republic		✓	✓	DB	
Denmark	✓	✓			DC
Finland			✓	DB	
France			✓	DB + points	
Germany				Points	
Greece			✓	DB	
Hungary				DB	DC
Iceland	✓	✓			DB
Ireland		✓			
Italy				NDC	
Japan		✓		DB	
Korea		✓		DB	
Luxembourg		✓	✓	DB	
Mexico		✓	✓		DC
Netherlands		✓			DB
New Zealand		✓			
Norway		✓	✓	Points	DC
Poland			✓	NDC	DC
Portugal			✓	DB	
Slovak Republic			✓	Points	DC
Spain			✓	DB	
Sweden			✓	NDC	DC
Switzerland			✓	DB	DB
Turkey			✓	DB	
United Kingdom	✓	✓	✓	DB	
United States				DB	

DB = defined benefit; DC = defined contribution; NDC = notional accounts.
Source: Country profiles in Part III of this report.

All OECD countries have programmes aimed to prevent poverty in old age, here called "first-tier, redistributive schemes". All these schemes are provided by the public sector and they are of three main types.

- First, *resource-tested* plans pay a higher benefit to poorer pensioners and reduced benefits to better-off retirees. In these plans, the value of benefits depends either on income from other sources or on both income and assets. All countries have general social safety-nets of this type, but in some cases they only cover a few older people who had many career interruptions. Rather than mark every OECD country in the table, only six countries are marked in this column. In these cases, full-career workers with low earnings (50% of the average) would be entitled to resource-tested benefits.
- Secondly, with *basic*-pension schemes, the benefit is either flat rate (the same amount is paid to every retiree) or it depends only on years of work, but not on past earnings. Nor does additional income in retirement change the value of basic pensions. Thirteen countries have a basic pension scheme or other provisions with a similar effect.

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- Thirdly, *minimum* pensions, which share many features with resource-tested plans, are found in 16 countries. In these schemes, the value of entitlements is determined by taking account only of pension income. However, unlike resource-tested schemes, they are not affected by income from savings or assets other than the relevant pension. Minimum credits in earnings-related schemes, such as those in Belgium and the United Kingdom, have a similar effect: benefits for workers with very low earnings are calculated as if the worker had earned at a higher level.

Programmes within the "second tier" play the role of "savings" in that they aim to provide retirees with an adequate income relative to their previous earnings, not just a poverty-preventing absolute standard of living. The schemes considered here are, like those in the first tier, mandatory whether public or private. Only Ireland and New Zealand of the 30 OECD countries do not have mandatory, second-tier provision.

- *Defined-benefit* (DB) plans are provided by the public sector in 17 OECD countries. Private (occupational) schemes are mandatory or quasi-mandatory in three OECD countries (Iceland, the Netherlands and Switzerland). In the schemes provided by the public sector, the retirement income depends on the number of years of contribution during the length of the working life and on the individual earnings. In the Netherlands the DB nature is explicit. In Iceland and Switzerland, the government sets the contribution rate, a minimum rate of return and the annuity rate at which the accumulation is converted into a pension, policies that together define the pension benefit.
- *Points* schemes exist in four OECD countries: the French occupational plans (which are operated by the public sector) and the German, Norwegian and Slovak public schemes. Workers earn pension points based on their individual earnings for each year of contributions. At retirement, the sum of pension points is multiplied by a pension-point value to convert them into a regular pension payment.
- *Defined-contribution* (DC) plans are compulsory in eight OECD countries (Australia, Denmark, Hungary, Mexico, Norway, Poland, the Slovak Republic and Sweden). In these schemes, contributions flow into an individual account. The accumulation of contributions and investment returns is usually converted into a pension-income stream at retirement. These are operated by the private sector, although their organisation varies substantially between countries. For example, in Australia, employers must cover their workers while in Hungary, Mexico and Poland, workers choose a pension provider without employer involvement. In Sweden, only a small contribution goes into the mandatory individual accounts with additional DC provision for most workers under quasi-mandatory occupational plans.
- There are *notional-accounts* schemes in three OECD countries (the public pension plans of Italy, Poland and Sweden). These schemes record each worker's contributions in an individual account and apply a rate of return to the accounts. The accounts are "notional" in that both the incoming contributions and the interest charged to them exist only on the books of the managing institution. At retirement, the accumulated notional capital in each account is converted into a stream of pension payments using a formula based on life expectancy. Since this arrangement is designed to mimic the design of DC schemes, they are often called notional defined-contribution plans (NDC).

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PART I

Policy Issues

This part of the report provides an in-depth look at the questions pension policymakers face today. It consists of four chapters.

The first examines the implications of the ongoing financial and economic crisis on pension systems. Which countries and which individuals are most affected? What can governments do to help and which policies should they avoid? The chapter presents data on the investment performance of private pensions.

The second looks at incomes and poverty of older people, examining trends over the past two decades. In many countries, the position of pensioners has improved relative to the population as a whole, but there remain pockets of old-age poverty. This chapter also takes a look forward, showing how changes in economies, societies and pension systems might affect incomes and poverty of today's workers when they reach old age.

The third sets the changes to pension systems announced in the period between 2004 and the end of May 2009. Nearly all OECD countries have reformed pensions in recent years, addressing issues of adequacy of retirement benefits, long-term sustainability of pension systems and the efficiency of retirement-income provision.

The final special chapter considers coverage of voluntary private pensions, looking at how this varies with age and earnings. The ongoing financial crisis has dealt a heavy blow to private retirement savings, but private pensions will remain part of the equation when providing for old age. This chapter evaluates five different policies.

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1. Pension Systems during the Financial and Economic Crisis

The financial crisis is rapidly turning into an economic and social crisis. Most OECD countries are already in recession and others will follow. Unemployment rates are rising around the world, while average earnings are beginning to fall. The financial crisis is having a profound impact on incomes during retirement, which are affected in a number of ways.

Private pension funds have been dealt a heavy blow: in the calendar year 2008, their investments lost 23% of their value on aggregate, or some USD 5.4 trillion. This means that many people have lost a substantial amount of their retirement savings, from pension plans and other assets. There is also a risk of individuals being doubly hit, by losing their jobs in addition to a large part of their savings. This problem is particularly serious for older workers, who not only encounter greater problems in the labour market if they become unemployed but also have little time to wait for their pension savings to recover.

But public pension schemes are affected too. Unemployment and lower earnings will reduce the contribution revenue of pay-as-you-go pension systems, making it more difficult for these schemes to deliver pension benefits. Some public pension reserve funds have also suffered major losses on their investments. The financial and economic crisis thus both highlights and exacerbates the more long-term structural problems faced by many countries' pension systems due to population ageing.

Section 1 of this chapter discusses which individuals' retirement incomes have been or will be affected by the financial and economic crisis. Section 2 looks more deeply into which countries' retirement income systems face the greatest challenges from the crisis. It examines how the scale of the impact depends on the national *design of pension systems* (including both public and private provision). It also explores the effect of the *way pension funds are invested*. Section 3 reviews the range of possible policy responses to mitigate the effects of the current crisis and to make the pension system more robust to future crises. Section 4 concludes.

1. Which groups are hardest hit by the crisis in pensions?

In order to assess the social impact of the crisis in the area of pensions, it is not sufficient to focus on pension funds alone. Average investment losses mask a wide range of effects on individual workers' and retirees' living standards. This chapter therefore focuses on *individuals* and their vulnerability in old age rather than on institutions, such as pension funds. It discusses the impact of the crisis for different groups of workers and pensioners, distinguished by a number of criteria, such as the age of the individual and the type of pension plan in which people are enrolled.

Age

The most important factor is the age of the individual. Table 1.1 divides the population into three groups: *i)* people who have already retired; *ii)* those about to retire; and *iii)* younger and prime-age workers for whom retirement is a long way off. Table 1.1 shows the degree to which each age group is affected, ranging from strongly affected to a limited impact.

Table 1.1. **Degree of effects on retirement-income provision by age group and pension plan**

	Younger/prime-age workers	People near to retirement	Retirees
Strongly affected		Individuals in mature, private DC schemes (especially: *i)* where exposure to riskier assets is greater; and *ii)* where people are required to annuitise their balances at retirement)	Retirees who did not annuitise their DC balances at retirement (especially those with greater exposure to riskier assets)
Moderately affected		Individuals in mature, private DB schemes Public, PAYG systems with deficits	Retirees in plans with automatic benefit adjustments (*e.g.* conditional indexation, balancing mechanisms, sustainability adjustments)
Less affected	Most individuals in this group	Individuals with recently established private DC schemes	Retirees who annuitised DC balances before the crisis Most retirees with DB private pensions or public, PAYG benefits

DB = defined benefit; DC = defined contribution; PAYG = pay-as-you-go.

The effects of financial and economic crisis can be expected to be smallest on younger and prime-age workers. Younger workers will have more time to rebuild their provision for old age once the economy recovers, though losses will obviously be greater the longer the recession lasts.

The balances in private pension accounts of younger workers are generally small and financial losses in absolute terms are therefore also small compared with other age groups. Figure 1.1 shows evidence of the change in account balances in 2008 for the main private, defined-contribution schemes in the United States: 401(k) plans, named after the relevant clause of the tax code. The change in balance is shown separately by age and the length of time individuals have been members of schemes. For 25-34-year-olds with at least five years in the plan, additional contributions made in the year outweighed investment losses, with balances increasing by nearly 5%.

The most acutely affected group in Table 1.1 is generally people who are near to retirement. Unlike younger workers, these people do not have enough time for markets to recover. This means that recent investment losses in private pension funds, public pension reserves and other savings may well not be recouped. Even postponing their retirement beyond the date that they had planned may only allow them to offset part of their loss. Figure 1.1 shows that the declines in account balances in private pensions in the United States were largest for the 45-54 year old age group, ranging from a loss of around 18% for people with short tenures to 25% for longer periods of coverage. At each tenure length, the fall in assets in account was a little lower for the 55-64 age group.

At the end of the age scale in Table 1.1 lie current pensioners. The degree to which the crisis affects this group depends on the composition of their old-age income. Public pensions are usually defined by a set of rules and the purchasing power of pensions is

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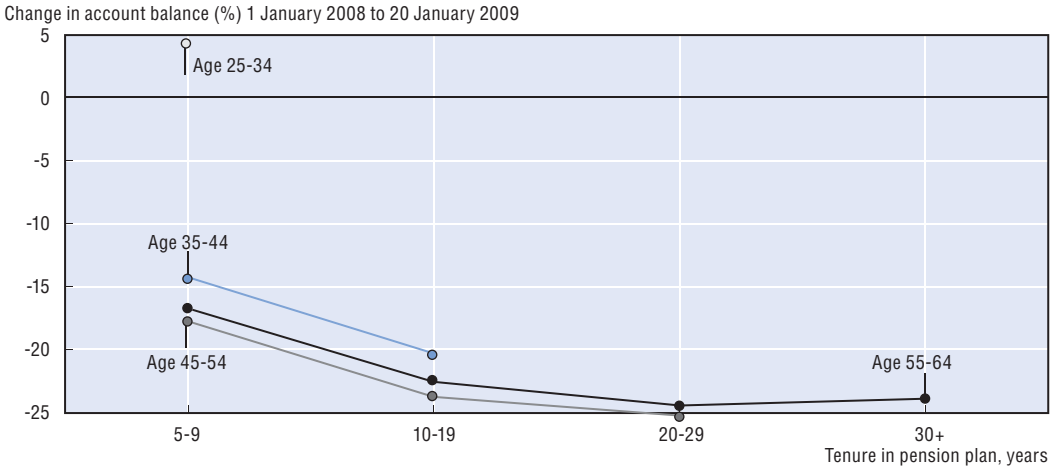
Figure 1.1. **Change in balances of 401(k) plans in the United States in 2008**



Note: Data cover people with an account balance on 31 December 2008, drawn from the 21 million 401(k) participants in the database of the Employee Benefit Research Institute (EBRI) and the Investment Company Institute (ICI).

Source: VanDerhei, J. (2009), "The Impact of the Recent Financial Crisis on 401(k) Account Balances", *Issue Brief*, No. 326, Employee Benefit Research Institute, Washington DC.

StatLink http://dx.doi.org/10.1787/635204112635

protected by automatic indexation arrangements. But in a number of countries, the crisis will have an impact on the level of public pensions as a result of automatic adjustment mechanisms which could result in lower benefits (see below). Private pension benefits in payment, too, are generally protected as occupational pension plans and annuity providers hold assets to back these benefits. The burden of rectifying shortfalls falls on other actors, such as employers, financial-service companies, government-backed guarantee programmes and plan contributors. But any voluntary retirement savings or housing assets that current pensioners were hoping to draw on during their retirement are, of course, hit by the crisis. For some current pensioners, losses in these assets are substantial and interest rates are at historic lows, which may mean much lower living standards in old age.

Type of pension plan

The second main factor determining the impact of the crisis on pensions is the type of pension schemes that make up a country's pension system and individuals' provision for old age.

In *defined-contribution* plans, each person saves for retirement in an individual account and the value of pension benefits is determined by investment performance. Depending on their exposure to riskier assets, people near to retirement may have to lock in recent investment losses and may not have the time to wait for markets to recover before they need their pension income. Younger workers have smaller balances in their accounts, so investment losses will also be relatively small (in the context of their lifetime pension savings). Moreover, these losses will be recouped in a recovery and low prevailing asset prices mean that their current contributions should enjoy good returns in the future. For retirees who had a defined-contribution plan, the effect of the crisis depends on what they did with the accumulated balance in their account at the time of retirement. Many are protected because they used their pension assets to purchase an *annuity* before the crisis, locking in earlier investment gains and benefiting from a life-long pension payment. Others, however, did not buy an annuity or deferred the purchase and, depending on their portfolio, may have suffered large losses.

Private defined-benefit schemes have also seen the value of their assets decline. These schemes are the cornerstone of retirement-income provision in Iceland, the Netherlands and Switzerland. They are also significant sources of old-age income for workers nearing retirement in other countries, such as Canada, Ireland, Sweden, the United Kingdom and the United States. However, younger workers are much more likely in these latter countries to have defined-contribution plans (see Box 1.1).

Box 1.1. **The shift from defined-benefit to defined-contribution occupational pensions plans**

The shift from defined-benefit to defined-contribution plans started earliest in the ***United States***. By 1980, 32% of active members of an occupational pension scheme were covered by a defined-contribution plan. This proportion doubled over the next 15 years to reach 64% by 1995, and grew further to 71% by 2003 (United States, Department of Labor, various years).

In ***Canada***, Statistics Canada reports a decline in occupational-pension coverage since the early 1980s. One reason for this change is that many employers now offer group personal pensions (known as registered retirement savings plans or RRSPs) instead of traditional occupational plans. Furthermore, among those retaining occupational plans, defined-contribution schemes accounted for 24% of members in 2003 compared with 14% a decade earlier (Morisette and Johnson, 2003).

The proportion of workers covered by a private-sector defined-benefit pension scheme in the ***United Kingdom*** nearly halved, from 23% to 12% of the total workforce between 1988-89 and 2002-03. Some 42% of members in 2003 were in schemes closed to active members. A recent survey by the National Association of Pension Funds suggested that 25% of large schemes were considering closing their schemes to existing as well as new members.

In ***Ireland***, the proportion of members of occupational scheme in the private sector covered by defined-contribution arrangements increased from less than 40% in 1999 to 50% in 2005 (Pensions Board, various years).

Finally, ***Sweden*** changed the largest occupational plan (for white-collar workers in the private sector) fully to defined-contribution from 2006. This follows an earlier shift to defined-contribution in the scheme for blue-collar workers.

In defined-benefit plans, pensions are, in theory, "defined" by a set of rules and should be paid whatever the fund's performance. However, the fall in asset prices means that many plans are now in deficit: their liabilities to pay current and future pensions exceed the assets in the fund (plus the "asset" in the form of future employer and member contributions). Sponsors of defined-benefit plans may be in a position to fill the deficit with additional employer contributions whilst waiting for asset prices to recover. Nonetheless, as discussed in more detail below, some of the recovery may have to come from reducing the plan's liabilities as well as increasing assets. In simple terms, this means cutting the benefits of future and even current retirees.

The financial part of the crisis has not directly affected most countries' *public pensions*. First, only eight OECD countries have public pension reserves that were worth more than 5% of national income in 2007 (see OECD, 2009a, Chapter 3 and the indicator "Assets in private pension funds and public reserves" in this report). Secondly, the fund in the United States is invested entirely in government bonds, which make up over 80% of the portfolio of Korea's

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reserve and over 60% of Japan's. In contrast, the government bond share is 35-40% in Norway and Sweden and less than 20% in New Zealand and Ireland. The Irish pension reserve fund has been affected still more by the crisis, since the government has proposed to use this fund to recapitalise troubled banks. The government intends to take EUR 4 billion of the fund, plus EUR 3 billon due to be paid in 2009 and 2010. This total amounts to more than 40% of the assets in the fund at 31 December 2008. In return, the reserve fund will receive the interest on the preference shares issued by the banks to the government.

However, the economic crisis, that started with financial-market turbulence, will significantly affect public pension systems. OECD economies are entering a recession and unemployment has begun to rise in most member countries. The OECD's latest forecast for all member countries, issued on 31 March 2009, is that GDP will fall by 4.3% in 2009 and remain stable in 2010. Unemployment in the OECD reached a low point of 5.6% of the workforce in 2007, increasing to 6.0% in 2008. The projections show further, large rises to 8.4% in 2009 and 9.9% in 2010.

Slower growth will also put pressure on wages. This will reduce the tax and contribution revenues on which public pension systems rely. It might also have an effect on the benefits side, with more workers taking early retirement as a result of the difficult situation in labour markets. Expenditure on unemployment and disability benefits might also increase. Public budgets will be squeezed by increased demand for spending and reduced supply of revenues. A number of countries have responded to this pressure by cutting pension benefits (see the special chapter on "Recent pension reforms").

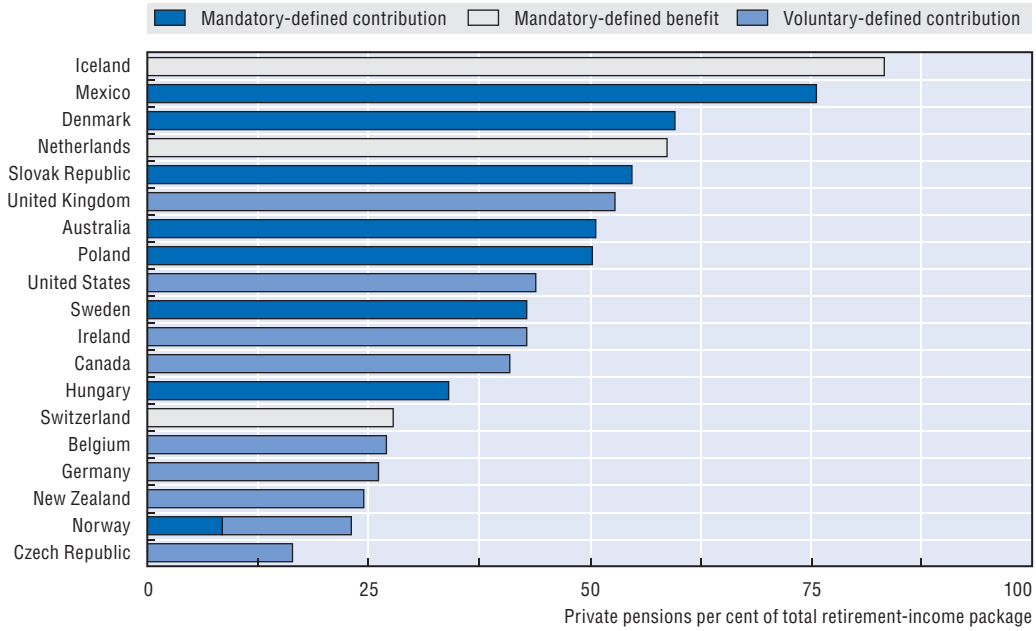
2. In which countries are pensions most affected?

OECD countries rely on a wide range of different mixes between public and private, funded and unfunded, and collective and individual pension arrangements. The impact of the financial and economic crisis on pension systems depends strongly on the mix a country has chosen. The larger the funded components are, the more pensions will be affected. And the more important individual pension arrangements are, in particular defined-contribution pension schemes, the stronger the impact on individual retirees.

Private pensions and the retirement-income package

Private pensions play a large and growing role in providing incomes in old age, a change largely driven by pension reforms over the past two decades.[1] Figure 1.2 illustrates the role of private pensions in the overall retirement-income package for a range of countries. As with the indicators of pension entitlements in Part II of this report, the data presented here are forward-looking, showing the structure of pension provision for workers entering the labour market today. In some countries, the position for new workers will look very different from the pattern for retirees in the next few years as the switch to mandatory private pensions has been relatively recent (see Box 1.2). The chart illustrates the percentage of total retirement incomes coming from private sources for people covered by private pensions: the public-sector component is simply the residual part up to 100%. (This includes resource-tested benefits, basic schemes, minimum pensions and public, earnings-related schemes.) Pension entitlements are calculated for workers earning between 50% and 200% of the economy-wide average and then a weighted average taken based on the distribution of earnings.[2]

Figure 1.2. **The role of private pensions in the overall retirement-income package by type of provision**



Note: Defined-benefit occupational pensions are mandatory in Iceland and Switzerland. They are "quasi-mandatory" in the Netherlands: industrial-relations agreements mean coverage is nearly universal. Defined-contribution plans in Denmark are part mandatory and part quasi-mandatory. Voluntary private pensions in Canada, Germany, Ireland, the United Kingdom and the United States are a mix of defined-benefit and defined-contribution plans. The results are shown for defined-contribution pensions in these cases because new labour-market entrants are much more likely to be covered by these schemes (see Box 1.1).

Source: OECD pension models; see also Whitehouse, E.R. *et al.* (2009), "Investment Risk and Pensions: Impact on Individual Retirement Incomes and Government Budgets", Social, Employment and Migration Working Paper No. 87, OECD, Paris, for a detailed description.

StatLink http://dx.doi.org/10.1787/635210127154

Box 1.2. **The shift from public pensions to mixed public/private defined-contribution provision**

The United Kingdom encouraged members of the public, earnings-related pension scheme to switch to private pensions from 1988, a policy that was much more successful than expected in part due to "mis-selling" of personal pensions.

Hungary, Mexico, Poland and Sweden adopted the same policy in 1997-99 and the Slovak Republic in 2005. In most of these cases (except Mexico and Sweden), many workers had a choice of pension provision. In Poland, for example, all workers under age 30 and future labour-market entrants had to switch to the new mixed system (see Mattil and Whitehouse, 2009). Workers between age 30 and 50 could choose: around 90% of people in their early 30s chose to switch, compared with only around 10% of people in their late 40s. In Mexico, people already in the public scheme at the time of the reform are guaranteed that their benefit will not be lower than under the old system.

The result is that there will only be a few retirements of workers with defined-contribution schemes in Hungary, Poland and the Slovak Republic for another five to ten years at least. Moreover, in all cases workers will have spent substantially less than a full career in the defined-contribution plan, and so their balances will not be so large and most of their pension entitlements will come from public schemes.

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The calculations cover eight countries with compulsory defined-contribution plans and three with mandatory (or near-mandatory) private, defined-benefit plans: Iceland, the Netherlands and Switzerland. Also included are nine countries where voluntary private pensions have broad coverage (see the indicator on "Coverage of private pensions" in Part II of this report) and data are available on average contributions paid to these plans (see the "Country profiles" in Part III). These comprise Belgium, the Czech Republic, Canada, Germany, Ireland, New Zealand, Norway, the United Kingdom and the United States.[3]

In most of the 11 OECD countries not shown in Figure 1.2, private pensions are not significant: in eight of them, assets held in private pensions are less than 5% of national income.[4] However, workers in all countries make voluntary savings for retirement outside of products labelled "pensions". In some, such as France, life insurance has traditionally been used for long-term savings, and the assets that insurance companies hold have been affected negatively by the crisis. In many countries, people have invested heavily in housing, hoping to finance retirement by moving to a smaller primary dwelling or living on the rental income from other properties. Unfortunately, where this behaviour has been most widespread – Australia, Ireland, Spain, the United Kingdom and the United States – the house-price bubble has burst.

In the 19 OECD countries that appear in Figure 1.2, assets of private pension funds were worth more than 50% of aggregate national income before the crisis hit. The share of private pensions in the retirement income package for the 19 countries shown is just below 50%. It is highest in Iceland and Mexico, where most of future retirement incomes are expected to come from mandatory defined-benefit and defined-contribution plans, respectively.[5] The remainder reflects the government's payment of resource-tested benefits and minimum pensions to workers with low earnings. Private pensions will also play the predominant role in a further six countries: Australia, Denmark, Iceland, the Netherlands, the Slovak Republic and the United Kingdom. Nearly all of these countries have public retirement-income provision that is heavily targeted on low earners. Interestingly, the United States shows a rather greater role for the public pension – known as social security – than in these other countries.

At the other end of the scale, typical contribution rates tend to be small: around 2%-4% in Belgium, the Czech Republic, Germany and New Zealand. In Norway, the mandatory contribution is 2%; while voluntary contribution rates are higher, they tend only to cover a slice of individual earnings. For Switzerland, it is important to note that the calculations cover the mandatory part of private pensions. Most employers offer higher benefits than the statutory minimum.[6]

The appropriate response to the impact of financial turmoil on pension funds clearly depends on the role these plans play in the overall retirement-income package. The political pressure for action will generally be greater, the higher countries rank in Figure 1.2. The degree of pressure, however, will depend on other factors. For example, Mexico, at the top of the scale, saw relatively small investment losses during 2008 due to conservative portfolios. In contrast, Ireland – in the middle of the scale – saw the largest losses.

Types of private pension provision

As explained above, the impact of the financial crisis on retirement incomes is direct with defined-contribution plans but indirect with defined-benefit schemes. Figure 1.2 shows that eight OECD countries have mandatory or quasi-mandatory defined-contribution

pensions while in only three are private pensions near universally of the defined-benefit type. In six countries, private pensions are voluntary. Here, there is a mix of defined-benefit and defined-contribution provision. And it is a mix that has been shifting over time, as outlined in Box 1.1. The growing role of defined-contribution private pensions means that there is a more direct link between individual retirement incomes and investment performance: the investment risk is shifted towards individuals in their retirement.

Maturity of different pension schemes

Figure 1.2 is based on a forward-looking analysis of pension entitlements, looking at the position of an individual entering the labour market in 2006. However, there is often a long lag between changes in pension systems and their impact on retirement incomes.

There are two key changes in retirement-income provision that imply that the position of younger workers will be significantly different from that of older workers. First, the shift from mainly public pension provision to mixed public/private defined-contribution arrangements is generally only a decade old and so recent retirees will have little or no defined-contribution entitlement (see Box 1.2).

Secondly, the change in private pensions from defined-benefits to defined-contribution is far from mature. In the United Kingdom, for example, the decline in coverage of defined-benefit occupational pensions is concentrated in the period since the early 1990s. Most schemes were simply closed to new members, so most retirees with occupational pensions retiring in the next decade or so will still mainly have defined-benefit entitlements. The shift was earliest and fastest in the United States and somewhat later and slower in Canada and Ireland (see Box 1.1).

Recent investment performance of pension funds

In 2008 as a whole, world stock markets (as measured by the MSCI index) fell by nearly a half and markets were much more volatile than in the past. In contrast, the world government-bond index (Citigroup) increased by around 7%. Property markets in many OECD economies weakened, in some cases dramatically. These assets, along with corporate bonds and deposits, account for nearly all of pension funds' investments. However, pension funds' portfolios differ significantly between countries and so their investment performance last year also varied between countries.

Figure 1.3 presents investment returns of pension funds in real terms (allowing for price inflation) for the 2008 calendar year. Data are shown for 23 OECD countries where private pension funds are large relative to the economy (with assets worth at least 4% of national income at the end of 2007, that is before the crisis gained momentum). The weighted average real return – of minus 23% – reflects the importance of the United States in the figures. The *unweighted* average (including each of the 23 countries equally) was minus 17%.

The United States, which accounts for around a half of all private-pension assets in OECD countries, showed the third largest decline: around 26%. Only Ireland, where the loss was nearly 38%, and Australia, with losses of 27%, showed a worse investment performance in 2008. In another five countries – Belgium, Canada, Hungary, Iceland and Japan – real investments fell by more than 20%.

At the other of the scale, losses were only around 10% in Germany, the Slovak Republic, Norway, Spain and Switzerland. They were smaller still in the Czech Republic and Mexico.

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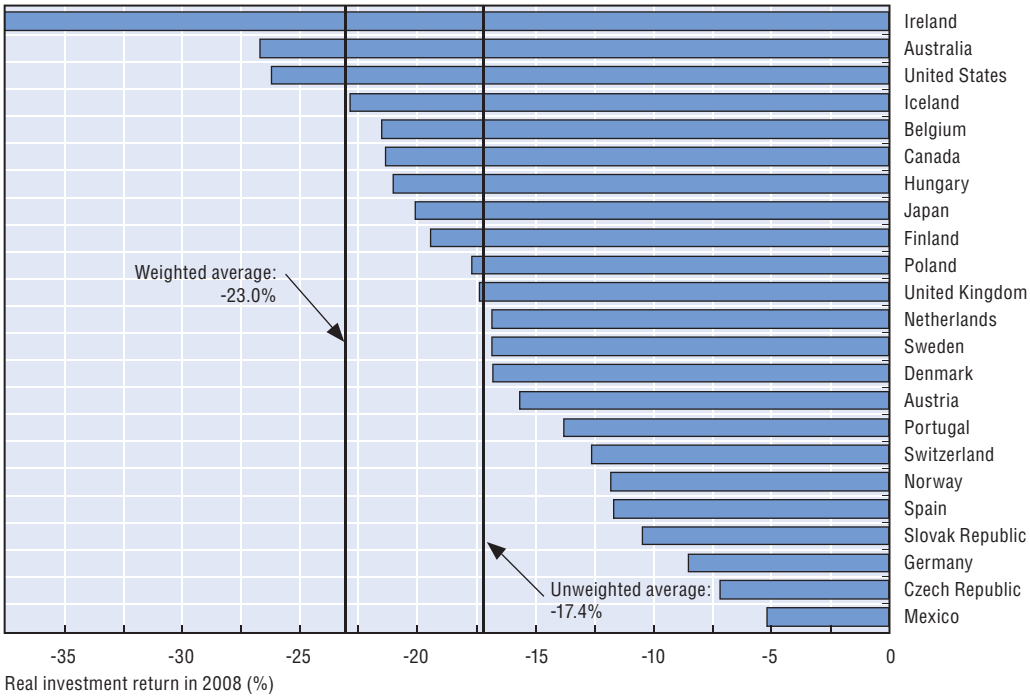
Figure 1.3. **Pension funds' real investment returns, 2008**



Note: Returns are shown only for countries where pension-fund assets exceeded 4% of gross domestic product (GDP) in 2007. Data are from official sources for Austria, Belgium, Finland, Hungary, Ireland, Mexico, Norway, Poland, Slovak Republic, Spain and Switzerland. Where data on actual pension-fund performance were not available, investment returns were estimated using data on pension funds' asset allocation and the returns on different asset classes. See OECD (2009a), *Private Pensions Outlook 2008*, footnote on p. 23.
Belgium: Data are for the year to end September 2008. Finland: data relate to the mandatory, public-sector occupational plans. Sweden: figures are for occupational schemes. Hungary and Slovak Republic: data are for mandatory private pensions only.

Source: OECD pension statistics.

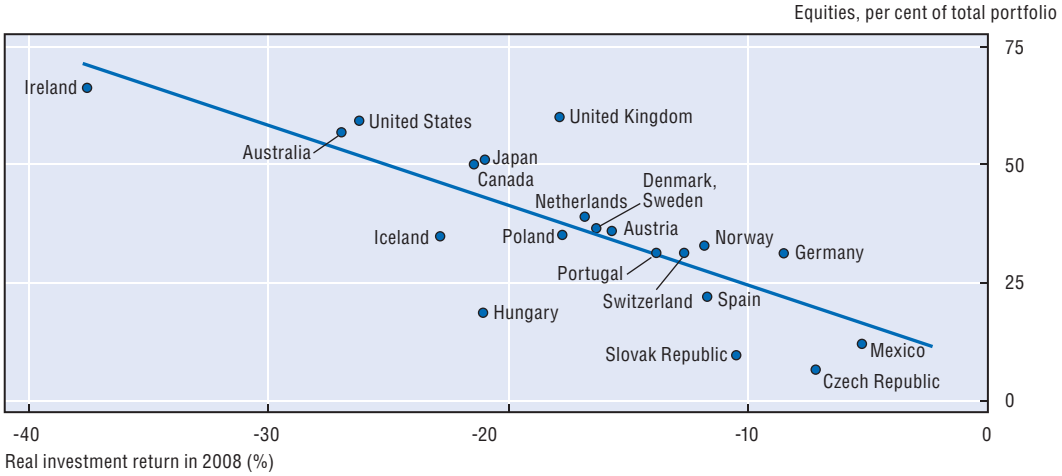
StatLink http://dx.doi.org/10.1787/635276166554

The major reason for the pattern of investment returns between countries is the way that funds are invested. In countries with smaller losses, pension funds tend to be invested mainly in bonds, especially government bonds. In countries with larger pension-fund losses, there is a greater exposure to equities. This is illustrated in Figure 1.4, which plots the investment returns from Figure 1.3 against the proportion of the portfolio invested in equities. The latter is measured for 2007 to give an idea of the picture before the financial crisis hit: equities' portfolio share will obviously have declined along with stock markets.

There is clearly a very strong relationship. Ireland has both the largest losses and the largest proportion invested in equities: two-thirds of the portfolio. Both equity shares and losses were also relatively high in Australia and the United States. Canada, Japan and the United Kingdom, all with large equity holdings of 50% or more of assets, did not perform as badly.

Most of the countries with the smallest losses in 2008 had bond-dominated portfolios: the equity share was just 6-12% in the Czech and Slovak Republics, Germany and Mexico, for example. However, it is important to bear in mind that over the long term, equities have delivered larger (albeit riskier) returns, an issue discussed in more detail below.

Figure 1.4. **Pension funds' real investment returns in 2008 and equity exposure in 2007**



Note: Where pension funds invest in mutual funds, the asset split of mutual funds from the Institutional Investors database is used to allocate these investments to different assets classes. See also notes to Figure 1.3.

Source: Equity portfolio share from OECD (2009a), *Private Pensions Outlook 2008*, Figure 2.12 and Table 2.8; Australian Prudential Regulatory Authority (2007), *Insight: Celebrating 10 Years of Superannuation Data Collection*; International Financial Services London (2009), *Pension Markets 2009*; The Pensions Regulator (2008), *The Purple Book: DB Pensions Universe Risk Profile*.

StatLink http://dx.doi.org/10.1787/635286855704

These investment losses directly affect individual defined-contribution pension accounts; however, they have also profoundly affected the finances of defined-benefit pension schemes. Many private, defined-benefit schemes are in deficit: their current and future pension liabilities are larger than the assets that they hold. This is measured by the "funding ratio", that is, the assets of the fund relative to pension liabilities.

- ***Belgium*** and ***Finland:*** between the end of 2007 and the end of 2008, average funding ratios fell from around 130% to 115%.
- ***Ireland:*** in December 2008 the aggregate funding ratio was 75%, compared with 120% a year earlier.
- ***Netherlands:*** the funding ratio for *nominal* pension benefits fell from 144% at the beginning of 2008 to around 90%-95% in early 2009, according to the Department of Social Affairs. (This does not allow for inflation adjustment either of pensions in payment or the accrued rights of workers: see below.)
- ***Switzerland:*** funding ratios were 116% on average at the end of 2007 but had fallen to 102% by the end of 2008.
- ***United Kingdom:*** average funding levels sank to 76% in February 2009, compared with 97% a year earlier and 118% at their peak in June 2007 (Pension Protection Fund, 2009).
- ***United States:*** the average funding ratio in 100 large schemes fell from 109% to 78% in 2008, according to Watson Wyatt, a large consulting firm.

Financial market performance in 2009 to date has not provided any comfort for members of private pensions or for pension-fund managers. Nearly all major stock markets fell further although the world index on 21 May was up 6.4% at the start of the year. Unlike 2008, bond markets have also fallen, primarily on fears of the effects of fiscal-stimulus packages on government debt. The loss to 21 May is 2.3%.

Automatic stabilisers and old-age safety nets

The overall impact of the crisis on retirement income depends on the automatic stabilisers and anti-poverty safety nets built into countries' pension systems. Most countries have provisions that help prevent retirees from falling into poverty in their old age, which may buffer the impact of investment losses on retirement income for some people.

Most public retirement-income programmes – basic pensions and earnings-related schemes – will pay the same benefit regardless of the outcome for private pensions. However, many resource-tested schemes interact with the value of private pensions. In Australia and Denmark, for example, most current retirees receive resource-tested benefits. The value of these entitlements increases as private pensions deliver lower returns, protecting much of the incomes of low- and middle-earners. The withdrawal rate of the benefit against other income sources is currently 40% in Australia and 30% in Denmark. In Australia, for example, each extra dollar of private pensions results in a 40 cent reduction in public pension. Conversely, a dollar less in private pensions results in 60 cents more from the public pension. More than 75% of older people in Australia and around 65% in Denmark receive at least some benefit from resource-tested schemes.

The proportion of older people receiving such resource-tested schemes is also relatively high in Canada, Ireland and the United Kingdom (20-35%). Low earners will have their overall pensions protected by resource-tested programmes.[7] In all these cases, the public retirement-income programmes act as "automatic stabilisers", meaning that some or most retirees do not bear the full brunt of the effect of the financial crisis on their income in old age.

However, not all resource-tested schemes use incomes from private pensions in calculating entitlements. The value of the guarantee pension in Sweden, for example, currently received by more than half of retirees, depends only on the value of the public, earnings-related scheme (which has a notional-accounts formula). Losses in private pension savings are thus not compensated for Swedish pensioners.

A second automatic stabiliser of *net* retirement incomes, faced with investment risk, comes through the personal income tax.[8] In most OECD countries, pensions in payment are taxable. An average earner could expect to pay about 30% of his or her pension in tax in Denmark and Sweden. In Belgium, Germany and Norway, the average earner would pay about 20% of retirement income in taxes and this figure is around 15% in Hungary and Poland. If investment returns turn out to be poor, then governments will collect less in taxes on pensions. The result is that individuals' net retirement incomes will fall by less than the decline in pension funds' asset values.[9] In contrast, pensions are not taxable in the Slovak Republic and special credits, allowances and reliefs for pension income or for older people mean that only retirees with very large incomes from voluntary pensions would pay much in income tax in Australia, Canada, Ireland, the United Kingdom and the United States.

Putting these two effects – taxes and resource-tested benefits – together, automatic stabilisers have much the largest effect in Denmark. The dampening effect on net retirement incomes is also substantial in Belgium, Poland and Sweden and is large in the United Kingdom and the United States.

Automatic adjustment of pension benefits

Three OECD countries – Canada, Germany and Sweden – have mechanisms in place that will automatically adjust benefits to ensure the solvency of the public pension scheme. These could be termed "automatic *de*stabilisers" as they have the reverse effect of the automatic stabilisers described above. Although they protect the finances of the pension scheme, they do so at the cost of varying individual retirement incomes. In each case, the adjustment comes primarily through the indexation of pensions in payment. However, current workers' accrued benefits can also be affected. A similar mechanism operates in the defined-benefit occupational pension plans in the Netherlands (see Box 1.3 for a discussion).

These automatic adjustments – if they are not overridden – might result in reductions in real benefits for current pensioners. This is due to a mix of the effect of the financial crisis on investment and the impact of the economic crisis on earnings and employment. Lower pension benefits might operate against any economic stimulus to maintain consumption during a recession (see below). A temporary suspension of these adjustments is already in place in Germany and other countries might want to follow suit. However, this would be more difficult in the Netherlands, since these adjustments relate to funded, defined-benefit occupational plans (see the discussion on regulating issues below).

However, it is unfair to single out these four countries: other countries' retirement-income systems face the same fiscal and financial constraints. It is just that they do not have *automatic* mechanisms to adjust pension entitlements in such bad times.

3. Policy responses: what to do and what not to do

Since the onset of the financial and economic crisis, all OECD countries have been responding to rising unemployment and increasing social distress by taking a range of measures to help both individuals and institutions under stress. This section discusses the various areas of intervention and makes recommendations for short-term measures to stabilise retirement incomes and pension systems without losing sight of the longer-term needs for structural change. Demographic pressures and population ageing have lost none of their threat and urgency, even as the immediate crisis has moved to the forefront of all discussions.

Labour-market policies

Labour markets are already weakening and unemployment is expected to rise significantly as the economic crisis continues. The OECD's latest forecast for all member countries, issued on 31 March 2009, is that unemployment will increase from 6.0% of the workforce in 2008, to 8.4% in 2009 and 9.9% in 2010.

Experience of past recessions suggests that the impact of weaker labour markets is felt most strongly by people at either end of the age spectrum. Young workers find it difficult to find a job when they leave education. Younger and older workers are often the first to lose their jobs as companies cut back and they are most vulnerable to long-term unemployment. When it comes to retirement incomes, however, younger workers have a long career ahead to make up for any shortfalls. But this is not true of older workers. This section examines how their retirement incomes might be affected by periods of unemployment.

Governments have often relaxed the rules or administration for early retirement or disability benefits in past recessions. This had two objectives: first, to protect the incomes of older workers who lose their jobs and are unable to find another; and, secondly, to limit

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Box 1.3. **Automatic adjustment of pension benefits**

In ***Canada***, there is a review of the financial sustainability of the earnings-related scheme every three years. The scheme is partially funded: the reserve is not designed to cover the entire liabilities but to smooth the required contribution rate over time and, in particular, to prepare for the impact of the large "baby boom" cohort reaching retirement age. If the scheme is deemed to be unsustainable, the law requires a freeze in nominal pensions and an increase in the contribution rate (of half the increase needed to reach solvency) for a three-year period until the next review. Any impact of the economic crisis on solvency would be shared between current retirees and current contributors. However, provincial finance ministers have the power to take alternative action to achieve solvency.[1]

Germany introduced a "sustainability factor" into its public-pension scheme – which is based on pension points – from 2005. The size of the adjustment to the value of pension points depends on a measure of the dependency ratio: that is, the ratio of the number of "standardised" beneficiaries relative to the number of contributors. The dependency ratio is "equivalised": it takes into account that high-earning contributors pay more into the scheme than low earners.[2] The adjustment affects the change in the pension-point value. This means that pensions in payment will not be fully indexed to earnings growth, although a safeguard clause rules out reductions in *nominal* benefits. It equally affects all current workers and pensioners, since the accrued rights and future accruals also be proportionately reduced or increased. In the parlance of this report, both "indexation" and "valorisation" are affected (see the first section of Part III for a definition and discussion of national provisions). The rosy economic outlook at the time of the decision meant that the government promised increases 0.6 to 0.7 percentage points greater than specified in the rules in 2008 and 2009. The fiscal and financial effects of the crisis (and the electoral cycle) mean that such generosity may not be repeated.

The "balance mechanism" in the notional-accounts scheme in ***Sweden*** also affects both current and future pensioners (*i.e.*, indexation and valorisation). Pensions in payment are indexed to earnings growth minus the "growth norm" of 1.6%. Current workers' notional accounts are awarded a notional interest rate equal to the growth of average earnings. The scheme's solvency is tested by comparing the assets and liabilities of the scheme. The assets comprise the value of a buffer fund, currently worth around four times annual expenditures,[3] plus the present value of the flow of contributions (see Settergren, 2001). The liabilities are the present value of the flow of pensions due to current retirees and current workers. If the measure of assets falls below liabilities, the indexation of pensions in payment and the notional interest rate are both reduced until solvency is restored. The ratio of the two reached a low point of 1.0014 in 2004 and remained just over one until 2007. In 2008, however, this has fallen to 0.9672. Under the rules, pension benefits of current and future retirees should be cut to restore the balance.

In the ***Netherlands***, occupational pension plans can also adjust indexation and valorisation to help restore solvency. Nearly all occupational plans remain defined-benefits (unlike other countries, such as the United Kingdom and the United States, discussed above). In the past few years, most schemes have moved from a final salary base for calculating pensions to lifetime average earnings, which means that valorisation has a large effect on individuals' entitlements. The same rate is generally applied to adjust accrued pension entitlements of workers and pensions in payment. Schemes are now required to state their objective for this rate and most plans have opted for a link to earnings, either in their industrial sector or in the economy as a whole.[4] The regulations strongly protect *nominal* benefits of both workers and pensioners. However, there is a less strict requirement for reserves to cover indexation and valorisation, and a series of large plans have this year announced increases less than their stated policy would allow.[5] The Central Planning Bureau has estimated that then loss for workers in their 50s (from indexation cuts and contribution increases) will be around 10% of pension benefits, with smaller losses for younger workers. However, the regulator has allowed pension funds longer to reach solvency and so cuts in indexation might be delayed (see the discussion of "Regulating defined-benefit plans" in Section 3 below).

1. Office of the Superintendent of Financial Institutions Canada (2007) and Brown (2008) offer a full analysis.
2. For a detailed description, see Börsch-Supan and Wilke (2006).
3. OECD (2008), "Pension markets in focus", *Financial Affairs Division Newsletter*, No. 5, December, Figure 11.
4. See Bikker and Vlaar (2006).
5. This reduction comes on top of indexation in the period 2003-06 that fell 3% behind wage growth and 2% behind price inflation as pension funds recovered from the 2000-02 stock-market crash (Dutch Central Bank, 2007).

the increase in the rolls of registered unemployed. However laudable the short-term objectives, the long-term impact on labour markets is negative. For example, these policies were widely adopted during the recession of the early 1980s. The result was that employment rates remained low well after economies had recovered. The main reason was that these policies proved very difficult to unwind.[10] So far however, governments have resisted the temptation to adopt such policies.

In countries with large and relatively mature defined-contribution pension systems – the United States being the main example – people may wish to work longer to repair their retirement savings. Working longer will help in three ways: first, adding extra contributions; secondly, reducing the number of years of retirement that the pension must finance; and, thirdly, perhaps allowing time for recovery in asset values. However, this may be too optimistic. Older workers may find it very difficult to work longer, because they lose their jobs and, as unemployment rises, are unable to find another. Furthermore, 2009 has so far seen further declines in asset prices and any recovery might be too far in the future to make a difference.

Old-age safety nets

The financial and economic crisis highlights and exacerbates the issue of safety-net benefits in retirement for workers with low earnings and career gaps. Figure 1.5 shows net replacement rates for full-career workers with earnings of half the national average. (The net replacement rate is the individual pension entitlement, net of any taxes and contributions, divided by individual earnings, again in net terms: see the discussion of the indicator in Part II.)

Spain has the same net replacement rate for low earners as the OECD average: 82%. In six countries, the net replacement rate for low earners is above 100%, meaning that net income is higher during retirement than when working. However, net replacement rates are less than 60% in Germany, Japan, Mexico and the United States. Bearing in mind that this calculation is for a low earner, the earnings being replaced are already half of the economy-wide average: old-age safety-nets in these countries are relatively weak.

Once a spell of late-in-life long-term unemployment or early retirement is also factored in, retirement incomes can be lower still. With weaker labour markets, many older workers may be forced to retire early or suffer long-term unemployment. The special chapter on "Recent pension reforms" shows that Belgium, Finland, France, Korea, Spain and the United Kingdom have recently decided to improve old-age safety nets (not included in these calculations). Some other countries, which have weak old-age safety nets, should also consider action.

Pensions are a long-term issue

The year 2008 was undoubtedly a bad one for pension funds – see Figure 1.3 – and 2009 has, so far, provided little comfort. Many individuals have understandably lost confidence in private pensions and some policymakers have begun to question the wisdom of the growing role of private pensions in most OECD countries in the past two decades. While not dismissing the genuine hardship faced by some individuals – especially those close to retirement – it is important to remember that pensions are a long-term policy issue.

Analysing 25 years of data on investment returns for the G7 major economies[11] and Sweden, a simulation shows a real annual return of 5.5% for bonds and 9.0% for equities over the 45-year horizon of a full career's pension savings. Table 1.2 shows the results of the simulation for a "balanced" portfolio: half in equities and half in bonds. The portfolio is assumed to remain unchanged over the career. (Results for different portfolios are shown

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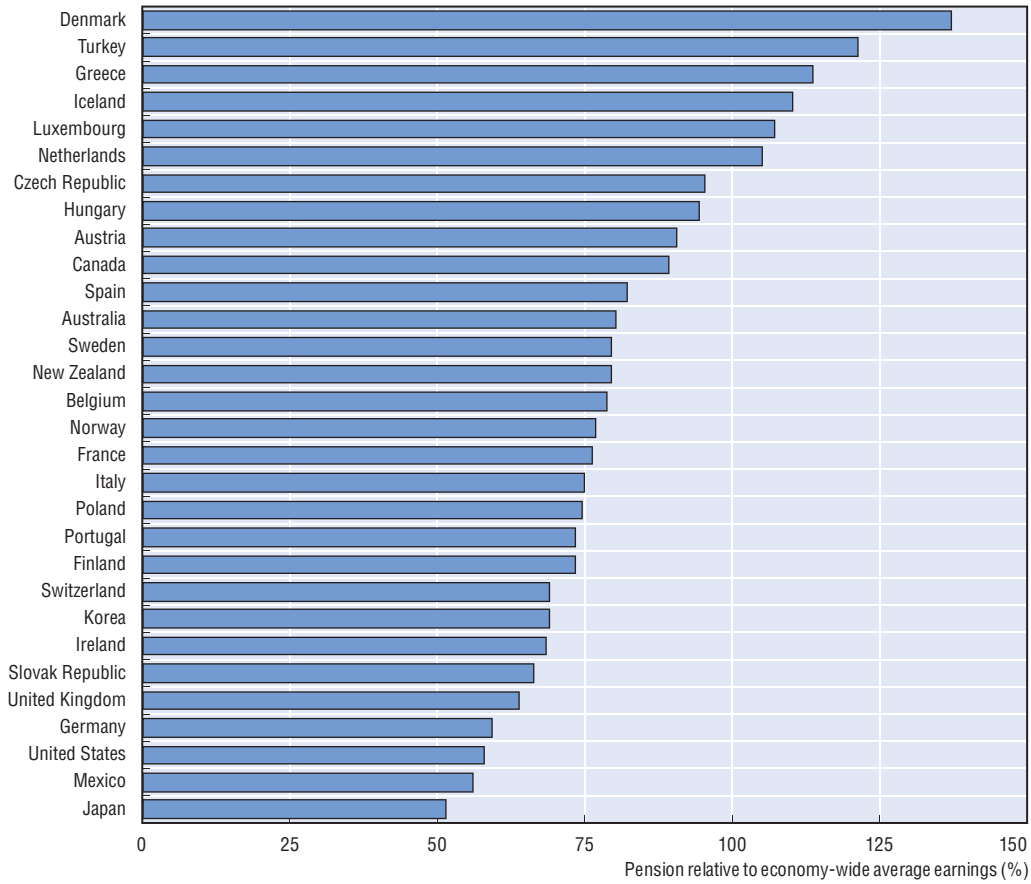
Figure 1.5. **Old-age safety nets: net replacement rate for full carreer workers**

Percentage of individual net earnings



Source: OECD pension models.

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Table 1.2. **Distribution of simulated future investment returns and replacement rates**

	Percentile of distribution								
	10	20	30	40	50	60	70	80	90
Rate of return	3.2	3.8	4.3	4.7	5.0	5.4	5.7	6.2	6.7
Replacement rate	32.2	36.8	41.2	45.2	48.6	53.5	57.6	65.3	74.2

Note: Based on unisex mortality rates of the OECD average projected for 2040. Assumes a contribution of 10% of earnings over a 45-year term.
Source: D'Addio, A.C. *et al.* (2009), "Investment Risk and Pensions: Measuring Uncertainty in Returns", Social, Employment and Migration Working Paper No. 70, OECD, based on Thomson Financial Datastream information.

in Box 1.4). The results allow for differences between market returns and those achieved by individuals on their pension savings, due to administrative charges, costs of converting accumulated balances into annuities, etc.[12] As a result, the average (median) return in this simulation is 5.0%, which compares with the 7.3% average over the last 25 years.

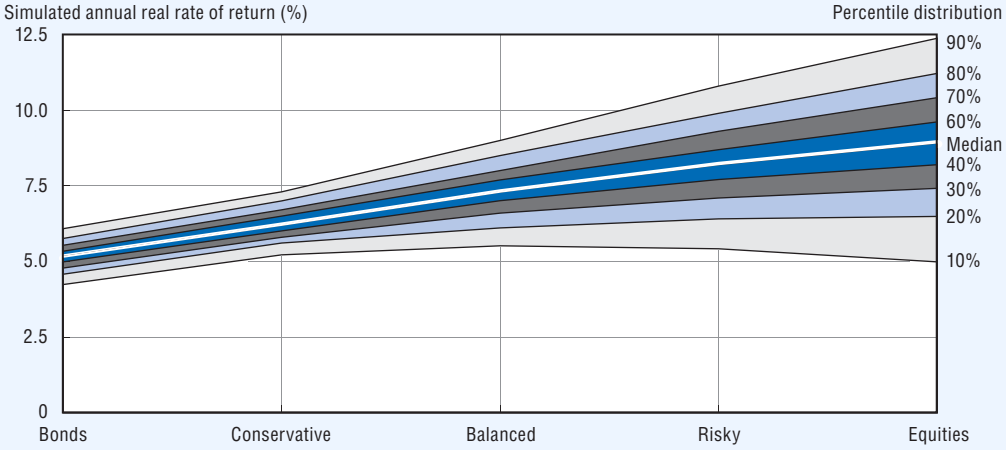
Box 1.4. **Long-term investment performance of different types of assets**

The data in Figures 1.3 and 1.4 showed that countries where pensions are invested conservatively – in government bonds, for example – saw much smaller losses in 2008 than countries where equities play a more important role in pension portfolios.

The following analysis assesses the effects of investment performance over the lifetime of contributors, rather than focusing on investment outcomes for a single year. It is a simulation of a 45-year pension investment based on analysis of around 25 years of data for eight countries, ending in 2006.* Note that the results in the text differ because the returns used there take account of administrative charges, etc. The key results are shown in Figure 1.6. The chart presents the range of simulated returns over the long horizon of pension savings. It focuses on the two key assets in pension funds' portfolios: equities and government bonds. At the left- and right-hand ends of the horizontal scale, returns are shown for equities and bonds. In between are three portfolios – here called "conservative", "balanced" and "risky" – that mix the two different assets in different proportions.

The white line in Figure 1.6 shows the median real return: half of the time returns will be above this level, and half the time below. This is 7.3% for a balanced portfolio, half-and-half in equities and government bonds. It is higher – 8.9% – for equities and lower – 5.2% – for bonds. The shaded areas of the chart show the likelihood of different outcomes, based on past experience. With a balanced portfolio, real returns are expected to be 5.5% a year or less 10% of the time. Equally, they are projected to exceed 9.0% a year also 10% of the time. The shaded areas fan out as the equity share in the portfolio increases, reflecting the greater volatility in returns on the stock market than on government bonds.

Figure 1.6. **Distribution of simulated annual average investment returns**



Note: Simulation based on historical data on returns for eight OECD countries: the G7 plus Sweden. Conservative portfolio is assumed to be 25% invested in equities, balanced 50% and risky, 75%. The remainder is assumed to be invested in government bonds with a range of maturities.

Source: D'Addio, A.C. *et al.* (2009), "Investment Risk and Pensions: Measuring Uncertainty in Returns", Social, Employment and Migration Working Paper No. 70, OECD, based on Thomson Financial Datastream information.

StatLink http://dx.doi.org/10.1787/635328886382

* The modelling involves complex time-series econometrics. First, a Generalised Autoregressive Conditional Heteroskedasticity (GARCH) process is estimated using monthly historical returns on equities and bonds (including both changes in asset values and income from dividends and interest). Secondly, a Filtered Historical Simulation method is applied to the results to project the range of future outcomes. The results presented here are based on 10 000 simulations. See D'Addio, A.C. *et al.* (2009) for details.

The analysis also investigates the scale of risk and uncertainty over investment returns. In the worst 10% of cases, for example, returns are expected to be just 3.2% a year or less. In the best 10% of cases, annual returns are 6.7% or more (upper line of Table 1.2).

There is an important *caveat*: the simulations are based on around 25 years of data, but the series analysed only reaches to the end of 2006. The more recent period includes both substantially negative returns on equities *and* much greater volatility. However, the equity market crash of 1987, included in the data, saw prices fall as much as 2008. Also, the end of the technology-stock bubble, which led to substantial stock-market falls in 2000-02, is in the time period covered.

The range of long-term investment returns does not appear very large. However, compounding these returns over the long time horizon involved in retirement saving has a huge effect. This is shown in the lower line of the table, which shows the replacement rate at these different levels of return. The model assumes a full career of contributions at 10% of individual earnings each year. The accumulation of retirement savings is converted into a flow of pension payments based on OECD average mortality rates projected for 2040. The result is presented as a replacement rate: the ratio of pension in retirement to earnings when working.

The replacement rate with the average (median) rate of return from this contribution of 10% of earnings is 49%. This means that half the time the replacement rate would be higher, and half the time, lower. However, in the worst 10% of cases, the replacement rate is 32% or less. The best 10% of cases yield a pension worth 74% of earnings. This range of 32-74% is very broad. It encompasses a "comfortable" retirement and "borderline old-age poverty".

Investment choice

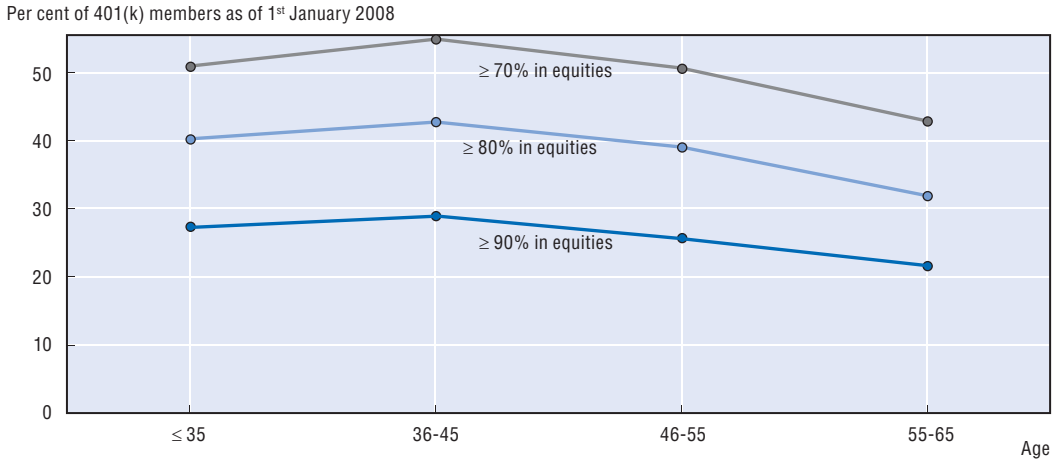
Individuals can choose their investment portfolio in most defined-contribution pension plans. In Australia, for example, around 85% of people are members of a scheme with investment choice, typically among five different funds. However, individuals are now free to choose among different pension providers: the menu of investments in retail funds averages 58. There has also been an expansion in choice in the most common defined-contribution arrangement in the United States. In the late 1970s, only 16% offered investment choice but by 1994 this had already climbed to 94%. More than half of schemes now offer five or more different kinds of investment. Each provider in Mexico and the Slovak Republic is required to offer a small range of funds with different risk-return characteristics. As a result of the crisis, Poland has recently announced plans to introduce a similar choice of investment portfolio.

For defined-benefit as well as defined-contribution plans, pension-fund investment regulations have been liberalised over the past decade. For example, only 12 OECD countries still set quantitative limits on equity investments. Even these are set at relatively high levels, an average of 52% of portfolios.[13] This allows pension fund managers to diversify their portfolios.

The investment choices that people have made will have important implications for the effect of the crisis on their pensions. Figure 1.4 explored this issue at the aggregate level: comparing pension funds' overall performance with the proportion of overall assets invested in equities. The analysis that follows looks at *individual* investment choices and their policy implications.

Figure 1.7 shows that individuals in the United States tend to shift away from equities towards less risky investments as they approach retirement. For example, around 55% of 36-45-year-olds hold more than 70% of their portfolios in equities, falling to 43% of people aged 56-65. The portfolio share of equities of this group of older workers, close to retirement, seems very high: more than one in five hold more than 90% of their 401(k)s in equities. Of course, it is impossible to assess the riskiness of people's financial decisions as a whole: they may, for example, hold lower-risk deposits and bonds outside of their 401(k)s. But it is a worrying indication: these workers close to retirement will have seen their pension savings significantly eroded relative to the minority who held most of their portfolios in lower-risk assets.

Figure 1.7. **Percentage of 401(k) plans in the United States invested in equities by age**



Note: Data cover drawn from the 21 million 401(k) participants in the database of the Employee Benefit Research Institute (EBRI) and the Investment Company Institute (ICI). The total proportion invested in equity is calculated as the sum of equity funds, holdings in the individual employer's stock and the relevant portion of mixed investment options (such as balanced and target date funds).

Source: VanDerhei, J. (2009), "The Impact of the Recent Financial Crisis on 401(k) Account Balances", *Issue Brief*, No. 326, Employee Benefit Research Institute, Washington DC.

StatLink http://dx.doi.org/10.1787/635332670337

What are the implications of this type of investment behaviour for policy? Should people be restricted in their choices to prevent them from having their old-age savings wiped out? Or should this be an individual decision and a risk to take at people's own discretion?

It is appropriate that people direct pension savings towards less risky investments as they near retirement (and thus the moment when the retirement savings will need to be drawn). This is a well established finding of the finance literature.[14]

At the least, therefore, government should encourage individuals to adopt this strategy. This shift, often called lifecycle investing, can reduce investment risk over the career without the sacrifice of financial returns from a broader portfolio at younger ages. Indeed, it would be sensible that this shift be automatic and that it should be the *default* option. Using a lifecycle approach as a default puts investments on "automatic pilot" and is especially useful for individuals who do not want to manage their portfolio actively (probably the majority). Such a policy can be adopted while preserving individual choice between portfolios with different risk-return characteristics (for the minority who do want to take their own investment decisions).

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Benefit choice

As discussed above, holders of annuity contracts were less affected by the crisis as their retirement income was already safely locked in and guaranteed until the end of their lives. People with defined-contribution pensions are often required to buy an annuity at the time of retirement. A high equity exposure of the fund just before retirement risks much lower living standards after a financial crisis. In such a case, restrictions on investment choice – limiting it to lower risk options – may be appropriate for people nearing retirement.

Countries should also reconsider mandating individuals to annuitise the balance in defined-contribution at a specific time or age. This risks locking in low asset values, with lower benefits throughout retirement. Some already allow "phased withdrawals", where a defined part of the fund balance can be withdrawn each year. Others might also adopt this more flexible approach. Ireland, for example, will allow retirees to draw a lump sum from their pension accounts but defer annuity purchase with the balance for up to two years.

However, phased withdrawals are not without their own risks: as with people near to retirement, some restriction of investment choice of people after retirement is needed. Furthermore, the rules determining the amount that can be withdrawn each year must be careful to avoid leaving people in penury in very old age. Governments should also explore a combination of phased withdrawals with a "deferred" annuity, to be bought at the time of retirement, which only pays out once individuals reach an advanced age (between 75 and 85 years, for example).

For the short-term, then, governments may wish to relax mandatory annuitisation temporarily until asset prices recover. But for the long term, annuities should be encouraged to protect people from a range of uncertainties: investment risk, longevity risk (outliving retirement savings) and, with indexed annuities, inflation risk.

Pension-plan choice

The financial-market turmoil and the losses incurred in private pensions have already led to pressures to allow people to switch back into the public scheme.[15] One example is the Slovak Republic. A six-month window was offered between January and June 2008 for people to opt back into the state scheme. The window for opting back has subsequently been extended, although in the first half of 2008 only 6% of members of the private plans chose to switch back.

This low take-up might result from inertia, but it could also indicate that people value the diversification of retirement provision that private pensions bring. Some 60% of Slovak workers actively chose the defined-contribution pension option at the time of reform. More significant for the long-term development of the Slovak pension system is a potential reduction in the flow of new contributors. It is no longer compulsory for labour-market entrants to join the private funds. Here, inertia might work in the opposite direction, reducing the numbers choosing private pensions. Since the decision is, on current rules, irreversible, this will have long-term effects on the retirement incomes of new labour market entrants.

There has been much discussion of allowing individuals to opt back into public pensions in other countries that adopted mandatory private pensions, most notably in central and eastern Europe. (Argentina went much further and nationalised its private pension funds: see Box 1.5.)

Box 1.5. **Nationalising private pensions: Argentina**

The government of Argentina nationalised its mandatory private pension funds, worth USD 30 billion (EUR 23 billion), in October 2008. The government presented this asset-grab to the public as a way of protecting contributors from alleged mismanagement amid the global financial crisis. But it is clear that an important motive was to replenish the government's coffers at a time when large repayments of public-sector debt were about to fall due.

The economic significance of this policy is not as large as might appear at first sight. This is, first, because Argentina maintained a large public pension, unlike other countries in Latin America such as Chile and Mexico (see Whitehouse, 2007). Secondly, much of the assets of the pension funds were already invested in non-marketable government debt.

Nonetheless, this policy shift is clearly destructive of stability and sustainability of retirement-income provision.

These policies undermine the stability of the pension system. First, demand for policy changes will simply recur. Although in the current gloom it may seem blindly optimistic, if investment returns were to be plus rather than minus 25% in a couple of years' time, people might wish to switch back to the private scheme with retrospective effect.

Secondly, if people are able to buy back their public pension rights using the diminished asset values in their private plans, this will give a short-term boost to the public finances as the funds are transferred. Many cash-strapped governments would welcome this short-term gain. But the cost to public pension spending will be greater in the medium- and long-term than the short-term gain.

The motivation for these changes has primarily been the fiscal crisis that has resulted from the economic and financial turmoil. It is unsurprising that governments wish to plug deficits with the revenues from contributions that go into private pensions. A more sensible way of achieving this goal is temporarily to reduce the contribution going into private pensions. Although no OECD country has adopted this strategy, it will be used in Latvia and Lithuania, for example.

Informed choice

The financial crisis has also brought issues of investor information and financial education to the centre of the debate again. Most individuals are not well informed about pensions, lacking both general facts about the pension system's structure and specific data on their own pension entitlements. This applies to pension systems of all types.

Private pension plans often place greater responsibility on individuals for planning their retirement income than public programmes. For example, people might need to choose between a range of competing pension managers or between different investment portfolios. And in many pension reforms, individuals had a choice over whether to join the defined-contribution pension scheme or to remain in a public, earnings-related scheme (see Box 1.2 above).

Effective disclosure by providers and broad-based financial education programmes can help people make informed choices about their retirement provision. This is highlighted in the current crisis, when the risk is that people make decisions based on short-term conditions that have negative implications over the long term. The crisis has clearly undermined public confidence in private pensions, bringing with it the risk that people will be more reluctant than ever to save for old age.

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Public guarantees

Should governments bail out individuals' pension accounts in the same spirit as the public rescue of banks? As noted previously, governments already stand behind many countries' occupational, defined-benefit schemes. The discussion that follows focuses on defined-contribution plans. (The one case of a bail out in practice – in Israel – is discussed in Box 1.6.)

Box 1.6. **Anatomy of a pension bail out: Israel**

Israel's government will compensate workers near to retirement who lost money in voluntary occupational pension schemes (of three different types, known as provident funds, executive insurance plans and budgeted pension funds). Workers must be aged 57 or older to qualify and have money invested in uninsured funds. The guarantee will apply to pension balances up to USD 350 000 and cover losses up to half of that figure.

The government expects that around 200 000 people could eventually benefit (equivalent to around 15% of the population currently aged over 55). The total cost is estimated at around USD 37 billion, spread over 13 years, worth around 23% of annual gross domestic product (GDP).

However, the compensation is limited to losses made since November 2008, so it is more of a guarantee against future losses than a bail out of pension funds to compensate for the impact of the financial crisis so far.

Israel has broad coverage of occupational pensions, which are mainly DC, with a single fund for all workers and no investment choice. Assets of private pension funds were worth 33.6% of GDP in 2007 (OECD, 2009a, Figure 2.25).

The case for government intervention rests critically on the design of the retirement-income system. It is weaker in countries where there is a sizeable public pension. Where people have investment choices – particularly where there is a default that shifts to less risky assets as people near retirement – there is also less of an argument for intervention.

Working in the opposite direction, governments may have a moral, if not a statutory, duty to help where defined-contribution pensions are mandatory rather than voluntary and annuitisation at retirement is obligatory.

A direct bail out, paying money into people's pension accounts, could prove to very expensive. Also, this cost would come at a time when the public finances are being squeezed by recession and economic-stimulus packages. The OECD expects that average government net borrowing in member countries will increase from a low point of 1.3% of gross domestic product (GDP) in 2006 to 7.2% in 2009 and 8.7% on 2010. These forecasts, issued on 31 March 2009, already show the public finances in one of their poorest states ever seen in peacetime. Moreover, in the short term at least, the money from a bail out of pension accounts would go into savings and so would provide little support for domestic demand during the recession.

In contrast, providing support to the retirement savings of those most affected by the crisis through the public pension system would have the advantage of spreading the cost over time. The payments would be made over the period of an individual's retirement rather than in one go either now or at the time of retirement. This would also allow for greater efficiency and flexibility: support could be targeted on low-income retirees, for example.

There is also a risk of moral hazard resulting from a direct bail out of pension funds. This is because the expectation of a bail out *next time* something goes wrong will encourage people to behave more riskily once the current crisis is over.

A bail out would make most sense for people who are close to pension age. However, this poses great political difficulties. If it were restricted, say, to people within a few years of normal pension age, then workers just slightly younger than the cut-off age would feel cheated. Similarly, retirees who annuitised their pension only recently, locking in financial-market losses, would complain if their contemporaries who kept their money in financial markets were to be compensated.

For these reasons, *ad hoc* guarantees of investment returns or compensation for losses in asset values should be avoided. Issues of equity and the fiscal impediments to paying money directly into pension funds, mean that governments should instead rely on their public-pension schemes to ensure that negative returns on pension funds over one year do not translate into widespread old-age poverty for one generation of retirees. Paying any compensation as a public pension benefit spreads the cost over the period of retirement of the individuals involved, reduces political tensions and alleviates problems of moral hazard.

Pension systems and engineering economic and financial recovery

Pension systems might play a part in helping recovery from the crisis. First, public pensions could be beneficiaries of fiscal measures to stimulate the economy. Secondly, many countries have large accumulations in private pension plans and public reserves. Thirdly, private pension funds continue to play an important role in financial markets as long-term investors.

Public pensions are part of economic stimulus packages that have been announced in some countries. In the ***United Kingdom***, for example, additional payments of pensioners of at least GBP 110 have already been made and indexation of the basic pension and the pension credit, targeted on the low-income elderly, will be more generous, the latter at a cost of GBP 300 million a year in 2009-12.[16] The economic stimulus in ***Australia*** also includes extra payments to pensioners. A one-off payment of AUD 1 400 was paid to single pensioners and AUD 2 100 to couples in December 2008. The ***United States*** will pay USD 250 to all recipients of public pensions in May 2009 at a cost of USD 13 billion. ***Greece*** has also made a one-off payment to people on low incomes, including pensioners, of between EUR 100 and EUR 200. ***Belgium***, ***France*** and ***Spain*** have all announced additional increases in minimum pensions. In Spain, for example, the increase is 6.4%.

In all these cases, the additional help will be worth most to low-income pensioners, which should help reduce old-age poverty. In Australia, for example, poverty of older people is more than double that of the population as a whole and the old are also more likely to be poor in Greece (see the special chapter on "Incomes and poverty of older people"). Other countries with high rates of old-age poverty might also consider additional short-term payments to older people as part of economic-stimulus packages. Some less orthodox policies of ensuring that fiscal stimulus supports domestic demand are explored in Box 1.7.

The second role for pension in engineering economic recovery is using the assets in pension funds and reserves to support demand. In an ideal world, of course, these assets would be strictly ring-fenced and preserved solely for providing income in retirement. But the current situation is far from ideal.

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Box 1.7. **Economic stimulus, domestic demand and consumption**

A potential problem with fiscal and monetary stimulus is that people use the money to save to repair their balance sheets. This undermines the effect on consumption, and so, on domestic demand. Japan has, in the past, experimented with handing out "shopping vouchers" as a way of maintaining levels of consumption during a recession. Vouchers for low-income households will form an important part of Korea's stimulus package. Since the poverty rate of older people in Korea is 45% – compared with less than 15% for the population as a whole – people of pension age are likely to be major beneficiaries. (See the special chapter on "Incomes and poverty of older people" in this report.) Italy has issued 0.5 million "social cards" to older people and families with children on low incomes. The card is worth EUR 40 a month towards basic goods and services.

The concept of these voucher programmes, which are designed to ensure that the stimulus money is spent rather than saved, has a long history. One proposal during the great depression of the 1930s aimed to increase consumption by a paying flat monthly amount to retirees aged 60 and over. The payment would be made in bills with a colour coding to ensure that their value expired and so they would be spent by the fifth day of the next month. The Townsend plan, named after its founder, a physician from California, rapidly gained momentum after the doctor wrote an extended letter to the editor of a local newspaper. A nationwide organisation, under the alliterative slogan "peace and prosperity thru pensions" soon developed. The introduction of social security (public pensions) by the Roosevelt administration in 1935 is widely credited to this campaign (Amenta, 2006).

Townsend's plan failed to be adopted for two main reasons. First, the amount of the flat-rate pension was very high. Secondly, it was to be financed by a national sales tax which was felt to favour large, vertically integrated corporations. Nevertheless, it shows one way of ensuring that a fiscal stimulus increases domestic demand, which is particularly significant for most Asian economies, both inside and outside the OECD.

Australia permits people to use their private pension savings to avoid foreclosure on their houses when mortgage payments are in arrears. Access to the pension accounts is controlled to ensure that all other options for dealing with mortgage arrears have been exhausted. It is difficult to argue that people should have ring-fenced retirement savings while losing their homes.

Early access to account balances in the "special pension" plan will be allowed in ***Denmark***. Balances are relatively low – DKK 14 600 or USD 2 600 – because the contribution rate is just 1% of earnings and contributions have been suspended since 2004. The government expects around a quarter of people to withdraw their balances.

Iceland will allow people to access their retirement savings in occupational plans beyond those needed to finance the mandatory replacement rate. They will also be able to use funds generated from voluntary contributions to relieve financial distress.[17] The Ministry of Finance (2009) estimates that around ISK 75 billion will be accessible, equivalent to more than 5% of GDP. The replacement rate from the mandatory private pension in Iceland is well above the OECD average, and so there is no harm to adequacy of retirement incomes from allowing access to these additional retirement savings.

In the ***United States***, around 90% of members are allowed to take loans from their 401(k) accounts. In 2007, only 18% of those eligible had taken a loan and the average size was only 12% of the account balance (VanDerhei *et al.*, 2008). Both figures have remained fairly constant over time despite cyclical fluctuations in the economy. Detailed analysis suggests

that this facility is used responsibly: loans drawn from retirement-savings accounts are not large and they are repaid (see Kusko *et al.*, 1998; and General Accounting Office, 1997). The law requires repayment with interest at market rates, otherwise the loan is treated as an early withdrawal and subject to tax penalties. Early withdrawals are allowed, without fiscal penalty, in carefully defined cases of severe hardship. But much the greatest "leakage" of earmarked retirement savings happens when people changes jobs. Approximately two-thirds of people do not "rollover" their 401(k) balances into another pension plan, despite the tax penalty, although these are typically small balances (two-thirds of *assets* are rolled over).

Norway, with the second largest sovereign wealth fund in the world, will tap these reserves to finance a fiscal stimulus package worth a total of 2.3% of GDP. The reserve, known as the Government Pension Fund – Global, may also be used to bail out banks. Norway's bank recapitalisation has so far cost 13.8% of GDP, the second largest relative to national income in the world. ***Ireland***, which will also use its pension reserves to pay for bank recapitalisation (see above) has so far spent close to the average of the G20 countries of 5.3% of GDP.[18]

Again, in an ideal world these reserves would be ring-fenced to provide for the future costs of ageing in terms of pensions and healthcare expenditure. In practice, bank recapitalisation is going to hit the public finances hard. It is difficult to see much economic difference between governments using these reserves or issuing bonds to pay the costs: the public sector's overall financial position is unchanged. The main worry is that this sets a precedent, and the reserves are continually tapped whenever governments are short of cash, leaving the coffers bare as the financial pressures of ageing get stronger.

Thirdly, pension funds might be able to play a role in stabilising financial markets. Private pension plans generally have very small liquidity needs (to pay benefits and cover administrative expenses) relative to their total assets under management and compared with other institutional investors. Pension funds also have long investment horizons. The main exception to the rule of low liquidity needs and long horizons comes from defined-benefit plans that are closed to new members. These are often running down assets to pay benefits. They are significant in countries such as the United Kingdom and the United States where the shift to defined-contribution plans has been most rapid (see the discussion in Box 1.1 above).

Pension funds will generally, therefore, not need to sell assets at the low prices currently prevailing to meet their liabilities since they can rely on a continual flow of contributions and investment income. However, this depends on the way pension funds, particularly defined-benefit plans, are regulated (which is discussed in the following section). Developments in accounting and regulatory standards, particularly those that force pension funds and sponsoring companies to recognise low prevailing asset values, might limit pension funds' role in helping to mitigate financial turmoil.

Regulating defined-benefit plans

Governments generally impose funding or solvency rules on defined-benefit, occupational schemes. These rules, typically policed by independent supervisory agencies, are designed to ensure that the assets currently held in the pension fund will be sufficient to meet the stream of future liabilities, mainly in the form of pension payments to current and future retirees. The funding rules have been tightened in recent years in a number of countries. Indeed, some sponsoring employers are still making additional contributions to make up for shortfalls created during the decline in financial markets in 2000-02.

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A common response to the current crisis has been to extend the "recovery periods" during which defined-benefit pension plans must restore their solvency. This makes sense in a recessionary environment, where company profitability is declining and access to credit is heavily restricted. Companies' cash-flows are already being strangled and so forcing employers to increase contributions to their underfunded pensions may only make matters worse. It may even threaten the solvency of sponsoring companies, which is obviously not in the interest of beneficiaries.[19]

The regulator in the ***Netherlands*** has extended recovery periods from three to five years, although it has stuck to the deadline of 1 April this year for outlines of schemes' recovery plans. Recent proposals to increase the pension age are, in part, designed to reduce the adjustments needed to contribution rates and indexation of pensions in payment and accrued retirement benefits of workers (see also Box 1.3). In ***Ireland***, the regulator has adopted a range of measures to help insolvent occupational schemes: *i)* extra time for filing recovery proposals; *ii)* longer periods for recovery plans, of ten years or more where appropriate; *iii)* taking account of voluntary employer guarantees. The government has also recently announced plans to protect workers with accrued pension rights when occupational plans are wound up due to insolvency of the employer. A temporary easing of funding requirements for employer-sponsored pension plans was included in the Pension Protection Act in the ***United States***. In ***Canada***, the authorities are considering an increase in solvency refinancing periods from five to ten years. In ***Norway***, the implementation of a requirement to hold additional reserves against increasing life expectancy has been deferred from three to five years' time. Finally, concerned at a forced sale of equities at a bad time, ***Finland*** will also suspend some solvency requirements until the end of 2010.

Some countries are also reconsidering recent changes in the standards for valuing pension-fund assets, particularly the introduction of "fair-value" or "mark-to-market" methods that, among other things, use discount rates that take account of both the maturity of pension liabilities and the current level of market interest rates. For example, pension funds in Denmark will be allowed to calculate solvency on the basis of a return to "normal" conditions. A similar policy has been adopted in Finland and is being discussed elsewhere. However, the regulator in the Netherlands has so far resisted pension-industry pressure to change the interest rate used to discount future pension liabilities.

However, it is critical that these policies – especially the extension of recovery periods – is clearly time-delimited and does not become a permanent weakening of funding regulations. The ultimate effect of this would be to reduce the protection of workers' incomes in retirement. The presence of pension guarantee funds[20] also means that public money is at risk.

4. Conclusions: security through diversity[21]

It is a time of sinking asset prices, shrinking economic output and rising unemployment in nearly all OECD countries. The short-term political pressures on governments to respond are huge. But it is important to resist expedient reactions that threaten the long-term stability and sustainability of retirement-income provision. It is also crucial to keep in mind that the long-term challenges to pension systems arising from demographic change and population ageing have not gone away. The short-term pressures have only aggravated these long-term problems.

The financial crisis means that *investment risk* is at the forefront of the minds of both the public and policymakers. But it is important to remember that there is a range of risks and uncertainties that affect pensions. This is because they are long-term contracts. Much can change in the 40 or more years between the time people enter the labour market, and so the pension system, and when they retire.

Public pensions, for example, impose the risk that governments (or rather voters) change their minds about what is a reasonable retirement income and pay lower pension benefits than expected. Taxpayers will be both fewer in number and more reluctant to part with their money if the financial crisis turns into a prolonged and severe economic downturn. Problems in the real economy will also affect retirement incomes as a result of higher unemployment and lower wages.

The problems for private pensions arising from the financial turmoil are not a sufficiently good reason for replacing private pensions with public provision. Many countries are already in a weak fiscal position which is projected to worsen further as economies slow. The emerging costs of population ageing on healthcare, as well as pension systems, mean that such a policy would threaten medium- and long-term sustainability of the public finances.

The best approach to pension provision is to use a mixture of sources of retirement income, including both public and private, as well as the two main forms of financing (pay-as-you-go and funded pensions). Relying solely or largely on one source in the face of different kinds of risk is imprudent.

The OECD has long advocated *diversified* retirement-income provision, arguing that "diversity has many virtues" (OECD, 1998). The report on *Maintaining Prosperity in an Ageing Society* went on to say that "each of the elements of the system has its own strengthens and weaknesses and a flexible balance among them not only diversifies risk but also offers a better balance of burden-sharing between generations".[22]

There are economic, demographic, financial and social uncertainties in pension systems and for individuals. It is clear that the best approach for an individual – and, by extension, for a government seeking to do the best thing for its citizens – is to use a mixture of ways of providing retirement incomes. Diversity of pension provision is the best way to deliver security in old age. The current crisis has not devalued this message.

Notes

1. OECD (2007a), Martin and Whitehouse (2008), and Queisser *et al.* (2007) provide a detailed discussion of these reforms.
2. See the discussion of the indicators of "Weighted averages: pension levels and pension wealth" and "Structure of the pension package" in Part II of this report.
3. It is important to note that there is substantial variation in contribution rates between individuals. For example, lower earners and younger workers tend to contribute less on average.
4. For the other three countries that are not covered in Figure 1.2 – Japan (private pension assets worth 20.0% of GDP), Portugal (13.7%) and Spain (7.5%) – information is not available on typical scheme rules. Nevertheless, the assets of these private pensions are lower than most of the countries shown in Figure 1.2. See the indicator of "Assets in private pension fund and public reserves" in Part II of this report.
5. However, workers already in the labour market at the time of the Mexican reform will continue to have most of their pensions paid by the government: see the special chapter on "The pension gap and voluntary retirement savings" in this volume.

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6. Unfortunately, data are not available on typical rules to enable the OECD to model these entitlements.
7. See Box 2.1 below and Pearson and Whitehouse (2009) on the coverage of resource-tested schemes among retirees.
8. See Keenay and Whitehouse (2003a and b) for analysis of the role of the tax system in old-age support.
9. Whitehouse *et al.* (2009), Table 4, provides detailed data. This paper also analyses the impact of taxes on net retirement incomes with different investment returns.
10. OECD (1996, 2008) and Ebbinghaus (2006) provide a detailed analysis. See OECD (2009b) for a comprehensive picture of the impact of the crisis on labour markets and social policy.
11. Canada, France, Germany, Japan, Italy, the United Kingdom and the United States.
12. See D'Addio *et al.* (2009), Sections 6-9, for a discussion.
13. The tightest restrictions on equity investments are in Korea and Mexico (30%) and Germany and Norway (35%); see OECD (2009a), Figure 2.18. In some countries, pension managers must offer a range of funds with different risk-return characteristics. The equity limit for the central or balanced fund is used to compute the cross-country average.
14. Put simply, younger workers generally have few assets other than their human capital (*i.e.* their future earnings). It is optimal for them to hold assets with a low correlation with their projected wages. For older workers, the position is reversed. As they approach retirement, their human capital diminishes but they will tend to have built up financial assets in private pensions or wealth in the form of the flow of future public pension entitlements. See, *inter alia*, Jagannathan, and Kocherlakota (1996) and Samuelson (1998a and b).
15. When countries shift part of their pension provision from public pay-as-you-go schemes to private pensions, a number of policy issues are raised. A critical one is the extent to which current and future workers should be allowed, encouraged or forced to switch to the private defined-contribution plans: see Box 1.2 above for a discussion.
16. First, a GBP 60 payment was made in January 2009, equivalent to bringing forward the indexation from April to the start of the year. Secondly, the basic pension is now uprated by the higher of the growth in the retail prices index (RPI) or 2.5%. The RPI shows deflation in December 2008 and January 2009 and is expected to remain negative for most of the year. This means that the basic pension will increase in real terms. Thirdly, the winter-fuel payment for pensioners increased by 25% to GBP 250 (with additional support for over 80s).
17. Individuals are allowed to contribute up to 4% of their earnings into a voluntary individual account. Employers will typically then pay in up to 2% of earnings.
18. However, the International Monetary Fund (2009) expects the Norwegian government to recoup 98% of this investment, compared with only 52% for Ireland.
19. There is worrying evidence from the Netherlands that riskier companies (smaller firms, those with high leverage) also have riskier investments in the defined-benefit plans that they sponsor (that is, a higher equity share in portfolios). See Davis *et al.* (2007).
20. These include the Pension Protection Fund in the United Kingdom and the Pension Benefit Guaranty Corporation in the United States.
21. "Security through diversity" – the slogan of the pension-reform process in Poland in the mid-to-late 1990s – remains apposite. See Chlon *et al.* (1999).
22. This conclusion is well-supported in the finance literature. For example, Merton (1983) set out why diversification between pay-as-you-go financing and funding is optimal using portfolio theory. The model was further developed in Bodie *et al.* (1992) and extended to include inflation risk in Heeringa (2008).

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2. Incomes and Poverty of Older People

Most of the analysis in *Pensions at a Glance* is forward-looking, in the sense that it assesses the future pension entitlements of today's workers. This special chapter[1] complements that analysis by examining the retirement incomes of today's pensioners. It asks: how does the current generation of older people fare compared with today's working-age population?

Pension policy-making involves balancing two objectives. The first is to provide adequate levels of retirement incomes to ensure that people are not at risk of poverty in their old age. This is particularly significant for people who had persistent low earnings, long periods in temporary or part-time jobs or broken careers due to unemployment or caring responsibilities. These groups are unlikely to have built up much benefit entitlement in public, earnings-related or private schemes.

The second objective is to ensure that pension incomes do not depart from the living standards individuals achieved during their working lives. Canada, Ireland, New Zealand and the United Kingdom, for example, place all or most emphasis on the goal of adequacy. Hungary, Italy, Poland and the Slovak Republic, in contrast, are countries that base their retirement-provision around a strong link between earnings when working and pension during retirement.[2]

Section 1 of this special chapter looks at incomes of older people (aged over 65) and compares them with population incomes. These measures of income are comprehensive, in the sense that they cover all sources of cash income and all groups of people. For older people, for example, they include benefits from public and private pensions and resource-tested benefits, as in the modelling of individual benefits in the analysis of pension entitlements presented in the indicators of "Pension entitlements" in Part II of the report. But they also take account of the returns on non-pensions savings and, earnings or income from self-employment, which play a significant role in supporting the "younger" old (aged 66-75) in many OECD countries. All people of working age are included in the calculation of population income, including those not in employment.

Section 1 presents overall incomes of older people and illustrates how these vary with age and between different types of households (single people and couples, for example). It also sets out data on the sources of incomes on which older people draw and how this differs between countries. Finally, the position of older people in the mid-2000s is compared the mid-1980s to explore trends in retirement incomes.

Section 2 focuses on low-income pensioners, presenting data on old-age poverty in OECD countries. The prevalence of poverty is also compared between men and women, different age groups, various household types and over time. *Section 3* investigates the distributional role of the state: the effect that public benefits and taxes have on disposable

incomes. *Section* 4 looks forward to explore how the patterns of incomes and poverty of older people might change in the future as a result of social and economic change, and pension reforms. *Section* 5 concludes and looks at the policy implications of the chapter's main findings.

1. Incomes of older people

Incomes are measured from the data in national household surveys,[3] carried out in the mid-2000s, and calculated as follows:

- Incomes include earnings, self-employment income, income from capital (dividends, interest, etc.), rental income and public transfers (such as retirement, family, unemployment, housing and disability benefits).
- The measure used is "disposable" income. This is income net of personal income taxes and social security contributions.
- Incomes are aggregated on a household basis. This is because members of the same household are assumed to share their resources – the most obvious example being the accommodation itself – and it is often difficult to attribute some kinds of income (such as income from savings) to individuals. This approach implicitly assumes that income is shared equally among the members of the household.
- Total household income is then divided among the individual(s) that make up the household. This is done on an "equivalent" basis, meaning that household incomes are adjusted for differences in household size. The old adage says that "two can live as cheaply as one". This is not entirely true, but there are undoubted "economies of scale" for households of more than one person. The OECD's adjustment effectively says that two people can live as cheaply as 1.4 people living alone.

Incomes of older people, aged over 65, were, on average, 82.4% of population incomes in the mid-2000s.[4] There is significant variation between OECD countries. Average income of all over 65s, shown in Figure 2.1 by the black curve, is highest in Mexico and Austria, at around 97% of population incomes. This compares with just 66% in Ireland. Other countries with relative low incomes of older people – between two-thirds and three-quarters of the population average – are Australia, Denmark, Finland, Korea, New Zealand and the United Kingdom. At the opposite end of the scale, France, Luxembourg and Poland all have older people's incomes of around 95% of the national averaged equivalent household disposable income. Near to the OECD average figure of 82.4% are Hungary, Italy, Sweden, Switzerland and the United States.

There is some relationship between the incomes of older people and public expenditure on old-age benefits, especially when account is taken also of differences between countries' demographic situation.[5] A 10% increase in public pension expenditure is associated with a 1.5 percentage point increase in older people's relative incomes. The precise design of retirement-income systems also has an effect. For example, Australia, Ireland, New Zealand and the United Kingdom all have low relative incomes for old people and mandatory old-age provision that is focused on adequacy rather than replacing a certain level of former earnings. But the same is true of Canada and the United States, which have above average old-age incomes relative to the population. Austria, France, Luxembourg and Poland have – for the current generation of retirees, at least – large public, earnings-related pensions and they have among the highest relative incomes in old age. But Finland and Spain have a similar pattern of pension entitlements and yet relative

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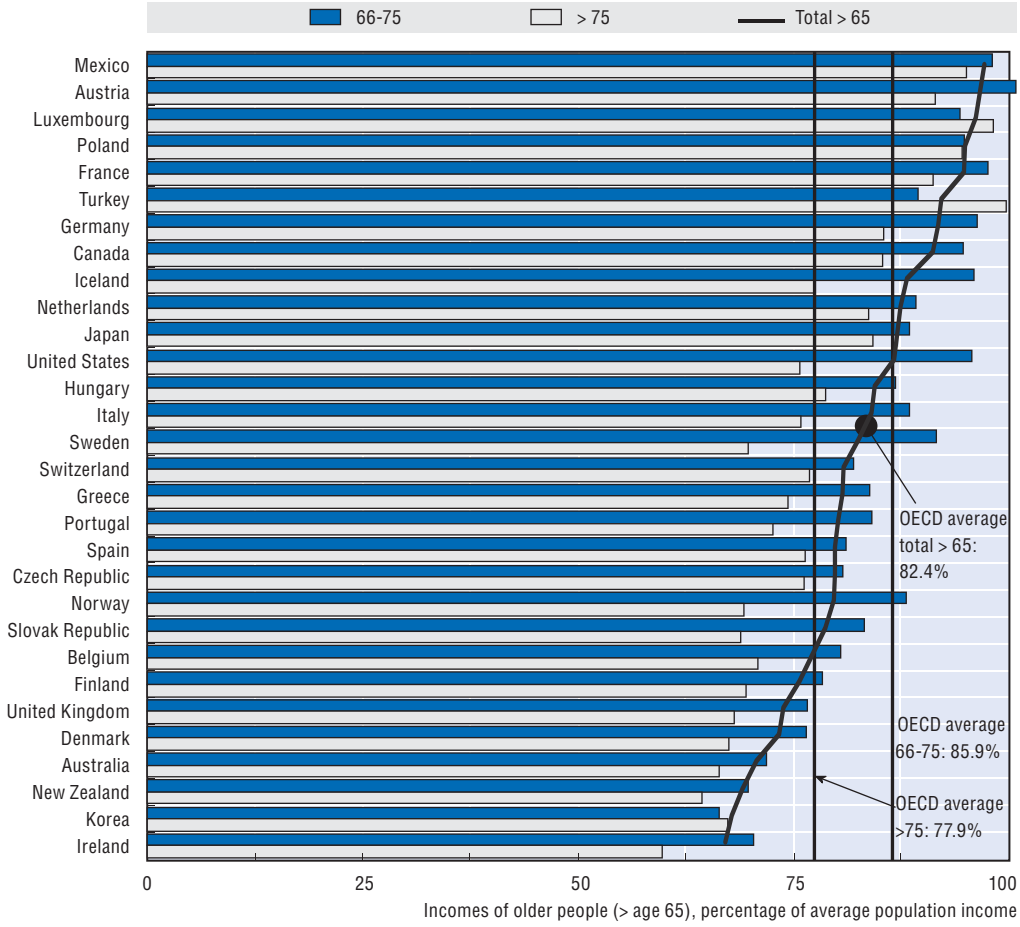
Figure 2.1. **Relative incomes of older people**

Equivalent household disposable income, mid-2000s



Note: Countries are ranked by the relative incomes of all aged over 65.

Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Figure 2.4.

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incomes of older people are below the OECD average. Korea's low old-age incomes are primarily because the public pension scheme was only introduced in 1988, so current retirees have little or no entitlements.

What are the implications of these results (based on equivalent disposable incomes) for a comparison of living standards in retirement compared with those during working life?[6] There are other factors that need to be taken into account when interpreting the statistics. First, retirees do not have to pay additional costs associated with working: commuting, clothing, meals, etc.[7] Secondly, housing costs can be very different for people of pension age than for those of working age. Many or most people of pension age in OECD countries own their own homes. Unlike people of working age, older home owners have generally paid off their mortgages.[8] Thirdly, older people generally have greater financial assets than people of working age. Although the income from dividends and interest on these assets is taken into account in measuring disposable income, the value of the assets is not. Many people draw down these financial assets to support consumption in retirement.[9] Finally, the focus on cash incomes ignores in-kind transfers in the form of publicly provided goods and services, such as healthcare, housing and social services,

which can be particularly important for older people.[10] All of these effects on the relative economic well-being of older people are, unfortunately hard to capture. But they must be borne in mind when interpreting the statistic that older people have incomes of 82.4% of the population on average in OECD countries.

Do the "older old" have the lowest incomes?

The bars in Figure 2.1 show the results separately for two different groups of older people: aged 66-75 and aged over 75. On average across the OECD, the "younger" old have incomes of nearly 86% of the population average while, for the "older" old (aged 75+), this figure is just 78%. Nevertheless, there is a significant variation in the pattern. The largest age differences in pensioners' incomes are found in Iceland, Ireland, Norway, the Slovak Republic, Sweden and the United States. The older old have *larger* incomes than the younger old in Korea, Luxembourg and Turkey and only slightly lower in Mexico and Poland.

There are many reasons why relative incomes of the older old are lower than those of the younger old. First, there is a *cohort* or generational effect. Nearly all OECD countries have some form of earnings-related pension provision. When the over 75s retired, their wages were on average somewhere around 10%-25% lower in real terms than average earnings when the 66-75 age group retired. This will be reflected in earnings-related benefits. Where real earnings have been growing very rapidly in recent years – in Ireland and Spain, for example – there will be larger age differentials in relative incomes. This is one of the main reasons for the large differences between incomes of the two age groups in Ireland and the Slovak Republic, for example.

Secondly, there is a pure *age* effect due to the way pensions in payment are indexed to allow for changes in costs and standards of living. (The cohort effect comes from the fact that pensions of new retirees are growing in line with age growth; the age effect occurs because of the way the relative value of the pension evolves after retirement.) Indexation policies and practices have changed over time (see below). However, most OECD countries now index pensions in payment to prices, protecting the purchasing power of pensions in payment. Again, however, countries that have seen rapid increases in real earnings – such as Ireland, the Slovak Republic and Spain – will also have seen a strong decline with age in relative incomes during retirement.[11] In contrast, Luxembourg, indexes pensions to average earnings. This policy is one reason why incomes of the oldest old are *higher* than those of the 66-75 age group.

Thirdly, there is a *compositional* effect. For obvious reasons, the group of the older old consists mainly of people with systematically longer-than-average life expectancy. Women, for example, are expected to live 5.7 years longer than men.[12] Women therefore predominate among the old, making up 53% of 66-75 year olds and 60% of the over 75s on average in OECD countries. They will tend to have lower pensions in their own right than men, because of lower wages, shorter working hours and longer breaks in their careers. Many, of course, will be widows, and so their circumstances will depend on the provisions for survivors' benefits. The largest age differences in old-age incomes (in Iceland, Norway, Sweden and the United States) are probably due mainly to the rules for survivors' pensions (see below).

Another compositional effect arises because richer people tend to live longer than poorer people do.[13] In higher-income OECD countries, this effect is rather small and socio-economic differences in mortality during retirement are much smaller than for people of

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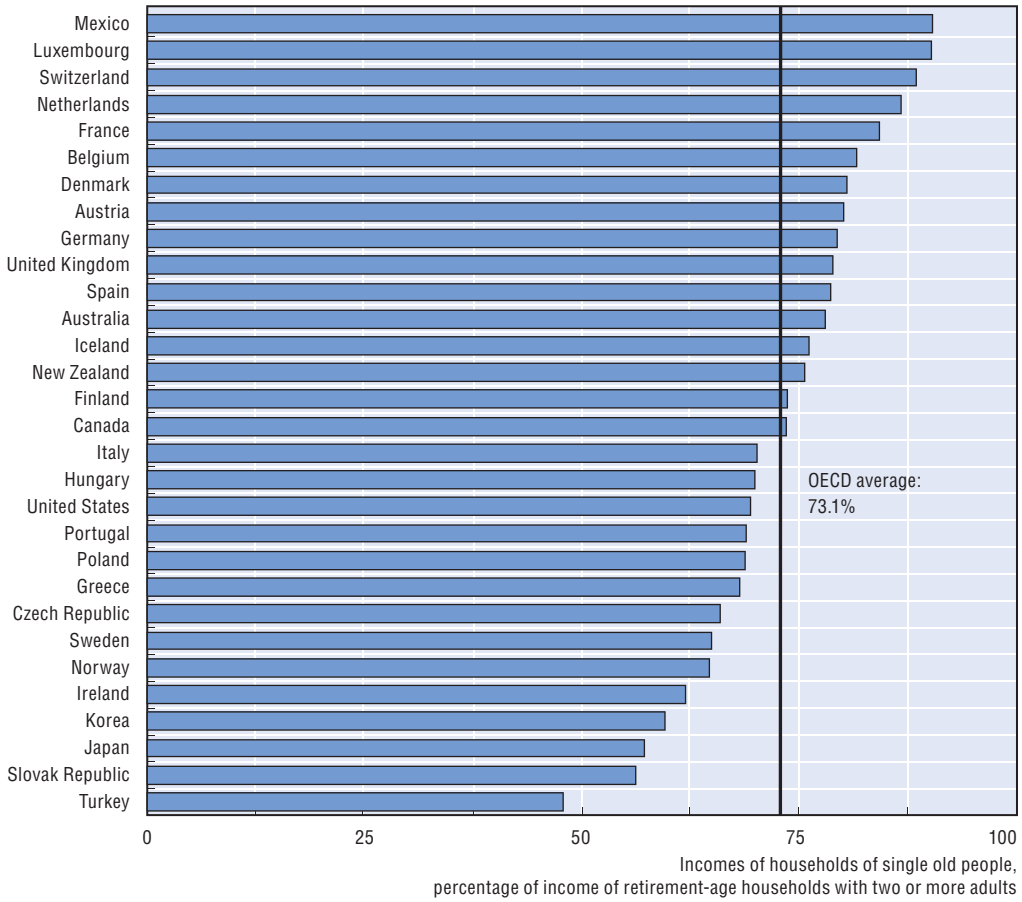
working age. Nevertheless, the fact that poorer men tend to die earlier than most women and richer men means that there are many widows at older ages who were married to men with low pensions and so they have low survivors' benefits. The impact of socio-economic mortality differentials is greater in lower-income OECD countries. In Turkey, for example, people with low incomes in their working lives were often not covered by the pension system. So, as richer people live longer, more of the over 75s have a pension entitlement, hence the significantly higher incomes of over 75s than the 66-75 age group. Similar effects are at work in Korea and Mexico.

How does income differ between single pensioners and couples?

The discussion of incomes by age has shown that a large part of the differences are likely to be because women, especially widows, predominate among the older old. Figure 2.2 compares the incomes of households headed by a single adult aged over 65 with that of households, headed by someone aged over 65, with two or more adults. It is important to remember that these household income figures have already been equivalised to allow for the different costs of living of households of different sizes. For example, a single pensioner with an income of around 70% of that of a couple would, on

Figure 2.2. **Relative incomes of single older people**

Percentage of incomes of retirement-age households with two or more adults, mid-2000s



Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Figure 2.4.

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the OECD's measure, be deemed to have the same level of economic well-being, as measured by equivalent income. In this example, therefore, the single person would be shown at 100% on the scale for relative equivalent income.

Single pensioners have fairly good incomes relative to couples in Luxembourg, Mexico, the Netherlands and Switzerland. This is due to a mix of relatively generous survivors' benefits and other protection for non-working spouses and indexation policies (as discussed above). In contrast, single pensioners fare rather badly in eastern European countries, Japan, Korea, Ireland and two of the Nordic countries – Norway and Sweden – for the reasons discussed above.

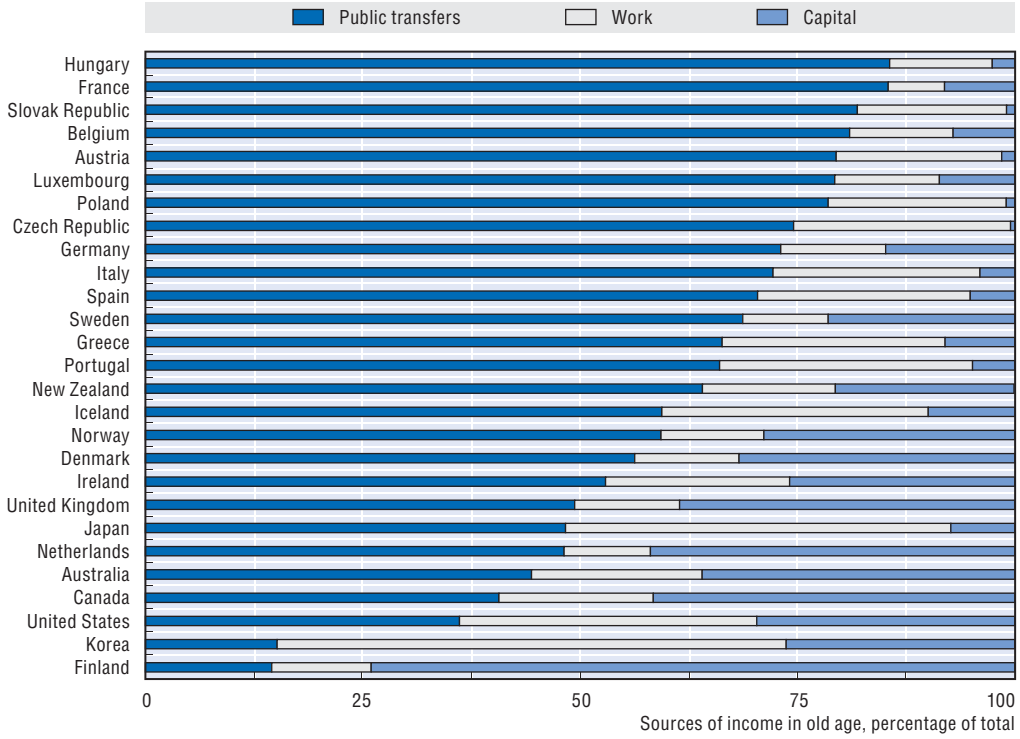
What are the sources of older people's incomes

Public transfers – in the form of earnings-related pensions, resource-tested benefits, etc. – make up 60% of older people's incomes on average in the 27 OECD countries shown in Figure 2.3. The over-65s are most reliant on the state for their incomes in France and Hungary: 85% of their incomes come from public transfers. Around three-quarters or more of old-age income is also state-provided in Austria, Belgium, the Czech and Slovak Republics, Luxembourg and Poland.

At the other end of the spectrum, public transfers are just 15% of average old-age income in Finland. However, this is because the mandatory occupational plans are here included as capital income, whereas the national accounts and *Pensions at a Glance* treat

Figure 2.3. **Sources of incomes of older people**

Percentage of household disposable income, mid-2000s



Note: Income from work includes both earnings (employment income) and income from self-employment. Capital income includes private pensions as well as income from the returns on non-pension savings.

Source: OECD Income Distribution Database.

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these schemes as part of the public sector. The share of old-age income derived from public transfers is also very low in Korea: this is because the public pension scheme was only established in 1988. Public transfers also provide less than half of old-age income in Australia, Canada, Japan, the Netherlands, Switzerland,[14] the United Kingdom and the United States.

In the east-Asian OECD countries, work – employment and self-employment – provides a very large proportion of income of the over 65s: 44% in Japan and 59% in Korea. Income from work also accounts for around a quarter or more of old-age incomes in another six OECD economies: the Czech Republic, Greece, Iceland, Portugal, Spain and the United States. In some of these countries, this probably reflects the fact that many people have not had full contribution histories in the public pension scheme and so keep on working to make up for these gaps. In Iceland and the United States, the normal pension age is above age 65. In contrast, income from work (employment and self-employment) accounts for less than 10% of older people's incomes in France, the Netherlands and Sweden.

Income from capital – mainly in the form of private pensions – plays the largest role in providing old-age incomes in Australia, Canada, Denmark, the Netherlands, the United Kingdom and the United States (Finland apart, for the reasons set out above). In these countries, capital income accounts for around 30% or more of older people's incomes.

It is important to bear in mind that Figure 2.3 refers to average values for older people as whole. However, the composition of incomes varies enormously across the income distribution: poorer older people derive income almost exclusively from public transfers, while private pensions and other capital income play a more significant part only among richer pensioners.[15] As the role of the latter income sources in retirement income provision has been growing, this may give further impetus to rising inequality of incomes in old age. (The redistributive role of taxes and public benefits in different countries is analysed in detail in Section 3 below.)

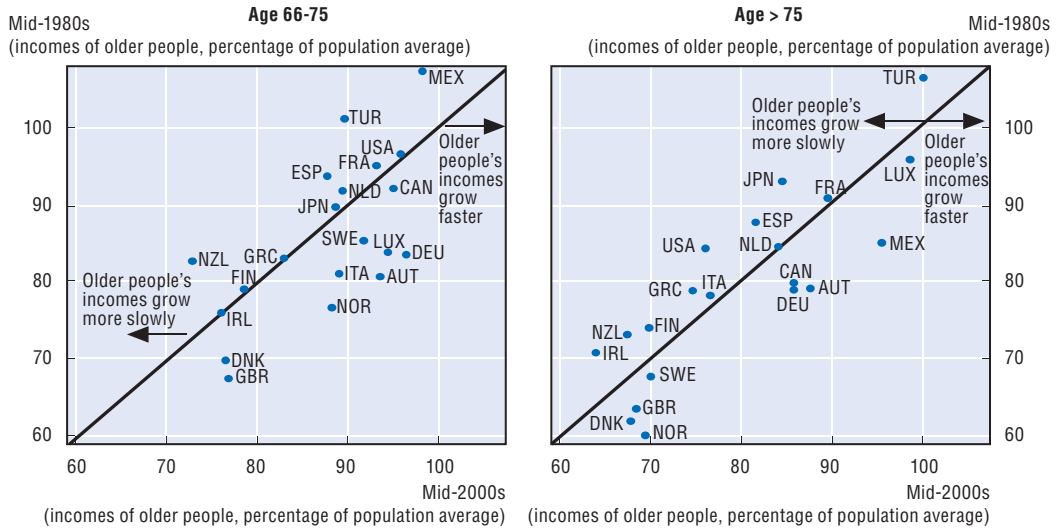
How have older people's relative incomes been changing?

In nine OECD countries, incomes of older people increased relative to those of the population as a whole between the mid-1980s and the mid-2000s. This is illustrated in Figure 2.4, which shows relative incomes of older people in the mid-2000s (on the horizontal axis) compared with the position in the mid-1980s (on the vertical axis). Results are presented for the 20 OECD countries for which data are available in both time periods. In countries to the right of the 45° line, older people's incomes grew faster than those of the population as a whole. In those to the left, pensioners did not share proportionately in increasing prosperity. The results are again split into two age groups.

The largest increases in relative incomes of 66-75 year olds were in Austria, Germany and Norway: around 11 percentage points. There were also significant increases – of 6-9 percentage points – in Denmark, Italy, Luxembourg and the United Kingdom. Relative incomes of the 66-75s fell behind the growth in population incomes in 11 countries, although the falls were relatively small in Finland, Greece and Ireland. The largest falls between the mid-1980s and mid-2000s were in Mexico and Turkey, but this was from a very high starting point. In New Zealand, 66-75 year olds had incomes of 84% of the population income in the mid-1980s but just 73% in the mid-2000s: the second lowest in the OECD (Figure 2.1).

Figure 2.4. **Income trends: mid-1980s to mid-2000s**

Percentage of population incomes



Note: Data for the mid-2000s refer to around 2000 for Austria, Ireland and Spain. In Turkey, real incomes fell by 15% for the total population, by 20% for age 75+ and by 25% for age 66-75. In Japan, real incomes increased overall but fell slightly for the group aged 75+.

Source: *OECD Income Distribution Database*; see OECD (2008), *Growing Unequal?*, Figure 2.6.

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Turning to the older age group, incomes of the over 75s also grew in nine OECD countries relative to the change for the population as a whole. At these ages, Austria, Germany and Norway also saw large increases in average incomes. The gains in Canada, Denmark, Sweden and the United Kingdom were nearly as large. In contrast with the fall in relative incomes for 66-75 year olds over time, incomes of the over 75s grew more rapidly in Mexico. The incomes of over 75s in Ireland, Japan, New Zealand, Spain, Turkey and the United States fell substantially behind the increase in incomes of the population as a whole.

An important explanation for these trends in older people's incomes lies in the maturing of pension systems. The cohort of pensioners in the 1980s entered the labour market in the 1920s and 1930s, when retirement-income provision was much more limited. Most public pension schemes along the lines of today's provision were established in the post-war era: in the late 1940s in Australia, France, Ireland, Switzerland and the United Kingdom, for example. Others were more recent: Austria, Belgium, Japan, Finland, Greece, Italy and the Netherlands established new pension systems in the 1950s and Belgium, Canada and Sweden in the 1960s. This means that older people in the mid-1980s had often spent half or less of their careers covered by these pension schemes. Earnings-related schemes of their current form were established in the 1970s in Mexico and the United Kingdom. It is notable that most of the countries that introduced current pension systems most recently show strong increases in relative incomes of older people over time in Figure 2.4.

The timeline for the introduction of public pension is echoed in the evolution of private pensions in countries where coverage is broad today. In Australia, Canada, Ireland, the United Kingdom and the United States, voluntary occupational schemes grew rapidly in the number of their members in the 1950s and 1960s. Private pensions were made mandatory in Australia in 1992 and, in Switzerland, in 1982.

A change in policy and practice over time comes from the adjustment of pensions in payment. Many OECD countries saw a period of strong real increases in pensions in payment that, more recently, came to an end. In France and Germany, for example, real pensions more than doubled between 1960 and 1978. In other countries, the period of strong increases in real benefits ended later: in the early and mid-1980s in Canada, Italy, New Zealand and the United States and the mid-1990s in Japan (Whitehouse, 2009). Indexation policies have a greater effect on older pensioners. Of these countries, the impact of changing indexation policy on retirement incomes is clearest for Japan, New Zealand and the United States, but less so for France and Italy. In Canada and Germany the effect has been offset by other economic factors and changes in pension systems.

2. Old-age income poverty

The question of what constitutes "poverty" has generated a huge debate, one which is unlikely ever to be resolved. For the "purposes" of international comparison, the OECD treats poverty as a relative (rather than an absolute) concept. It is relative in two senses of the word. First poverty is measured against a yardstick dependent on median household incomes. Secondly, the poverty thresholds are country-specific, so poverty is measured against prevailing norms for living standards in a particular country at a particular time. This means that a person classified poor in a prosperous OECD country will have a higher income than many of the non-poor in other countries that are less prosperous overall. The general approach of measuring poverty relative to a proportion of median income, adopted by the OECD for its cross-country analysis, is widely used elsewhere: for example, in the rates of poverty risk in the framework of the European Union's social reporting system.

Most of the analysis in the *Growing Unequal?* report (OECD, 2008), sets the threshold for poverty at 50% of median, equivalised household disposable income. People with incomes below this level are counted as "income poor".[16]

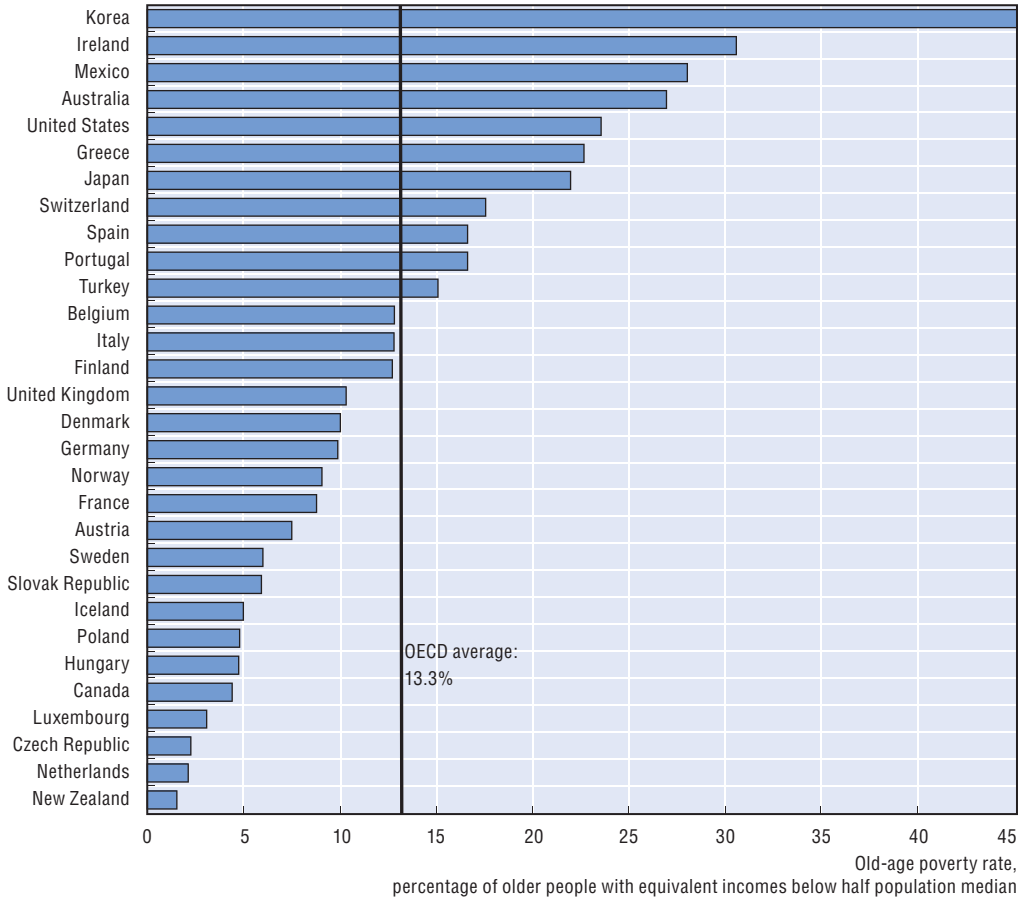
In the mid-2000s, 13.3% of older people (aged over 65) were income poor on average in OECD countries. The old-age poverty rate was much the highest in Korea, at 45% (see Figure 2.5). Other countries with a high poverty rate for older people – above 20% – are Australia (27%), Greece (23%), Ireland (31%), Japan (22%), Mexico (28%) and the United States (24%). There is a group of countries clustered a little above the average for OECD countries: Portugal, Spain, Switzerland and Turkey, with 15-18% of older people living in poverty. Just below the OECD average are Belgium, Finland and Italy. The eight countries with the fewest poor old people – with income poverty rates of less than 5% – are Canada, the Czech Republic, Hungary, Iceland, Luxembourg, the Netherlands, Poland and New Zealand.

One of the main drivers of differences in old-age poverty rates is the level at which old-age safety-net benefits are set. In Australia, for example, the full age pension in 2005 was AUD 12 700 a year, lower than the poverty threshold of AUD 14 770 for a single person.[17] The difference between the two is larger in Ireland: EUR 8 870 for the basic pension and EUR 10 775 for the poverty threshold. In both countries, there are many people clustered around the income level of these programmes, which are 86% of the poverty threshold in Australia and 82% in Ireland. This explains why these countries have among the four highest old-age poverty rates.

In contrast, the basic pension in New Zealand, of NZD 16 100 a year in 2005, was much higher than the poverty threshold of NZD 13 040 for a single person. In the Netherlands, the basic pension was just a little under the poverty threshold of EUR 11 500 in 2005. Given

Figure 2.5. **Old-age income poverty rates, mid-2000s**

Percentage of over 65s with incomes of less than half median equivalised population incomes



Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Table 5.3.

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that coverage of these schemes is near universal (because they are residency-tested), it is unsurprising that old-poverty rates are the lowest in these two countries. (Box 2.1 provides more detailed data on the level and coverage of basic, resource-tested and minimum retirement benefits.)

Are older people more likely to be poor?

One explanation for the pattern of old-age poverty described above may lie in the fact that incomes are distributed less equally in some countries than others during working lives and that this persists into retirement. Figure 2.8 compares rates of income poverty of older people (on the vertical axis) with those of the population as a whole (horizontal axis). Thus, countries above the line have higher old-age poverty than the population as a whole. In countries below the line, the old are less likely to be poor. There is indeed a strong, positive correlation between old-age and general poverty, but there remain many cross-country differences in the relationship between the two.[18]

On average in OECD countries, the population poverty rate – of 10.6% – is below the old-age poverty rate – of 13.3%. Older people are less likely to be poor than the population as a whole in 11 countries. The difference is particularly large in Canada, New Zealand and

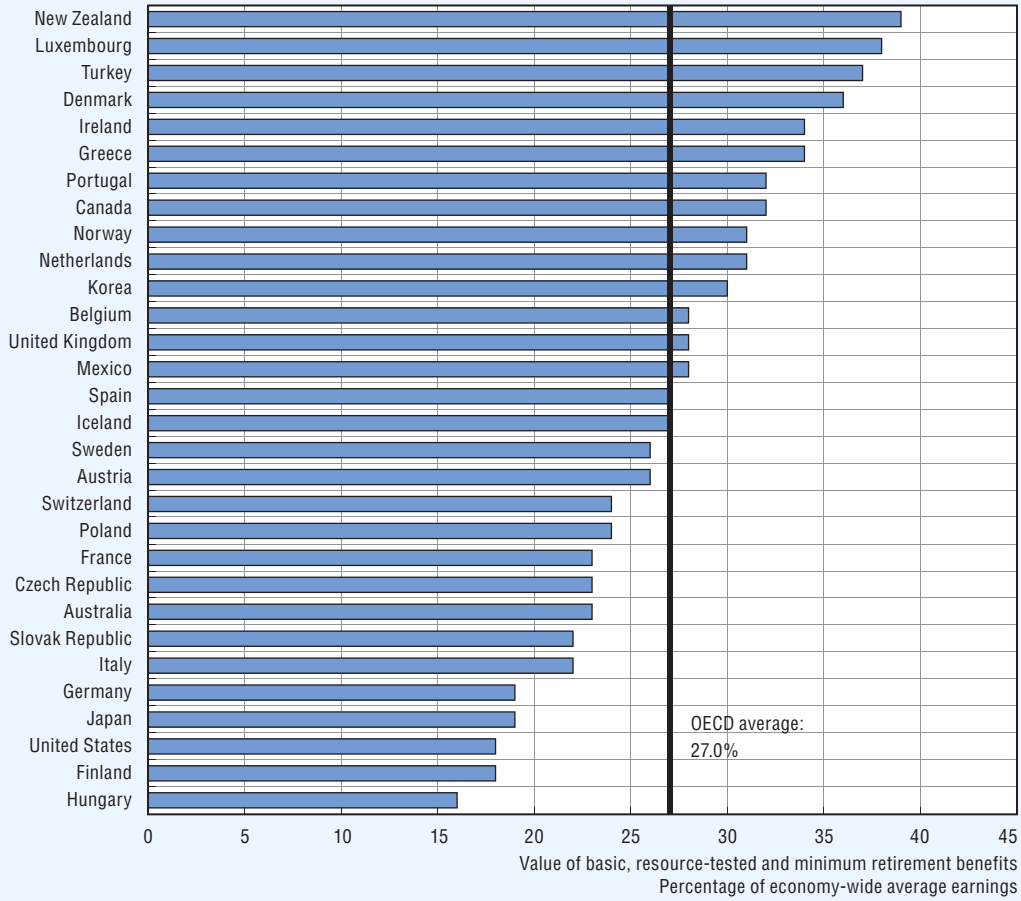
Box 2.1. **Old-age safety nets***

Old-age safety-nets are the benefits from "first-tier, redistributive schemes" in the "Framework of *Pensions at a Glance*", set out above. They therefore include all basic, resource-tested and minimum pensions which low-income older people might receive. In some countries, there are different programmes or benefit levels depending on individuals' contribution histories. In these cases, the calculations show the highest level of benefit, which typically requires a certain period of contributions.

At the bottom of the scale, social assistance, basic and minimum pensions provide a minimum retirement income of less than 20% of average earnings in Finland, Germany, Hungary, Japan and the United States.

Figure 2.6. **Value of basic, resource-tested and minimum retirement benefits**

Percentage of average earnings



Source: "Country profiles" in Part III of this report.

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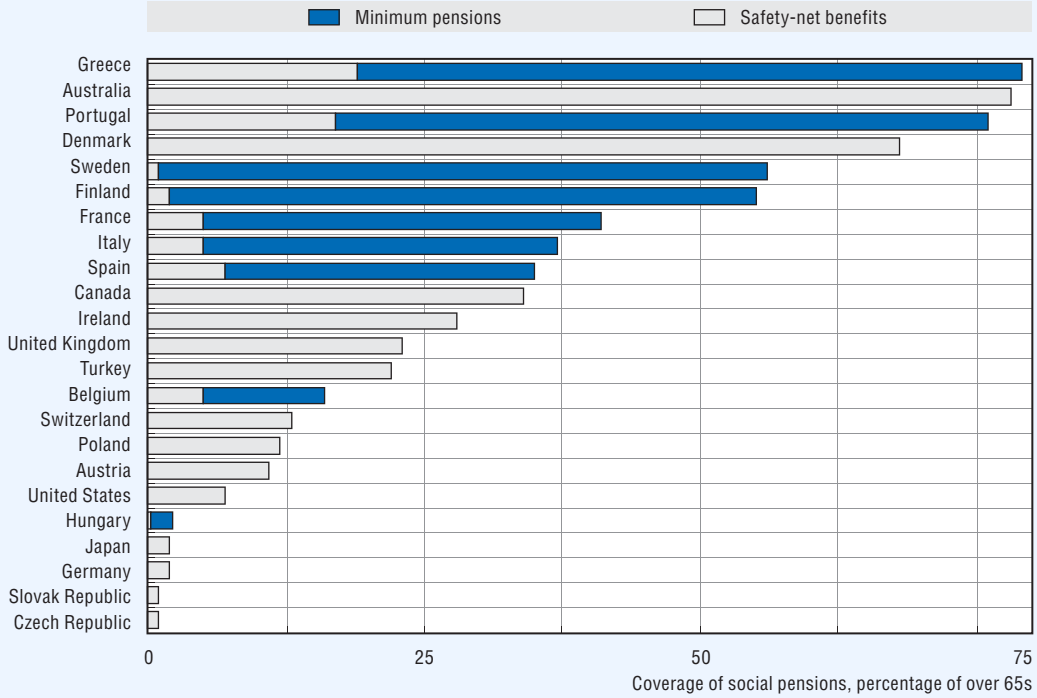
Figure 2.7 shows the percentage of the over 65s covered by resource-tested benefits, divided, where appropriate, between different programmes. In Portugal, for example, almost 60% of pensioners are on the minimum contributory pension, with another 17% receiving the social pension or solidarity benefit. Coverage of both kinds of programme is even higher in Greece. In Finland and Sweden more than half of older people are also in receipt of minimum pensions. However, the coverage of the safety-net benefit

Box 2.1. **Old-age safety nets*** *(cont.)*

Figure 2.7. **Coverage of resource-tested and minimum pensions**

Percentage of over 65s in receipt of one or more benefits



Source: European Union, Social Policy Committee (2006); Pearson and Whitehouse (2009), "Social Pensions in High-Income Countries", in R. Holzmann and N. Takayama (eds.), *Closing the Coverage Gap: The Role of Social Pensions*, World Bank, Washington DC, forthcoming.

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(provided by social assistance) is very narrow in both countries compared with Greece and Portugal. This probably reflects the history of a large informal sector in the southern European countries that must rely on last-resort safety-net benefits. The Nordic countries, in contrast, have a very small informal sector and comprehensive protection, through pension credits, for people out of paid work.

For most countries, the data in Figure 2.7 relate to a single retirement-income programme. The range of coverage of these programmes is huge. In Australia, for example, the public pension is resource-tested. Nevertheless, more than 75% of older people are eligible for the benefit. Compare this with Germany and Japan, where just 2% of older people receive social assistance. In all three of these countries, benefits are resource-tested. But the way they work in practice is fundamentally different. Australia's scheme has been described as "affluence-tested" because the benefit is paid to most people of pension age and denied only to the richest pensioners. In contrast, the German and Japanese programmes are best characterised as "poverty-tested". This is because benefits are paid only to the very poorest older people.

The chart does not include recipients of basic pensions. In the Netherlands and New Zealand, for example, basic pensions are based on adult residency in the country, and so virtually 100% of older people receive a benefit. In the United Kingdom, just fewer than 25% of older people are in receipt of the resource-tested programmes – pension credit and savings credit – but some 98% receive at least some payment from the basic pension. The situation is similar in Canada, the Czech Republic, Denmark, Ireland and Japan, where basic pensions have near-universal coverage.

* This box draws on the more detailed analysis in Pearson and Whitehouse (2009).

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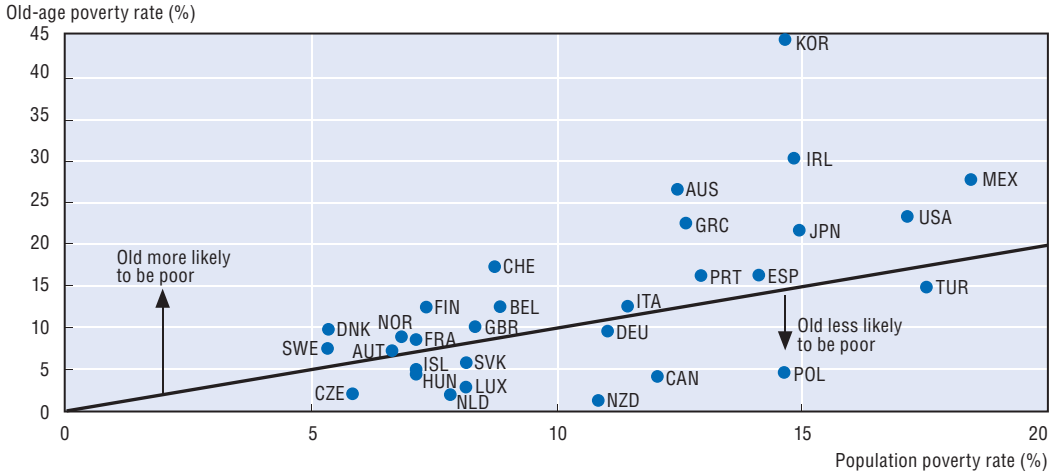
Figure 2.8. **Income poverty rates of older people and the population, mid-2000s**

Percentage with incomes of less than half median equivalised population incomes



Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Tables 5.1 and 5.3.

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Poland, where population poverty rates are in the 10%-15% range while poverty of the over 65s is 5% or less. Older people are also significantly less likely to be poor in the Czech Republic, Luxembourg and the Netherlands.

Of the 19 OECD countries where old-age poverty is relatively more widespread, the difference between poverty rates of the over 65s and the population is fairly small in six of them: France, Italy, Norway, Spain, Sweden and the United Kingdom. However, the differences are large in eight countries. Korea again stands out, with three times as many of the over 65s living in poverty as the population as a whole. In Australia, Ireland and Switzerland, old-age poverty rates are double those of the population; the differences are also significant in Greece, Japan, Mexico and the United States.

As discussed above, one of the main drivers of these cross-country differences lies in the level and coverage of safety-net benefits. This explains relatively low risk of poverty for older people in Canada, Luxembourg, the Netherlands and New Zealand. Similarly, the much higher poverty risk of older people relative to the population occurs in countries with weaker safety nets. In addition to Australia and Ireland (discussed above) safety-net benefits are worth only around 34% of the poverty threshold in Greece, 53% in Japan and the United States and 75% in Switzerland.

It is important to remember that these figures are based on measures of *income* poverty. Box 2.2 illustrates how alternative measures of poverty, looking at people's access to basic needs, provides a rosier picture of poverty risks in old age.

Are older women more likely to be poor than older men?

Older women generally have a much higher poverty rate than older men in OECD countries. On average, older women have a poverty rate of around 15%, compared with around 10% for older men. The only exceptions are in three countries with low overall poverty rates for older people: Iceland, Luxembourg and New Zealand (see the left-hand panel of Figure 2.10). In Luxembourg and New Zealand, this probably reflects the fact that social pensions (minimum and basic, respectively) are among the four highest relative to average earnings in their economies. However, in a further five countries, the poverty rate

Box 2.2. **Income poverty, social exclusion and material deprivation***

Poverty is clearly a more complex phenomenon than can be captured by measures of income poverty alone. For example, people with low incomes may benefit from in-kind support from the state or their relatives. Some older people are undoubtedly "asset rich, income poor", meaning that they have a stock of assets that they can draw down to support themselves. Conversely, people might have insufficient income for special needs, such as sickness and disability. Indicators of "material deprivation" or "hardship" try and capture some of these effects.

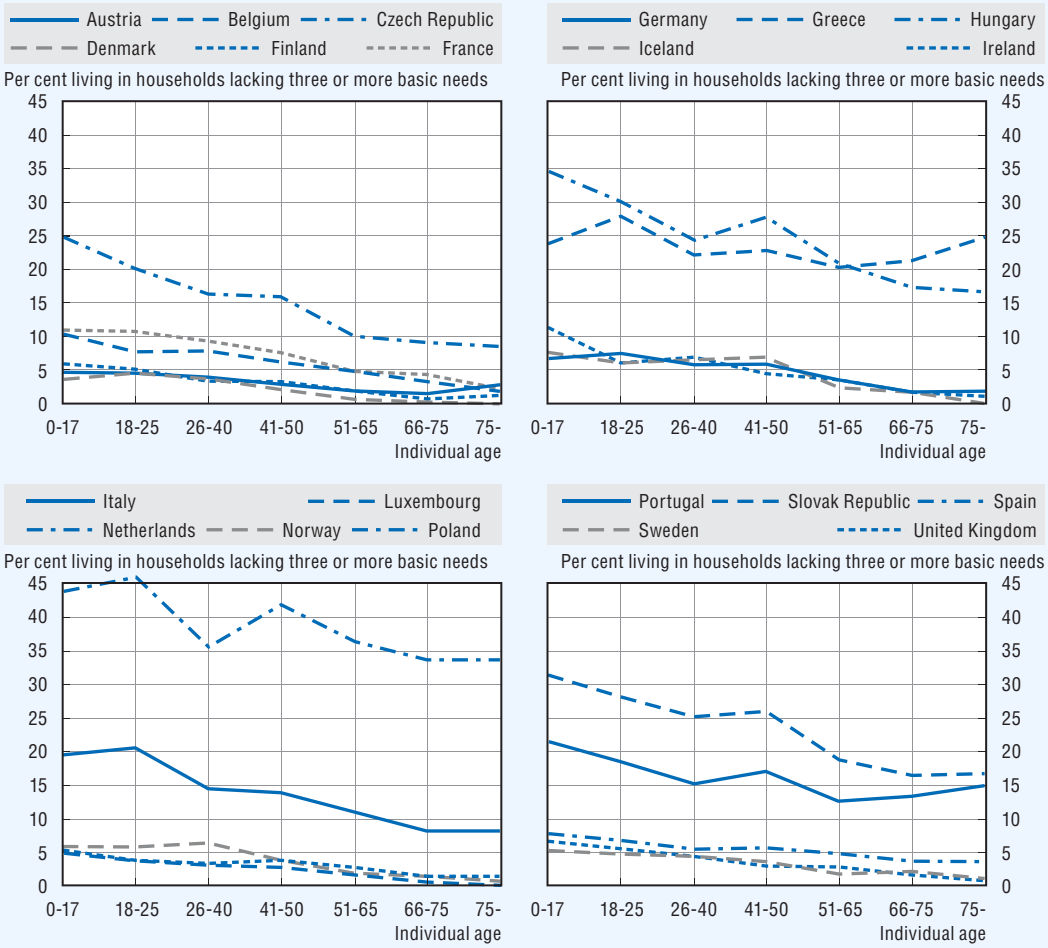
Material deprivation is the lack of socially perceived necessities. Examples of such hardship, which can be measured across a range of countries in similar ways, include:

- inadequate heating;
- constrained food choices;
- overcrowding;
- poor environmental conditions;
- arrears in utility bills;
- arrears in rents or mortgages;
- inability to make ends meet.

In the 21 countries where data are available, 10.6% of all individuals live in households materially deprived in three or more ways. Overall material deprivation is highest in Eastern Europe: at 40% in Poland, around 25% in Hungary and the Slovak Republic and 16% in the Czech Republic. It is also high in Greece, Italy and Portugal.

Figure 2.9. **Material deprivation by age**

Percentage of individuals in households lacking three or more basic needs



Source: OECD *Income Distribution Database*; see OECD (2008), *Growing Unequal?*, Figure 7.4.

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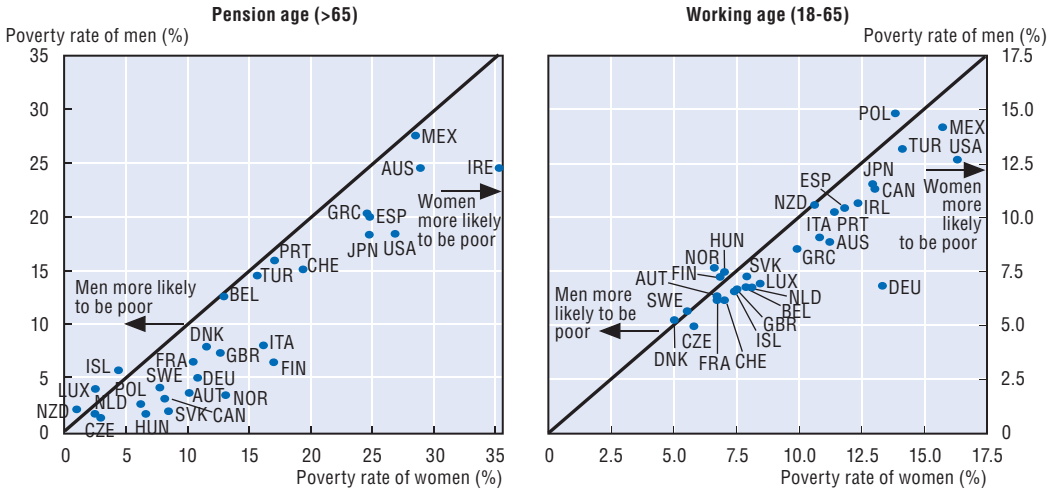
Box 2.2. **Income poverty, social exclusion and material deprivation*** *(cont.)*

Exploring the results by age reveals that material deprivation is highest on average in OECD countries for children (aged 17 or less) and young adults (aged 18-25), at 14.1% and 13.1% respectively. Material deprivation is much less common among older people (aged over 65): around 6.8%. Most countries follow this general pattern of a decline in material deprivation with age (Figure 2.9); the main exceptions are Greece, Poland and Portugal, where there is little difference between age groups. Material deprivation is also relatively high for older people compared with the population as a whole in Hungary, the Slovak Republic and Spain. Material deprivation is practically non-existent among older people in Denmark, Iceland, Luxembourg, the Netherlands, Norway and the United Kingdom.

* See OECD (2008), *Growing Unequal?*, Chapter III.7 for a detailed analysis.

Figure 2.10. **Income poverty rates by age and sex, mid-2000s**

Percentage with incomes of less than half median equivalised population incomes



Note: For reasons of clarity, the outlier Korea has been excluded from the charts. The poverty rate for men of pension age is 41.8% and for women, 47.2%. For working age, the figure for men is 11.0% and for women, 12.4%.

Source: *OECD Income Distribution Database*; see OECD (2008), *Growing Unequal?*, Figure 5.6.

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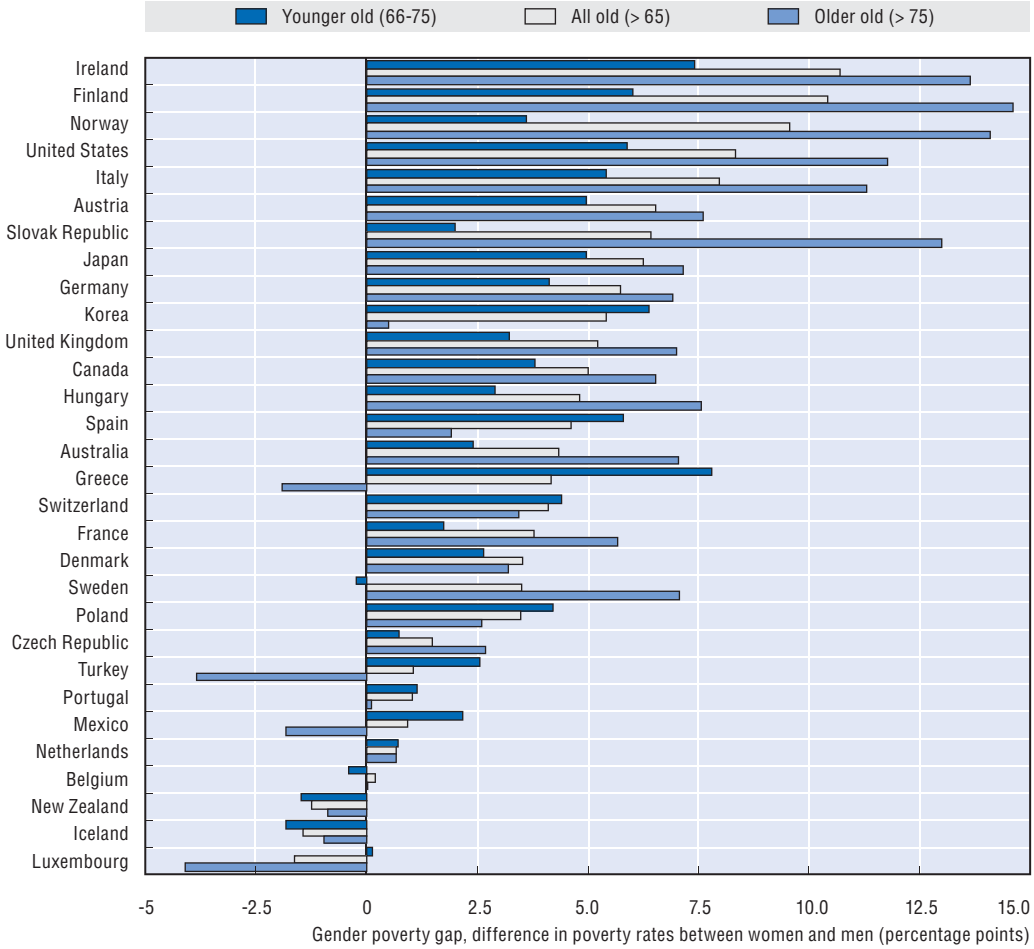
for older women is only a little larger (one percentage point or less) than for men: Belgium, Mexico, the Netherlands, Portugal and Turkey. The largest differences between old-age poverty for men and women are in Ireland, Finland and Norway, where poverty rates for women are 10 percentage points higher than for men. The differences are also large and significant in Austria, Italy, Japan, the Slovak Republic and the United States.

The right-hand panel of Figure 2.10 carries out the same comparison of poverty rates by sex for people of working age (18-65). For reasons of clarity, the scale used for working-age people is exactly half the one used for people of pension age. As is evident from the comparison of old-age and population poverty rates, people of working age are generally less likely to be poor. Working-age poverty rates are 9.8% for women and 8.8% for men, compared with poverty rates of 15.2% and 10.7% respectively for people of pension age. The largest difference in working-age poverty between the sexes is in Germany, where women's poverty rate is 13% and men's is 7%. The gender differential in poverty is also relatively large in Australia and the United States. However, it is readily apparent from Figure 2.10 that most countries have only marginally higher poverty among women of working age than men.

Delving deeper into the differences in poverty risk between men and women, Figure 2.11 is based on analysis of poverty rates of older people aged 66-75 and over 75. The chart shows the "gender gap" for old-age poverty: the difference, in percentage points, between the poverty rates for men and women. A positive figure shows that women are more likely to be poor than men. For reference, the chart also shows the overall poverty gap for all men and women aged over 65.

Figure 2.11. **Gender gap in old-age poverty: difference in poverty rates between men and women by age, mid-2000s**

Percentage with incomes of less than half median equivalised population income



Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Figure 5.6.

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What explains the striking pattern of increasing feminisation of poverty with age? It is useful to employ again the distinction between age, cohort and generational effects used to describe patterns of relative incomes of older people in Section 1 above. First, the *age* effect is driven by policies for indexing pensions in payment. Since poverty is treated as a relative concept, price indexation might mean that older pensioners fall below the poverty threshold as they get older. This will affect women more than men because they live longer on average.

However, the *cohort* or generational effect is the most significant. The younger old (aged 66-75) entered the labour market in the 1960s while the older old mainly started working in the 1950s. The women of these generations started a family earlier than today: the average age when mothers had their first child in 1970 was 24, compared with nearly 28 in 2005. These women also had more children than today's: an average of 2.7 children per woman in 1970 in contrast to just 1.65 in 2005. (See the indicator of "Fertility" in Part II of this report.) Given that this trend is a longstanding one, the older old tended to have more children and start their families earlier than the younger old. This in itself would mean that the younger old will tend to have had shorter career breaks to care for children.

Moreover, women's position in the labour market has changed dramatically in this period. Although countries have varied in the scale and pace of the change, the direction has been the same: successive generations of women have been spending more of their lives in paid work. Also, anti-discrimination legislation has led to a narrowing in the gap between the earnings of women and men (although in many countries the gap remains large). This means that more members of each generation of women reaching retirement have built up greater pension entitlements in their own right, rather than relying on benefits derived from their husband's pension contributions. In addition, many countries have adopted policies to provide pension credits for women out of the labour force caring for children.

Also, pension ages for women in many OECD countries used to be below those for men, also giving earlier generations fewer years of contributions to the pension system and so lower benefits in their own right. In 1983, for example, pension age for men in OECD countries averaged 63.6 years, 2.0 years older than for women. The gap between the two closed over the next decade to 1.5 years by 1993: pension eligibility age fell for both sexes, but by a larger amount for men. By 2002, a small increase for men and a one-year increase for women brought the gap between men's and women's pension ages down to 0.7 years. Under current legislation, there will be increases in pension age for both sexes that will bring them to an average of 65.3 for men and 64.8 for women in the long term.[19]

Thirdly, there is a *compositional* effect. Women live longer than men on average and are often married to men older than themselves. This means that the older old group contains many widows, whose incomes are, to a large extent, derived from survivors' benefits. The rules for these benefits therefore have a powerful impact on poverty rates of the older age group of female retirees. Furthermore, the prevalence of poor women among the older old reflects differences in mortality between socio-economic groups: women who were married to poorer men are more likely to be widows.

The role of earnings

Most OECD countries offer increments in pension entitlements to people who delay their retirement and continue to work beyond the normal pension-eligibility age. However, the labour-market opportunities for older people can often be limited by age discrimination and other barriers, such as pay schedules that link earnings strongly to seniority (thereby making older workers expensive to hire or retain).[20]

Around 27% of people aged over 65 are working (or live in a household where someone is working) on average in OECD countries. This proportion has remained stable over the past decade, as the earlier decline in effective retirement ages has come to a halt.[21]

Working households of pension age have much lower poverty rates – 7% on average – than households with no workers: 17% (Table 2.1). Differences in poverty rates by working status of the household member(s) are most noticeable in Australia, France, Germany, Greece, Ireland, Italy, Norway, Portugal and the United Kingdom. The effect on the poverty rate is much lower in Austria, Finland, the Netherlands, New Zealand and Poland. In Turkey, however, non-working older households have lower poverty rates than working ones. This is because of the relatively low coverage of the pension system, which is concentrated among higher earners.

Table 2.1. **Poverty rates for older people (aged over 65) by household type and working status**

Percentage with incomes of less than half median equivalised population incomes

	All	Head of household is of pension age (over 65)				
		All	Working	Not working	Single	Couple
Australia	27	27	4	32	50	18
Austria	7	8	7	9	16	4
Belgium	13	12	4	13	17	10
Canada	6	7	2	10	16	4
Czech Republic	2	3	[..]	3	6	2
Denmark	10	10	2	12	17	4
Finland	13	14	11	14	28	4
France	9	9	1	9	16	4
Germany	9	8	2	9	15	5
Greece	23	21	7	31	34	18
Hungary	5	5	[..]	5	11	1
Iceland	5	5	3	7	10	2
Ireland	31	25	5	36	65	9
Italy	13	13	3	17	25	9
Japan	22	21	13	30	48	17
Korea	45	49	35	69	77	41
Luxembourg	3	3	[..]	4	4	3
Mexico	28	23	19	39	45	21
Netherlands	2	2	2	2	3	2
New Zealand	2	4	1	2	3	1
Norway	9	9	1	10	20	1
Poland	5	6	6	6	6	6
Portugal	17	20	5	25	35	16
Slovak Republic	6	4	[..]	7	10	3
Spain	23	27	12	32	39	24
Sweden	6	6	3	7	13	1
Switzerland	18	18	[..]	[..]	24	15
Turkey	15	18	20	16	38	17
United Kingdom	10	10	1	12	17	7
United States	24	24	9	34	41	17
OECD	**13**	**14**	**7**	**17**	**25**	**9**

[..] indicates that the sample size is too small.

Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Table 5.3.

StatLink http://dx.doi.org/10.1787/651474216837

The role of living arrangements

Table 2.1 also assesses the degree of poverty among older people living in different types of household. The first two columns, for example, show the poverty rate for all older people and for people living in a household headed by someone of pension age (over 65).

The difference between the two is generally small, and averages just one percentage point in the OECD as a whole. Only in Portugal, Spain and Turkey are people more likely to be poor in households headed by a retired person. This mainly reflects the extent to which older people live in multi-generational households; living with their children, for example.

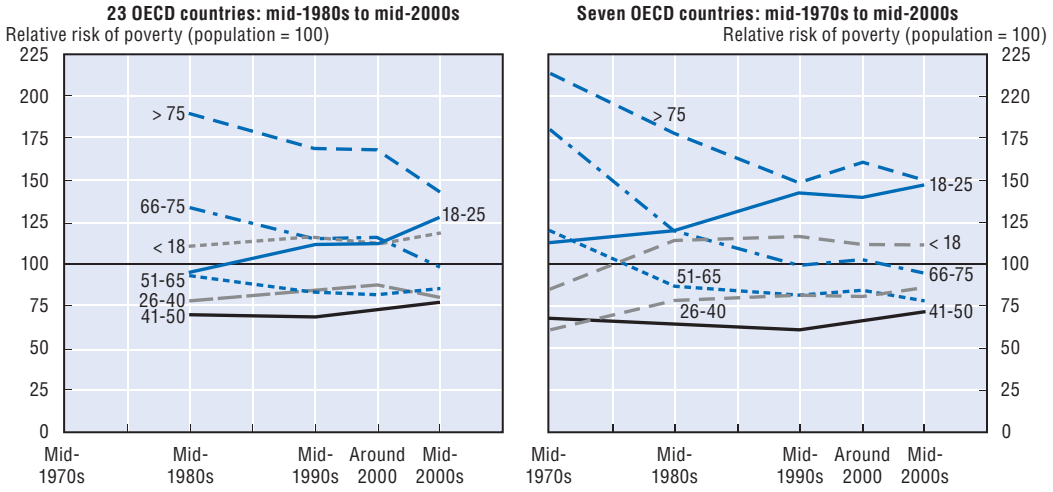
The starkest difference in risk of poverty is between single people of pension age and couples where the head of the household is of pension age, with poverty rates of 25% and 9% respectively on average in OECD countries. Single older people fare worse in Ireland and Korea, with well over half of them living in poverty. Poverty rates are also high – 40-50% – for single older people in Australia, Japan, Mexico and the United States.

How has old-age poverty changed?

Poverty rates of older people have fallen over the past three decades. Figure 2.12 shows poverty rates over time for a range of different age groups relative to the poverty rate for the population as a whole. The left-hand panel presents data for 23 OECD countries. In the mid-1980s, the older old (aged over 75) were nearly twice as likely to be poor as the population as a whole. The relative poverty of older people fell over the next two decades: from 90% to less than 45% above the overall poverty rate. The improvement for the younger old (aged 66-75) was equally marked. Their relative risk of poverty was 33% higher than average in the mid-1980s, but fell a little below the average by the mid-2000s. Poverty rates of people of prime working age (26-50) were fairly stable. Thus, it was children and young adults (people aged 25 or under) who replaced older people over time as a group with a relatively high risk of poverty.

Figure 2.12. **Trends in relative risk of poverty by age group**

Population risk of poverty = 100



Note: Right-hand panel comprises data from Canada, Finland, Greece, the Netherlands, Sweden, the United Kingdom and the United States. Left-hand panel shows the remaining 23 OECD countries.

Source: *OECD Income Distribution Database*; see OECD (2008), *Growing Unequal?*, Figure 5.5.

StatLink http://dx.doi.org/10.1787/651227035011

A longer series of data – back to the mid-1970s – is available for seven countries: Canada, Finland, Greece, the Netherlands, Sweden, the United Kingdom and the United States. The results for these seven, shown in the right-hand panel of Figure 2.12, demonstrate that the trend to lower old-age poverty is a longstanding one.

This pattern of declining old-age income poverty is common to most OECD countries (although this is not shown graphically here: see OECD, 2008, Table 5.3). However, there are some exceptions. Ireland and Spain have seen a large increase in the proportion of older people who are poor throughout the late-1980s, the 1990s and the early 2000s. This was driven by rapid economic growth and increases in real earnings that, in a way, left older people behind. In Mexico, an increase in the risk of poverty at retirement age between the mid-1980s and mid-1990s was offset by a decline between the latter period and the mid-2000s. Australia, Finland, Sweden, Switzerland and the United States have all seen increases in old-age poverty over time, with the growth occurring during the period from the mid-1990s to the mid-2000s.

Returning finally to the role of living arrangements, during the decade spanning the mid-1990s and mid-2000s, poverty rates for single older people fell more rapidly than the equivalent rates for older couples. This decline is strongest in the Czech Republic (19.1 percentage points), followed by Norway (13.8) and Austria (11.6). However, the effect was the opposite in seven countries: in particular for Spain and Finland, where poverty rates for the single older people rose by 32.7 and 12.5 percentage points respectively.

3. The redistributive role of the state: taxes and benefits

The analysis of incomes and poverty of older people – and how they compare with the position of the population as a whole – is based on *disposable* income. The state plays an important role in determining people's disposable income. It takes money away from households in the form of personal taxes and social security contributions. It gives some of it back in the form of cash benefits, including, of course, old-age pensions.

Taxes and contributions

The first two columns of Table 2.2 show the proportion of household income paid in taxes and contributions by individuals of pension age (over 65) and of working age (18-65). In the 24 countries for which data are available, people of working age pay an average of 31% of their incomes in direct taxes.[22] For people of pension age, the direct tax burden is just 18% of income on average in OECD countries. This difference in tax burdens has a large effect when the incomes of older people are compared with those of people of working age at any point in time. They also have an important effect on individuals' living standards as they move from work into retirement (see the indicator on "Net replacement rates" in Part II of this report).

Differences between countries in the tax burdens of people of working age are well described in other OECD reports.[23] The tax burden for older people tends to be smaller than that carried by people of working age. There are three main reasons. First, OECD countries' income taxes are progressive: richer people pay a higher proportion of their income in taxes. Older people tend to have lower incomes than people of working age. Secondly, most OECD countries do not levy social security contributions on pensioners, or do so only at a low rate to finance particular benefits, such as healthcare. Thirdly, most OECD countries offer concessions in their income-tax regimes for either pensioners or pension income.

The progressivity of taxes and transfers is measured by comparing their distribution with the distribution of equivalent household disposable income. The concept is illustrated in Figure 2.13. The horizontal axis shows the cumulative percentage of the population, ranked by equivalent household disposable income, with the poorest to the left and the

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Table 2.2. **Scale and progressivity of household taxes and cash benefits**

Share of household taxes and public transfers in disposable income
and measure of progressivity of taxes and transfers expressed in percentage terms, mid-2000s

	Household taxes (% of disposable income)		Progressivity of household taxes		Public transfers (% of disposable income)		Progressivity of public transfers		
	Pension age	Working age	Pension age	Working age	Pension age	Working age	Pension age	Working age	Old-age benefits
Australia	9.7	24.8	81.6	49.2	48.7	10.1	–8.0	–43.1	–47.0
Austria	27.5	35.0	46.4	36.5	101.3	27.4	25.6	13.0	24.9
Belgium	19.6	42.1	42.0	36.3	96.9	22.3	16.9	–14.1	–8.9
Canada	15.0	27.0	58.6	47.2	46.7	9.3	–0.6	–17.3	–11.0
Czech Republic	6.1	23.9	78.9	42.4	79.1	17.0	3.7	–15.1	–10.8
Denmark	44.2	53.8	33.6	33.2	81.1	19.9	–5.4	–30.3	–49.4
Finland	24.8	31.0	44.4	41.9	18.1	12.4	–13.8	–25.8	–44.1
France	11.1	28.8	47.4	35.4	96.4	22.6	28.5	9.8	25.3
Germany	12.5	41.1	48.5	43.9	82.2	16.4	17.5	–6.6	10.1
Greece[1]	. .	. .	. .	. .	66.4	16.7	20.2	17.6	14.5
Hungary[1]	. .	. .	. .	. .	85.6	27.5	11.9	–2.5	1.0
Iceland	34.2	54.1	29.6	25.7	79.7	12.3	3.7	1.8	
Ireland[1]	5.4	20.7	78.2	53.1	55.8	13.3	–0.1	–20.5	–32.0
Italy	21.1	32.0	62.3	51.2	87.4	21.1	22.5	15.8	21.8
Japan	15.4	21.0	42.9	35.6	55.8	11.0	12.1	2.0	2.3
Korea	5.0	8.1	46.2	36.3	15.7	3.0	28.2	4.0	
Luxembourg	14.8	26.3	43.0	40.4	91.0	22.4	14.5	7.5	17.3
Mexico[1]	. .	. .	. .	. .	21.3	5.4	51.8	40.7	
Netherlands	10.0	26.9	70.5	43.6	53.0	12.7	–1.4	–22.3	–16.0
New Zealand	19.8	29.1	24.9	48.5	76.8	13.1	–1.1	–33.1	–32.4
Norway	22.7	35.0	43.3	35.5	72.7	15.4	7.4	–17.7	–26.7
Poland[1]	17.9	28.8	32.5	38.2	92.6	30.4	19.8	17.3	26.0
Portugal[1]	. .	. .	. .	. .	74.2	20.3	29.5	31.5	33.2
Slovak Republic	5.0	22.0	72.6	38.8	86.0	22.0	10.4	–3.0	–0.2
Spain[1]	. .	. .	. .	. .	70.4	15.0	17.5	10.2	4.1
Sweden	40.2	44.2	31.2	33.0	96.3	21.4	9.0	–15.3	–18.7
Switzerland	32.9	36.6	20.2	21.1	63.6	9.7	1.5	–17.6	–18.7
Turkey[1]	. .	. .	. .	. .	46.0	18.6	28.8	32.0	37.3
United Kingdom	10.0	26.2	61.4	48.6	54.3	8.7	3.5	–34.7	–20.6
United States	16.4	27.7	65.8	54.9	42.1	5.6	10.5	–11.5	–3.8
OECD24	**18.4**	**31.1**	**50.2**	**40.4**	**69.7**	**15.8**	**8.5**	**–10.7**	**–4.5**

1. For Greece, Hungary, Mexico, Portugal, Spain and Turkey, data on public transfers are reported net of taxes and so household taxes cannot be separately identified. The OECD average therefore excludes these six countries. Progressivity of public transfers are calculated on net values for these countries, plus Ireland and Poland.

Source: OECD Income Distribution Database; see OECD (2008), *Growing Unequal?*, Tables 4.2-4.4 and the surrounding discussion.

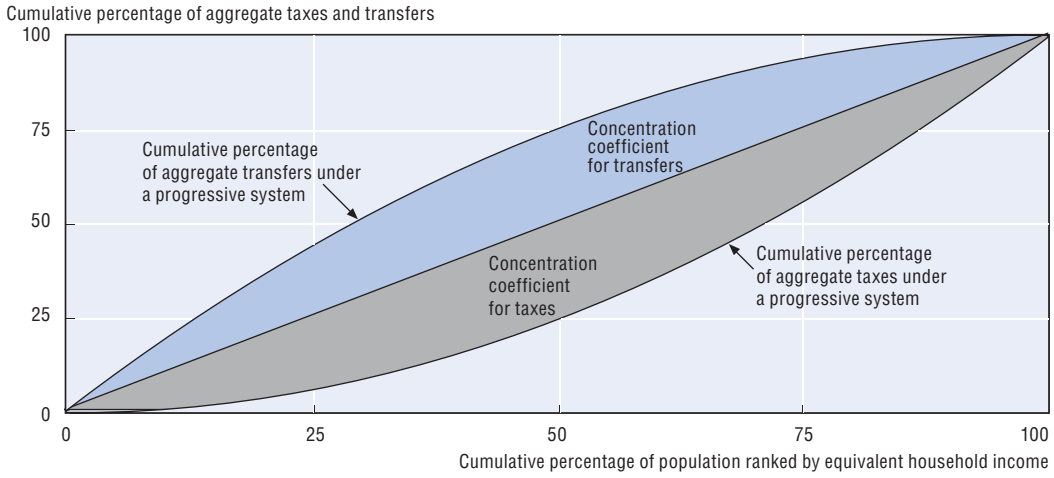
StatLink http://dx.doi.org/10.1787/651477340623

richest to the right. The vertical axis shows the cumulative percentage of total taxes or transfers paid or received. If taxes and transfers were distributed equally, then the result would be a 45° line. In practice, they are not shared in this way.

The chart shows the effect of a progressive tax system, where the share of income paid in tax rises with income. This is the curve below the 45° line. It also shows the effect of a redistributive system of transfers, where the share of total benefits received declines with income. This is the curve above the 45° line.

The shaded areas show the measure of progressivity of taxes and transfers presented below. Formally, these are called "concentration coefficients".[24] The larger the area between the 45° line and the share of taxes and transfers, the more progressive these

Figure 2.13. **Measuring progressivity of taxes and transfers: an illustration**



systems are. In the illustrative example shown in Figure 2.13, public transfers are redistributive, and so the result for the concentration measure is negative.

Table 2.2 presents the empirical measure of progressivity of taxes and social security contributions in the third and fourth columns. A value of zero would indicate that all households paid an equal share of taxes and contributions (and so the curve for taxes would be the 45° line in Figure 2.13). The higher the value, the more progressive is the tax system.

For people of working age, the English-speaking countries – Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States – along with the Czech Republic, Germany and the Netherlands have the most progressive tax systems. Direct taxes are the least progressive in France, Switzerland and the Nordic countries.

For people of pension age, taxes are significantly more progressive than for people of working age in 16 of the 24 countries for which data are available. There are three main reasons. First, basic tax reliefs (allowances, credits and so on) are often larger for pensioners than people of working age. As a result, many pensioners pay no tax. Secondly, retirees in most OECD countries do not pay social security contributions (or do so at a low level). Social security contributions are generally more regressive than the personal income tax. There is often a single contribution rate that applies equally to all earners. Also, ceilings on contributions cap the contributions paid by high earners (see Table III.1 in Part III).

However, differences in progressivity between taxes on people of working and pension age are small – or taxation of workers is more progressive than pensioners – in the Nordic countries, New Zealand, Poland and Switzerland. The reasons for this pattern differ: high overall taxes in the Nordic countries, the absence of social security contributions in New Zealand and contributions paid by pensioners for healthcare in Poland.

Public cash transfers

The right-hand part of Table 2.2 examines public cash benefits. These include the full range of public retirement benefits: basic, resource-tested and minimum programmes and earnings-related schemes. However, they also include other cash benefits paid to older people that are not generally covered elsewhere in the report, such as family, unemployment, housing and disability benefits.[25]

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The first two of the five columns show the share of these benefits in disposable income. Unlike the data on income sources in Figure 2.3 above, these are shown in gross terms, before the deduction of income tax and social security contributions. (This explains why public transfers account for more than 100% of disposable income in Austria.)

Unsurprisingly, public transfers are a more important source of income for people of pension age than working age in all countries. On average, public benefits make up 70% of the gross incomes of older people but only 16% for people of working age. Public transfers are most heavily targeted on people of pension age in Iceland, New Zealand, Switzerland, the United Kingdom and the United States. This is principally because public transfers to people of working age in these countries are a smaller proportion of disposable income than the OECD average.

The final columns of Table 2.2 show how public cash transfers are distributed across income groups, again divided between people of working age and people of pension age. The measure of progressivity used here would again have the value of zero if all income groups received the same share of public benefits. Unlike taxes, however, many of the values for cash benefits are negative. This means that people with lower incomes receive a greater-than-proportionate share of the pool of benefit payments (see the explanation around Figure 2.13 above).

Cash transfers paid to people of working age are more progressive in their distribution than payments to people of pension age in all OECD countries bar Portugal and Turkey. In particular, family and unemployment benefits are targeted on lower-income groups.[26] In contrast, 23 of the 30 OECD countries have public, earnings-related pensions (see Table 0.1 in the Framework of *Pensions at a Glance* above). These, by design, pay a higher level of benefits to people who had higher earnings when they were working. This accounts for much of the difference between the redistribution inherent in schemes paid to working-age families than to retirees.

To study this effect more closely, the final column of Table 2.2 separates out old-age benefits and shows the empirical measure of progressivity (the concentration coefficient) for these schemes alone. In six countries[27] that do not have public, earnings-related pension schemes – Australia, Denmark, Finland,[28] Ireland, the Netherlands and New Zealand – the progressivity measure is strongly negative. This is because public transfers take the form either of basic pensions or resource-tested retirement benefits. As a result, coverage of these programmes is high or, in some cases, near-universal (see Box 2.1 above). Other countries with relatively large proportions of older people covered by resource-tested, minimum and basic pensions – such as Belgium, Canada, Sweden and the United Kingdom – also have highly progressive public transfers to older people. In the Czech Republic, Switzerland and the United States, the public pension system is designed to pay higher pensions relative to earnings for low-paid people and, again, the progressivity measure in Table 2.2 is negative.

In contrast, the empirical progressivity measure of old-age benefits is positive in 12 countries. This is typically because pension benefits are strongly related to earnings when working: in Austria, France and Italy, for example. In others, it is because low-income workers have often spent all or part of their lives working in the informal sector. This explains the results for Greece, Portugal and Turkey (and the result for the progressivity of all transfers to people of pension age in Mexico).

It is interesting also to compare these empirical measures of the distribution of public retirement benefits paid out today with the projections of the distribution of future pensions for people entering the labour market today and so reaching normal pension age in 40-50 years' time (the indicator of "Progressivity of pension benefit formulae" in Part II of this report). Some of the differences between the two sets of results reflect differences in the types of benefits received: for example, public pensions are highly redistributive in Finland, the Netherlands, Sweden and Switzerland. However, the overall retirement-income system is less so, because of the exclusion of mandatory or quasi-mandatory occupational plans from the analysis underlying Table 2.2. The second reason is the fact that many pension systems have been reformed, meaning that the level and distribution of retirement benefits will be very different from those of today's pensioners.

4. Looking forward

This chapter has analysed the economic situation of today's older people, looking at the level of their incomes and the extent of old-age poverty. Today's retirement incomes depend on the rules of pension systems in the past and on pensioners' job and earnings history. This underlines the long time horizon involved in analysing pensions. This begs the question of how the position will look in 20 or 40 years' time, when today's prime-age and younger workers will be retiring.

The experience of these generations of current workers will look very different from those of their parents and grandparents.

First, there have been widespread *social* changes: greater divorce and lone parenthood, fewer children and the decline of the model of the single, male breadwinner as women's participation in the labour market has grown.

Secondly, there have been profound and continual *economic* changes, with many countries experiencing persistent, long-term unemployment into the 1990s. Labour markets have much improved in recent years. However, the ongoing economic crisis seems likely to have a strong impact, in the short-term at least. The financial crisis, too, will have profound implications for many retirees over the next five to ten years. (See the special chapter on "Pension systems during the financial and economic crisis" above.)

Thirdly, the last two decades have seen a wave of *pension reforms*. These will substantially affect the level and sources of retirement incomes of today's workers and so the way old-age incomes and poverty will evolve.

Changes in societies and economies

The most significant economic and social change has been the changing role of women. The older people whose incomes are analysed in this paper entered the labour market in 1940 or earlier. This was a period when the family model of the single, male breadwinner was strong. Women often left the labour market when they got married or had children (at rather earlier ages than today) and spent long periods out of the labour market caring for their children. Some never took paid work again.

The gap between the sexes in employment has changed, as women have fewer children, give birth later and spend less time out of the labour market caring for children. The gap between the sexes in pay has also fallen, as a result of anti-discrimination legislation, changing social attitudes, smaller gender differentials in education and qualifications, and longer working hours for women. The result of this change is that,

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generation by generation, more women will earn pensions in their own right and their value will be greater. The pattern of lower old-age incomes and wider old-age poverty of women observed among today's retirees should be less stark in the future.

Another social change affecting women has been the rise in divorce. Whilst a few countries allow for pensions to be split between couples on divorce, even these rules are relatively recent. Many women moving into retirement in coming years will no longer be able to rely on survivors' benefits, for example. More widespread divorce has made lone parenthood more prevalent. Lone parents tend to have low incomes because of caring responsibilities and lack of affordable child care.

Taken together, these social and economic developments affecting women's position in the labour market might result in higher old-age incomes on average for women. But this might be accompanied by greater rates of old-age poverty as a result of more widespread divorce and lone-parenthood.

Changes in pension systems

Pension systems have also been subject to change in recent times, affecting most OECD countries. *Pensions at a Glance* has set out the key components of these reforms, in the special chapter on "Recent pension reforms" in this volume and in the last edition (OECD, 2007a, Part II.1). The analysis here focuses on the impact of these changes on the pension entitlements of individuals with different levels of earnings. This is, in part, a stylised exercise: it asks, what would the pension entitlements of a worker entering the labour market in 2006 have been, had pension reform not taken place? It then compares this with the results for the same individual under the current rules, including any changes that are being phased in. If there have been multiple reforms in the past 15 to 20 years, the analysis generally shows the cumulative effect of the changes.

Table 2.3 presents the results for replacement rates: the ratio of pension during retirement to earnings when working. It shows these in gross and net terms (after taxes and contributions).[29] Results are provided for three earnings levels: 50%, 100% and 150% of the economy-wide average. The 20 countries shown in the table can be divided into four groups.

First, one of the key motives for pension reform has been to improve the long-term financial sustainability of pension systems. Eight countries have achieved this through *across-the-board cuts* in benefits, which apply equally (or almost equally) to low, middle and high earners alike. This applies to Austria, Finland, Germany, Italy, Japan, Korea, Portugal and Turkey. Gross pension entitlements for people under the reformed rules will be an average of 22% lower for full-career workers than under the pre-reform rules in these countries. The largest cuts, of around 40% will be in Korea and Portugal, with more modest changes of 10-25% in the rest of this group.

A second group of countries has also cut benefits but these reforms have *protected low earners* from all or most of the reduction in benefits. This group comprises France, Mexico and Sweden. The reform in Mexico, for example, will cut pensions by 50% for average earners compared with less than 25% for low earners (with half-average earnings). The cuts for average earners in France and Sweden are approximately 20%, but they are only around 5% for low earners.

The third set of countries has moved towards a *stronger pension-earnings link*, the opposite direction of the second group. In Hungary, Poland and the Slovak Republic, the redistributive features of the new pension system are much smaller than the previous one. Pensions for low earners will be cut substantially: by 25% in Poland and 13% in the

Table 2.3. **Impact of pension reforms on individual entitlements**

Gross and net replacement rates under pre- and post-reform rules, in percentage

Individual/earnings	Gross replacement rate						Net replacement rate					
	Pre-reform			Post-reform			Pre-reform			Post-reform		
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Australia	46.2	23.1	15.4	67.0	41.6	33.1	55.3	30.4	21.8	80.2	53.1	41.8
Austria	90.0	90.0	85.9	80.1	80.1	76.4	98.4	99.2	95.1	90.5	90.3	86.3
Belgium	54.8	40.4	31.4	58.1	42.0	32.5	74.2	62.1	50.6	78.7	63.7	51.7
Czech Republic	72.1	45.0	32.9	79.2	49.7	36.4	86.7	58.1	44.6	95.3	64.1	49.4
Finland	69.9	66.2	65.2	66.5	56.2	56.2	75.9	71.4	72.4	73.2	62.4	63.8
France	64.7	64.7	58.4	61.7	53.3	48.5	79.7	78.2	70.8	76.2	65.7	60.2
Germany	47.9	47.9	46.5	43.0	43.0	42.6	56.4	66.6	66.4	59.2	61.3	60.3
Hungary	69.9	57.7	53.6	76.9	76.9	76.9	85.9	83.2	79.1	94.3	105.5	99.2
Italy	90.0	90.0	90.0	67.9	67.9	67.9	99.1	99.1	99.2	74.8	74.8	77.1
Japan	56.5	40.6	35.3	47.1	33.9	29.4	55.8	41.0	37.0	51.4	38.7	33.9
Korea	100.0	69.3	56.0	64.1	42.1	33.6	105.9	74.9	61.6	68.8	46.6	38.7
Mexico	72.5	72.5	72.5	55.3	36.1	34.5	73.4	76.5	83.2	56.0	38.0	39.6
Norway	62.5	51.9	41.9	66.2	59.3	49.8	80.4	62.0	52.3	76.7	69.3	60.6
New Zealand	77.5	38.7	25.8	79.3	41.1	29.0	77.5	38.7	25.8	79.3	41.1	29.0
Poland	81.2	62.9	56.8	61.2	61.2	61.2	97.1	76.9	69.7	74.4	74.9	75.0
Portugal	91.3	89.9	88.5	63.0	53.9	53.1	106.1	112.0	110.8	73.2	69.6	72.0
Slovak Republic	65.0	58.9	39.3	56.4	56.4	56.4	76.4	75.9	52.2	66.3	72.7	74.9
Sweden	82.5	78.6	76.5	76.6	61.5	75.6	84.5	80.3	81.9	79.3	64.1	81.2
Turkey	107.6	107.6	107.6	86.9	86.9	86.9	150.0	154.4	157.9	121.2	124.7	127.1
United Kingdom	41.1	29.7	20.6	51.0	30.8	21.3	51.9	39.8	28.3	63.8	40.9	29.2

Source: OECD pension models; see also OECD (2007), *Pensions at a Glance*, Part II.1.

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Slovak Republic. The cuts for average earners will be small: less than 5%. High earners (at 150% of average earnings) will receive higher pensions under the new rules than they would have done under the old. In Hungary, replacement rates are higher after reform at all earnings levels, but the increase in pension is greater for higher earners.

Finally, countries with *higher pensions* after reform make up a fourth group. In Australia and Norway, this is because private pensions have been made mandatory. Previously, private pensions had broad coverage in both countries, but this measure will ensure that many low-to-middle income workers are now covered by private pensions. In New Zealand, the pension age was increased but the level of benefit was unchanged. In the Czech Republic and the United Kingdom, pension ages will also be increased, but this will allow people to build up larger pension entitlements. In addition, the United Kingdom's public, earnings-related pension scheme will gradually move to a flat-rate benefit. Low earners will see a large increase in benefits – nearly 25% – while the gains for low and middle earners will only be around 4%. In Belgium, the higher replacement rate arises under the standard assumption of retirement at the normal pension age (of 65) due to an increased pension bonus paid to people who work between 62 and 65.

5. Conclusions

There are large differences in the economic well-being of older people between OECD countries. In some of them, older people's incomes are, on average, almost the same as the population as a whole once differences in household size is taken into account. In others, older people have to get by on incomes of just two-thirds of the population average. The proportion of pensioners living in income poverty varies even more. In some countries, old-age poverty is

virtually non-existent, while in others more than 40% of older people are poor. Even in countries with relatively low numbers of poorer pensioners overall, there are still pockets of old-age poverty, particularly among the oldest old, women and those living alone.

The findings are summarised in Table 2.4, which compares poverty rates and relative incomes of older people. At the top right are six countries with low rates of poverty and high old-age incomes. Yet these countries have radically different pension systems. At the other end of the spectrum lie Australia, Korea and Ireland, which have low old-age incomes and high poverty rates. Greece, Japan Portugal, Spain, Switzerland and the United States also have high old-age poverty rates, but incomes of older people are towards the middle of the distribution. In Belgium, Denmark, Finland, Norway and the United Kingdom, relative incomes of older people are low while poverty rates are towards the middle of the range. France, Germany and Turkey also have mid-range poverty rates for older people, but high old-age incomes overall.

Table 2.4. **Summary: old-age poverty rates and relative incomes of older people**

Relative incomes of older people	Old-age poverty rates		
	High	Medium	Low
High	Mexico	France, Germany, Turkey	Austria, Canada, Iceland, Luxembourg, Netherlands, Poland
Medium	Greece, Japan, Portugal, Spain, Switzerland, United States	Italy, Sweden	Czech Republic, Hungary
Low	Australia, Ireland, Korea	Belgium, Denmark, Finland, Norway, United Kingdom	New Zealand, Slovak Republic

Source: OECD Income Distribution Database, see OECD (2008), *Growing Unequal?*.

These findings are at least suggestive of policy directions. Low incomes and high poverty of older people indicates that governments might consider redistribution from the working-age population to retirees. Indeed, since the OECD income-distribution data were collected in the mid-2000s, Australia, Ireland and Korea have already taken steps in this direction. In contrast, there is a weaker case for redistribution from workers to pensioners in countries with middle or high old-age incomes. However, in countries that combine this with middle or high levels of old-age poverty, there might be a case for greater targeting of old-age pensions on people with low retirement incomes. Nevertheless, there are, of course, many other considerations to take into account in designing pension policy.

Looking forward, the major social and economic change that will affect future incomes and poverty of older people is the changing role of women: greater labour-market participation, a narrowing gender pay gap and better protection for periods of childcare leave, as discussed in Section 4 above. Pension reforms will also have a substantial impact on the evolution of old-age incomes and poverty.[30] Countries that have cut benefits across-the-board are likely to see lower pensioner incomes and greater poverty in the future, unless individuals make up for these cuts by working longer or with voluntary retirement savings.[31] Average old-age incomes may well fall in countries which protected low earners from cuts, but this policy means that pensioner poverty will not be affected by reform. In the countries that moved to a stronger pension-earnings link, average incomes of the old may increase, but the lack of redistribution in the new pension systems means that pensioner poverty may be higher. Finally, the group that increased mandatory retirement provision should naturally see higher incomes in old age. In all of these cases, the changes will help low earners more, and so there should be a larger effect on pensioner poverty.

Notes

1. The chapter draws on the OECD's income-distribution database, which underlies much of the analysis contained in the recent report on inequality and poverty, *Growing Unequal?* (OECD, 2008).
2. See the indicators on "Progressivity of pension benefit formulae" and the "Pension-earnings link" in Part II.
3. See OECD (2008), Table 1.A1.1 for information on the surveys used and adjustments made to the data.
4. For most countries, the data are for the year 2004. However, for Canada, Denmark, Germany, Hungary, Ireland, Korea, the United Kingdom, and the United States the data refer to 2005. The survey used for the Netherlands relates to 2003 and the one for Korea to 2006.
5. A standard linear regression of older people's relative incomes yields the following results, with standard errors in parentheses:
   income = 2.128 × public expenditure/GDP – 0.761 × dependency ratio
   (0.483) (0.311)
   Both coefficients are significant at the 5% level and the R^2 for the regression is 0.31. The data are drawn from the indicators in Part II.
6. Most people of retirement age do not have dependent children, but the cost of children is already taken into account by the process of equivalising incomes.
7. We are unaware of any studies that have attempted to measure these directly. However, they often discussed in the literature on consumption behaviour over the lifecycle: see, *inter alia*, Banks *et al.* (1995) and Browning and Crossley (2001).
8. Analysis of household debt by age of household head for five countries shows a peak in the 35-44 age range. People aged 65 and over have virtually zero debt in these countries (see OECD, 2008, Figure 10.1).
9. See OECD (2008), Chapter IV.10 for evidence on the distribution of wealth by age for seven OECD countries. Disney and Whitehouse (2003) and Crystal and Shea (1990) discuss alternative measures that take account of the value of wealth.
10. OECD (2008), Chapter IV.9 analyses the distribution of publicly provided services. In particular, see Figure 9.1 for analysis of healthcare expenditures by age of recipient.
11. See Whitehouse (2009) for an analysis of pension-indexation policy and related issues.
12. See the indicator of "Life expectancy" in Part II of this report for discussion and data for all 30 OECD countries.
13. See Whitehouse and Zaidi (2008) for a survey of the literature, and new evidence on socio-economic differences in mortality of older people in Germany, the United Kingdom and the United States.
14. Data for Switzerland are not shown in Figure 2.3. This is because capital (mainly private pensions) and work incomes are aggregated in the database. Together they account for 52% of older people's incomes on average, with the 48% residual coming from public transfers.
15. See the evidence in Förster and Mira d'Ercole (2005) and Disney and Whitehouse (2001), Chapter 7, for example.
16. OECD (2008), Annex 5.A1 shows the thresholds for low income for different family types in both national currencies and US dollars (at purchasing-power-parity exchange rates).
17. Benefit levels for 2005 are taken from the database underlying the calculations in Whitehouse (2009). The "Country profiles" in Part III give 2006 values. The level of poverty thresholds for 2005 is taken from OECD (2008), Table 5.A1.1.
18. The correlation coefficient is 0.6425, which is significant at the 0.01% level. Based on the R^2 for a simple regression, general levels of poverty "explain" 41.3% of cross-country differences in old-age poverty.
19. See Whitehouse *et al.* (2009), Turner (2007) and Part III of this report for information on the change in pension eligibility ages for men and women over time.
20. OECD (2006) offers a comprehensive analysis of the situation of older workers.
21. See OECD (2006) and OECD (2008), Chapter III.5.

22. The calculations do not include social security contributions levied on employers or indirect taxes, such as consumption taxes (value-added tax, goods-and-services tax and excise duties). Warren (2009) and OECD (2008), Chapter V.11 discuss the impact of allowing for consumption taxes on income-distribution analysis.
23. OECD (2007b and 2009), for example.
24. The technical details of the calculation are set out in OECD (2008), Chapter II.4. The technique is similar to the calculation for the distribution of retirement benefits: see the indicator on "Progressivity of pension benefit formulae" in Part II of this report and the discussion thereof.
25. Nevertheless, data on public expenditure on these benefits is shown for ten countries where these are significant in the indicator of "Pension expenditure" in Part II.
26. See OECD (2008), Table 2.4 for measures of progressivity disaggregated into eight separate programmes, such as disability, family, unemployment and housing benefits.
27. Iceland also does not have a public earnings-related scheme, but data are not available on the progressivity of public old-age benefits. Mexico's replacement of public earnings-related with private defined-contribution pensions has very little impact on people already retired.
28. The occupational plans in Finland are treated as "public" elsewhere in *Pensions at a Glance* and in the national accounts. However, they are treated as "private" in the OECD income-distribution database because they are funded, defined-benefit plans.
29. For a more detailed discussion of replacement rates and presentation of the results for the post-reform scenario, see the indicators of "Gross replacement rates" and "Net replacement rates" in Part II of this report).
30. Note that incomes and poverty are *relative* measures: both compare incomes of older people with those of the population as a whole. Thus, developments in the incomes of people of working age – driven by changes in employment rates and earnings, for example – will also have an effect on the position of older people.
31. See the special chapter on "The pension gap and voluntary retirement savings" below.

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3. Recent Pension Reforms

There are clear objectives and principles that all well designed pension systems share. These have been set out in numerous OECD reports.[1] The analysis of recent pension reforms in this special chapter is built around a framework of six objectives of retirement-income provision.

1. *coverage* of the pension system, by both mandatory and voluntary schemes;
2. *adequacy* of retirement benefits;
3. *financial sustainability* and *affordability* of pensions to taxpayers and contributors;
4. *economic efficiency:* minimising the distortions of the retirement-income system on individuals' economic behaviour, such as labour supply and savings outside of pension plans;
5. *administrative efficiency:* keeping the cost of collecting contributions, paying benefits and (where necessary) managing investments as low as possible; and
6. *security* of benefits in the face of different risks and uncertainties.

This framework neatly illustrates the trade-offs involved in pension-system design and pension reform. For example, higher pensions would improve the adequacy of retirement benefits but would also worsen financial sustainability. In other cases, there are synergies between the different objectives. Encouraging later retirement improves both economic efficiency and financial sustainability. Similarly, extending coverage of pensions should also improve adequacy of retirement benefits for today's workers.

OECD countries have continued, in recent years, to be active in reforming their pension systems. The 2007 edition of *Pensions at a Glance* reported on pension reforms in the period from 1990 to 2004.[2] This special chapter updates this earlier work. The measures that OECD countries have taken towards achieving the six desirable aims for pension systems in the period 2004-08 are set out in Table 3.1.

1. Coverage of pension systems

Changes that aim to increase pension coverage have mainly been aimed at voluntary, private pensions. France, Hungary, Poland and Portugal have introduced new private-pension plans, often with tax privileges. Germany extended the tax incentives that were due to expire in 2008.

In the period 2004-08, only Norway joined other OECD countries that have mandated private pensions. (These countries include Australia, Hungary, Iceland, Mexico, Poland, the Slovak Republic, Sweden and Switzerland.)

Italy and Korea have continued an already lengthy reform process that aims to convert existing, employer-managed severance-pay schemes into occupational pension plans. In these new plans, savings are earmarked for retirement rather than withdrawn when people change jobs or become unemployed. However, in neither country have the occupational plans been as popular as governments had hoped, with coverage remaining relatively low.

New Zealand introduced its KiwiSaver scheme, which requires individuals to opt out of rather than opt in to private pensions. The United Kingdom has legislated for a similar scheme that will begin operating in 2012.[3]

Some countries aimed to extend coverage of the mandatory pension system. Greece, with relatively low coverage currently, hopes to increase this with new institutional arrangements. Switzerland has reduced the earnings floor to ensure that more part-time, low-paid workers are covered. The United Kingdom has relaxed the qualifying conditions for a full basic pension and strengthened credits for carers. One expected result is that 90% of women will qualify for a full basic pension in 2050, compared with just 30% now.

2. Adequacy of retirement benefits

Increases in pension benefits have, in general, been targeted on low earners. Such changes comprise one-off payments in Australia and Greece and increases in basic pensions in Korea and the United Kingdom. Australia will also increase the age pension by 10.8% for couples and by more for single people. Finland will introduce a new guarantee pension from 2011, worth EUR 8 200 a year in today's money. This will provide a safety-net income level 23% higher than the current national pension. Belgium, France and Spain will all increase minimum pensions by more than required by the normal indexation rules.

The increases in Germany in 2008 and 2009 will raise all pensions by the same proportion, in contrast with the targeted increases elsewhere.

The other policy changes that improve living standards in retirement have been delivered through the tax system. Australia, Finland and Sweden have all reduced taxes on pensioners.

3. Financial sustainability

Gloomy long-term fiscal projections have prompted many countries to improve the long-term financial sustainability of retirement-income systems through lower benefits in future. In France and Mexico, reforms have focused on public-sector workers whose pensions were largely unreformed when major changes were made to the benefits of private-sector workers in the 1990s. Iceland will cut future pensions of senior public officials while Ireland has imposed a contribution levy on members of its civil service pension scheme.

Finland and Portugal have introduced measures that will cut future benefits in line with increases in life expectancy. This brings to 12 the number of OECD countries that have adopted such a policy in one or more of their mandatory pension schemes.[4]

In Hungary, Korea and Switzerland, there have been more direct cuts in pension benefits. Hungary will abolish the 13th-month pension payment for higher-income retirees as a condition to a large IMF loan. The target replacement rate of the Korean public pension will gradually fall from 60% to 40%.In Switzerland, the statutory minimum interest rate paid on mandatory private pensions moved up and down over the period, though for 2009 it will be just 2%. This is the lowest level of the statutory interest rate since the scheme was introduced (when it stood at 4%). New rules for the conversion of occupational pension

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balances into retirement annuities will cut benefits by as much as 5.5%. Other moves to improve financial sustainability involve changes in indexation procedures for pensions in payment. To alleviate current fiscal problems, Hungary will postpone the 2009 increase for a year. Future increases will be linked to price inflation rather than a mix of 50% wage growth and 50% prices. France will move to price indexation for public-sector schemes.

4. Economic efficiency

Many of the potential improvements to financial sustainability of pension systems come from measures to improve retirement incentives. These changes here come under the heading of "economic efficiency" because they are designed to reduce the distortions to the labour market caused by incentives to retire early. Effective retirement ages are currently below the normal statutory pension age in more than two-thirds of OECD countries. Indeed, men retire before age 60, on average, in eight OECD countries: Austria, Belgium, Finland, France, Hungary, Italy, Luxembourg and the Slovak Republic.[5]

In the period 2004-08, Denmark, Germany and the United Kingdom legislated for gradual increases in the normal pension age to reach 67 or 68. The Czech Republic will increase its normal pension age to 65. The government of the Netherlands has proposed increasing the normal pension age from 65 to 67 (although this is still subject to discussion with social partners). Nevertheless, the intention seems to be for a more rapid increase than in other countries: in 24 monthly steps, perhaps in place by 2011. Hungary will implement a phased increase in the normal pension age from 62 to 65 beginning of 2012.

Belgium, Denmark, Greece, Hungary and Italy either increased early pension ages, increased the number of years of contributions needed to qualify for early retirement or did both. France and Ireland applied such measures in their public-sector pension schemes. The Netherlands has removed tax incentives for private, occupational early-retirement schemes. Finland, France and the United Kingdom increased incentives for people to work after the normal retirement age. Finland has also recently proposed an increase in the age at which early retirement is allowed.

France and Japan have introduced measures that will limit employers' ability to fire workers who wish to continue in work after the normal pension age. However, a Spanish worker lost a case in the European Court of Justice (the highest court of the European Union) arguing that compulsory retirement was counter to anti-discrimination laws.

A change in Australia was aimed at improving incentives to save (in contrast to the other changes that were aimed at work incentives). The assets test under the means test for the public pension will be less strict, increasing the reward for voluntary saving for retirement.

5. Administrative efficiency

A major administrative problem in Japan was revealed in the summer of 2007. Until 1997, each time Japanese workers changed job, they were often issued with a new identification number by the Social Insurance Agency (SIA). A new SIA database, introduced that year, aimed to combine an individual's multiple pension accounts into a single account with a unique identification number. However, many records were not linked, meaning that some 50 million accounts are not attached to individual workers and pensioners. To solve the problem, the government has adopted a number of measures, including the removal of the statute of limitations on pension claims. The SIA will be abolished in 2010 and its record-keeping and contribution-collection functions privatised,

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with a new regulatory body to oversee administration. Individual members have received, or will soon receive, a detailed statement of their pension history.

Greece has streamlined its pension provision, by merging 133 pension schemes into 13. A centralised database and unique identification numbers should reduce administrative costs, improve compliance and reduce the problems of unmatched records that caused difficulties in Japan. Sweden will merge the bodies responsible for mandatory defined-contribution plans (the Premium Pension Authority) and the public pension (consisting of notional accounts and a minimum pension). However, individuals will still be able to choose the way their defined-contribution pensions are invested.

Other measures have aimed to reduce administrative costs and charges for private pensions. In Mexico, workers have been encouraged to switch to lower-cost providers. Poland recently announced plans to bring forward a reduction in the ceilings on charges for private pensions from 2014 to next year. The Slovak Republic has proposed lower fees and a stronger link between charges and performance. The United Kingdom has a long-term target for administrative charges of 0.3% of assets per year (and 0.5% at the time of the introduction) for the new national pension savings scheme. This compares with a ceiling of 1% on charges for existing stakeholder pensions. To keep costs low, the United Kingdom will operate a central clearing house for contributions, along the lines of the administrative body in Sweden.

6. Security of benefits

Pensions are inherently risky because they are long-term contracts: on average, people will spend nearly 60 years from the time of their first contribution to the time they receive their last benefit. The recent financial crisis has highlighted the importance of investment risk as more people are covered by defined-contribution, private pension plans in many OECD countries.[6]

Diversification is the key to limiting investment risk without undue sacrifice of investment returns. In Belgium, Canada and Mexico, for example, pension funds are now freer to invest in a wider range of assets than before. Australians now have greater choice over both the manager of their pension fund and the way it is invested.

A way of further mitigating investment risk is to encourage workers to shift their pensions into less risky assets as they near retirement. Hungary will now automatically switch workers' investments in this way. Mexico has increased the range of investment choice to members of defined-benefit schemes. Poland will introduce a system of three funds of different risk-return characteristics from each provider. Only younger workers will be able to choose the riskiest of the three. The new national pension saving scheme in the United Kingdom will put contributors by default into a "lifecycle" fund that automatically reduces portfolio risk as workers age. New regulations in the United States will make it easier for employers to offer default investment options of this type.

Iceland will strengthen the finances of its defined-benefit occupational plans by increasing the mandatory employer contribution.[7] The United Kingdom has made arrangements to protect defined-benefit occupational pensions through a Pension Protection Fund (similar to the Pension Benefit Guaranty Corporation in the United States) and a financial-assistance scheme. However, the ongoing financial and economic crisis will further strain occupational pension schemes in all of these countries. The special chapter on "Pension systems during the financial and economic crisis" further discusses recent changes in the regulation of private pensions in response.

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New indexation procedures in Portugal and Turkey should improve the protection of the purchasing power of pensions in payment.[8] However, the new policy in Turkey offsets the effect of other reform measures that improve the long-term financial sustainability of public pensions by cutting benefits and increasing the pension age.

7. Pension reform: process and politics

The period of 2004-08 has been one of evolution rather than revolution in pension systems. Most OECD countries have taken further steps during the past few years to make their retirement-income provision fit for the long term.

Nevertheless, there has been none of the wide-ranging, systemic reforms that took place in the decade up to 2004. In that period, Hungary, Mexico, Poland and the Slovak Republic introduced defined-contribution plans as a substitute for part or all of public pension provision. This marked a major break with the past, when the government was essentially a monopoly provider of pensions. Also, there were major changes to pension systems in the decade up to 2004 that have improved the long-term financial sustainability of public pensions. In the 16 OECD countries that undertook major reforms in that period, the effect was to cut lifetime pension benefits by an average of 22% for men and 25% for women. France, Germany, Italy and Portugal, for example, all substantially reduced benefits for future retirees.

In some countries, the reform process has stalled. The administration's proposal in 2001[9] to substitute defined-contribution plans for part of public, earnings-related pensions in the United States failed to achieve legislative support. Indeed, the United States is one of the few OECD countries where there have been no significant changes to public pensions since the 1980s. In Norway, too, more far-reaching reforms proposed by an independent commission were rejected by the parliament. The result was a modest compulsory defined-contribution plan, extending coverage to 40% of workers who did not already have an occupational pension scheme. The coalition government in Austria fractured over the issue of pension reform. The adoption of a link between life expectancy and retirement benefits was particularly controversial. Finally, a series of reports from independent groups and government discussion papers have yet to forge a consensus over the direction of pension reform in Ireland. Some favour mandatory pensions on top of the existing basic pension, while others do not. Among those supporting a compulsory second pension, there are people who favour a publicly provided, earnings-related scheme and others who prefer private, defined-contribution schemes.

In other countries, the reform process has slowed or even gone into reverse. Legislated changes in Italy that would have increased the pension age and reduced benefits to reflect increased life expectancy have been postponed. In the Slovak Republic, workers covered by the new defined-contribution plans have been allowed to switch back to the public system, although few have chosen to do so.

In conclusion, the financial and economic crisis means that governments' attention is focused, more than ever, on the short term. This brings with it two dangers. The first is that long-term, strategic planning – so vital to retirement-income policy – is set aside. The second is that more governments may be tempted by short-term expediency to backtrack on earlier reforms by, for example, relaxing rules for early retirement as labour-market conditions worsen. It remains necessary, in spite of these pressures, that governments take steps to ensure that public policies deliver a retirement-income system for the long term that is secure, adequate, financially sustainable and economically efficient.

Table 3.1. **Pension reforms: 2004-09**

	Coverage	Adequacy	Financial sustainability	Economic efficiency	Administrative efficiency	Security
Australia		Increase in target value of age pension from 25% to 27.7% of average earnings. Increase in age pension for single pensioners to two-thirds of the rate for couples. One-off payment of AUD 1 400 to single pensioners and AUD 2 100 to couples (Dec. 2008) as part of economic-stimulus package.		Increase in pension age from 65 to 67 in 2017-23. Lower deduction from mean-tested benefit entitlement for financial assets, from 7.8% of value to 3.9%, to promote voluntary saving.		Future fund established to prefund benefits of public-sector employees. Aim to achieve full funding by 2020. Choice of pension provider in mandatory DC scheme.
Austria						
Belgium		Increase in minimum pensions additional to standard indexation.		Increase in pre-pension eligibility age from 58 to 60 between 2008 and 2012. Abolition of social security tax exemption for sabbatical leave under the "time-credit" programme. Tighter job-search requirements before older unemployed eligible for early-retirement benefits.		Adoption of "prudent-person" rule for portfolio allocation of private pensions.
Canada						Relaxation of limits on foreign investments.
Czech Republic				Gradual increase in pension age to 65 for men and women by 2030; increase in contribution years required from 25 to 35.		
Denmark				Increase early pension age from 60 to 62 between 2019 and 2022; increase normal pension age from 65 to 67 between 2024 and 2027; link both ages to life expectancy thereafter.		
Finland		New guaranteed pension to be introduced from 2011. Cuts in taxes on pensions worth between EUR 15 000 and 30 000 to bring pensioner tax into line with worker tax.	Earnings measure moves from final ten years to lifetime average. Link between benefits and life expectancy.	Changed adjustments for early and last retirement. Increase in early pension age from 63 to 65 over the period 2011-22 (proposal).		

Table 3.1. **Pension reforms: 2004-09** *(cont.)*

	Coverage	Adequacy	Financial sustainability	Economic efficiency	Administrative efficiency	Security
France	New individual retirement-saving plan (PEIR) allowing 10% of earnings up to EUR 24 000 to be contributed with tax privileges.	Increase in minimum pensions additional to standard indexation.	Indexation of public-sector pensions with prices rather than wages.	Employers only able to have compulsory retirement at 70 rather than 65. Increase in contribution years for public-sector workers from 37.5 to 40 by 2012; reduction in benefits for early retirement of public-sector workers. Gradual abolition by 2010 of "Delalande" tax on firing of workers over 50. Increment for working age 60-65 raised from 3% to 4% and 5% from age 65.		
Germany	Extension of social security tax exemption (due to expire in 2008) for DC OP contributions up to 4% of earnings.	Increase pensions by 1.1% in 2008 (rather than 0.46% under the 2005 rules); increase of 2.41% in 2009 (rather than 1.76%). Pensions were not increased in the period 2003-06.		Gradual increase in normal pension age from 65 to 67 between 2012 and 2029. (However, early retirement age will remain at 63, subject to benefit reductions.)		Relaxation of limits on foreign investments of Pensionskassen.
Greece	New administrative arrangements (see right) aim to increase compliance with and coverage of public schemes.	One-off payment of EUR 100-200 to pensioners.		Equalise normal pension ages for men and women at 65; early retirement from 55 with at least 15 years' contributions.	Merger of 133 pension funds into 13 schemes; centralised database of members and employers; unique identification numbers issued of individuals.	
Hungary	New voluntary retirement savings account with government matching contributions up to HUF 100 000 a year; accounts also exempt from capital gains tax (introduced in 1997) and broader range of investments than current plans are allowed.		Abolish 13th-month payment for pensions above HUF 80 000 per month. Price indexation of pensions in payment instead of mixed earnings/prices. Postponement of indexation adjustment for 2009 until 2010.	Increase pension age from 62 to 65 starting in 2012. Tighter conditions for early retirement brought forward from 2013 to 2011.		Pension funds to offer three different types of fund; automatic lifecycle adjustment of portfolio.
Iceland			Pensions for senior public officials to be cut.			Increase mandatory employer contribution to OPs from 6% to 8%; requirement to reduce benefits if actuarial shortfall of 10% in one year or 5% for each of five years to restore solvency of OP.

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Table 3.1. **Pension reforms: 2004-09** *(cont.)*

	Coverage	Adequacy	Financial sustainability	Economic efficiency	Administrative efficiency	Security
Ireland			Contribution levy, averaging 7.5%, on members of civil-service pension scheme.	Reductions in civil-service pensions for early retirement.		Annuities for OPs that are wound up to be provided by new Pensions Insolvency Payment Scheme run by the government.
Italy	Companies' (with more than 50 employees) severance-pay schemes to be converted into pension plans; choice of employer plan, other private provider or government-run scheme. (The last is the default option.) Government predicts around a third of contributions will go to new OPs, a third to the government scheme and a third to remain in severance-pay schemes.		Reduction in transformation coefficient used to convert NDC balances into pensions from 2008 to reflect changes in life expectancy. Cuts in pensions range from 6.4% for new retirees aged 57 to 8.5% for 65-year-old retirees.	Increase full pension age from 57 to 58 in 2008 and 60 from 2011; increase in contribution years for full pension from 35 to 36 years. (However, this delays earlier laws to reach age 60 from 2008). Phased increase in normal pension age for women to 65 (proposal).		Limits on companies' ability to take short- or medium-term loans from severance-pay plans.
Japan				Compulsory retirement age that employers can apply to private-sector workers increased 60-65 in the period 2006-13.	Problem of 50 million pension records unmatched with individuals: Social Insurance Agency to be replaced with a new regulatory body from 2010; elimination of five-year limitation on retrospective pension claims.	
Korea	New firms required to set up DB or DC OPs rather than severance-pay schemes; existing employers must ballot employees on whether to maintain severance pay or switch to Ops.	Doubling in value of basic pension from 5% to 10% of average earnings; extension of coverage from 60% to 70% of over 65s.	Gradual cut in target RR from 60% to 40% from 2028	"Wage-peak" system: government subsidies pay of over 53s who stay in jobs while taking a pay cut. Encouraging longer careers through earlier labour market entry (shorter military service, periods in education).		
Luxembourg						

Table 3.1. **Pension reforms: 2004-09** *(cont.)*

	Coverage	Adequacy	Financial sustainability	Economic efficiency	Administrative efficiency	Security
Mexico			DC scheme for public-sector workers (like the scheme for private sector); new employees must join; workers under 46 can choose DC option or remain with DB plan. (7% of employees work in the public sector).		Charges restricted to those on account balances; switching to low-cost providers encouraged. (Charges are currently double the average in Latin America).	Extension of investment choice in DC plan from two to five portfolios per manager, with up to 30% equity share.
Netherlands				Tax advantages for early-retirement OPs abolished. Increase in normal pension age from 65 to 67 in 24 monthly steps (proposal).		Stronger governance of OPs; clear statement of OP indexation policies; solvency buffer against future liabilities for OPs; market valuation of OPs' assets.
New Zealand	KiwiSaver: DC scheme with automatic enrolment; government match of contributions up to NZD 1 040; one-off payment of NZD 1 000 when account opened; contributions of either 4% or 8% for employees (now reduced to 2% minimum); employer contribution of 1% rising to 2%.					
Norway	Minimum employer contribution of 2% to DC plan from 2006 unless superior arrangements already in place, extending coverage to 25% of workforce.					
Poland	New voluntary DC plan with tax incentives.			New rules for occupations retiring early, cutting eligible numbers from 1.3 million to 0.25 million. Time limits on new rules.	Tighter limits on charges for DC plans.	Choice of investment portfolios between three options. Rules for payout of DC benefits set out, through programmed withdrawals and mandatory annuitisation at 65.
Portugal	New centrally managed, voluntary DC plan, with contributions of 2% or 4% for under 50s and 6% for over 50s.		Cut pension benefits with life-expectancy increases from 2008; accelerated shift to lifetime earnings measure.			Indexation of pensions in payment to mix of prices and GDP growth rather than changes in minimum wage.

Table 3.1. **Pension reforms: 2004-09** *(cont.)*

	Coverage	Adequacy	Financial sustainability	Economic efficiency	Administrative efficiency	Security
Slovak Republic					Tighter limits on charges for DC plans.	
Spain		Increase in minimum pensions of 6.4%.				
Sweden		Cut taxes on over 65s with incomes up to SEK 363 000 from 2009, affecting 90% of pensioners.	DB OP scheme for white-collar workers in private sector converted to a DC scheme.	Cut employers' social security contributions by 1% from 2009.	Merger of bodies managing public and mandatory DC plans.	
Switzerland	Lower earnings threshold to cover more low-paid and part-time workers.		Reduction in minimum interest rate for mandatory OPs from 2.75% to 2% for 2009. (However, this had earlier increased from 2.5% in 2007 to 2.75% in 2008.) Reduction in annuity rate for mandatory OPs from 7.2% to 6.8-7.15%, depending on age and sex.	Increase in normal pension age for women from 63 to 64. (Men's pension age remains at 65.)		
Turkey				Gradual increase in pension age from 58 for women and 60 for men to 65 for both by 2048.		Change benefit adjustment from monthly price indexation to annual changes to a mix of price inflation and GDP growth.
United Kingdom	National pension savings scheme from 2012: automatic enrolment of 22-65 year olds without an OP or PP; employee contribution of 4%, employer of 3% and government of 1% phased in. Reduction in number of years required for full basic pension to 30.	Basic pension to be indexed to average earnings from 2012; increases 2004-08 in line with earnings. Acceleration of change of state second pension from an earnings-related to a flat-rate scheme, with initial benefits indexed to average earnings; improved credits for carers.		Increment for late retirement raised from 7.4% to 10.4% a year; increment now payable as a one-off bonus.	Central clearing house for new national pension savings scheme; aim to have costs of 0.5% of balance initially, falling to 0.3%. New Pensions Regulator established in 2005, combing previous agencies.	Pension Protection Fund, to insure defined-benefit plans, established in 2004. Premiums paid by plans, related to measures of risk, double the originally predicted level. Tightening of recovery rules for plans in deficit. Extension of Financial Assistance Scheme for insolvent OPs, covering 140 000 extra workers.
United States	Employers permitted to enrol employees automatically in pension plans.					

DB = defined benefit; DC = defined contribution; NDC = notional accounts; OP = occupational pension; PP = personal pension; RR = replacement rate.

Notes

1. OECD (1998, 2001), for example. The World Bank has also set out a similar list of aims: see Holzmann and Hinz (2005).
2. OECD (2007), Part II.1. See also Martin and Whitehouse (2008) and Whiteford and Whitehouse (2006).
3. See the special chapter on "The pension gap and voluntary retirement savings" in this volume, Antolín and Whitehouse (2009) and Queisser *et al.* (2007) for more details on this policy.
4. See Whitehouse (2007) for more details.
5. See OECD (2006) for a detailed policy analysis.
6. See the special chapter on "Pension systems during the financial and economic crisis" in this volume.
7. However, the financial and economic crisis is especially acute in Iceland, and so it remains to be seen how occupational pension funds will withstand these strains.
8. See Whitehouse (2009) for a detailed analysis of inflation risk and pension indexation.
9. President's Commission to Strengthen Social Security (2001).

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4. The Pension Gap and Voluntary Retirement Savings

Most OECD countries have seen major pension reforms over the last 20 years. The main, although not the sole, motivation for these changes has been to strengthen the financial sustainability of public pensions. In the 16 OECD countries with the most wide-ranging reforms, lifetime retirement benefits have been cut on average by 22% for men and 25% for women.[1]

The scale of such cuts implies a significant rebalancing of responsibility for pension provision between the public and private sectors. Today's workers will either need to save more in voluntary, private pension plans, retire later or see a lower income in old age relative to earnings when working than under pre-reform parameters and rules. Indeed, this amounts to implicit or explicit "privatisation" of part of the retirement-income system.

This special chapter[2] begins by exploring the difference in mandatory pension entitlements between OECD countries. It then focuses on 16 countries with particularly low mandatory pensions. In these countries, many people who fail to save will see a precipitate drop in living standards as they move from work into retirement. Based on the shortfall in replacement rates from mandatory schemes in these countries compared with the OECD average, the OECD pension models are then used to calculate the proportion of earnings that should be saved in order to fill this pension gap. The analysis moves from results for individuals on average earnings to people across the earnings range.

Having established who needs to save for retirement and how much they need to save in different countries, the chapter goes on to look at data on retirement-savings behaviour. First, it looks at how coverage of voluntary, private pensions varies with age and income. Secondly, it presents information on contributions.

The chapter concludes by exploring different policies to encourage private retirement savings. The most obvious policy is to mandate participation. However, more flexible approaches include soft compulsion (*e.g.* automatic enrolment with the possibility of opting out); facilitating individuals' access to retirement-saving instruments; policies to improve financial awareness; and preferential tax treatment of retirement savings.

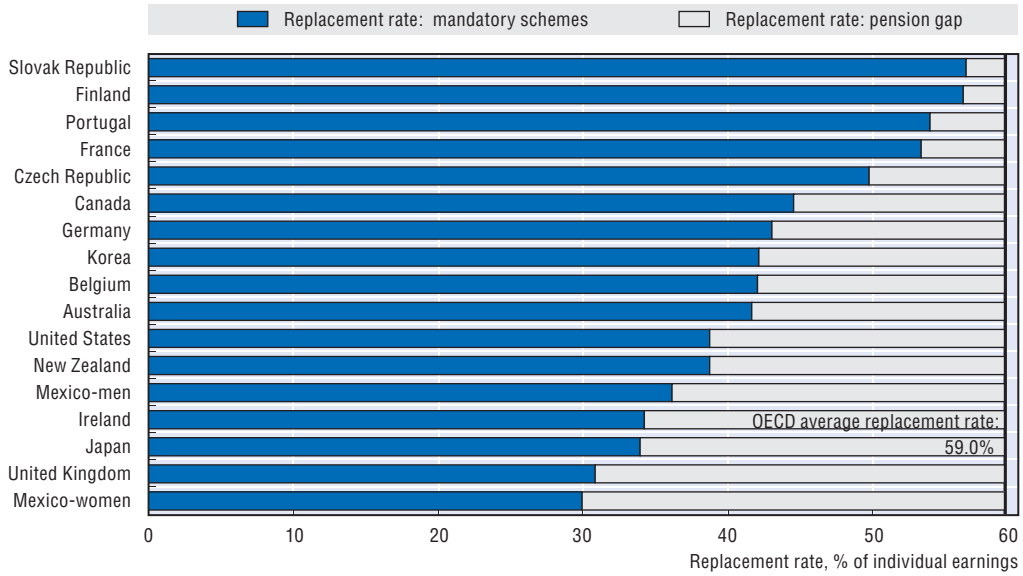
1. The pension gap

The replacement rate – the relationship between income in retirement and earnings when working – is widely used to illustrate cross-country differences in pension systems. Data on the 30 OECD countries, provided in Part III of this report, show that the average gross replacement rate for an average earner is 59.0%.

Figure 4.1 shows the projected gross replacement rate for average earners for 16 countries where this is below the OECD average. The calculations include all *mandatory* programmes for providing retirement income, which can include compulsory private pensions and broad social-assistance schemes. This group of 16 countries includes all six of the mainly English-speaking members of the OECD: Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States. It also includes the two East Asian OECD members – Japan and Korea – and a selection of continental European countries, including Belgium and Germany.

Figure 4.1. **The pension gap**

Gross replacement rate for an average earner from mandatory pension schemes and difference from OECD average replacement rate



Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651244736381

In many of these countries, coverage of voluntary private pensions is widespread because mandatory provision is relatively small. However, even among these 16 countries, the need for additional retirement income from voluntary savings varies considerably because mandatory replacement rates differ between countries.

To calculate the varying need for retirement savings in different countries a target replacement rate is needed. As in previous OECD analysis, the benchmark replacement rate used is the average replacement rate from mandatory pensions in all OECD countries. The difference between the replacement rate from the mandatory pension system and the OECD average is called the "pension gap".

In the United Kingdom, private pension schemes would need to deliver a replacement rate of 28.2% to bring the overall pension of an average earner up to the level of the OECD average. Finland and the Slovak Republic have the smallest pension gap of the 16 countries analysed: around 2.5% of earnings. For the 16 countries as a whole, the replacement rate from mandatory pensions is 41.8% for average earners. This implies a pension gap of 17.2% on average. For Mexico, the results for men and women are different because annuities are calculated on a sex-specific basis and so women must spread their accumulation over a longer retirement period.

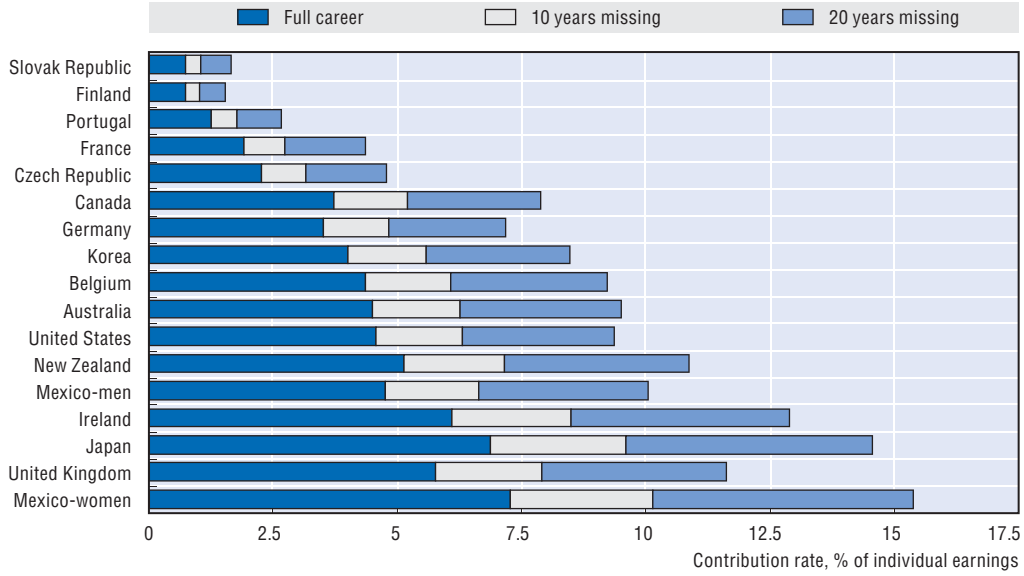
It is also important to remember that, like the rest of the report, the analysis considers the parameters and rules of the pension system for people entering the labour market in 2006. This assumption is particularly important when analysing the position in Mexico, because all existing workers were guaranteed that their defined-contribution pension would be topped up by the government to reach the same level as the level under the pre-reform, earnings-related scheme. The OECD pension models suggest that the replacement rate for workers already in the labour market at the time of the reform will be around double that offered by the defined-contribution scheme under the standard assumption for the rate of return (see OECD, 2007, pp. 65-66).

How much will people have to contribute to voluntary, private pensions to lift overall replacement rates from the national, mandatory level to the average for OECD countries? For simplicity and comparability, the calculations assume that people with voluntary pensions have a defined-contribution plan, where the value of the benefit depends on contributions and investment returns.[3] The modelling makes the same general assumptions as the calculations in Part II of the report. In particular it assumes an annual real return of 3.5% on pension savings, net of administrative charges.

Figure 4.2 shows the percentage of earnings that an average earner would need to pay into a private pension plan to plug the retirement-savings gap in the respective country. Countries are ordered in the same way as in Figure 4.1, that is by the size of the pension gap. The darkest bars show the contribution rate needed with a full history, that is contributions in each year from age 20 to the normal pension age in the country.

Figure 4.2. **Filling the pension gap**

Contribution rate required for average earner to reach OECD average gross replacement rate



Source: OECD pension models.

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The chart shows the impact of different national pension ages. The required contribution rate in Germany, the United Kingdom and the United States is lower because pension ages will increase to 67 or 68. Similarly, lower pension ages below 65 – in France and the Slovak Republic – reduce the number of contribution years and increase the retirement duration.

Differences in life expectancy also have an effect. In Mexico, for example, 65-year-olds are projected to live an extra 17.6 years, while this figure is 22.2 years in Japan. Longer life expectancy, of course, increases the required contribution rate because the pension that it finances must be paid for a longer period.

Effect of incomplete contribution histories

With a full contribution history, the proportion of earnings that would need to be paid into retirement savings plans to fill the pension gap is not generally large: around 6% in Ireland and the United Kingdom and around 7% in Japan. In many cases – Australia, Belgium, Canada, Germany, Korea and the United States – the required contribution rate is 3.5-4.5%.

However, as discussed later in this special chapter, workers are unlikely to have full contribution histories. The lighter bars show two scenarios: one with 10 missing contribution years, the other with 20. It is assumed that these missing years occur at the start of the career: that is, people delay joining a private pension until they are 30 or 40 years old. For the countries shown, the average of the required contribution rate increases from 4.0% with a full career to 5.5% with ten missing years and to 8.4% with 20 years missing.

Effect of individual earnings

The analysis so far has focused on the position of average earners. For lower earners, however, safety-net benefits tend to play a more important role in providing retirement incomes. This can mean higher replacement rates than received by average earners. At the other end of the scale, ceilings on pensionable earnings can mean lower replacement rates for higher earners.

Figure 4.3 shows how replacement rates vary with earnings in the 16 countries under study relative to the OECD average. Workers with 50% of average earnings have an average replacement rate of 72% across the 30 OECD countries, compared with 59% for workers on mean earnings. At double average earnings, the replacement rate averages 50%. How do the countries measure up against this benchmark?

In the left-hand panel of Figure 4.3, the pension gap is broadly constant with earnings in Japan and the United States: the progressivity of mandatory pensions there broadly matches the average pattern among OECD countries.

In Germany, the replacement rate from the mandatory system is constant from 50% of average earnings to the ceiling of around 150% of average earnings. The pension gap, relative to the OECD average replacement rate by earnings, is therefore larger for *low* earners than it is for average earners. In Finland, Portugal and the Slovak Republic, the replacement rate is close to constant across the earnings range. This means that high earners would have a replacement rate above the OECD average, while low earners would need to make voluntary retirement provision to meet the OECD replacement rate at that level of pay.

The countries in the right-hand panel show the opposite pattern. Indeed, in Canada, the Czech Republic and New Zealand, the mandatory replacement rate for low earners exceeds the OECD average: there is no pension gap for these workers. The gap is very small for the low paid in Australia and Ireland. The pension gap increases with earnings in eight countries at the right of Figure 4.3. For high earners (at 200% of mean earnings), mandatory replacement rates are less than 25% in Belgium, Canada, Ireland, New Zealand and the

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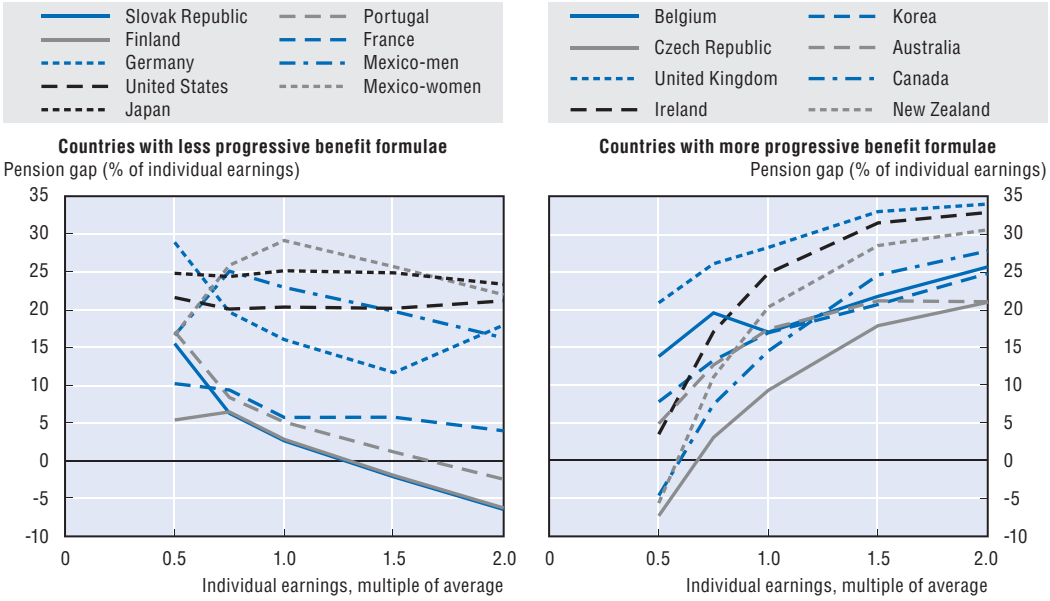
Figure 4.3. **The pension gap and individual earnings**

Difference between mandatory, national and OECD average replacement rate



Note: Countries have been grouped according to the OECD index of progressivity of pension benefit formulae.

Source: OECD pension models.

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United Kingdom, compared with the benchmark OECD average of 50%. The pension gap is 27% on average for high earners in the eight countries in the right-hand panel. This compares with just 4% for workers with half-average pay.

Figure 4.4 explores the implications of differences in mandatory replacement rates by earnings on the need to save for old age to reach the benchmark, overall replacement rate. Countries are grouped in the same way as in Figure 4.3. The analysis assumes that people have ten years missing from their contribution history for voluntary plans (that is, they start paying in from age 30 but then contribute in each year until the national, normal, pension age).

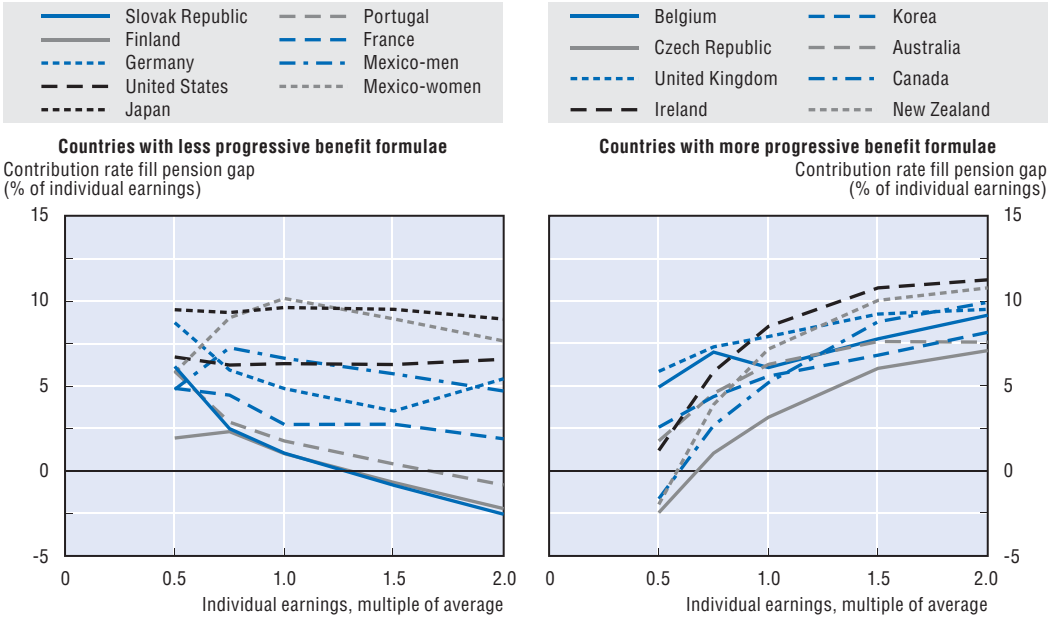
In the right-hand panel, the required contribution rate increases with earnings. For example, in Canada, the Czech Republic and New Zealand, there is little or no need for low earners to provide for their own retirement because mandatory schemes already do this. In Australia, Ireland and Korea, the required contribution rates for people earning half of the average is 2.5% of earnings or less. Averaging across the eight countries in the right-hand panel, the required contribution rate is less than 1.5% for low earners, 6% for average earners and 9% for high earners (with double average pay).

The left-hand panel of Figure 4.4 shows countries with less progressive pensions than at the right of the chart. Workers in Japan and the United States need to save a similar proportion of their pay across the earnings range: around 9.5% and 6.5% of pay respectively. This suggests that the degree of progressivity in the mandatory pension systems of Japan and the United States is close to the average among OECD countries.

In contrast, replacement rates in Germany are constant over much of the earnings range. To reach the higher target replacement rate for low earners would require much higher contributions of nearly 9% of pay compared with around 5% for average earners. There are similar patterns in Finland and Portugal.

Figure 4.4. **Filling the pension gap at different earnings levels**

Contribution rate with ten contribution years missing required to reach OECD average gross replacement rate



Note: Countries have been grouped according to the OECD index of progressivity of pension benefit formulae.

Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651335460125

Effect of taxes and means testing

The calculations so far have looked only at gross pension entitlements whereas it is obviously income net of taxes and contributions that determines living standards, both in work and in retirement. The effects of taxes and contributions on the results are complex. A relatively high tax on old-age income increases the need to contribute to reach a certain living standard. In contrast, high taxes and contributions paid by workers increase the net replacement rate and so reduce the need to contribute compared with other countries and compared with workers at different earnings levels.

The calculations have also assumed that voluntary private pension savings feed straight through to retirement income and so did not take account of the fact that benefits are means-tested in some countries. Extra private pension therefore results in lower public retirement benefits. Means-testing therefore increases the need to contribute for people affected.

Figure 4.5 compares gross and net calculations of the contribution rate required to reach the OECD average (gross or net) replacement rate at different levels of earnings for selected countries. Australia illustrates the effect of broad means-testing, where even middle and high earners are affected. For an average earner, for example, an individual would need to pay 13% of their earnings into a voluntary pension plan – in addition to the 9% mandatory contribution – to reach the OECD average net replacement rate. This is because income from a private pension currently results in a reduction in entitlement to the public pension of 40% of its value at the margin.

In Germany, in contrast, the net pension gap is smaller than the gross across nearly all of the earnings range. The required contribution rate is highest for low earners measured in both gross and net terms because the German pension system offers a constant replacement rate for workers up to the pension ceiling, while the OECD average replacement rate has a progressive structure, with higher replacement rates for low earners. The main driver of the

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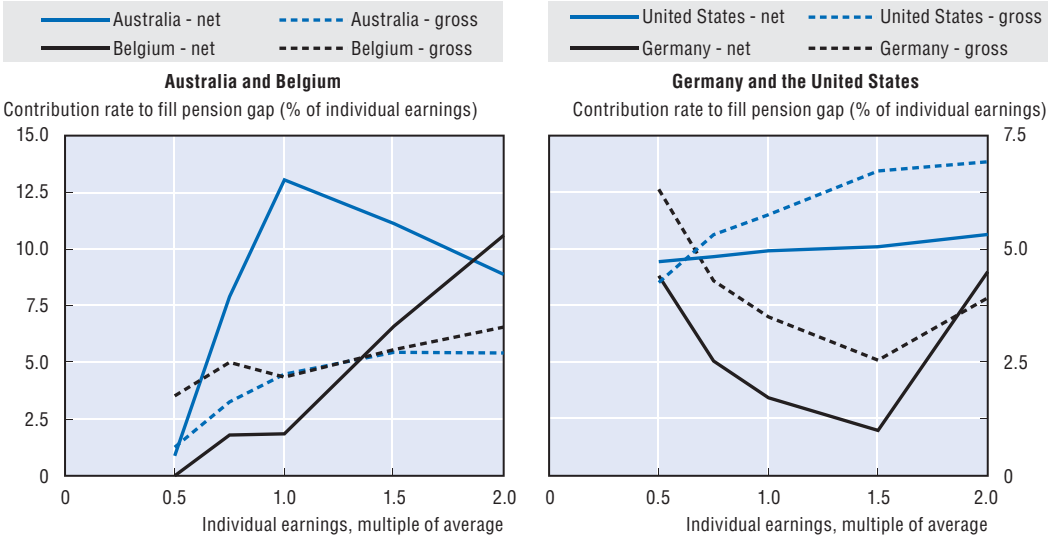
Figure 4.5. **Filling the pension gap: the impact of taxes and means-testing**

Contribution rate with a full history required to reach OECD average (gross and net) replacement rate by earnings in Australia, Belgium, Germany and the United States



Note: The vertical axis differs between the two panels of the figure for reasons of clarity.

Source: OECD pension models.

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large difference between gross and net measures of the contribution rate needed to fill the pension gap is the relatively high tax burden faced by both workers and pensioners in Germany.

The effect of taxes on the pension-gap calculations is most dramatic for Belgium. For low and middle income workers, taxes and contributions are relatively large but little or no tax is due in retirement. This significantly reduces the required contribution rate. However, higher earners will also pay a significant slice of their income in taxes during retirement. This increases the required contribution rate on a net basis compared with the calculations on a gross basis.

Finally, in the United States, the pattern of required contribution rates is very similar on a gross and net basis. This is also the case in many of the countries not shown: Canada, Ireland and the United Kingdom, for example.

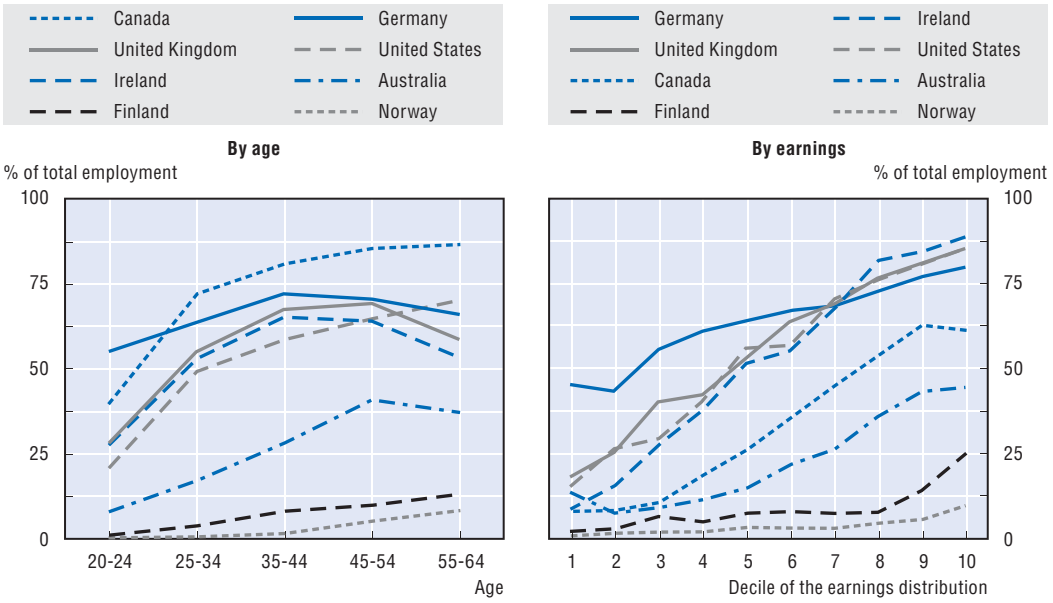
2. Coverage of voluntary private pensions by age and earnings[4]

The evidence on coverage of private pensions, obtained from household surveys, deals with eight OECD countries in most of which mandatory schemes provide a relatively low replacement rate. In these cases, people need voluntary pensions to complement their future retirement income.

Coverage of voluntary private pensions has a hump-shaped relationship with age, reaching a peak at prime working ages, *i.e.* 35-44 or 45-54, depending on the country (left-hand panel of Figure 4.6). However, young people are more likely to have a private pension in Germany than older people. This probably reflects the recent introduction of a tax-privileged retirement-savings plan. There is a fall in coverage rates at older working ages in most countries (with the notable exceptions of Canada and the United States). It could be linked to early retirement of people with private pensions (because of their greater pension wealth than people without private retirement-savings plans).

Figure 4.6. **Coverage of voluntary private pension plans**

Percentage of total employment



Source: Antolín, P. and E.R. Whitehouse (2009), "Filling the Pension Gap: Coverage and Value of Voluntary Retirement Savings", Social, Employment and Migration Working Paper No. 69, OECD; OECD analysis of national datasets (Finland and Norway).

StatLink http://dx.doi.org/10.1787/651406013027

Coverage of voluntary private pensions tends to increase with earnings (right-hand panel of Figure 4.6). However, it typically reaches a plateau after the 7th and 8th deciles of the distribution. Among the poorest groups, coverage is low: 10-20% in all countries, bar Germany (40%).

Although overall coverage of voluntary private pension plans is well above half of the employed population in many of the countries analysed, it is unevenly distributed. Younger workers and people with low earnings are much less likely to be members of voluntary pensions. The analysis of pension gaps in Section 1 of this special chapter showed that lower-income individuals can reach the OECD average replacement rate with little or no voluntary private retirement saving in Australia, Canada and Ireland. Low rates of coverage for low earners is therefore not as much of a policy concern as it is in the United Kingdom and the United States, where even low earners would need to save 4-5% of their earnings throughout their working lives to reach the benchmark replacement rate. Pension gaps for low earners are also relatively large in Germany, but coverage of private pensions is also high among these groups. These results suggest that some, but not all, OECD countries need to focus efforts to expand coverage among low earners.

The pattern of coverage by age suggests that most people who do eventually have a private pension only start contributing at age 30 or even later. These missing years in people's contribution history substantially increase the savings effort needed in the years when people do pay into their private pension. For example, delaying joining a pension from age 20 to 30 raises the required contribution rate by nearly a half (see Figure 4.2 above). The implication is that public policy needs to focus on younger workers, bringing forward the time at which people start contributing to private pensions.

3. Contributions to private pensions

Evidence on voluntary contributions to private pensions is available for only a few of the countries indentified as having a pension gap in Section 1 of this special chapter. Table 4.1 shows that contribution rates are close to (Belgium, Germany) or exceed the contribution rate required to eliminate the pension gap, conditional on a full career. However, once a period of missing contribution years is factored in, many more countries have a shortfall in average contribution rates (Belgium, Czech Republic, Germany). In the United Kingdom, the average rate is close to the required contribution rate with ten missing years. But in addition to uncovered workers, many people will be contributing less than the average. In Ireland, for example, the average contribution rate in defined-contribution plans is 10%, split equally between employers and employees. However, 30% of schemes have employee contribution rates below 5% while 18% of schemes have an employer contribution rate below 5%.

Table 4.1. **Total contribution rates in voluntary, defined-contribution pension plans**

Percentage of earnings

	Average contribution rate
Belgium	4.3
Czech Republic	2.5
Germany	4.0
Ireland	10.0
United Kingdom	8.8
United States	9.0

Note: Data for the United Kingdom relate to defined-contribution occupational plans and do not include people with personal pensions. Figures have been rounded.
Source: Antolín, P. and E.R. Whitehouse (2009), "Filling the Pension Gap: Coverage and Value of Voluntary Retirement Savings", Social, Employment and Migration Working Paper No. 69, OECD.

4. Policies to encourage private pension savings

Public pensions will be much lower for workers entering the labour market today than those offered to their parents and grandparents. This means that voluntary, private provision for old age is needed to maintain living standards into retirement. Indeed, many of the reforms to public pensions have been predicated on the assumption that voluntary retirement savings *will* increase. In some countries, such as Canada, Japan, the United Kingdom and the United States, this has long been the case. But it is a new phenomenon in others, such as France and Germany. Moreover, the need to save for old age now encompasses more of the population, including groups such as low earners who have not traditionally made active retirement-savings decisions.

Some data suggest that coverage of, and contributions to, retirement-savings plans are adequate. Others imply that there might be substantial gaps. This inconclusive evidence provides no grounds for complacency among policymakers. Fortunately, governments have been highly active in developing policies to encourage private pension savings.

Compulsion

Mandating contributions is an easy way to achieve both high coverage and a uniform distribution of coverage across age and earnings levels. In countries such as Australia,

Iceland, Norway and Switzerland voluntary private pensions historically had broad coverage (of 50% or more of employees). Governments simply made it mandatory for employers to organise and contribute to private pensions on their employees' behalf. However, the mandatory level of pension provision was generally below the customary level that prevailed when private pensions were provided voluntarily. A second policy has been to mandate private-pension contributions as a substitute for part of the public pension. Hungary, Mexico, Poland, the Slovak Republic and Sweden have all taken this route.

Other countries such as Denmark, Sweden and the Netherlands, do not directly mandate contributions to private pensions, but as a result of employment agreements, participation in private pensions is *de facto* compulsory ("quasi-mandatory") and coverage exceeds 85% of employees. Coverage of voluntary pension arrangements in Belgium and Germany has also edged upwards in recent years as a result of the establishment of industry-wide pension plans. However, this model is difficult to export to other OECD countries, where labour-market and industrial-relations structures are less amenable to achieving near universal coverage of private pensions.

The main argument for compulsion is that it protects people from the regret of not having saved enough for their retirement when they were younger. It also protects societies from having to pay for safety-net benefits for those feckless people who did not provide for old age. Implementing this paternalistic approach is simple: it involves choosing a target replacement rate (which may or may not vary with earnings) and then ensuring that people reach that target through either public retirement-income provision or mandatory private pension plans.

An important, but sadly unresolved question is whether compulsion is necessary. Are people myopic? Left to their own devices, will they fail to save enough for retirement? The analysis of pensioner incomes in the special chapter above on "Incomes and poverty of older people" suggests that, adjusted for household size, these tend to be 75-85% of the average income for the population as a whole. But there is no link between relative incomes and the type of pension system. Voluntary, private pensions play an important role in Canada and the United States where older people's relative incomes are above the OECD average. However, the same is true of Ireland with the lowest old age incomes and the United Kingdom, which are towards the bottom. The OECD (2001) has described this phenomenon as "convergent outcomes, divergent means". These data provide some evidence against the myopia hypothesis.

There are also arguments against compulsion.

- First, even if individuals are myopic, it does not mean that greater mandatory pension provision is always a good thing. Mandating retirement saving means choosing a target replacement rate. However, this is difficult to determine but important to get right. The losses in terms of individual welfare from forcing people to over-save can be as great as the losses from myopia and under-saving. For example, resources diverted to retirement savings might come at the expense of devoting the necessary amounts to raising and educating children.
- Secondly, formal pension plans are not the only way people can and do save for retirement. People might want to invest in property or their own businesses. This perfectly rational behaviour may not be possible with large, mandatory savings through formal pension schemes.

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- Thirdly, mandatory contributions to pensions are often perceived as a tax, which is likely to discourage people from working.
- Finally, the providers of voluntary pension arrangements – especially occupational pension schemes – have often opposed compulsion because it would crowd out these existing plans. There is also the risk that existing provision is reduced if the target set by the government is lower than prevailing norms.

Soft compulsion

Mandating pensions has disadvantages while purely voluntary pension provision runs the risk of under-saving. Automatic enrolment into private pensions means that people have to opt out of saving for retirement rather than opt in. The goal is to increase participation while preserving individual choice. Many people report in surveys that saving for retirement is important and that they feel they should be planning for old age (OECD, 2005). Unfortunately, this often does not translate into action. An obvious reason is that signing up for a pension plan can be long and complex while information about and understanding of saving options can be missing. Automatic enrolment is designed to turn procrastinators into retirement savers.

A number of employer-provided pension plans in the United Kingdom and the United States have long used automatic enrolment to increase coverage among their employees. In the United States, there has recently been rapid expansion of automatic enrolment in defined-contribution occupational plans [known as 401(k)s after the relevant clause of the tax code] from 8.4% in 2003 to 16.9% in 2005. This has been led by larger schemes. In 2002, just 17% of these had automatic enrolment, increasing to 41.3% by 2006. This is likely to increase further as a result of legislative changes that removed obstacles to automatic enrolment.

An analysis of the United Kingdom distinguishes four different enrolment procedures. Some 44% of employees used a process of "streamlined joining", meaning just signing a pre-completed form (McKay, 2006). Only 19% of employees were covered by a plan with full automatic enrolment, that is, requiring an active opt out. As in the United States, both of these enrolment procedures were more common among larger employers. Traditional opt-in accounted for 19% of plans, weighted by the number of members.

Automatic enrolment is now being implemented on a national scale. New Zealand has already adopted such a policy and the United Kingdom will do so shortly. There has also been active discussion of such programmes in Germany, Ireland and the United States.

The key question about automatic enrolment is: Does it work? Despite growing enthusiasm for automatic enrolment, evidence of its impact is fairly limited. One of the most widely cited papers – Madrian and Shea (2001) – looks at the experience of a single employer in the United States. Before automatic enrolment, only 57% of people who had been with the company for less than three years had joined the occupational plan, increasing to 80% or more for people with tenure of ten years or more. In the first 18 months of automatic enrolment, coverage increased to 86%. Similarly, Beshears *et al.* (2006) found a 35 percentage point increase in coverage for people with three month's tenure in another firm, falling to 25 points at two years' tenure. These results tend to suggest that automatic enrolment brings forward people's decision to join a company pension plan but that coverage of long-term employees does not increase as much.

Horack and Wood (2005) looked at 11 company pension schemes in the United Kingdom that changed their enrolment arrangements. Two firms that introduced automatic enrolment increased coverage; from 25% to 58% and from 45% to 62% respectively. The other two firms already had very high coverage rates of 86% and 88%, most likely because the schemes did not require employee contributions. Automatic enrolment increased coverage to 92% and 100% respectively. Another survey, carried out for the Department of Work and Pensions, found coverage of 41% with traditional opt-in compared with 60% with automatic enrolment (McKay, 2006). These figures relate to larger employers (with more than 20 employees). Among smaller employers, coverage was virtually the same with traditional and automatic enrolment (at 67%).

New Zealand's KiwiSaver, introduced in July 2007, is the first national implementation of automatic enrolment (see Rashbrooke, 2009). Employers must enrol new employees into the scheme and individuals have two months to opt out. So far, the proportion of workers opting out has averaged around one third. Unsurprisingly, opting out is more widespread among younger workers (37% of 25-34 year olds, for example) than older (25% for people aged 55 or over). However, analysis of the policy in New Zealand is complicated by the generous incentives to join KiwiSaver. For example, 47% of members are people who opted in to the scheme through a financial-services company and a further 17% did so through their employers. Thus, only 36% of KiwiSavers can for certain be said to be in the plan because of automatic enrolment.

Taking these studies as a whole, they suggest a potentially large effect of automatic enrolment on coverage of private pensions. However, it is always best to be wary of generalising from a small number of case studies. And there are many reasons to expect experience with national schemes for automatic enrolment is likely to be different than with employer-provided plans. There is a clear need for further evidence before evaluating the effectiveness of soft compulsion in extending coverage of private pensions.

- First, if automatic enrolment simply mitigates procrastination, bringing forward the starting point for retirement saving, then the effects on future pensions will not be large.
- Secondly, longer-term data are needed to assess the degree of persistence in pension coverage. For example, workers may, over time, overcome their inertia in the opposite direction and realise that opting out is a quick way of increasing current income.
- Thirdly, it is important to investigate the way in which individuals finance the contributions to automatic-enrolment retirement savings schemes (see the analysis of tax incentives below).
- Finally, the schemes with automatic enrolment have also involved sizeable subsidies to individual savings. This is most obvious with the government's contribution to KiwiSaver accounts in New Zealand. But the occupational plans in the United Kingdom and the United States all involved employer contributions of varying sizes. Care is therefore needed to isolate a "pure" automatic enrolment effect on coverage separately from the effect of tax reliefs, employer contributions and other subsidies.

Arguments against soft compulsion are of two types: those that favour "hard" compulsion and those that support a purely voluntary approach. The validity of the former argument rests on the failure of automatic enrolment to increase coverage substantially. The argument for a purely voluntary approach echoes the case against compulsion: that the scheme with automatic enrolment will crowd out existing schemes and lead to a levelling down of provision for income in retirement. For example, case studies of automatic enrolment in the

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United States have shown that the default contribution rate acts as a powerful indicator for scheme members and so automatic enrolment reduces average contribution rates (see, for example, Beshears *et al.*, 2006; and Madrian and Shea; 2001). Indeed, many employers deliberately set low default contribution rates to minimise the degree of opting out.

Nevertheless, automatic enrolment is likely to spread as a way of extending coverage of private pensions. Survey evidence suggests that automatic enrolment is much more popular with individuals than compulsion in the United Kingdom (Bunt *et al.*, 2006; Hall *et al.*, 2006). And voters' views are shared by many politicians, who worry that workers will view mandatory contributions to private pensions as an unwelcome tax on their earnings.

Financial education

Financial education can also be a means of improving awareness of the need to save for retirement and, it is hoped, coverage of voluntary funded pensions. There is evidence, for example, that employment-based information campaigns have increased participation in and contributions to private pension schemes (OECD, 2005). For example, studies in the United States have shown that more financially literate workers in 401(k) plans are more likely to join the plan (or less likely to opt out of a scheme with automatic enrolment plans). Statements of individual pension rights – which have recently been introduced or improved in France, Germany, Sweden and the United Kingdom, among others – can help people better plan their retirement and make informed choices about voluntary private-pension savings.

Facilitating access to private pensions

Participation might be increased by facilitating access to private pension plans. The availability of occupational pensions is concentrated among workers with large employers. Just under 50% of workers in companies with fewer than 25 employees have access to an occupational pension in the United Kingdom, compared with more than 95% of those where there are more than 1 000 employees (Office of National Statistics, 2009, Table 6.10). In the United States, around two-thirds of firms with more than 500 employees have a pension plan, compared with 28% of those in smaller firms, with less than 25 employees. This pattern is echoed in other countries. People who work for smaller employers tend to have relatively low earnings, meaning that low earners are less likely to have access to an occupational pension plan. In the United States, for example, around 30% of workers earning less than USD 20 000 are employed by a firm with a pension scheme, compared with nearly 70% for workers earning more than USD 50 000 (Copeland, 2007).

A widely cited reason for the fact that smaller employers are less likely to establish occupational pension plans is the fixed cost of operating such a scheme, some of which is attributed to the burden of complying with regulations. The United States has responded to this problem by allowing small employers to establish pension plans with lighter administrative requirements than those for larger companies. For example, in the United States employers can establish the Simplified Employee Pension (SEP) plan is effectively a collection of individual retirement accounts managed by a financial institution acting as trustee.

Tax incentives

A standard policy to encourage private, voluntary retirement savings is to give preferential tax treatment to contributions and returns from investments in pension plans.

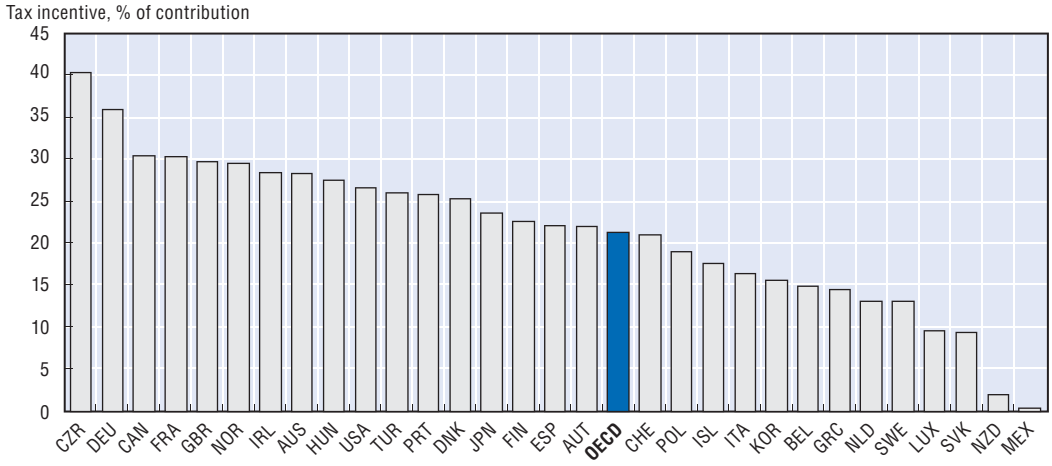
The idea is that a higher *net* rate of return on savings will encourage people to save more. These tax incentives tend to come with conditions, usually over duration of saving and restrictions on the way benefits can be withdrawn. It is these conditions that qualify them as "retirement savings" (see Engen *et al.*, 1994, and 1996 for example).

The key policy issue is whether such tax incentives are effective in increasing savings earmarked for retirement. The OECD has measured incentives to save in pension schemes by comparing the effective tax rate on pensions with that applied to "benchmark savings"; typically this is a bank deposit (see Yoo and De Serres, 2004). The scale of tax incentives is calculated as a percentage of contributions, but considers revenues foregone from deductible contributions and tax-free investment returns and takes account of revenues collected when benefits are withdrawn. It is important to note that the study uses tax parameters and rules for 2003: in many countries, there have been significant changes to the tax treatment of pension since then.

The results suggest that there is indeed an incentive to save in pension plans (Figure 4.7). The size of the tax incentive varies significantly, ranging from around zero in Mexico and New Zealand to over 40% of contributions in the Czech Republic. These two apart, most countries provide incentives of at least 10% of contributions and the OECD average is above 20%.

Figure 4.7. **Tax incentive for private pensions relative to benchmark savings**

2003 parameters and rules



Source: Yoo, K.Y. and A. De Serres (2004), "Tax Treatment of Private Pension Savings in OECD Countries", *OECD Economic Studies*, Vol. 39, No. 2, pp. 73-110.

Surveys of the literature suggest that tax incentives for private pension plans do increase *pension* savings (see Engen *et al.*, 1994 and 1996 for example). However, this increase in retirement savings could result from people actually increasing their overall savings (*i.e.*, new saving) or from people shifting savings from other saving vehicles (*i.e.*, reallocation) and leaving their total savings unchanged. Unfortunately, the empirical evidence on whether savings flowing into tax-advantaged pension schemes are new or reallocated is inconclusive and it is largely based on the United States.

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If new saving predominates, then *national* saving (taking account of the reduction in public saving due to the tax incentive) is very likely to increase. But if reallocation is more important, then national saving would decline. This substitution of private for public saving has little macroeconomic effect. However, it may serve a public-policy purpose by locking individual savings into long-term plans earmarked for retirement.

The design of tax incentives is also important. Simply making contributions to private pensions deductible from personal income tax liabilities means that higher earners, paying higher marginal rates, get the greatest benefit. In contrast low earners, who do not pay any income tax or pay at a low rate, have a smaller tax incentive to save for old age. Moreover, their relatively low pension entitlements might mean that they are subject to means-testing in retirement. This is effectively an additional "tax" on pension saving, as shown above. However, it is possible to design fiscal incentives that benefit low earners equally or are focused on the low paid. For example, the tax relief on contributions might be limited to the lower or standard rate of income tax. Another method is to offer matching contributions or tax credits that are paid even to individuals who are not liable for income tax on their earnings.

Notes

1. See OECD (2007, Section II.1), Martin and Whitehouse (2008) and the special chapter on "Recent pension reforms" in this volume.
2. This special chapter draws on the more detailed analysis in Antolín and Whitehouse (2009). The calculations in Section 1 of this chapter update the modelling in from 2004 to 2006 parameters and rules of pension systems, as in the rest of this report. Queisser *et al.* (2008) also discuss the changing balance of public and private pension provision.
3. A detailed, step-by-step illustration of the calculations is set out in OECD (2007), pp. 83-84.
4. Overall coverage of private pensions is presented in the indicators section in Part II of this volume.

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PART II

Indicators of Pension Policies

Part II updates the important indicators of retirement-income systems developed for the first and second editions of Pensions at a Glance. It also offers an expanded range of indicators. This information – presented in a clear, "at a glance" style – provides a comprehensive and consistent framework for comparing and evaluating pension systems and pension policies.

The 17 indicators are divided into three categories. The first of these groups comprises indicators of individual pension entitlements under all 30 of OECD member countries' pension regimes. Along with the familiar measure of pension replacement rates, there are indicators of pension wealth, the progressivity of retirement-income systems and the balance between public and private provision.

The second group of indicators looks at retirement-income systems as a whole. These comprise data on contribution rates for public pensions, assets in private pension funds and national pension reserves, coverage of private pensions and expenditure on pension benefits.

The third and final category of indicators relate to the background and context in which retirement-incomes systems must operate. These include key demographic measures – such as life expectancy and fertility – and average earnings.

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Pension Entitlements

Pension entitlements are calculated using the OECD pension models, based on national parameters and rules applying in 2006. They relate to a worker entering the labour market in that year.

The first three indicators show the familiar replacement rate: the ratio of pension to individual earnings. Of these, the first looks at gross (before tax) replacement rates from all mandatory sources, including compulsory private pensions. The second shows public and private schemes separately, including data on voluntary private pensions where these have broad coverage. The third gives replacement rates in net terms, taking account of taxes and contributions paid on earnings and pensions.

There follows two indicators of "pension wealth": the lifetime value of the flow of retirement benefits. This is a more comprehensive measure than replacement rates because it takes account of pension ages, indexation of pensions to changes in wages or prices and life expectancy.

The balance between two policy goals – providing adequate old-age incomes and replacing a target share of earnings – is explored in the next pair of indicators. They summarise the progressivity of pension benefit formulae and the link between pensions and earnings.

The final two indicators of entitlements summarise the effect of the pension system on people at different levels of earnings, showing average pension levels, pension wealth and the contribution role of each part of the retirement-income system.

Key results

The gross replacement rate shows the level of pensions in retirement relative to earnings when working. For workers with average earnings, the gross replacement rate averages 59% in the 30 OECD countries. But there is significant cross-country variation. At the bottom of the range, Ireland, Japan and the United Kingdom offer future replacement rates of less than 35% for new labour market entrants. Iceland and Greece, at the top of the range, offer replacement rates of more than 90%. Other countries with high projected replacement rates (between 70% and 90%) are Austria, Denmark, Hungary, Spain, Luxembourg and the Netherlands while Finland, Norway and Switzerland have gross replacement rates close to the OECD average.

Most OECD countries protect low-income workers from old-age-poverty by providing higher replacement rates for them than for average earners. For example, the table shows that workers earning only half the average receive replacement rates averaging 72%, compared with 59% for average earners. However, in nine countries replacement rates are the same at average and half-average pay: Austria, Germany, Greece, Hungary, Italy, Poland, the Slovak Republic, Spain and Turkey. At the top of the range, there are three countries that provide low earners with pensions equal to their earnings when working or even higher: Denmark (replacement rate of 124.0%), Iceland (108.3%) and Luxembourg (99.4%). At the other end of the scale, Germany and Japan offer replacement rates of 43 and 47% for low earners, respectively. Some countries, such as Canada and New Zealand, pay relatively small benefits to average earners, but are towards the middle of the range for low-income workers.

On average in the 30 OECD countries, the gross replacement rate at 1.5 times average earnings (here called "high earnings") is 54.3%, somewhat below the 59.0% figure for average earners. For high earners, country variations are again wide. Replacement rates exceed 80% in six countries: Greece, Iceland, Luxembourg, the Netherlands, Spain and Turkey. At the other end of the spectrum, Ireland and New Zealand (which have flat-rate public pensions) and the United Kingdom offer replacement rates of less than 26%.

At median earnings – the level which half of workers lie above and half below – the average gross replacement for OECD countries is 60.8%. In general, it is little different from the gross replacement at average (mean) pay. (Median earnings are between 75% and 90% of the mean; see the indicator on "Average earnings".)

Gross pension replacement rates for women differ (due to a lower pension eligibility age for women than for men) in three countries: Italy, Poland and Switzerland. Differences between the sexes are substantial in Italy and Poland, with replacement rates around one third smaller for women than they are for men. In Mexico, replacement rates for women are also lower than they are for men, but much less than in the Poland and Italy. Finally, in Switzerland, replacement rates are slightly higher for women than for men because women receive a higher accrual than men at certain ages under mandatory occupational schemes.

Definition and measurement

The old-age pension replacement rate measures how effectively a pension system provides a retirement income to replace earnings, the main source of income before retirement. Often, the replacement rate is expressed as the ratio of the pension to final earnings (just before retirement). Here, however, pension benefits are shown as a share of individual lifetime average earnings (re-valued in line with economy-wide earnings growth). Under the baseline assumptions, workers earn the same percentage of economy-wide average earnings throughout their career. In this case, lifetime average re-valued earnings and individual final earnings are identical. If people move up the earnings distribution as they get older, then their earnings just before retirement will be higher than they were on average over their lifetime and replacement rates calculated on individual final earnings would be lower.

The gross replacement rate is defined as gross pension entitlement divided by gross pre-retirement earnings. It is shown here at median earnings and at 0.5, 0.75, 1, 1.5 and 2 times average earnings levels, using the newly defined OECD "average worker" concept. (See the indicator on "Average earnings".)

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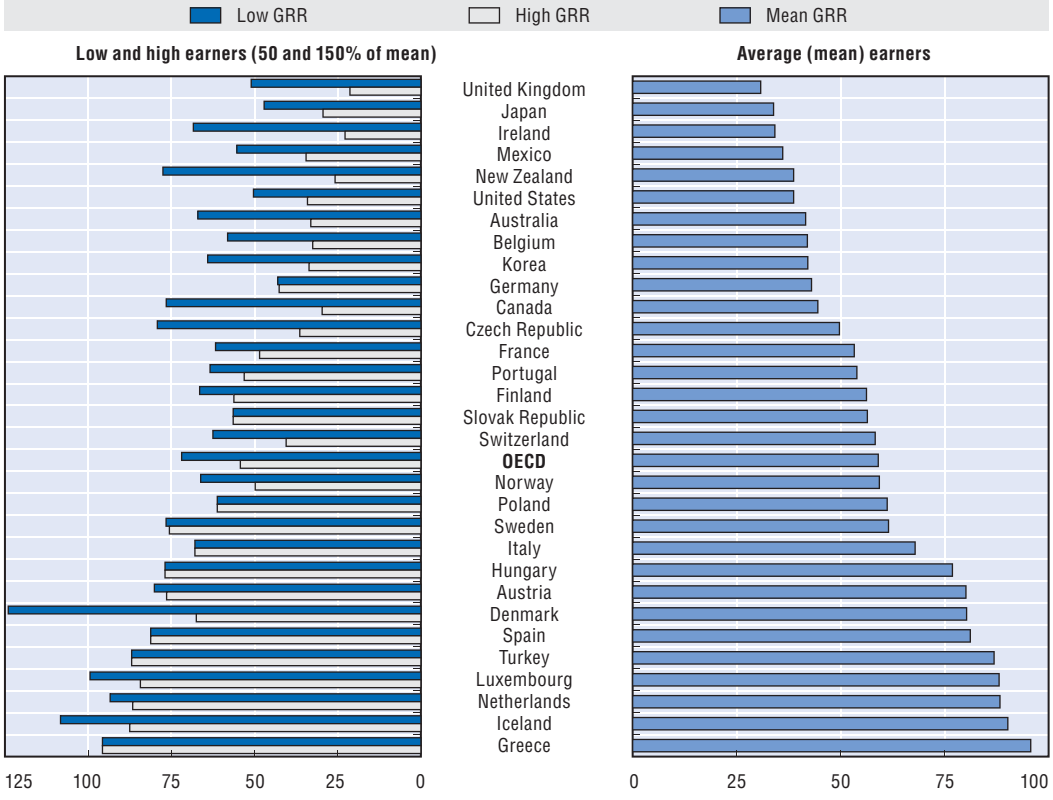
Gross pension replacement rates by earnings

	Median earner	Individual earnings, multiple of mean				
		0.5	0.75	1	1.5	2
Men						
Australia	45.7	67.0	50.0	41.6	33.1	28.9
Austria	80.1	80.1	80.1	80.1	76.4	57.3
Belgium	42.4	58.1	43.1	42.0	32.5	24.3
Canada	50.2	76.5	55.2	44.5	29.7	22.2
Czech Republic	54.9	79.2	59.6	49.7	36.4	29.0
Denmark	88.0	124.0	94.9	80.3	67.5	63.7
Finland	56.2	66.5	56.2	56.2	56.2	56.2
France	53.3	61.7	53.3	53.3	48.5	46.0
Germany	43.0	43.0	43.0	43.0	42.6	32.0
Greece	95.7	95.7	95.7	95.7	95.7	95.7
Hungary	76.9	76.9	76.9	76.9	76.9	76.9
Iceland	91.7	108.3	93.0	90.2	87.5	86.1
Ireland	39.8	68.4	45.6	34.2	22.8	17.1
Italy	67.9	67.9	67.9	67.9	67.9	67.9
Japan	35.7	47.1	38.3	33.9	29.4	26.6
Korea	45.1	64.1	49.4	42.1	33.6	25.2
Luxembourg	90.1	99.4	91.9	88.1	84.3	82.5
Mexico	36.9	55.3	37.6	36.1	34.5	33.7
Netherlands	88.9	93.4	90.0	88.3	86.6	85.8
Men *(cont.)*						
New Zealand	45.6	77.5	51.6	38.7	25.8	19.4
Norway	59.6	66.2	61.0	59.3	49.8	42.2
Poland	61.2	61.2	61.2	61.2	61.2	61.2
Portugal	54.1	63.0	54.3	53.9	53.1	52.4
Slovak Republic	56.4	56.4	56.4	56.4	56.4	56.4
Spain	81.2	81.2	81.2	81.2	81.2	66.7
Sweden	61.5	76.6	64.6	61.5	75.6	81.3
Switzerland	62.0	62.5	62.1	58.3	40.5	30.4
Turkey	86.9	86.9	86.9	86.9	86.9	86.9
United Kingdom	33.5	51.0	36.6	30.8	21.3	16.0
United States	40.8	50.3	42.6	38.7	34.1	28.8
OECD	**60.8**	**72.2**	**62.7**	**59.0**	**54.3**	**50.0**
Women						
Italy	52.8	52.8	52.8	52.8	52.8	52.8
Mexico	32.5	55.3	36.8	29.9	28.6	28.0
Poland	44.5	49	44.5	44.5	44.5	44.5
Switzerland	62.6	62.8	62.6	59.0	41.0	30.7

Note: Figures are only shown for women where these are different from men's.
Source: OECD pension models.

Gross pension replacement rates (GRR) by earnings levels



Note: Countries are ranked in order of gross pension replacement rates (GRR) of average earners, *i.e.* mean GRR in the chart.
Source: OECD pension models.

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Key results

Private pensions play a large and growing role in providing for old age. This is illustrated with calculations of gross pension replacement rates that have been separated out between public and private sectors. The OECD average for replacement rates of an average earner from public schemes alone is 46%, compared with 59% with mandatory private pensions included. When voluntary private pensions, under typical rules, are added, the average replacement rate is 68% for an average earner.

For the 11 countries where the calculations cover only public pensions, the replacement rate for an average earner is 67% on average. For the 22 countries with data for public and mandatory private provision, the average replacement rate is 66%. For all 30 OECD countries, including public, mandatory private and voluntary private pensions, the average replacement rate is again 67%.

This shows substitution between different scheme types. Australia, Denmark and Iceland have highly targeted public programmes, so very low public replacement rates for middle and high earners are topped up with mandatory private pensions. In Hungary, Mexico, Poland, the Slovak Republic and Sweden, the substitution was direct: reforms replaced part of public provision with mandatory private pensions. Canada, Ireland, the United Kingdom and the United States have long had relatively low public pensions and widespread voluntary provision.

Mandatory private pensions

The first group of 11 countries has mandatory private pensions or private pensions that have near-universal coverage and so are described as "quasi-mandatory" (Denmark, the Netherlands and Sweden).

In Iceland, the Netherlands and Switzerland, private pensions are defined benefit while in other countries, they are defined contribution. Replacement rates from mandatory private schemes for average earners range from 23% to 33% in seven of the 11 countries. But they are significantly above this range in Denmark, Iceland and the Netherlands and much lower in Norway.

In five countries, replacement rates are the same for workers earning between 50% and 150% of the economy-wide average. However, some countries have private pensions designed to cover earnings above the ceiling of the public scheme. This is the reason that replacement rates from private plans increase with earnings across the range in the Netherlands and Norway. It also explains why replacement rates for workers on 150% of average earnings are much higher in Sweden.

The pattern in Switzerland is complex. Again, low earners have a lower replacement rate to take account of public benefits. But the ceiling on earnings that must be covered by the occupational plans is relatively low.

Voluntary private pensions

Replacement rates are shown for nine countries where voluntary private pensions are widespread: covering between 40% and 65% of the workforce (see the indicator of "Private pension coverage"). The only country with a comparable proportion of the workforce in voluntary private pensions is Japan, but information is not available on typical rules. It is assumed that workers with voluntary private pensions spend a full career in the scheme. (Evidence on and the implication of shorter contribution histories are discussed in the special chapter on "The pension gap and voluntary retirement savings".)

The rules that have been modelled are in the "Country profiles" in Part III. In five countries, a defined-contribution plan is modelled. In four – Canada, Ireland, the United Kingdom and the United States – replacement rates for both defined-contribution and defined-benefit plans have been calculated. The information for defined-benefit plans is mainly for illustration: it is unlikely that a private-sector worker entering the labour market in 2006 would be offered a defined-benefit scheme (see Box 1.1 in the special chapter on "Pension systems during the financial and economic crisis").

In general, the defined-contribution schemes pay a constant replacement rate with earnings. (Data on actual contribution rates by earnings are not available for most countries, and so an average or typical rate is assumed across the earnings range.) Belgium and Germany are exceptions due to ceilings on pensionable earnings that qualify for tax incentives. In Norway, as with the mandatory defined-contribution plan, replacement rates increase with earnings because the private schemes are designed to offset some of the redistribution in public retirement benefits.

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Gross pension replacement rates from public, mandatory private and voluntary private pension schemes

Percentage of individual earnings

	Public			Mandatory private			Voluntary DC			Voluntary DB			Total mandatory			Total with voluntary		
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Australia	40.1	14.6	6.2	26.9	26.9	26.9							67.0	41.6	33.1			
Austria	80.1	80.1	76.4										80.1	80.1	76.4			
Belgium	58.1	42.0	32.5				16.6	16.6	13.0				58.1	42.0	32.5	74.7	58.7	45.4
Canada	76.5	44.5	29.7				33.2	33.2	33.2	26.4	26.4	30.8	76.5	44.5	29.7	93.2	72.6	59.4
Czech Republic	79.2	49.7	36.4				11.6	11.6	11.6				79.2	49.7	36.4	90.8	61.3	48.0
Denmark	61.5	22.9	11.7	62.5	57.4	55.8							124.0	80.3	67.5			
Finland	66.5	56.2	56.2										66.5	56.2	56.2			
France	61.7	53.3	48.5										61.7	53.3	48.5			
Germany	43.0	43.0	42.6				18.3	18.3	18.1				43.0	43.0	42.6	61.3	61.3	60.8
Greece	95.7	95.7	95.7										95.7	95.7	95.7			
Hungary	50.7	50.7	50.7	26.2	26.2	26.2							76.9	76.9	76.9			
Iceland	26.4	8.3	5.5	81.9	81.9	81.9							108.3	90.2	87.5			
Ireland	68.4	34.2	22.8				40.8	40.8	40.8	0.0	15.7	27.1	68.4	34.2	22.8	109.2	75.0	63.6
Italy	67.9	67.9	67.9										67.9	67.9	67.9			
Japan	47.1	33.9	29.4										47.1	33.9	29.4			
Korea	64.1	42.1	33.6										64.1	42.1	33.6			
Luxembourg	99.4	88.1	84.3										99.4	88.1	84.3			
Mexico	23.8	4.6	3.1	31.4	31.4	31.4							55.3	36.1	34.5			
Netherlands	60.5	30.2	20.2	32.9	58.1	66.5							93.4	88.3	86.6			
New Zealand	77.5	38.7	25.8				15.9	15.9	15.9				77.5	38.7	25.8	93.3	54.6	41.7
Norway	60.1	51.9	41.9	6.0	7.4	7.9	9.1	12.8	18.1				66.2	59.3	49.8	75.2	72.1	67.9
Poland	30.0	30.0	30.0	31.3	31.3	31.3							61.2	61.2	61.2			
Portugal	63.0	53.9	53.1										63.0	53.9	53.1			
Slovak Republic	24.0	24.0	24.0	32.4	32.4	32.4							56.4	56.4	56.4			
Spain	81.2	81.2	81.2										81.2	81.2	81.2			
Sweden	52.9	37.8	27.9	23.7	23.7	47.7							76.6	61.5	75.6			
Switzerland	52.4	35.6	23.8	10.1	22.7	16.7							62.5	58.3	40.5			
Turkey	86.9	86.9	86.9										86.9	86.9	86.9			
United Kingdom	51.0	30.8	21.3				39.2	39.2	39.2	38.4	38.4	38.4	51.0	30.8	21.3	89.3	70.0	60.6
United States	50.3	38.7	34.1				40.1	40.1	40.1	30.6	30.6	30.6	50.3	38.7	34.1	90.4	78.8	74.2
OECD	**60.0**	**45.7**	**40.1**										**72.2**	**59.0**	**54.3**	**81.1**	**68.4**	**63.6**

DB = defined benefit; DC = defined contribution.
Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651514008102

Key results

For average earners, the net replacement rate across OECD averages around 70%, which is 11 percentage points higher than the gross replacement rate. This reflects the higher taxes and contributions that people paid on their earnings when working than they pay on their pensions in retirement. Net replacement rates again vary across a large range, from under 40% in Mexico and Japan to well over 100% in Greece and Turkey for average earners.

For low earners (with half of mean earnings), the average net replacement rate across OECD countries is 82%. For high earners (150% of mean earnings) the average net replacement rate is 65%, lower than for low earners. As with gross replacement rates, the differences with earnings reflect progressive features of pension systems, such as minimum benefits and ceilings.

The personal tax system plays an important role in old-age support. Pensioners often do not pay social security contributions and, as personal income taxes are progressive and pension entitlements are usually lower than earnings before retirement, the average tax rate on pension income is typically less than the tax rate on earned income. In addition, most income tax systems give preferential treatment either to pension incomes or to pensioners, by giving additional allowances or credits to older people. Therefore, net replacement rates are usually higher than gross replacement rates.

For average earners the pattern of replacement rates across countries is different on a net rather than a gross basis. The Belgian and German pension systems have considerably higher net replacement rates than gross. This is due, first, to favourable treatment of pension income under social security contributions. Secondly, because replacement rates are relatively low compared with OECD countries and personal income taxes are strongly progressive in these countries, people pay much less in income tax when retired than they did when working. This is despite the fact that the very generous tax treatment of pension income in Germany is gradually being withdrawn.

In contrast, New Zealand and Sweden move lower down the chart on a net basis. This is because these countries tax pension income and earnings at very similar rates (although Sweden re-introduced tax concessions for pensioners in 2009: see the special chapter on "Recent pension reforms" in Part I).

For low-earners, the effect of taxes and contributions on net replacement rates is more muted than for workers higher up the earnings scale. This is because low-income workers typically pay less in taxes and contributions than those on average earnings. In many cases, their retirement incomes are below the level of the standard reliefs in the personal income tax (allowances, credits, etc.). Thus, they are unable to benefit fully from additional concessions granted to pensions or pensioners under the income tax.

The difference between gross and net replacement rates for low earners is 10 percentage points on average. Belgium and the Czech Republic have much higher replacement rates for low earners measured on a net basis.

The net replacement rate for workers earning 150% of the average is highest in Turkey because pension income is not taxable. Not surprisingly, the lowest replacement rates are found in the flat-rate pension systems of New Zealand and Ireland. In both countries, workers earning 150% of the average will receive pensions that amount to less than a third of their previous net earnings.

There are regional differences in the gap between gross and net replacement rates. For median earners in the EU15 countries, net replacement rates are on average 11 percentage points higher than gross rates. In southern Europe, the difference is 13 percentage points whereas for the Nordic countries, the difference is only 7 percentage points. This is due to the fact that income taxes play a more important role in the Nordic countries than elsewhere.

Definition and measurement

The net replacement rate is defined as the individual net pension entitlement divided by net pre-retirement earnings, taking account of personal income taxes and social security contributions paid by workers and pensioners. Otherwise, the definition and measurement of the net replacement rates are the same as for the gross replacement rate (see previous indicator). The results again cover full-career workers with median earnings and with 0.5, 0.75, 1, 1.5 and 2 times average (mean) earnings.

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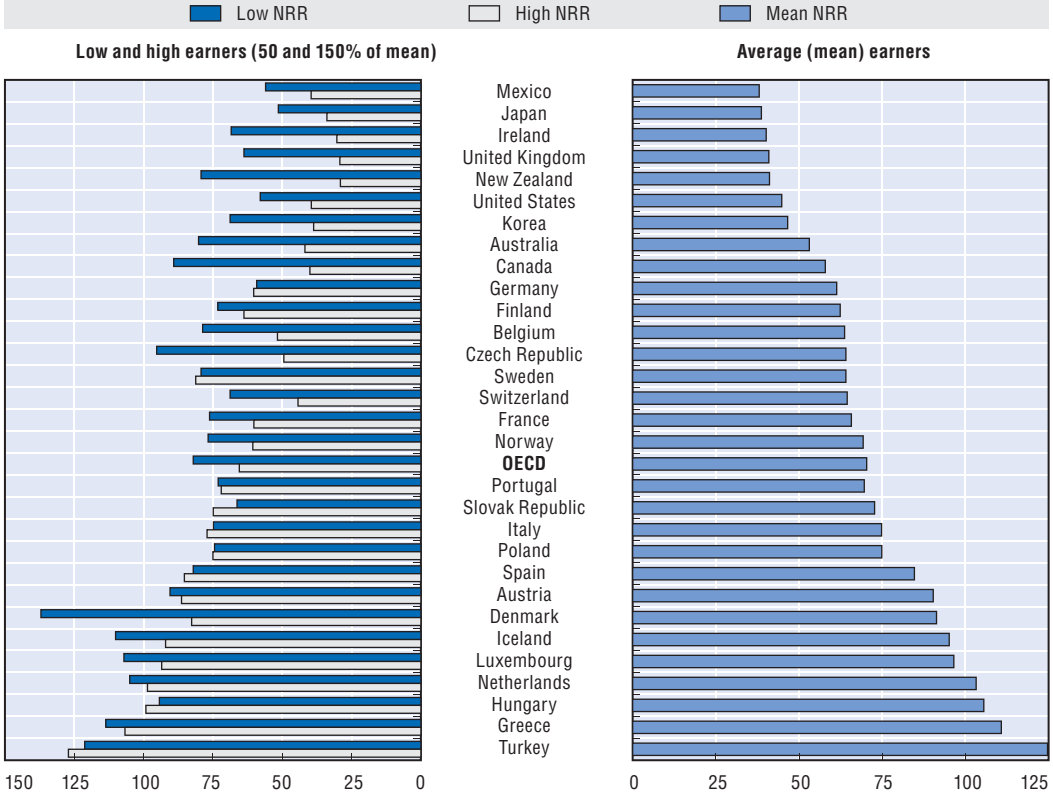
Net pension replacement rates by earnings

	Median earner	Individual earnings, multiple of mean						Median earner	Individual earnings, multiple of mean				
		0.5	0.75	1	1.5	2			0.5	0.75	1	1.5	2
Men							**Men** *(cont.)*						
Australia	59.2	80.2	63.7	53.1	41.8	36.8	New Zealand	47.3	79.3	53.5	41.1	29.0	22.8
Austria	90.3	90.5	90.3	90.3	86.3	64.8	Norway	70.2	76.7	72.3	69.3	60.6	52.8
Belgium	65.3	78.7	69.0	63.7	51.7	41.2	Poland	74.8	74.4	74.7	74.9	75.0	77.0
Canada	63.6	89.1	68.9	57.9	40.0	30.9	Portugal	68.0	73.2	66.7	69.6	72.0	72.6
Czech Republic	69.8	95.3	74.7	64.1	49.4	41.1	Slovak Republic	71.5	66.3	70.4	72.7	74.9	75.9
Denmark	98.7	137.0	106.2	91.3	82.7	77.7	Spain	84.2	82.1	84.1	84.7	85.3	72.2
Finland	62.0	73.2	62.7	62.4	63.8	64.5	Sweden	64.1	79.3	67.4	64.1	81.2	85.9
France	65.3	76.2	65.6	65.7	60.2	57.5	Switzerland	69.5	68.8	79.4	64.5	44.3	33.4
Germany	61.5	59.2	61.1	61.3	60.3	44.4	Turkey	124.0	121.2	123.4	124.7	127.1	130.4
Greece	110.4	113.6	110.1	110.8	106.7	104.2	United Kingdom	44.3	63.8	48.0	40.9	29.2	22.8
Hungary	95.4	94.3	95.4	105.5	99.2	99.2	United States	47.1	57.9	49.2	44.8	39.5	33.3
Iceland	96.5	110.1	97.7	95.1	92.1	90.6							
Ireland	45.6	68.4	50.1	40.1	30.3	24.4	**OECD**	**71.8**	**82.4**	**74.0**	**70.3**	**65.5**	**60.8**
Italy	74.8	74.8	74.8	74.8	77.1	78.7							
Japan	40.3	51.4	42.8	38.7	33.9	30.8	**Women**						
Korea	49.2	68.8	53.5	46.6	38.7	29.6	Italy	58.1	76.6	58.1	58.1	59.9	63
Luxembourg	98.1	107.1	99.7	96.5	93.5	91.8	Mexico	33.5	56	37.3	31.5	32.8	32.9
Mexico	38.0	56.0	38.1	38.0	39.6	39.7	Poland	55.2	60.6	55.3	55.2	55	56.4
Netherlands	105.5	105.0	107.4	103.2	98.6	95.5	Switzerland	70.2	69.1	67.3	65.3	44.9	33.8

Source: OECD pension models.

Net pension replacement rates (NRR) by earnings levels



Note: Countries are ranked in order of net pension replacement rates (NRR) of average earners, *i.e.*, mean NRR in the chart.

Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651534227057

Key results

Pension wealth measures the total value of the lifetime flow of pension incomes. Pension wealth for average earners is 9.3 times annual individual earnings on average in the OECD countries. For women, the average is higher – 10.9 times individual earnings – because of women's longer life expectancy.

Replacement rates give an indication of the size of the pension promise, but they are not comprehensive measures; they measure only the level of benefits at retirement. For a full picture, account must also be taken of life expectancy, retirement age and indexation of pensions. Together, these determine for how long the pension benefit must be paid, and how its value evolves over time. Pension wealth – a measure of the "stock" of future flows of pension benefits – takes all of these into account. It can therefore be thought of as the lump sum needed to buy an annuity giving the same flow of pension payments as that promised by mandatory retirement-income schemes.

For men, gross pension wealth for average earners is highest in Luxembourg at each earnings level, followed by the Netherlands, Greece and Iceland. Pension wealth in these countries averages 15.9 times individual earnings, about 70% higher than the OECD average of 9.3 times. Pension wealth for men with average earnings is lowest in the United Kingdom, due to the relatively low replacement rate and the increase in pension age to 68. The United Kingdom is closely followed by Mexico; in both countries, pension wealth is less than 5.0 times individual earnings.

Higher replacement rates for low earners mean that pension wealth tends to be higher for low than for average earners. For men with half- average earnings, pension wealth is 11.4 times individual earnings on average, compared with 9.3 times for people with average earnings. Similarly, for women with low earnings, pension wealth of 13.4 compares with 10.9 times individual earnings for average earners. For men, in the four countries where pension wealth for low earners is highest (Denmark, Iceland, Luxembourg and the Netherlands), its value is 17.0 times individual earnings or more.

In countries with shorter life expectancies, such as Hungary, Mexico, Poland, the Slovak Republic and Turkey, benefits are paid for a shorter retirement period and so, other things equal, the pension promise becomes more affordable. The effect is the reverse in Switzerland and the Nordic countries, where life expectancies are high. Unlike measures of replacement rates, the link between affordability and life expectancy is captured by the pension-wealth indicator.

For the same reason, since women's life expectancy is longer than men's, pension wealth for women is relatively higher in all countries. This is simply because pension benefits can be expected to be paid over a longer retirement period. Also, some countries still have lower retirement ages for women; this extends the payment period even further.

Pension wealth is also affected by pension ages. Denmark, Germany, Iceland, Norway, the United Kingdom and the United States, for example, all have or plan to have pension ages above age 65, which reduces pension wealth.

Pension wealth is also affected by indexation rules. Although most OECD countries now index pensions in payment to prices, there are exceptions: Luxembourg, for example links pensions to average earnings, while five countries, comprising the Czech Republic, Finland, Hungary, the Slovak Republic and Switzerland, index to a mix of price inflation and earnings growth. In normal times, at least, earnings tend to grow faster than prices, so that pension wealth is higher with these more generous indexation procedures than with price indexation.

Different indexation policies also affect the pension wealth of women relative to men. Women's longer life expectancy means that they tend to benefit more from more generous indexation procedures (above price inflation, for example).

Definition and measurement

The calculation of pension wealth uses a uniform discount rate of 2% and country-specific mortality tables. Since the comparisons refer to prospective pension entitlements, the calculations use projections for the year 2040.

Pension wealth is measured and expressed as a multiple of gross annual individual earnings. It is shown here for workers with earnings of 0.5, 1 and 1.5 times the average, separately for men and women.

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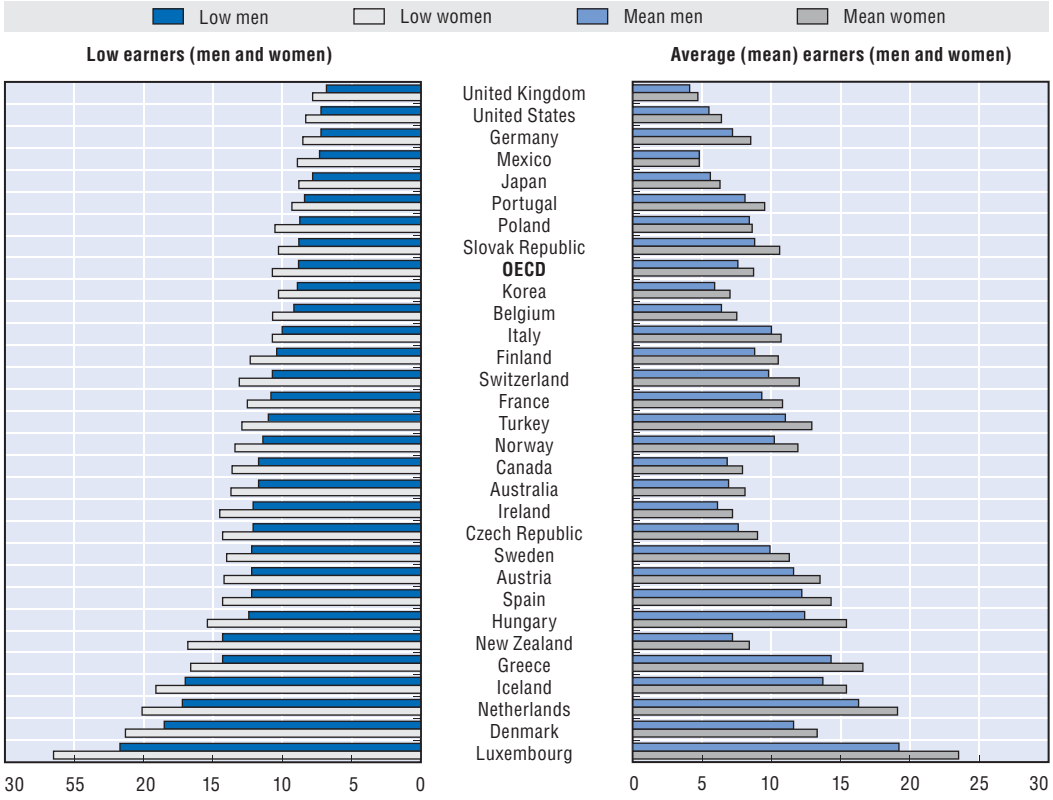
Gross pension wealth by earnings

	Individual earnings, multiple of mean							Individual earnings, multiple of mean					
	0.5	1.0	1.5	0.5	1.0	1.5		0.5	1.0	1.5	0.5	1.0	1.5
	Men			Women				Men			Women		
Australia	11.7	6.9	5.3	13.7	8.1	6.2	Luxembourg	21.7	19.2	18.4	26.5	23.5	22.5
Austria	12.2	11.6	10.5	14.2	13.5	12.1	Mexico	7.3	4.8	4.6	8.9	4.8	4.6
Belgium	8.9	6.4	5.0	10.3	7.5	5.8	Netherlands	17.2	16.3	16.0	20.1	19.1	18.7
Canada	11.7	6.8	4.5	13.6	7.9	5.3	New Zealand	14.3	7.2	4.8	16.8	8.4	5.6
Czech Republic	12.1	7.6	5.6	14.3	9.0	6.6	Norway	11.4	10.2	8.5	13.4	11.9	9.9
Denmark	18.5	11.6	9.6	21.3	13.3	11.0	Poland	8.4	8.4	8.4	9.5	8.6	8.6
Finland	10.4	8.8	8.8	12.3	10.5	10.5	Portugal	9.2	8.1	8.0	10.7	9.5	9.3
France	10.8	9.3	8.5	12.5	10.8	9.8	Slovak Republic	8.8	8.8	8.8	10.6	10.6	10.6
Germany	7.2	7.2	7.1	8.5	8.5	8.4	Spain	12.2	12.2	12.2	14.3	14.3	14.3
Greece	14.3	14.3	14.3	16.6	16.6	16.6	Sweden	12.2	9.9	12.0	14.0	11.3	13.7
Hungary	12.4	12.4	12.4	15.4	15.4	15.4	Switzerland	10.7	9.8	6.8	13.1	12.0	8.3
Iceland	17.0	13.7	13.2	19.1	15.4	14.8	Turkey	11.0	11.0	11.0	12.9	12.9	12.9
Ireland	12.1	6.1	4.0	14.5	7.2	4.8	United Kingdom	6.8	4.1	2.9	7.8	4.7	3.3
Italy	10.0	10.0	9.9	10.7	10.7	10.7	United States	7.2	5.5	4.9	8.3	6.4	5.7
Japan	7.8	5.6	4.9	8.8	6.3	5.5							
Korea	8.9	5.9	4.7	10.7	7.0	5.6	**OECD**	**11.5**	**9.3**	**8.5**	**13.4**	**10.9**	**9.9**

Source: OECD pension models.

Gross pension wealth by earnings level and sex



Note: Countries are ranked in order of gross pension wealth of low earners (men).

Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651560047608

Key results

Net pension wealth, like the equivalent indicator in gross terms, shows the present value of the lifetime flow of pension benefits, but also takes account of taxes and contribution paid on pension incomes. Both figures for pension wealth are expressed as a multiple of individual gross earnings.

For average earners, net pension wealth for OECD countries is on average 7.9 times gross individual earnings for men and 9.2 for women. Values are higher for women than men, due mainly to differences in life expectancy between the sexes.

Net pension wealth, at the left-hand side of the table, will always be less than gross pension wealth (if there is some tax liability during retirement) or the same (if pensions are not taxed or pension income is below tax thresholds). For example, pension wealth is the same net and gross in the Slovak Republic and Turkey because pensions are not taxable.

The right-hand columns of the table show the proportion of pensions paid in taxes and contributions for retirees with different levels of earnings when working. There would be no tax liability for average earners with only mandatory pensions in the Czech Republic, Ireland, Mexico, Portugal and the United States. This is because mandatory replacement rates are low relative to other OECD countries. Therefore, workers on average earnings will not build up sufficient entitlements to be taxed in retirement, due to basic income-tax reliefs and exemption from social security contributions. This is also true of high earners (at 150% of average earnings) in all these countries bar Portugal, where they would pay just 2.2% of their pension in taxes meaning that net pension wealth is a little below the gross figure.

The rankings of pension wealth change significantly when measured on a net rather than a gross basis. For example, the Slovak Republic has the eighth highest net pension wealth for an average earner compared with the 15th highest measured on a gross basis. The situation in Denmark is the reverse, because it levies the highest taxes on mandatory pensions at all levels of earnings when working. It has the seventh highest gross pension wealth but the 14th highest in net terms.

In the five Nordic countries, Austria, Italy, Luxembourg and the Netherlands, retirees face a substantial tax burden. In part, this reflects the high level of the gross replacement rate from the mandatory system. But it also results from high levels of taxation in the economy as whole.

Low earners would not be liable for taxes and contributions in ten countries: Australia, Belgium and Canada, in addition to the seven countries where there was no tax liability on pensions for average earners. In a further four countries – Greece, Hungary, Korea and the United Kingdom – the tax liability for low earners in retirement would be very small: less than 1% of pension.

It is important to note that these calculations look at the benefit side of the pension system only. The impact of taxes and contributions paid by people of working age on living standards during retirement relative to work are discussed above in the indicator of "Net pension replacement rates".

Definition and measurement

Net pension wealth is the present value of the flow of pension benefits, taking account of the taxes and social security contributions that retirees have to pay on their pensions. It is measured and expressed as a multiple of gross annual individual earnings in the respective country. The reason for using gross earnings as the comparator is to isolate the effects of taxes and contribution paid in retirement from those paid when working. This definition means that gross and net pension wealth are the same where people are not liable for contributions and income taxes on their pensions.

Taxes and contributions paid by pensioners are calculated conditional on the mandatory pension benefit to which individuals at different levels of earnings are entitled. The calculations take account of all standard tax allowances and tax reliefs as well as concessions granted either to pension income or to people of pension age. Details of the rules that national tax systems apply to pensioners can be found in the on-line country profiles at *www.oecd.org/els/social/pensions/PAG*.

Net pension wealth is shown for workers with pay of 0.5, 1 and 1.5 times the average (mean).

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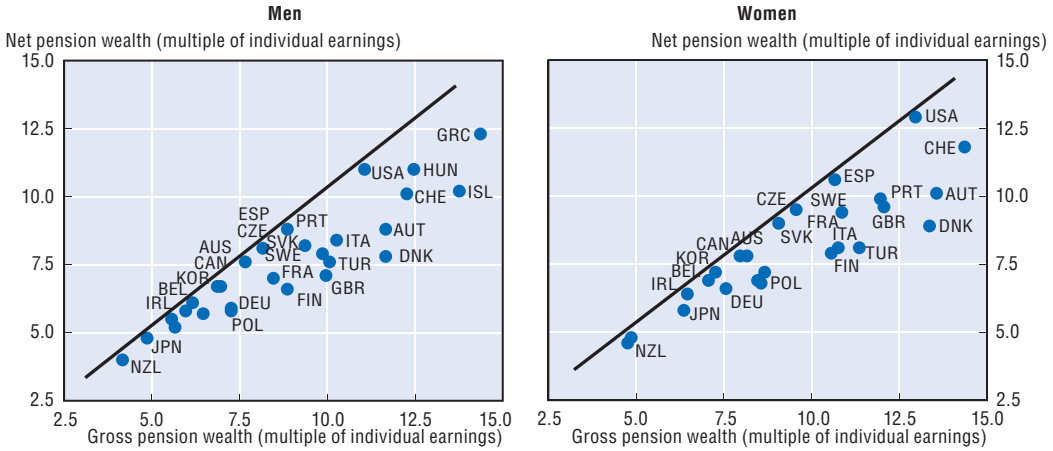
Net pension wealth and taxes and contributions paid by pensioners

Individual earnings when working	Net pension wealth: Multiple of individual annual gross earnings						Taxes and contributions paid by pensioners (percentage of pension)		
	Men			Women					
	0.5	1	1.5	0.5	1	1.5	0.5	1	1.5
Australia	11.7	6.7	4.8	13.7	7.8	5.5	0.0	2.8	10.7
Austria	10.9	8.8	7.4	12.6	10.1	8.5	11.1	24.7	29.7
Belgium	8.9	5.7	4.1	10.3	6.6	4.8	0.0	12.0	16.5
Canada	11.7	6.7	4.5	13.6	7.8	5.2	0.0	1.0	1.0
Czech Republic	12.1	7.6	5.6	14.3	9	6.6	0.0	0.0	0.0
Denmark	12.7	7.8	6.1	14.6	8.9	7	31.5	33.2	36.3
Finland	9	6.6	6.2	10.6	7.9	7.3	13.6	24.9	30.0
France	10.2	8.2	7.1	11.7	9.4	8.2	5.9	12.6	15.7
Germany	6.6	5.8	5.3	7.8	6.8	6.3	8.4	19.6	25.2
Greece	14.3	12.3	11.1	16.5	14.3	12.9	0.3	13.9	22.3
Hungary	12.4	11	9.5	15.3	13.6	11.7	0.2	11.2	23.8
Iceland	13.9	10.2	9.3	15.6	11.4	10.5	18.2	25.6	29.1
Ireland	12.1	6.1	4	14.5	7.2	4.8	0.0	0.0	0.0
Italy	7.6	7.6	7.5	10.7	8.1	8.1	24.1	24.1	24.1
Japan	7.1	5.2	4.4	7.9	5.8	4.9	9.7	8.0	10.7
Korea	8.9	5.8	4.6	10.6	6.9	5.5	0.8	1.6	2.2
Luxembourg	19.2	15.2	13.3	23.5	18.5	16.3	11.3	21.1	27.5
Mexico	7.3	4.8	4.6	8.9	4.8	4.6	0.0	0.0	0.0
Netherlands	14.2	12.1	11	16.6	14.2	12.8	17.4	25.6	31.4
New Zealand	11.8	5.9	3.9	13.9	6.9	4.6	17.6	17.6	17.6
Norway	10.3	8.4	6.8	12.1	9.9	7.9	9.8	17.3	20.1
Poland	7.2	7	6.9	8.3	7.2	7.1	14.1	17.0	18.0
Portugal	9.2	8.1	7.8	10.7	9.5	9.1	0.0	0.0	2.2
Slovak Republic	8.8	8.8	8.8	10.6	10.6	10.6	0.0	0.0	0.0
Spain	10.9	10.1	9.7	12.8	11.8	11.3	10.1	17.1	20.6
Sweden	9.3	7.1	8	10.6	8.1	9.1	23.8	27.9	33.3
Switzerland	10.4	7.9	5.5	12.7	9.6	6.7	2.6	19.6	19.2
Turkey	11	11	11	12.9	12.9	12.9	0.0	0.0	0.0
United Kingdom	6.8	4	2.8	7.8	4.6	3.2	0.9	2.8	3.6
United States	7.2	5.5	4.9	8.3	6.4	5.7	0.0	0.0	0.0
OECD	**10.5**	**7.9**	**6.9**	**12.3**	**9.2**	**8.0**	**7.7**	**12.7**	**15.7**

Source: OECD pension models.

Gross *versus* net pension wealth by sex, average earner



Note: The scales of both charts have been capped at gross pension wealth of 15 times individual earnings, which excludes Luxembourg and the Netherlands from both charts and Greece, Hungary and Iceland from the chart for women.

Source: OECD pension models.

StatLink http://dx.doi.org/10.1787/651566282217

Key results

The progressivity index varies from 100 in pure basic schemes (Ireland and New Zealand) to a negative result in Sweden, indicating that the retirement-income system overall is regressive. The average index across OECD countries is 31. The regional differences are striking. The index averages 80 in the Anglophone countries, meaning that their systems are strongly progressive. However, in southern European countries it averages just 6, indicating a very strong link between earnings and pension benefits.

"Pure-basic" pension systems pay the same benefit regardless both of their earnings history and their other sources of income. The relative pension value is independent of earnings and the replacement rate falls with earnings. "Pure-insurance" schemes, in contrast, aim to pay the same replacement rate to all workers when they retire. Defined-contribution plans generally conform to this pure-insurance model as do earnings-related schemes that offer the same accrual rate regardless of earnings, years of service or age.

These two benchmarks underpin the "index of progressivity" used for cross-country comparison of pension benefit formulae. The index is designed so that pure-basic systems score 100% and a pure-insurance schemes, zero. The former is maximally progressive; the latter is not progressive since the replacement rate is constant. A high score is not necessarily "better" than a low score or *vice versa*. Countries with a high score simply have different objectives than countries with a low score.

The first column of the table shows the Gini coefficient for gross pension benefits. The second column shows the index of progressivity of the benefit formula. In addition to the two countries with an index of 100, Australia, Canada, the Czech Republic, and the United Kingdom all have highly progressive pension systems where the index is close to 70 or higher. These countries all have significant targeted or basic pensions.

At the other end of the scale, Finland, Greece, Hungary, Italy, the Netherlands, Poland, Portugal, the Slovak Republic and Turkey have almost entirely proportional systems and so limited progressivity. The index is less than 10. This group includes two countries with notional accounts, which have a close link between contributions and benefits by design. Other countries lie between these two groups. The result for Sweden stands out with a negative progressivity index. This regressivity can be seen in the gross replacement chart in the "Country profile" in Part III, which shows that both low and high earners have higher replacement rates than average earners.

The final two columns explore whether inequality in pension entitlements is explained by inequality in the national earnings distribution or by differences in benefit formulae. The charts show the distribution of earnings for selected countries. In fact, the index of progressivity averages around 40 on both measures for the 18 countries with complete data.

Finally, it is important to note that the index of progressivity of pension benefit formulae measures only the mandatory parts of the pension systems. Some countries have extensive private occupational and personal pension provision. Taking these into account would make the distribution of pensioners' incomes wider.

Definition and measurement

OECD countries' retirement-income systems place differing emphasis on the roles of insurance and redistribution. The progressivity index is designed so that a pure basic scheme would give 100 and a pure insurance scheme, zero. The calculation is based on Gini coefficients, a standard measure of inequality. Formally, the index of progressivity is 100 minus the ratio of the Gini coefficient of pension entitlements divided by the Gini coefficient of earnings, on both cases weighted by the earnings distribution. Calculations were carried out with both national data (where available) and the OECD average earnings distribution.

The indicator is based on the analysis of Musgrave and Thin (1948). It has been adopted by other researchers (see Biggs *et al.*, 2009).

References

Biggs, A.G., M. Sarney and C.R. Tamborini (2009), "A Progressivity Index for Social Security", Issue Paper No. 2009-01, United States Social Security Administration, Washington DC.

Musgrave, R.A and T. Thin (1948), "Income Tax Progression 1924-48", *Journal of Political Economy*, Vol. 56, pp. 498-514.

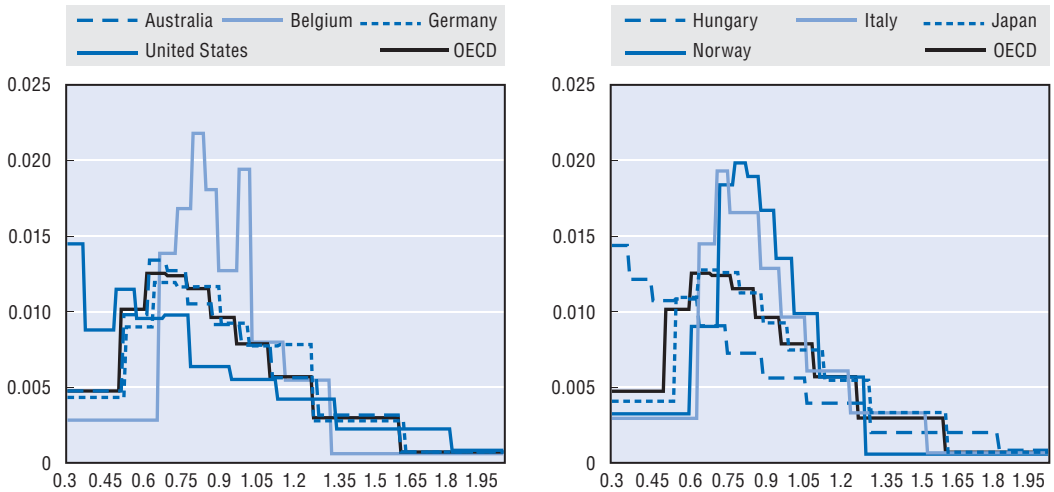
Gini coefficients on pension entitlements and earnings

OECD average and national earnings-distribution data

	OECD average distribution		National earnings distribution		
	Pension Gini	Progressivity index	Pension Gini	Progressivity index	Gini wage
Australia	8.1	70.3	8.1	70.1	27.2
Austria	18.7	31.2			
Belgium	11.8	56.7	10.2	52.6	21.6
Canada	3.3	87.7			
Czech Republic	8.5	69	8.8	65.5	25.5
Denmark	12.8	53.1			
Finland	24.9	8.5	22.6	5.9	24
France	21.9	19.5			
Germany	20.6	24.2	19.8	24.7	26.3
Greece	26.1	4.3			
Hungary	27.2	0	33.6	0	33.6
Iceland	22.5	17.2			
Ireland	0	100	0	100	29.6
Italy	26.8	1.6	23.3	1.8	23.7
Japan	14.6	46.5	14.3	46	26.4
Korea	9.3	65.8	10.2	65.5	29.6
Luxembourg	22.5	17.3			
Mexico	18.5	31.9			
Netherlands	25.7	5.8	24.3	5.7	25.7
New Zealand	0	100	0	100	27.7
Norway	16.8	38.4	13.6	38.1	22
Poland	26.3	3.4	29.2	4.1	30.5
Portugal	26.2	3.8			
Slovak Republic	27	0.9			
Spain	22.4	17.9	25.7	17.1	31.1
Sweden	29.6	–8.8	26.4	–14.4	23.1
Switzerland	12.7	53.4			
Turkey	26.5	2.8			
United Kingdom	5.1	81.3	5.1	82.4	28.9
United States	16.1	40.8	16.1	50.8	32.7
OECD average	**17.8**	**34.8**			
OECD18	**16.3**	**40.1**	**16.2**	**39.8**	**27.2**

Note: OECD18 refers to the countries for which national earnings-distribution data are available.
Source: OECD pension models; *OECD Earnings Distribution Database*.

Distribution of earnings: OECD average and selected countries



Source: *OECD Earnings Distribution Database*.

StatLink http://dx.doi.org/10.1787/651571250203

Key results

In some countries, such as Hungary, Italy and the Slovak Republic, there is a very strong link between pension entitlements and pre-retirement earnings. In contrast, flat-rate benefits in Ireland and New Zealand mean that there is no link between pension and earnings.

The figure shows relative pension levels in OECD member countries on the vertical axis and individual pre-retirement earnings on the horizontal. Countries have been grouped by the degree to which pension benefits are related (or not) to individual pre-retirement earnings. The grouping is based on the distribution of pension benefits relative to the distribution of earnings, set out in the previous indicator of "Progressivity of pension benefit formulae".

In the first set of five countries (Panel A), there is little or no link between pension entitlements and pre-retirement earnings. In addition to the flat-rate systems in Ireland and New Zealand, the relative pension level varies little in Canada: from 38% for low earners to 44% for those on average earnings and above. Although Canada has an earnings-related pension scheme, its target replacement rate is very low, its ceiling is set at average economy-wide earnings and a resource-tested benefit is withdrawn against income from this scheme. In the United Kingdom, the earnings-related scheme has a strongly progressive formula and there is also a basic pension programme. In Australia, the relatively flat curve results mainly from the means-tested public pension programme. There is also a limit to the earnings for which employers must contribute to the DC scheme.

At the other end of the spectrum lie five countries with a very strong link between pension entitlements and pre-retirement earnings (Panel F). In the Netherlands, there is no ceiling to pensionable earnings in quasi-mandatory occupational plans. In the Slovak Republic and Italy, ceilings on pensionable earnings are three or more times average earnings. In these countries, relative pension levels increase with earnings in a linear way over most of the range shown.

The five countries in Panel E have a slightly weaker link between individual pre-retirement earnings and pensions than those in Panel F. One explanation is that Luxembourg and Sweden have redistributive programmes targeting a relatively high minimum retirement income worth 38% of average earnings.

The remaining half of OECD countries represents intermediate cases (between those with little or no link between individual earnings and pensions and those with a strong or very strong link). The ten countries in Panels B and C exhibit stronger links between pensions and pre-retirement earnings than the first group of countries, but their pension systems have much more progressive formulae than those of the five countries shown in Panel F. In the Czech Republic, Norway and the United States this redistribution to low earners is primarily the result of a progressive benefit formula that replaces a larger share of pre-retirement income for poorer workers than for average and higher-income earners. In Iceland, this is done through targeted retirement-income programmes. Denmark has significant basic and targeted schemes.

Panel D shows five countries that lie towards the middle of the OECD countries in terms of the link between pension entitlements and pre-retirement earnings. France and Portugal have redistributive pension programmes – minimum and targeted schemes – at lower-income ranges and strong earnings-benefit links at higher income levels.

Definition and measurement

The strength of the link between pension entitlements and individual earnings is measured using the relative pension level, that is, the gross individual pension divided by gross economy-wide average earnings (rather than by individual earnings as in the replacement-rate results). It is best seen as an indicator of pension *adequacy*, since it shows the benefit level that a pensioner will receive in relation to average earnings in the respective country. The relative pension levels illustrate the link between individual pre-retirement earnings and pension benefits, with data for individuals with earnings from 0.5 to 2 times the average (mean).

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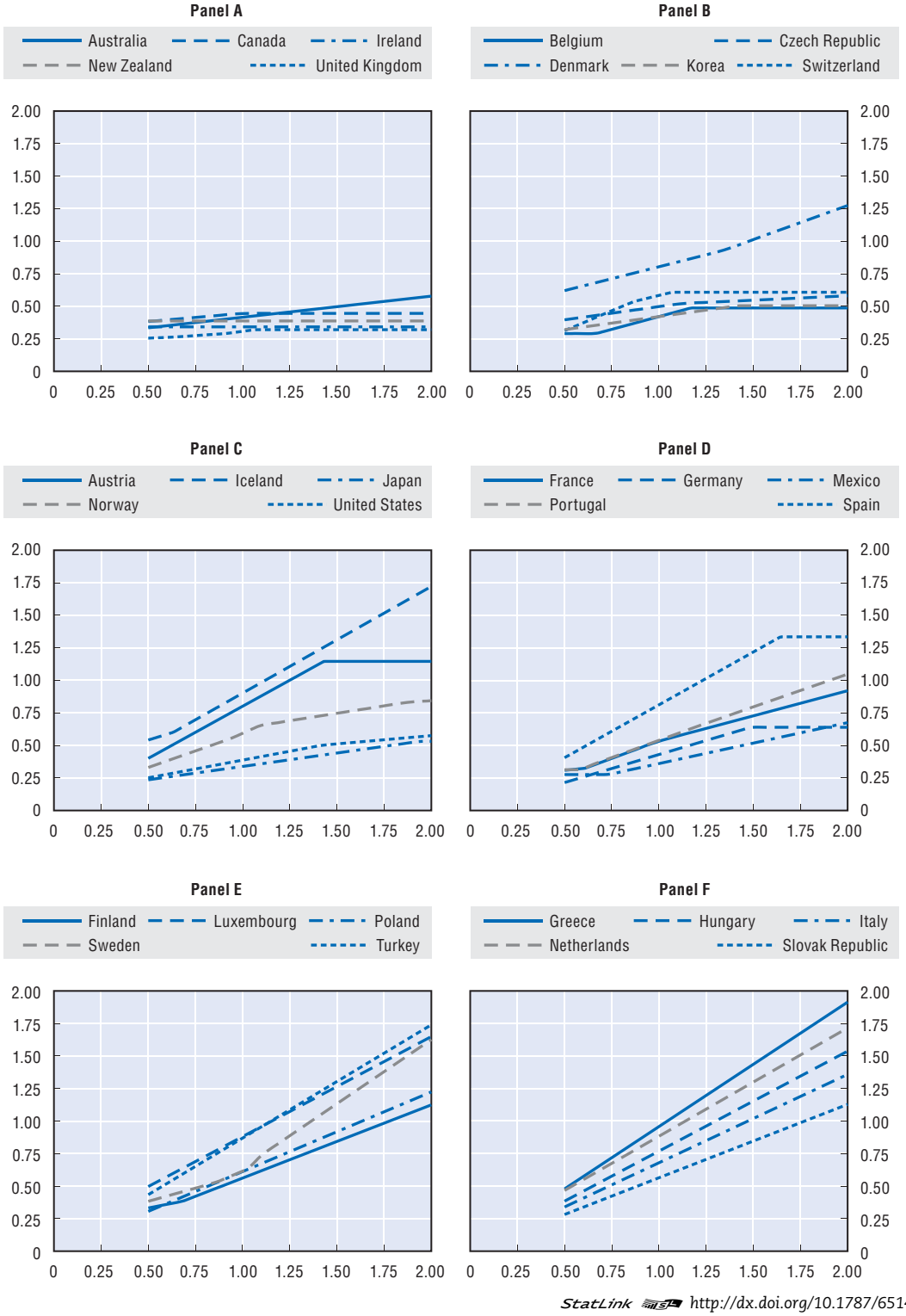
The link between pre-retirement earnings and pension entitlements

Gross pension entitlement as a proportion of economy-wide average earnings



StatLink http://dx.doi.org/10.1787/651411374141

Key results

The indicators so far have shown replacement rates, relative pension levels and pension wealth for people at different levels of earnings. By taking a weighted average of these indicators across the earnings range, the measures presented here show the average for the pension level at the time of retirement and pension wealth. The first is designed to show the level of the average retirement income, taking account of the different treatment of workers with different incomes. The second aims to summarise the total cost of providing old-age incomes.

The weighted average pension level is 57.6% of economy-wide average earnings across the OECD countries. Weighted average pension wealth is an average of 9.8 times mean earnings for men and 11.4 for women.

The measure of weighted average relative pension level combines data on the distribution of earnings with calculations of pension entitlements. The relative pension level is averaged over individuals across the earnings distribution using weights that allow for the fact that there are many more with earnings below the mean than above. The weighted average pension level is expressed as a percentage of economy-wide average earnings. The results are shown in the first and second columns of the table for men and women respectively.

At the top of the range, the weighted average pension levels in Greece and Iceland, followed closely by the Netherlands and Luxembourg are worth more than 86% of average earnings. In another five countries – Denmark, Spain, Austria, Hungary and Sweden – the weighted average pension level is above 70% of the average earnings. At the other end of the spectrum, in seven OECD countries (New Zealand, Belgium, Mexico, the United States, Ireland, Japan and the United Kingdom) the weighted average pension level is less than 40% of average earnings

The same type of weighting procedure can also be applied to the pension wealth measure which is the most comprehensive measure of the scale of the pension promise made to today's workers (third and fourth column of the table). The averages across OECD are worth USD 407 000 for men and USD 476 000 for women (fifth and sixth column of the table).

Values well above the average for weighted average pension wealth, between 13.6 and 16.5 for men and 15.6 and 19.3 of average earnings for women, are found in Denmark, Greece, Iceland and the Netherlands. Austria, Hungary, Italy, Spain and Turkey are closely clustered with values of this indicator of around 10-12 times average earnings. When converted in USD the pension promises in these nine countries amount to USD 565 000 for men and more than USD 650 000 for women. These numbers represent the present value of the transfers that societies are promising on average to future retirees under the current pension system rules.

At the other end of the spectrum, in four countries (Japan, Mexico, the United Kingdom and the United States) pension wealth is well below the average for OECD, at less than 6 times average earnings for men and 7 times average earnings for women.

Pension promise measured with the weighted average pension wealth is also lower in countries with shorter life expectancy such as Poland.

Definition and measurement

Building on the results for replacement rates and pension levels across the range of individual earnings, it is possible to develop composite indicators of countries' pension systems that aggregate the results for workers at different earnings levels. The indicators are the weighted average pension level and the weighted average pension wealth. The indicators build on the calculations of pension entitlements for people earning between 0.3 and 3 times the economy-wide average.

Each level of individual earnings is given a weight based on its importance in the distribution of earnings. The calculations use the average distribution of earnings based on data for 18 OECD countries. The earnings distribution is skewed. The mode (or peak) of the distribution is at around two-thirds of mean earnings. The median (the earnings level both below and above which half of employees are situated) is typically between 80 and 85% of mean earnings. Two-thirds of people earn less than mean earnings. Thus, there are many people with low earnings, and fewer with high earnings, so low earners are given a larger weight in the calculation of the indicator than high earners.

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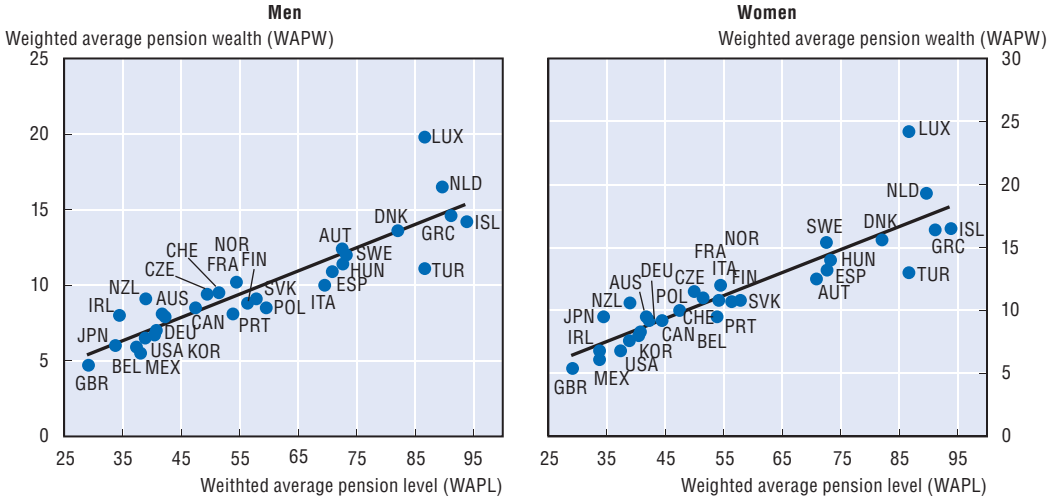
Weighted averages

	Weighted average pension level		Weighted average pension wealth		Average pension wealth (USD)	
	Men	Women	Men	Women	Men	Women
Australia	41.5	41.5	8.1	9.5	337 000	395 000
Austria	72.4	72.4	11.4	13.2	474 000	549 000
Belgium	38.6	38.6	6.5	7.6	270 000	316 000
Canada	42	42	7.9	9.2	328 000	382 000
Czech Republic	47.2	47.2	8.5	10	353 000	416 000
Denmark	81.8	81.8	13.6	15.6	565 000	648 000
Finland	57.6	57.6	9.1	10.8	378 000	449 000
France	51.2	51.2	9.5	11	395 000	457 000
Germany	40.5	40.5	7	8.3	291 000	345 000
Greece	93.6	93.6	14.2	16.5	590 000	686 000
Hungary	72.3	72.3	12.4	15.4	515 000	640 000
Iceland	90.9	90.9	14.6	16.4	607 000	682 000
Ireland	34.2	34.2	8	9.5	333 000	395 000
Italy	69.3	53.9	10	10.8	416 000	449 000
Japan	33.5	33.5	6	6.8	249 000	283 000
Korea	40.2	40.2	6.7	8	278 000	333 000
Luxembourg	86.4	86.4	19.8	24.2	823 000	1 006 000
Mexico	37.8	33.5	5.5	6.1	229 000	254 000
Netherlands	89.4	89.4	16.5	19.3	686 000	802 000
New Zealand	38.7	38.7	9.1	10.6	378 000	441 000
Norway	54.2	54.2	10.2	12	424 000	499 000
Poland	59.3	44.2	8.5	9.2	353 000	382 000
Portugal	53.6	53.6	8.1	9.5	337 000	395 000
Slovak Republic	56.1	56.1	8.8	10.7	366 000	445 000
Spain	73	73	12	14	499 000	582 000
Sweden	70.6	70.6	10.9	12.5	453 000	520 000
Switzerland	49.2	49.7	9.4	11.5	391 000	478 000
Turkey	86.4	86.4	11.1	13	461 000	540 000
United Kingdom	28.9	28.9	4.7	5.4	195 000	224 000
United States	37.1	37.1	5.9	6.8	245 000	283 000
OECD average	**57.6**	**56.4**	**9.8**	**11.4**	**407 000**	**476 000**

Weighted averages compared: pension levels *versus* pension wealth by sex



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Key results

The retirement-income package is divided into different components using the taxonomy from the "Framework of *Pensions at a Glance*" above. This divides pension systems into two mandatory tiers: *i)* a redistributive part, to ensure pensioners achieve an absolute minimum standard of living; and *ii)* and an insurance part, to achieve a target income in retirement compared with earnings when working. This indicator, showing the division of national pension systems between these tiers and between different benefits within the tiers, again demonstrates substantial differences in policies between countries.

The first-tier of redistributive benefits is divided into three types.

First, minimum pensions, significant in 13 countries, aim to prevent pension benefits (often from a single scheme) falling below a certain level. In Belgium and the United Kingdom, minimum pension credits have a similar effect: benefits for workers with low earnings are calculated as if the worker had earned at a higher level. These credits form a very large part of overall benefits in the United Kingdom. Minimum pension are also significant in Belgium, France, Mexico and Sweden.

Another first-tier benefit is basic schemes, whose value does not depend on earnings or the level of other pensions. Basic schemes (or provisions with similar effects in Korea and Mexico) are found in 13 OECD countries. Mandatory pensions in Ireland and New Zealand are entirely from basic schemes. In Japan, Korea, the Netherlands and the United Kingdom, basic pensions contribute 40-60% of the total pension promise. They are also significant in Canada, Denmark and Norway, accounting for 25-35% of resources transferred to pensioners.

All OECD countries have a safety-net for low-income pensioners. But in most of them, full-career workers, even those with low earnings, will not be eligible. There are seven exceptions. Australia is most striking because the whole of its first-tier provision is means-tested and this scheme makes up almost half of the total pension package. In Canada and Denmark, they also play a very important role by providing between 14% and 21% of the pension promise, respectively.

The balance between first- and second-tier schemes in the retirement-income package is shown in the left-hand chart. The second tier accounts for 95% or more in more than the half of OECD countries. In some countries – Austria, Italy, Poland, Spain and Turkey – this reflects high target replacement rates in the second tier. In others, such as Switzerland and the United States, the benefit formula of the public scheme is progressive: redistribution done by the first tier in other countries is carried out by second-tier plans. At the other end of the spectrum, there are no second-tier, mandatory pensions in Ireland and New Zealand, and in the United Kingdom, most of the earnings-related plan goes into benefits from minimum credits.

The second tier of mandatory benefits is divided in the table between public and private providers and, for the latter, between defined-contribution (DC) and defined-benefit (DB) provision. There are public, earnings-related schemes in 23 OECD countries. They provide almost all of the benefits for full-career workers in nine countries: Austria, Finland, Germany, Greece, Italy, Portugal, Spain, Turkey and the United States.

In 11 countries, private pensions are mandatory or quasi-mandatory. They are DB in Iceland, the Netherlands and Switzerland, but DC in most cases. In five countries – Australia, Denmark, the Netherlands, Poland and the Slovak Republic – they account for 50-60% of the total, mandatory pension package. They are significantly more important in Iceland and Mexico. The balance between public and private provision is shown in the right-hand chart.

Definition and measurement

The structure of the pension package is illustrated using the indicator of weighted average pension wealth presented above, divided into the different components of the pension system. The weights derive from the earnings distribution.

Empty cells generally indicate that a country does not have that type of retirement-income provision. However, it is important to remember that the calculations cover full-career workers. All of the first-tier programmes will be much more important for people with incomplete contribution histories. But it is hard to obtain information on the distribution of past contribution histories let alone predict them into the future.

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Structure of the pension package

Percentage contribution of components of the pension system to weighted average pension wealth

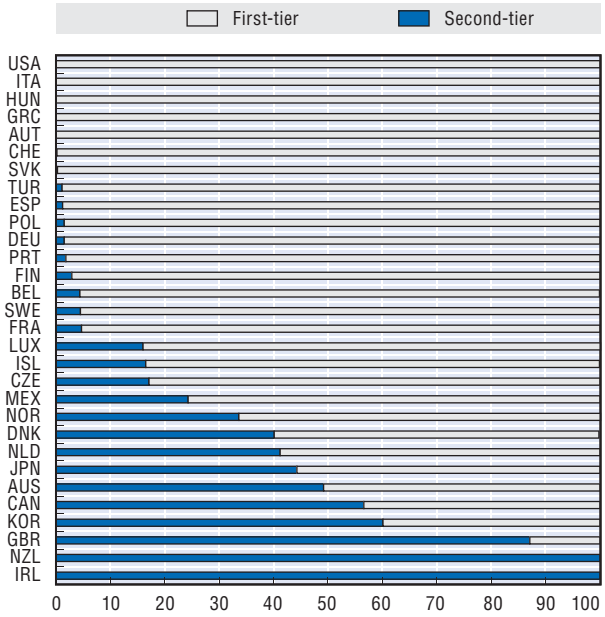
	First-tier			Second-tier			Total		First-tier			Second-tier			Total
	Resource-tested	Basic	Minimum	Public	Private DB	Private DC			Resource-tested	Basic	Minimum	Public	Private DB	Private DC	
Australia	49.2					50.8	100	Korea		60.1[5]		39.9			100
Austria				100.0			100	Luxembourg		15.8[6]	0.2	84.1			100
Belgium			4.4[1]	95.5			100	Mexico		14.0	10.3[7]			75.7	100
Canada	21.4	35.2		43.4			100	Netherlands		41.2			58.8		100
Czech Republic		17.1		82.9			100	New Zealand		100					100
Denmark	13.8	26.3				59.7[2]	100	Norway		32.4	1.2	56.5		10.0	100
Finland			2.9	97.1			100	Poland			1.5	48.2		50.3	100
France			4.7	95.3[3]			100	Portugal			1.8	98.2			100
Germany	1.5			98.5			100	Slovak Republic			0.3	44.9		54.8	100
Greece				100[4]			100	Spain			1.2	98.8			100
Hungary				65.9		34.1	100	Sweden			4.5	52.6		42.9[8]	100
Iceland	3.5	13.0			83.4		100	Switzerland	0.2			72.0	27.8		100
Ireland		100					100	Turkey			1.1	98.9			100
Italy				100.0			100	United Kingdom	0.7	50	36.4[9]	12.9			100
Japan		44.3		55.7			100	United States				100.0			100

DB = defined benefit; DC = defined contribution.
1. Belgium: includes both minimum pension and minimum credits.
2. Denmark: private DC plans include both quasi-mandatory occupational (51.0%) and the special pension (5.0%).
3. France: public pensions include both the state scheme (64.2%) and the complementary, occupational scheme (31.1%).
4. Greece: public pension is made up of the main (73.0%) and the supplementary components (27%).
5. Korea: basic component represents the part of the public pension based on average rather than individual earnings.
6. Luxembourg: basic pension also includes the end-of-the-year allowance.
7. Mexico: basic component calculated from the flat-rate government contribution to DC accounts of 5.5% the real minimum wage from 1997.
8. Sweden: private DC includes both DC schemes (12% and 30.9%).
9. United Kingdom: minimum pension relates to minimum credits in public, earnings-related scheme.

Source: OECD pension models.

Balance between first-tier, redistributive programmes and second-tier, insurance schemes

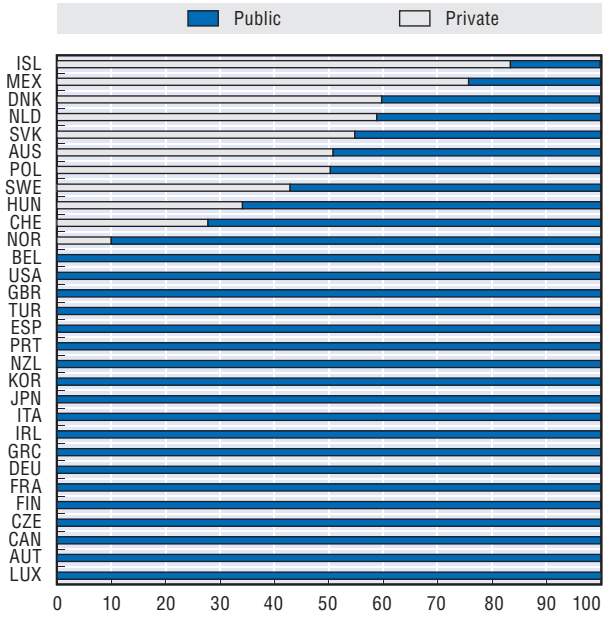
Percentage of weighted average pension wealth



Source: OECD pension models.

Balance between public and private provision of mandatory pensions

Percentage of weighted average pension wealth



Source: OECD pension models.

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Retirement-income Systems

The first set of indicators focused on individual pension entitlements. In contrast, this group looks at retirement-income systems as a whole.

The first two indicators look at how pensions are financed: contributions for public pensions and the assets that back both public and private pension promises. Contribution rates for public pensions, where these can separately be identified, are shown for a series of years between 1994 and 2007. The assets of private pension funds are presented for 2007. Data on the value of public pension reserves are also shown for the same year.

Expenditure on pension benefits is the third of the indicators of retirement-income systems. This indicator shows how much of national income is needed to pay for pensions. It also shows the importance of public pensions in the overall government budget. In many countries, mandatory private pension schemes and public provision of "in-kind" benefits (for housing, for example) are important sources of support in old age. Where available, data are given for spending on these items as well. The evolution of all these measures of the cost of pensions is shown for the period from 1990 to 2006.

The final indicator also looks at private pensions, showing the proportion of the workforce covered by mandatory, quasi-mandatory and voluntary schemes.

Key results

Pension contribution rates have remained broadly stable since the mid-1990s. The average contribution rate in the 21 OECD countries that levy separate public contributions increased from 20.0% in 1994 to 21.0% in 2007. This probably reflects governments' concerns over the effect on employment of high labour taxes. Indeed, these concerns seem to have taken precedence over the pressure on pension-system finances from ageing populations and maturing of schemes.

In the 23 countries for which data are available, revenues from these contributions were worth an average of 5.0% of national income, representing 14.1% of total government revenues raised from taxes and contributions.

Most of the measures presented in *Pensions at a Glance* look at the benefits side of the pension system. These indicators look at the contribution side.

The left-hand side of the table looks at the evolution of contribution rates. Around a third of countries with separate pension contributions saw rates unchanged between 2004 and 2007: Austria, Belgium, Greece, Luxembourg, Turkey and the United States. In addition, there were only very small changes in Germany and Switzerland. There were significant increases in contribution rates in the Czech Republic, Canada and Korea, although in the last two, this was from a relatively low base. Among the more modest changes, there were small increases in contribution rates in Finland, France, Italy and Poland, probably reflecting the pressure of growing public pension spending. In contrast, there were cuts in contribution rates in Japan, the Slovak Republic and Spain. These were often motivated by a desire to reduce labour taxes to increase employment.

The right-hand side of the table looks at the money raised from contributions to public pension schemes. The revenue figures complement those for the contribution rate, because they illustrate the effect of other parameters of the pension system. For example, most OECD countries have ceilings on pension contributions, which range from around the level of average earnings to 3.7 times in Italy and 5.9 times in Mexico. A lower ceiling will, of course, reduce revenues for a given contribution rate. In other countries, there are floors to contributions, which can mean that low earners pay little or no contributions. Finally, some countries' revenues may be affected by the size of the informal sector or under-reporting of earnings.

Public revenues from pension contributions are highest in Italy, at 9.4% of gross domestic product (GDP). Despite the contribution rate in Turkey being around the same as the OECD average, it raises just 2.2% of national income in contributions, reflecting the size of the informal sector. Contribution revenues are also low in Canada – 2.7% of GDP – because of the low contribution rate (half the OECD average) and the low ceiling (around average earnings).

On average, employee contributions raise a total of 1.8% of GDP compared with 2.9% of GDP for employers' contributions. Employees pay 36% of the total, on average, compared with 58% of the total paid by employers. (The remainder is mainly accounted for by contributions from the self-employed, although it also includes contributions from other groups, such as the unemployed.) The great bulk of contributions is levied on employers in the Czech Republic, Finland, Hungary, Italy and Spain. However, it is important to bear in mind that levies on employers have been shown in numerous economic analyses to be passed, in part or in full, onto workers. This can take the form of lower wages or fewer jobs. In many countries, the contributions are evenly balanced between employer and employee levies, including Austria, Belgium, Canada, Germany, Japan, Switzerland and the United States.

The final column of the table shows pension contributions as a percentage of total government revenues from taxes and contributions. This time, Italy does not show the highest figure. In Greece, Poland and Spain, pension contributions account for 23-24% of total revenues, compared with 22.4% in Italy. In Australia, Denmark and New Zealand, pensions are financed by general revenues. For the reasons explained above, pension contributions are a relatively small part of government revenues in Canada, Korea and Turkey.

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Public pension contribution rates and revenues

	Pension contribution rate (per cent of gross earnings)				Pension contribution revenues, 2006			
					(per cent of GDP)			(per cent of total taxes)
	1994	1999	2004	2007	Employee	Employer	Total	
Australia	Private pension contributions only				0.0	0.0	0.0	0.0
Austria	22.8	22.8	22.8	22.8	3.5	3.7	7.9	18.9
Belgium	16.4	16.4	16.4	16.4	2.2	2.0	4.6	10.4
Canada	5.2	7.0	9.9	9.9	1.3	1.3	2.7	8.1
Czech Republic	26.9	26	28.0	32.5	1.7	5.7	7.8	21.2
Denmark	Private pension contributions only				0.0	0.0	0.0	0.0
Finland	18.6	21.5	21.4	20.9	1.6	6.9	8.9	20.5
France	21.5	24.0	24.0	24.0				
Germany	19.2	19.7	19.5	19.5	2.6	2.7	5.8	16.4
Greece	20.0	20.0	20.0	20.0	2.9	3.5	7.5	23.9
Hungary	30.5	30.0	26.5	26.5	1.0	4.8	5.8	15.7
Iceland	No separate pension contribution							
Ireland	No separate pension contribution							
Italy	28.3	32.7	32.7	32.7	2.2	7.3	9.4	22.4
Japan	16.5	17.4	13.9	14.6	2.9	2.9	5.9	21.0
Korea	6.0	9.0	9.0	9.0	1.6	1.0	2.6	9.8
Luxembourg	16.0	16.0	16.0	16.0	2.5	2.2	4.8	13.3
Mexico	Private pension contributions only				0.0	0.0	0.0	0.0
Netherlands	33.1	37.7	28.1	31.1				
New Zealand	No contributions				0.0	0.0	0.0	0.0
Norway	No separate pension contribution							
Poland		32.5	32.5	35.0	4.3	3.7	8.1	24.0
Portugal	No separate pension contribution							
Slovak Republic	28.5	27.5	26.0	24.0	1.3	2.3	5.2	17.4
Spain	29.3	28.3	28.3	28.3	1.3	6.6	8.5	23.3
Sweden	19.1	15.1	18.9	18.9	2.5	3.6	6.2	12.7
Switzerland	9.8	9.8	9.8	10.1	2.8	2.7	6.0	20.4
Turkey	20.0	20.0	20.0	20.0	1.1	1.1	2.2	8.8
United Kingdom	No separate pension contribution							
United States	12.4	12.4	12.4	12.4	2.3	2.3	4.6	17.2
OECD	**20.0**	**20.7**	**20.2**	**21.0**	**1.8**	**2.9**	**5.0**	**14.1**

Note: All figures are rounded to one decimal place. The OECD average figure for contribution rates excludes the countries for which there are no pension contributions or they are part of contributions to wider social security programmes. The OECD average figure for contribution revenues includes zero for the countries with no contributions in the calculation.

In some cases, pension contribution revenues have been calculated assuming that the revenues are split between different social security programmes in the same proportion as the contribution rates. The total contribution includes payments from people who are not employed (principally the self-employed).

Finland: contribution rates are now higher for employees aged 53 and over. There is an additional levy on employers that varies between 0.8% and 3.9% of payroll, depending on the employer's capital. France and the Netherlands: it is not possible to separate the contribution revenues into those for pensions and for other purposes. Poland: the contribution rate for pensions was cut by 3 percentage points in July 2007; the earlier, higher figure is shown.

Source: OECD (various years), *Taxing Wages*; OECD (2008), *Revenue Statistics*; Social Security Administration, United States (various years), *Social Security Programs throughout the World*; OECD pension models and tax-benefit models.

StatLink http://dx.doi.org/10.1787/651685284288

Key results

Public spending on cash old-age pensions and survivors' benefits in OECD increased 16.7% faster than the growth in national income between 1990 and 2005, from an average of 6.2% of gross domestic product (GDP) to 7.2%. This is a result of population ageing and the maturing of pension systems.

Italy had the highest public pension spending in 2005: 14.0% of GDP. Public pension spending on cash benefits is also well above 10% of GDP in some other European countries: Austria, France, Germany, Greece and Poland. At the other end of the scale, Korea and Mexico spend only around 1.5% of GDP on old-age and survivors' benefits. In Korea, this reflects the fact that the public pension scheme was only introduced in 1988. But spending grew rapidly between 1990 and 2005 – more than doubling relative to national income – due to the maturing of the scheme and rapid population ageing. In Mexico, low spending reflects relatively low coverage of pensions (only around 35% of employees) and a relatively young population.

Spending also tends to be relatively low in other countries with a favourable demographic profile, such as Australia, Canada, Ireland, New Zealand and the United States. However, this is not always the case: Turkey spends 7.8% of GDP on public pensions – more than the OECD average of 7.2% – despite being the second youngest OECD country in demographic terms.

In some OECD countries, public pension spending is low due to mandatory private provision (first memorandum item in the table). The most important case is Switzerland, where mandatory private pension spending of 6.0% of GDP is not far short of public spending, of 6.8% of GDP. Adding the two together, total pension spending of 12.8% of national income is second only to Italy, and a little above Austria and France. The mandatory defined-contribution scheme in Australia was introduced in 1992, so current retirees have little or no accumulation in these plans. Total payouts in 2005 amounted to just 0.4% of GDP, but this will increase rapidly in coming years. Similarly, mandatory private pensions in Poland and Hungary (introduced in the late 1990s) and the Slovak Republic (in 2005) will see little or no payouts for a decade or more.

Pension spending relative to national income was stable over the period 1990-2005 in five OECD countries: Belgium, Canada, Spain, Sweden and the United States. In six countries, public pension expenditures increased at a slower rate than national income. In Ireland, this reflects the stellar growth in GDP over the period. In New Zealand, the decline of over 40% in pension spending relative to national income reflects two policies: freezing the value of the basic pension in 1992-94 and increasing the pension age from 60 to 65. The other countries with significant falls in pension spending are Iceland, Luxembourg, the Netherlands and Norway.

In five OECD countries, public pension expenditure more than doubled relative to national income. In the case of Korea and Mexico (and, to a lesser degree, Turkey), this reflected the low starting point for pension spending in 1990. However, Poland and Portugal have moved from having pension spending below the OECD average to well above.

The right-hand columns of the table show spending on cash old-age and survivors' benefits relative to total public spending (rather than national income). Again, Italy has the highest figure, with pensions taking nearly 30% of the budget. In Austria, France, Germany, Greece and Poland, around a quarter of public spending goes on pensions. The risk in these countries is that public pension spending crowds out other desirable expenditure, both in social policy (on benefits for children and parents) and elsewhere (on education, for example).

Public old-age support is not limited to cash benefits. The second memorandum item shows total public spending on older people, including non-cash benefits. The most important is housing benefits and subsidies. These are defined as "non-cash benefits" because they are contingent on particular expenditure by individuals. They are particularly important in the five Nordic countries: non-cash benefits cost an average of 1.8% of GDP. Housing is also an important part of old-age support in the Netherlands and the United Kingdom, while the figures for Australia related mainly to healthcare.

Definition and measurement

Data and definitions are set out in more detail in the on-line *Social Expenditure Database*: *www.oecd.org/els/social/expenditure*.

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Expenditures on old-age and survivors' benefits

	Per cent of GDP				Change 1990-2005 (%)	Per cent of government spending	
	1990	1995	2000	2005		1990	2005
Public cash benefits							
Australia	3.1	3.7	3.9	3.5	*+10.6*	8.6	9.9
Austria	11.7	12.6	12.3	12.6	*+7.8*	22.7	25.3
Belgium	9.1	9.3	8.9	9.0	*–0.9*	17.4	17.3
Canada	4.2	4.7	4.3	4.1	*–2.9*	8.7	10.6
Czech Republic	6.1	6.2	7.5	7.3	*+20.0*		16.3
Denmark	5.1	6.2	5.3	5.4	*+6.1*	9.2	10.3
Finland	7.3	8.8	7.6	8.4	*+16.4*	15.1	16.7
France	10.6	12.0	11.8	12.4	*+16.3*	21.5	23.0
Germany	10.0	10.5	11.0	11.4	*+14.0*		24.3
Greece	9.9	9.6	10.7	11.5	*+16.6*		26.6
Hungary			7.3	8.5			17.1
Iceland	2.2	2.4	2.2	2.0	*–10.5*		4.7
Ireland	3.9	3.5	3.1	3.4	*–12.1*	9.0	10.0
Italy	10.1	11.4	13.6	14.0	*+37.9*	19.2	29.0
Japan	4.9	6.2	7.4	8.7	*+75.5*		22.7
Korea	0.8	1.2	1.4	1.6	*+108.5*	3.8	5.4
Luxembourg	8.2	8.8	7.5	7.2	*–11.2*	21.6	17.3
Mexico	0.5	0.8	0.9	1.3	*+161.6*		
Netherlands	6.7	5.8	5.0	5.0	*–26.3*	12.2	11.0
New Zealand	7.5	5.8	5.1	4.4	*–41.8*	14.0	10.9
Norway	5.6	5.5	4.8	4.8	*–14.3*		11.5
Poland	5.1	9.4	10.5	11.4	*+121.6*		26.3
Portugal	5.0	7.4	8.2	10.2	*+102.1*		22.0
Slovak Republic		6.3	6.3	6.2			16.2
Spain	7.9	9.0	8.6	8.1	*+1.9*		21.0
Sweden	7.7	8.2	7.3	7.7	*–0.3*		13.9
Switzerland	5.6	6.6	6.6	6.8	*+21.6*	18.3	19.1
Turkey	3.2	3.7		7.8	*+146.1*		
United Kingdom	4.9	5.4	5.4	5.7	*+15.4*	11.9	12.8
United States	6.1	6.3	5.9	6.0	*–0.7*	16.1	16.2
OECD	**6.2**	**6.8**	**6.9**	**7.2**	***+16.7***		
Memorandum: Total spending including mandatory private							
Australia	3.1	4.4	4.8	3.9	*+23.5*		
Italy	12.9	14.5	14.8	15.1	*+17.3*		
Japan	5.1	6.4	7.9	9.0	*+76.6*		
Switzerland	8.7	11.3	12.4	12.8	*+47.2*		
United Kingdom	5.0	5.6	5.9	6.2	*+23.4*		
Memorandum: Total public spending including non-cash benefits							
Australia	3.7	4.2	5.1	4.7	*+25.1*		
Denmark	7.4	8.4	7.1	7.3	*–1.5*		
Finland	8.0	9.7	8.4	9.4	*+17.8*		
Hungary			7.8	9.1			
Iceland	3.5	3.7	3.5	3.8	*+10.4*		
Japan	5.1	6.4	8.1	9.9	*+94.4*		
Netherlands	7.3	6.3	5.7	5.8	*–19.7*		
Norway	7.5	7.5	6.8	6.6	*–12.4*		
Sweden	9.2	10.5	9.8	10.2	*+11.0*		
United Kingdom	5.2	5.9	5.9	6.3	*+19.6*		

Note: Countries are only shown in the memorandum items if the relevant value – mandatory private spending or public spending on non-cash benefits respectively – is significant.

Source: OECD Social Expenditures (SOCX) Database, OECD Main Economic Indicators Database.

StatLink http://dx.doi.org/10.1787/651748842654

Key results

As future public pensions for today's workers have been reduced to try and restore financial sustainability to public pension schemes, the burden of providing for old age has been shifted onto private pensions. In 11 OECD countries, private pensions are mandatory or quasi-mandatory (that is, they achieve near-universal coverage of employees through industrial-relations agreements). In a further eight OECD countries, voluntary private pensions cover a significant part of the workforce: more than 55%.

In Iceland, Norway and Switzerland, occupational pensions are mandatory: employers must operate a scheme and contribution rates are set by the government. In the Netherlands and Sweden, occupational plans are "quasi-mandatory": through industrial-relations agreements, employers establish schemes and employees must join them. As a result, 90% or more of the workforce is covered.

Six OECD countries – Denmark, Hungary, Mexico, Poland, the Slovak Republic and Sweden – have mandatory personal pensions. Coverage is near-universal in Denmark and Sweden. However, in Eastern Europe, the schemes were introduced in the last decade. Older workers tended not to be covered by the new plans. The coverage rate of around 65-75% will therefore increase over time as new workers join personal pensions while workers with only public pensions retire.

In Mexico, the coverage rate for mandatory personal pensions is low because of the size of the informal sector in the economy.

Australia's system combines occupational and personal provision. Originally, employers chose the pension provider, either an industry-wide plan or a financial-services firm. But individuals can now choose to opt out of their employer's chosen provider and pick a different one or invest their retirement savings themselves. It is not easy to separate out the overall coverage of 85% into occupational and personal plans.

Turning to voluntary private pensions, coverage is highest – at 55% or more – in Belgium, Canada, Germany, Ireland, Japan, Norway, the United Kingdom and the United States. Occupational plans are the only or main provider of private pensions. They are "voluntary" in the sense that employers are free to set up an occupational plan or not and employees can often choose whether to join.

Where the OECD has household-survey data, overall coverage of voluntary private pensions is shown to involve much "double-counting": people with both occupational and personal plans. This effect is strongest in the United States: 46% of employees are members of occupational plans and nearly 35% have personal pensions, whereas overall private-pension coverage is just less than 58%. This implies that two-thirds of people with personal plans also have an occupational pension.

Coverage of voluntary personal pensions is generally quite low: the largest figures are Germany (44%) and the United States (about 35%). In many cases, this is probably because the demand for private pensions is mainly met with occupational provision, which "crowds out" demand for personal pensions.

The effect of the new "KiwiSaver" scheme in New Zealand is apparent (see the special chapters in Part I on "Recent pension reforms" and "The pension gap and voluntary retirement savings"). Private pension coverage had declined substantially after the reduction of tax incentives. In 2007, 13% of employees had an occupational plan and 5.5% were members of personal schemes. KiwiSaver has now enrolled nearly a third of employees through occupational provision and a further 10.7% through personal plans. This is early evidence of the effectiveness of the automatic enrolment arrangements in the scheme.

Definition and measurement

It is very difficult to get accurate and comparable data on private pensions because of substantial institutional differences between countries in the way that pensions are set up. The table aims, as far as possible, to match the categorisation of the various types of scheme used elsewhere in *Pensions at a Glance*. As a result, the classification of different schemes is not exactly the same as in OECD (2009) *Private Pensions Outlook*. The aim here is to express coverage of employees as a percentage of total employment. However, in some countries, some of the covered may be self-employed or not working and so enter the numerator but not the denominator of the percentage figures shown.

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Coverage of private pension schemes by type of plan

In percentage

	Mandatory/quasi-mandatory		Voluntary		Total
	Occupational	Personal	Occupational	Personal	
Australia	– 85.0 –		18.8	9.7	
Austria			13.9		
Belgium			55.6		
Canada			39.4		57.3
Czech Republic			– 45.0 –		
Denmark	> 90.0/76.1	88.6			
Finland			8.7	7.3	
France			15.0		
Germany			64.0	44.0	
Greece					
Hungary		74.0	– 31.0 –		
Iceland	> 90.0				
Ireland			42.9	14.9	55.0
Italy			10.6	5.1	
Japan			45.0		
Korea					
Luxembourg			5.6		
Mexico		34.5			
Netherlands	> 90.0				
New Zealand			13.0/32.6	5.5/10.7	n.a./43.3
Norway	> 90.0		60.0	3.0	
Poland		71.7	– 1.0 –		
Portugal			4.0		
Slovak Republic		65.8			
Spain			8.7		
Sweden	> 90.0	> 90.0			
Switzerland	> 90.0				
Turkey					
United Kingdom			47.1	18.9	59.1
United States			46.0	34.7	57.7

Note: Empty cells indicate that there is no legal basis for that scheme type in a particular country or that coverage is negligible (less than 1%). The entry "> 90.0" indicates that coverage is near universal. The column for total coverage is only filled where there are adequate data to deal with double-counting of people with both occupational and personal plans.

Australia: the mandatory "superannuation-guarantee" scheme allows individuals to choose between an employer-wide scheme, industry-wide funds, a financial-services firm or to invest the funds themselves: a mix between occupational and personal provision. Czech Republic, Hungary and Poland: voluntary private pensions are provided by both occupational and personal plans: it is not possible to distinguish coverage of each type. Denmark: under mandatory occupational, the first figure relates to ATP and the second to quasi-mandatory DC occupational pensions. The figure under the "mandatory, personal" column relates to the special pension (SP). See the country chapter on Denmark for more details. Germany: coverage of occupational pensions is a percentage of employees covered by the public pension. Korea: the government aims to convert severance-pay schemes into occupational plans (see the special chapter in Part I on "Recent pension reforms") but there have been few conversions so far, although exact figures are not available. New Zealand: the second figure in each cell shows people covered by KiwiSaver (either through their employer – occupational – or a financial-services firm – personal). The first figure shows coverage of traditional occupational and personal pensions (excluding people contributing to personal pensions aged over 65 for tax reasons).

Source: OECD (2009), *OECD Private Pensions Outlook 2008*; OECD (2007), *Pensions at a Glance: Public Policies across OECD Countries*, European Union, Social Protection Committee (2008), *Privately Managed Funded Pension Provision and their Contribution to Adequate and Sustainable Pensions*; Antolín, P. and E.R. Whitehouse (2009), "Filling the Pension Gap: Coverage and Value of Voluntary Retirement Savings", Social, Employment and Migration Working Paper No. 69, OECD, Paris; *World Bank Pensions Database*; national authorities.

StatLink http://dx.doi.org/10.1787/651756380648

Key results

Substantial assets have been accumulated in most OECD countries to help meet future pension liabilities. The total assets in private pensions were the equivalent of nearly 75% of gross domestic product (GDP) in 2007. Half of OECD countries have built up public pension reserves to help pay for pensions. In these countries, public pension reserves are worth nearly 15% of GDP.

However, it is important to bear in mind that these figures relate to 2007, before the impact of the financial crisis on asset values.

In 2007, private pension assets exceed annual national income in four OECD countries: Australia, Iceland, the Netherlands and Switzerland. Private pension funds were also significant in the United Kingdom and the United States, worth around 75% or more of GDP.

Because of the weight of the United States in the OECD economies as a whole, aggregate private pension assets are the equivalent of more than 75% of aggregate OECD GDP. However, weighting OECD countries equally, the average for private pension assets is just 33% of GDP.

Again, it is important to stress that these numbers are "pre-crisis", since they mainly refer to 2007. The impact of the financial crisis on pension funds' investments, explored in the special chapter in Part I on "Pension systems during the financial and economic crisis", has been profound. Pension funds' investments in OECD countries lost 23% of their value during 2008, with particularly large losses in Australia, Iceland, Ireland and the United States. In 2009, asset prices have fallen further.

The countries with the largest pension funds relative to their economies all have mature private pension schemes that have been in place for a long time. Along with the six mentioned above, this also includes Canada, Denmark and Ireland.

In other countries, private pension provision was developed much more recently. Hungary, Mexico, Poland and the Slovak Republic, for example, all introduced mandatory private pension as a substitute for part of public pensions in the late 1990s and early 2000s. Assets have grown rapidly since that point, reaching around 11-12% of GDP in Hungary, Mexico and Poland. These figures will grow rapidly over coming years and decades as more people join the new retirement-income system and existing members make further contributions.

New Zealand could also see such rapid growth. Although there was a long history of private, occupational plans, coverage declined significantly from the early 1980s onwards, falling to around 13% currently. However, the new KiwiSaver voluntary private scheme covered more than 40% of employees after its first year of operation. This suggests that private pension assets will increase significantly in coming years.

Some 15 OECD countries have public pension reserves. Many of these are relatively small: in only eight countries were public pension reserves worth more than 5% of national income in 2007. The fund in the United States is invested entirely in government bonds. Some have argued that this is simply a circular way of financing pensions on a pay-as-you-go basis, whereby current contributions pay for current benefits. This is because the contributions that go into the reserve are merely lent to the government to finance current spending on other programmes.

Government bonds also make up over 80% of the portfolio of Korea's public pension reserve and over 60% of Japan's.

However, the government bond share is just 35-40% in Norway and Sweden and less than 20% in New Zealand and Ireland. These are also relatively large funds.

Similar arguments to those about the maturity of recently established private pension schemes apply to public pension reserves. Those in Australia, Ireland and New Zealand – three demographically young OECD countries – have been established relatively recently. Assets should build up over the coming years, but will be drawn down once the population begins to age significantly.

Definition and measurement

The OECD has established a set of guidelines for classifying private pensions (see OECD, 2004). The analysis uses this framework. For details see OECD (2008 and 2009).

References

OECD (2005), *Private Pensions: OECD Classification and Glossary*, OECD, Paris.

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Assets in private pension funds and public pension reserves

	Value of assets (% of GDP) 2007	
	Private pension funds	Public pension reserves
Australia	105.4	4.9
Austria	4.8	
Belgium	4.0	
Canada	55.3	7.9
Czech Republic	4.7	
Denmark	32.4	0.3
Finland	71.0	
France	1.1	1.9
Germany	4.1	
Greece	0.0	
Hungary	10.9	
Iceland	134.0	
Ireland	46.6	11.5
Italy	3.3	
Japan	20.0	26.2
Korea	3.1	23.9
Luxembourg	1.0	
Mexico	12.1	0.9
Netherlands	138.1	
New Zealand	11.1	7.8
Norway	7.0	5.2
Poland	12.2	0.3
Portugal	13.7	4.3
Slovak Republic	4.2	
Spain	7.5	4.5
Sweden	8.7	31.7
Switzerland	119.2	
Turkey	1.2	
United Kingdom	78.9	
United States	76.7	16.6
Total OECD	**74.5**	**14.5**
Unweighted average	33.1	9.9

Note: Data on public pension reserve funds for Norway, Mexico and Portugal are from 2006. For Norway, the Government Pension Fund – Global, which was previously a sovereign wealth fund called the Government Petroleum Fund, draws its funding from oil revenues and has a mandate that goes beyond financing pension expenditures; so it is not classified as a sovereign pension reserve fund. The figure in this table, therefore, only refers to the Government Pension Fund – Norway, formerly the National Insurance Scheme Fund (5.2%). By contrast the total assets of the larger Government Pension Fund – Global, would amount to 79.7% of GDP.

"Total OECD" aggregates member countries. Unlike the "unweighted average", it therefore reflects difference in the size of GDP between countries. The "total OECD" and "unweighted average" figures for public pension reserves cover only the 15 countries for which data are shown.

Source: OECD (2008), "Pension Markets in Focus", *Newsletter*, No. 5, Figure 6, OECD, Paris; OECD (2009), *OECD Private Pensions Outlook 2008*, Table 3.1, national sources.

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Demographic and Economic Context

Population ageing has been one of the main driving forces behind pension policies and reforms in the past two decades. Ageing is the result of two demographic changes.

The first factor pushing population ageing is increasing life expectancy. Changes in life expectancy – at birth and at age 65 – over time are shown. There is also a brief discussion of how life expectancy might change in the future. The second is a decline in the number of births. Fertility rates and how they have changed over time are explored in the first indicator in this section, along with a brief discussion of explanations for the trends.

Population ageing is directly addressed by the third indicator. The degree of ageing is measured with the dependency ratio: the number of people of pension age relative to the number of working age. The old-age dependency ratio is shown for a century: historical data back to 1950 and projections forward to 2050.

The final indicator shows the economic context. It gives data on average earnings, calculating using the OECD's "average-worker" measure, for 2006. These data are used widely in the report: many values for parameters and results for pension entitlements are reported as percentages of national average earnings.

Key results

The remarkable increase in life expectancy is one of the greatest achievements of the last century. Lives continue to get longer. Since 1960, women's life expectancy has increased by nearly 11 years, to 81.7 years. For men, the increase is a little over ten years, to 76.0 years. In 2006, life expectancy at birth among women was highest in Japan (85.8 years), followed by France, Spain, Switzerland and Italy. For men, life expectancy was highest in Iceland (79.4 years) followed by Switzerland, Japan, Australia and Sweden. Life expectancy at older ages – which is more relevant for pension systems – has also increased substantially.

The general increase in life expectancy in OECD countries was accompanied by convergence between countries. In Korea and Turkey, life expectancy at birth for women and men combined increased by 26.7 and 23.3 years respectively between 1960 and 2006, while in Mexico the gain exceeded 18 years. Catch-up gains in life expectancy by these countries mainly reflect lower infant mortality.

There is little evidence that increases in life expectancy are approaching a ceiling. Gains in life expectancy at birth for Japanese women halved after the period of catching-up, but have since continued at a rate of around 3% per year.

The gender gap in life expectancy has widened slightly: from 5.0 years in 1960 to 5.7 years in 2006. However, there have been different trends between earlier and later decades. While the gender gap in life expectancy increased substantially during the 1960s and 1970s (to a peak of 6.7 years, on average, in 1980), it has narrowed during the past 25 years. This narrowing reflects, in part, the lower differences in the prevalence of risky behaviour (such as smoking) between men and women and fewer deaths from cardiovascular disease among men.

Old people are living longer. In 2006, on average, women aged 65 could expect to live an additional 20.1 years, up by 5.3 years since 1960. Men of the same age could expect to live 16.7 more years, with a gain of 4.0 years since 1960. Gender gaps in longevity of older people have narrowed in several OECD countries since the mid-1980s.

Overall longevity gains are due to rising living standards, but also greater access to quality health services. However, gains in life expectancy have been smaller among people from lower socioeconomic groups (OECD, 2004).

Analysts differ on how life expectancy is likely to develop in the future. Optimists point to developments in biotechnology and so on. Pessimists stress the dangers of a global influenza pandemic, increasing obesity and the failure to tackle chronic conditions of old age, such as Alzheimer's disease. Some OECD calculations, based on the experience of changes in mortality rates since 1945, are shown in the table. Starting in 2002, the central projection is an increase in life expectancy at age 65 of around 3.5 years over the next 50 years. This would increase pension costs, all other things being equal, by around 20%. However, the worst case shows an increase of only around two years, while the best case is an increase of five years. Given this uncertainty, most OECD countries now have elements of their retirement-income provision that automatically adjusts pensions to reflect changes in life expectancy.

Life expectancy at age 65 in 2002: distribution of 50-year projections

	Base	5%	25%	50%	75%	95%
Life expectancy (years)						
Men	15.1	20.1	19.1	18.5	18.0	17.1
Women	18.7	23.7	22.8	22.2	21.7	20.9
Change (years)						
Men	0.0	+5.0	+4.0	+3.4	+2.9	+2.0
Women	0.0	+5.0	+4.1	+3.5	+3.0	+2.2

Source: Whitehouse, E.R. (2007), "Life-expectancy Risk and Pensions: Who Bears the Burden?", Social Employment and Migration Working Paper, No. 60, OECD, Paris. Calculations use the *Human Mortality Database* (University of California, Berkeley and Max Planck Institute for Demographic Research). Baseline mortality rates for 2002 are from the *United Nations/World Bank Population Database*.

Definition and measurement

The indicators presented here, life expectancy at birth and at age 65, are defined as the average number of years that a person could expect to live if he or she experienced the age-specific mortality rates prevalent in a given country in a particular year: in this case, 1960 and 2006. Each country calculates its life expectancy using methodologies that vary. However, the impact of these methodological differences is relatively small, altering measured life expectancy by only a fraction of a year.

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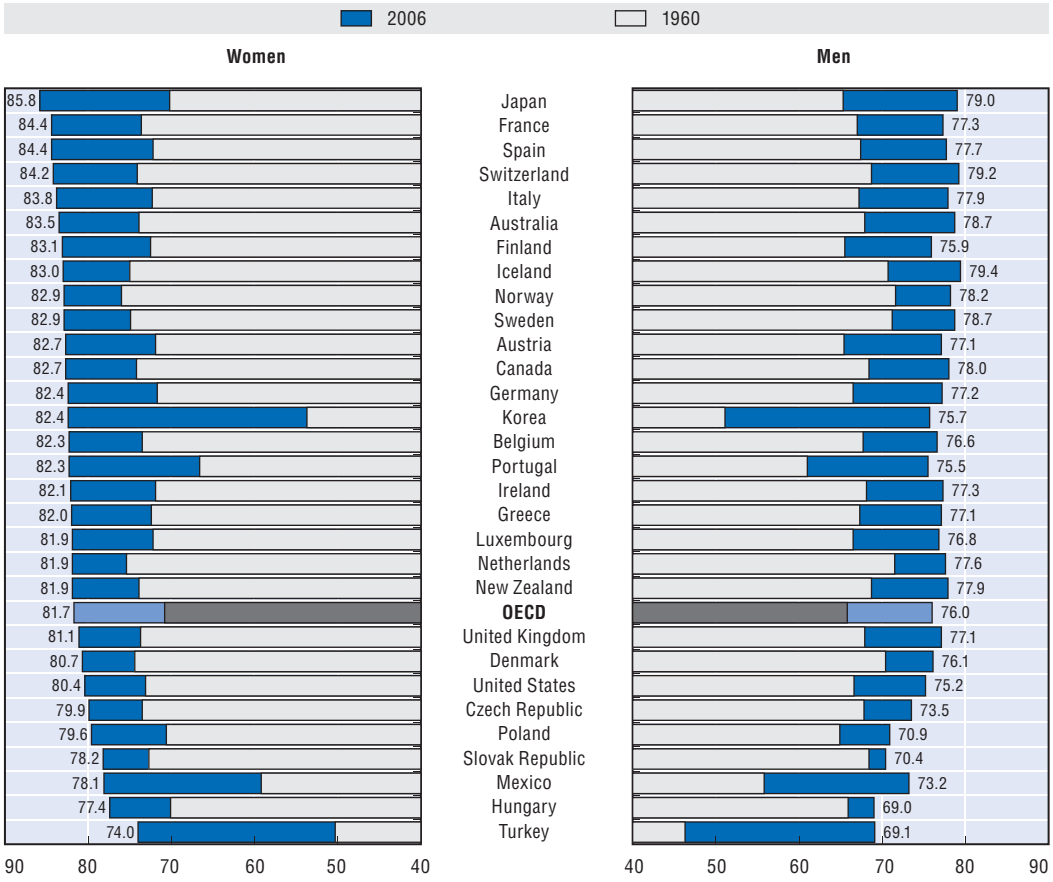
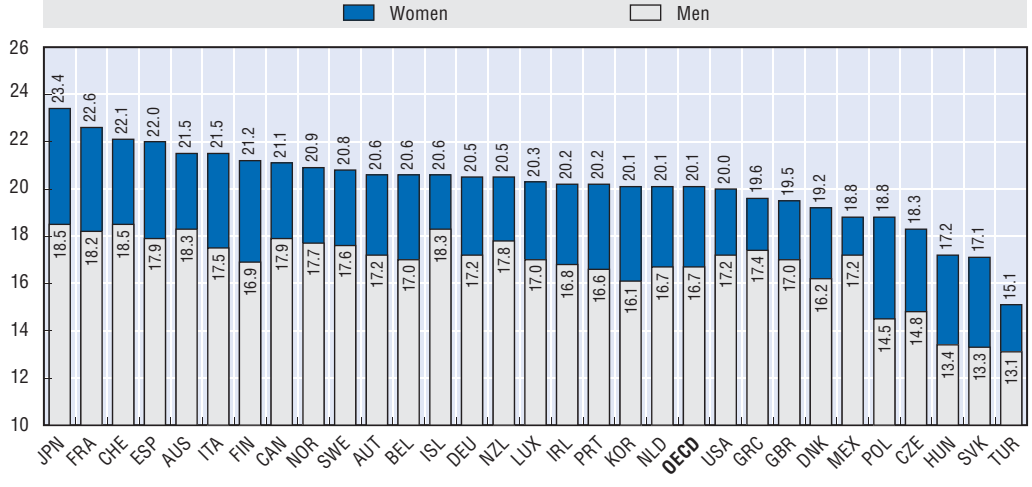
Life expectancy at birth, in years, men and women, in 1960 and 2006



Source: OECD (2008), *OECD Health Data 2008*, OECD, Paris (*www.oecd.org/health/healthdata*) and OECD (2009), *Society at a Glance*.

Life expectancy at 65, in years, men and women, in 2006



Note: Data are from 2005 for Canada, the United Kingdom and the United States and 2004 for Italy.

Source: OECD (2008), *OECD Health Data 2008*, OECD, Paris (*www.oecd.org/health/healthdata*) and OECD (2009), *Society at a Glance*.

StatLink http://dx.doi.org/10.1787/651413351581

Key results

The total fertility rate is below the replacement level – the number of children needed to keep the total population constant – in 26 out of 30 OECD countries. The only exceptions are Mexico and Turkey (with 2.2 children per woman) and Iceland and the United States (with fertility rates of around 2.1). However in more than two-thirds of OECD countries there has been a moderate increase in fertility rates since 2002.

Fertility rates have a profound implication for pension systems because they, along with life expectancy, are the drivers of population ageing.

In 2006, fertility rates averaged 1.65 across OECD countries, well below the level that ensures population replacement. The trend to fewer children has been going on since the 1970s. The fall in fertility rates reflects changes in both individuals' life-style preferences and in the constraints of everyday living, such as labour-market insecurity, difficulties in finding suitable housing and unaffordable childcare.

The positive (and widening) gap between the number of children women declare that they want and the number that they actually have shows the influence of these constraints (D'Addio and Mira d'Ercole, 2005).

Another effect comes from the changing marital status of women. The larger share of women that are unmarried may have depressed fertility rates, particularly in countries where there is a strong link between marriage and maternity. The strongest link is in Japan and Korea, although it is also significant in several European countries, such as Greece, Italy, Poland and Switzerland. However, the childbearing patterns of unmarried women have also changed. For example, half or more of births now occur outside of marriage in France, Iceland, Norway and Sweden (according to *Society at a Glance*). The OECD average proportion of births outside marriage is now one third of the total.

In recent years, there have been reversals of the decline in the number of children in some OECD countries. The biggest rebounds have occurred in the United Kingdom, France, Sweden, Spain, and the Czech Republic. The reasons for this reversal differ: policy measures, including more support for families and working women, may have played a role. But the rebound may also be due to more births to women who had postponed motherhood until their thirties or later.

Low fertility rates have a number of wider social and economic consequences. First, the decline in population can become self-reinforcing, as the number of women of childbearing age falls. Secondly, there are fewer family carers to help people in old age. Thirdly, there is a growing tax burden for people of working age who have to finance pensions and health care for older people. Fourthly, the workforce will also age and so might be less adaptable to technological change, thereby reducing productivity and economic growth. Finally, ageing may result in a smaller pool of savings to finance investment in the economy as older people use their savings to support their consumption.

The trend towards lower fertility rates has been accompanied by (and is partly explained by) the postponement of childbirth to later ages. The average age at birth of first child has risen from around 24 in 1970 to nearly 28 in 2005. Postponing childbearing has lasting consequences. First, it increases the probability that women remain childless or have fewer children than desired. Secondly, it raises the risk of morbidity for both mothers and their children.

Definition and measurement

The total fertility rate in a specific year is the number of children that would be born to each woman if she were to live to the end of her child-bearing years and if the likelihood of her giving birth to children at each age was the currently prevailing age-specific fertility rates. It is generally computed by summing up the age-specific fertility rates defined over a five-year interval. A total fertility rate of 2.1 children per woman ensures broad stability of the population, on the assumptions of no migration flows and unchanged mortality rates.

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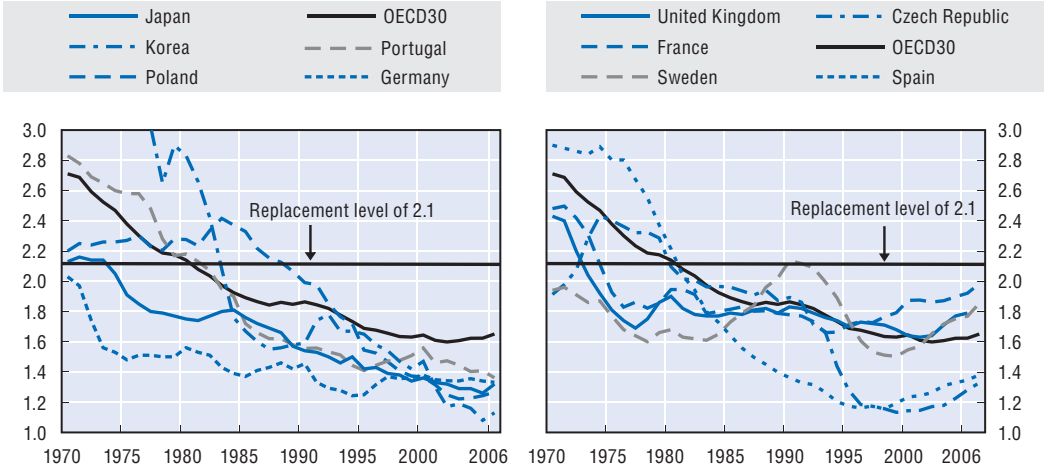
OECD (2009), *Society at a Glance*, OECD, Paris.

Total fertility rates from 1970 to 2006



First time mothers are getting older

Mean age of mothers at first childbirth

	1970	1995[1]	2000[2]	2005[3]
Australia	23.2	26.8	. .	28.0
Austria	. .	25.6	26.4	27.2
Belgium	24.3	27.3	. .	27.4
Czech Republic	22.5	23.3	25.0	26.6
Denmark	23.8	27.4	27.7	28.4
Finland	24.4	27.2	27.4	27.9
France	24.4	28.1	27.9	28.5
Germany	24.0	27.5	28.2	28.1
Greece	25.0	26.6	27.5	28.5
Hungary	22.8	23.8	25.1	26.7
Iceland	21.3	25.0	25.5	26.3
Ireland	. .	27.3	27.6	28.5
Italy	25.0	28.0	. .	28.7
Japan	25.6	27.5	28.0	29.1
Korea	. .	. .	. .	29.1
Luxembourg	24.7	27.4	28.4	29.0
Mexico	. .	20.9	21.0	21.3
Netherlands	24.8	28.4	28.6	28.9
New Zealand	. .	. .	28.0	28.0
Norway	. .	26.4	26.9	27.7
Poland	22.8	23.8	24.5	25.8
Portugal	. .	25.8	26.5	27.4
Slovak Republic	22.6	23.0	24.2	25.7
Spain	. .	28.4	29.1	29.3
Sweden	25.9	27.2	27.9	28.7
Switzerland	25.3	28.1	28.7	29.5
United Kingdom	. .	28.3	29.1	29.8
United States	24.1	24.5	24.9	25.1
OECD16	**24.0**	**26.2**	**26.8**	**27.7**

1. 1992 for Mexico.
2. 2001 for New Zealand; 2003 for Mexico.
3. 2003 for Finland, Greece, Spain and United Kingdom; 2002 for United States; 2004 for New Zealand; and 2006 for Mexico.

Source: OECD (2009), *Society at a Glance*.

StatLink http://dx.doi.org/10.1787/651441476388

Key results

Population ageing is one of the main driving forces behind the wave of pension reforms in recent years. The old-age dependency ratio is an important indicator of the pressures that demographics pose for pension systems. It measures how many people there are of pension age (65 plus) relative to the number of working age. On average in OECD countries, there are 24 people of pension for every 100 of working age. Or, put another way, there were 4.2 people of working age for every pensioner.

OECD countries have been ageing for some time: between 1950 and 1980, the dependency ratio increased from 14% to 21%. However, the current period and recent history has been relatively benign. In 2010, for example, the dependency ratio is expected to be 25%, a much slower rate of growth than 1950-80. From 2010, ageing is expected to accelerate, with the dependency ratio doubling to 50% or more from 2047 onwards. At that point, there will be just two people of working age for every person of pension age.

In 2007, the demographically oldest OECD country was Japan, with a dependency ratio of 36%. Germany, Greece and Italy also had dependency ratios above 30%. The youngest countries in 2007 were Mexico and Turkey, with dependency ratios of just 10%, followed by Korea, at 15%. Four of the five mainly English-speaking OECD members – Australia, Canada, Ireland and the United States – all have a relatively favourable demographic situation. Dependency ratios range between 17 and 22%. This is probably a result of immigration of workers. Many of the other countries that are currently young are in eastern Europe: the Czech and Slovak Republics and Poland have dependency ratios of 18-22%.

The evolution of dependency ratios depends on mortality rates, fertility rates and migration. As shown in the previous two indicators, OECD countries have seen continual increases in life expectancy, which most expect to continue in the future. This increases the number of older people and so the number of pensioners. There have also been substantial declines in fertility, which, of course, will reduce the number of workers entering the labour market. Since the babies have already been born, we know the scale of the change in the number of people of working age for the next two decades. For example, fertility rates fell below the replacement level on average in OECD countries around 1980, meaning that each new generation will be smaller than that of its parents. By 2000, for example, the number of births implies that the cohort of "millennium babies" will be 20-25% smaller than its parents' generation. In the future, however, there is a great deal of uncertainty over how fertility rates will evolve.

For the OECD as a whole, the rate of population ageing will accelerate from a low point in 2006 to a peak in 2013. The dependency ratio will reach 30% by 2018, from its current level of 24%. From 2030 onwards, the process of demographic ageing will slow down. Nevertheless, dependency ratios will continue to rise, reaching an average of 52% in 2050. At this point, there will be just less than two people of working age for each of pension age, compared with over four currently.

The most rapid population ageing among OECD countries by far will be in Korea. The dependency ratio is projected to grow from 15% in 2007 to 77% by 2050. Korea will move from being the third youngest country in the OECD to the second oldest, after Japan. The other OECD countries that are currently demographically young – Mexico and Turkey – will also age more rapidly as their demographics converge on that of other OECD countries. However, unlike Korea, they will remain among the youngest OECD countries in 2050, with dependency ratios of 38% and 30% respectively.

Some of the OECD countries that are currently old in demographic terms – Belgium, France, the Netherlands, Norway, Sweden and the United Kingdom, for example – are projected to see relatively small increases in dependency ratios over the next 40 years or so. Again, this illustrates a degree of convergence in the extent of population ageing in OECD countries.

Definition and measurement

The projections for old-age dependency ratios used here are based on the most recent "medium-variant" population projections. They are drawn from the *OECD Demographic and Labour-Force Database*.

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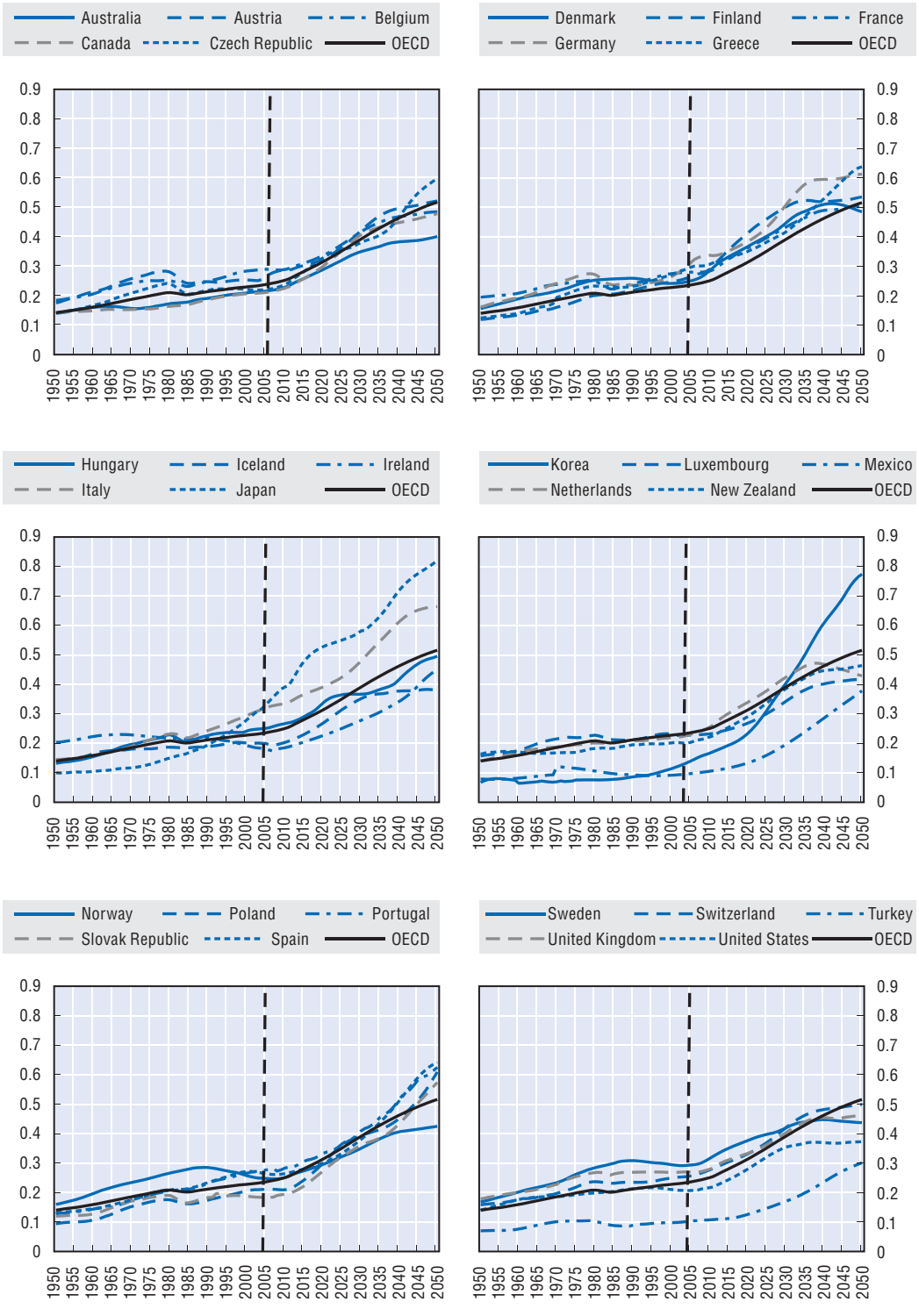
Old-age dependency ratios – historical and projected values, 1950-2050



Source: OECD Demographic and Labour Force Database.

StatLink http://dx.doi.org/10.1787/651454560624

Key results

"Average earnings" are an important metric underlying the presentation of system parameters and the results of pension modelling. However, it is very difficult to obtain reliable and comparable data for different countries.

The OECD developed a method of calculating average earnings in the 1970s that could produce comparable results for member countries. However, this comparability was bought at the price of results that were not representative of all workers, and this has become more unrepresentative over time.

A new measure, adopted from 2004, calculates average earnings using a broader base of employees but retains the comparability of the previous measure.

The OECD's pension modelling now uses a new and more comprehensive measure of average earnings corresponding to an "average worker" (AW), starting with the second edition of *Pensions at a Glance*. This concept is broader than the previous benchmark of the "average manual production worker" (APW). This new concept was introduced in the report *Taxing Wages* and also serves as benchmark for *Benefits and Wages*.

The reasoning behind the change was that a manual worker in the production sector is not representative of the "typical taxpayer", given the steady decline in manual employment in manufacturing in most OECD countries. The new base for calculating average earnings includes more economic sectors and both manual and non-manual workers. The concept and definition of earnings, however, remains the same: gross wage earnings paid to average workers, measured before deductions of any kind, but including overtime pay and other cash supplements paid to employees.

The table reports average earnings levels according to the new average-earnings definition, for the year 2006. Only two countries (Ireland and Turkey) are not yet able to supply earnings data on the broader basis and so the modelling is based on the old, APW measure of average earnings. Average earnings are displayed in national currencies and in US dollars (both at market exchange rates and at purchasing power parities, PPP). The PPP exchange rate adjusts for the fact that the purchasing power of a dollar varies between countries: it allows for differences in the price of a basket of goods and services between countries. *The Economist* regularly produces a popular and easy-to-understand version of PPP – the "Big-Mac" index – which shows how currencies differ from the level that would mean the burger cost the same worldwide.

Earnings across the OECD countries averaged USD 35 800 in 2006 at market exchange rates. At PPP, average earnings were USD 32 800. The lower figure for PPP earnings suggests that many OECD countries exchange rates with the US dollar were higher than the rate that would equalise the cost of a standard basket of goods and services.

Mean and median earnings

Most of the results presented in this report are based around mean earnings. However, many of the key indicators are shown also using estimates of "median" earnings, that is the level below and above which half of workers' earnings lie. The table at the bottom of next page, drawn from the OECD earnings-distribution database, shows median earnings as a percentage of mean earnings. There is significant variation between countries, The broad distribution of earnings in Hungary and the United States means that the median is only around three-quarters of mean earnings. In contrast, the median is nearly 90% of the mean in Belgium, Germany, the Netherlands and Sweden. The table also shows the lowest decile of earnings: 10% of workers earn less than this. For the countries shown, this averages around 50% of mean earnings, a level which is used as the case of a "low earner". The top decile – 10% of workers earn more than this – averages nearly 160%. In the main results, a "high earner" is assumed to be an individual with 150% of mean earnings.

Revisions to 2004 earnings data

Since the second edition of *Pension at a Glance*, estimates of average-worker earnings have been revised. The results for only eight countries are affected, and, apart from Turkey and the United Kingdom, the effect is relatively small. For the United Kingdom, average earnings were revised upwards from GBP 27 150 (USD 49 747) to GBP 29 312 (USD 53 708). Since the basic pension is an important part of mandatory provision for old age, this significantly reduces the replacement rate for the average earner.

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OECD measures of average earnings, 2006

National currency and USD at market price and purchasing-power-parity exchange rates

	OECD measures of average earnings			Exchange rate with USD			OECD measures of average earnings			Exchange rate with USD	
	National currency (AW)	USD, market exchange rate	USD, PPP	Market rate	PPP		National currency (AW)	USD, market exchange rate	USD, PPP	Market rate	PPP
Australia	55 200	41 600	39 100	1.33	1.41	Luxembourg	43 600	54 800	45 900	0.8	0.95
Austria	36 700	46 100	42 600	0.8	0.86	Mexico	73 200	6 700	10 600	10.9	7.22
Belgium	37 700	47 300	42 400	0.8	0.89	Netherlands	39 700	49 900	44 800	0.8	0.888
Canada	40 600	35 800	33 700	1.13	1.2	New Zealand	43 000	27 500	28 200	1.54	1.52
Czech Republic	234 800	10 400	16 500	22.59	14.19	Norway	397 800	62 000	43 200	6.41	9.21
Denmark	330 900	55 700	39 200	5.94	8.44	Poland	29 300	9 400	15 700	3.1	1.87
Finland	33 500	42 100	34 800	0.8	0.97	Portugal	15 300	19 300	21 700	0.8	0.706
France	31 000	38 900	34 200	0.8	0.91	Slovak Republic	231 200	7 800	13 500	29.65	17.13
Germany	42 400	53 200	48 700	0.8	0.87	Spain	21 200	26 500	27 300	0.8	0.774
Greece	23 000	28 900	32 800	0.8	0.7	Sweden	324 600	44 000	35 600	7.37	9.12
Hungary	1 988 700	9 500	15 400	210.4	129.19	Switzerland	72 400	57 800	42 200	1.25	1.71
Iceland	3 480 000	49 800	34 000	69.9	102.49	Turkey	15 600	10 900	16 700	1.43	0.939
Ireland	30 000	37 600	29 500	0.8	1.01	United Kingdom	31 500	58 000	49 200	0.54	0.645
Italy	24 600	30 900	27 100	0.8	0.86	United States	39 400	39 400	39 400	1	1
Japan	4 988 900	42 900	40 100	116.35	124.46						
Korea	30 440 200	32 000	40 000	951.82	762	**OECD**		**35 800**	**32 800**		

Note: AW = average wage. PPP = purchasing power parity. Average earnings are not available on the AW measure for Ireland and Turkey, for which the APW (average production worker) definition is used. Monetary values for Turkey divided by 1 000 000. Average earnings are rounded to the nearest 100 and exchange rates rounded to decimal places.

Source: OECD (2008), *Taxing Wages 2006-2007*; and *OECD Main Economic Indicators*.

Points of earnings distribution (% of mean earnings)

	Lowest decile	Median	Top decile
Australia	51.1	86.1	159.3
Belgium	65.5	88.7	132.6
Czech Republic	52.5	87.1	153.9
Finland	61.6	87.9	148.7
Germany	53.0	89.3	161.1
Hungary	36.9	74.4	180.4
Ireland	43.9	85.6	172.7
Italy	63.6	87.7	152.2
Japan	54.4	88.0	160.2
Korea	44.0	88.0	170.0
Netherlands	53.6	89.1	156.4
New Zealand	48.5	86.4	165.2
Norway	60.7	87.4	128.3
Poland	41.2	81.7	168.4
Spain	39.9	80.3	168.5
Sweden	63.7	88.1	147.3
United Kingdom	46.5	82.9	162.5
United States	36.9	77.4	179.1
OECD18	**51.0**	**85.3**	**159.3**

Source: *OECD Earnings Distribution Database.*

Effect on gross replacement rates for average earners of revisions to earnings data, 2004

	Replacement rate (%)		Difference
	Before	After	
Iceland	77.5	77.1	*–0.4*
Ireland	32.5	31.9	*–0.6*
Luxembourg	88.3	87.9	*–0.4*
Mexico	35.8	36.6	*+0.8*
Portugal	54.1	54.0	*–0.1*
Turkey	72.5	80.9	*+8.4*
United Kingdom	30.8	29.9	*+0.9*
United States	41.2	38.7	*–2.5*

Source: OECD pension models.

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PART III

Country Profiles

This part of Pensions at a Glance *presents profiles of the parameters and rules of national pension systems. Before illustrating the country profiles, however, the introduction sets out a cross-country comparison of their key features and provides a guide to the contents of the country profiles. A table at the end of the introduction summarises the pension-scheme parameters and rules.*

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Introduction

Key features of pension-system design

The "Framework of *Pensions at a Glance*" set out above categorised the main components of national retirement-income systems into tiers (see Figure 0.1 in the "Framework"). The first two of these tiers are mandatory. The first tier is publicly provided and comprises schemes that are focused on income adequacy in retirement. The second tier can be publicly or privately provided and comprises schemes whose primary goal is to provide retirement incomes that replace some level of earnings when working. Table III.1 summaries the key features of these two tiers: the key parameters and rules that determine how much retirement income people will receive.

First-tier, redistributive schemes

The level of benefits under first-tier, redistributive schemes is expressed as a percentage of average earnings in each country (see the indicator of "Average earnings" in Part II). Because some countries have a mix of different programmes, the benefit level is shown separately for each. Basic schemes pay a flat-rate benefit conditional either on residency (in the Netherlands and New Zealand, for example) or on years of contributions (Ireland and the United Kingdom). Resource-tested schemes have a target level of income and reduce benefits in proportion to all other income sources. In contrast, minimum pensions only take the value of pension income into account when calculating entitlements.

In the cases of minimum pensions and basic schemes, the benefit entitlement is shown for a worker who enters at age 20 and works without interruption until he or she reaches the *normal* pension eligibility age. In most OECD countries, this is age 65, as shown in the last lines of Table III.1. Only full-career workers with very low earnings will be eligible for the resource-tested programmes; the majority of beneficiaries will be those with short and interrupted contribution histories.[1] The final row shows the total, first-tier benefit for a full-career worker. In some cases, workers can receive several different types of first-tier benefits, while in other cases they are only eligible for one programme.

On average in the OECD countries, first-tier benefits are worth 27% of national average earnings. Benefits are especially high relative to average earnings in Belgium, Luxembourg and New Zealand. They are at their lowest in Finland, Germany, Hungary, Japan and the United States, at less than 20% of national average earnings.

Second-tier, insurance schemes

The information on the second, insurance tier of retirement-income systems is shown separately for earnings-related and defined-contribution (DC) plans.

Table III.1. **Summary of pension-scheme parameters and rules**

	Australia	Austria	Belgium	Canada	Czech Republic	Denmark	Finland	France	Germany	Greece
First tier (% average earnings)										
Resource-tested	23	26	22	18	23	18	18	22	19	11
Basic	–	–	–	14	8	18	–	–	–	–
Minimum	–	–	28	–	11	–	–	23	–	34
Overall entitlement (full-career worker)	23	26	28	32	23	36	18	23	19	34
Second tier										
Earnings-related										
Type	None	DB	DB	DB	DB	None	DB	DB/points	points	DB
Accrual rate (% indiv. earnings)	–	1.78	1.33	0.63	0.45 [w][1]	–	1.5 [a][2]	1.75 [w][3, 4]	1.00	2.57[3]
Earnings measure	–	40	L	b34	f30	–	L	b25/L	L	f5
Valorisation	–	w[5]	p	w	w	–	80 w/20 p	p/p	w[6]	[7]
Indexation	–	d	p	p (c)	33 w/67 p	–	20 w/80 p	p/p	w[6]	d
Defined contribution										
Contribution rate	9	–	–	–	–	1 + 10.8[8]	–	–	–	
(% indiv. earnings)										
Ceilings (% average earnings)										
Public	–	146	118	104	None	–	–	99	149	325[9]
Private/occupational	244	–	–	–	–	–	None	298	–	–
Pension age										
Normal	65	65	65	65	65	65	65	61	67	65
(women)					62-65[10]					
Early	55		60	60	60		62		63	55
(women)					59-60[10]					

Parameters are for 2006 but include all legislated changes that take effect in the future. For example, some countries are increasing pension ages and extending the earnings measure for calculating benefits; pension ages for women are shown only if different from those for men. Early pension ages are shown only where relevant.

– = not relevant; [a] = varies with age; b = number of best years; (c) = indexation conditional on scheme finances; d = discretionary indexation; f = number of final years; fr = valorisation at a statutorily fixed rate; L = lifetime average; p = valorisation/indexation with prices; w = valorisation/indexation with average earnings; [w] = varies with earnings; [y] = varies with years of service.

DB = defined benefit; DC = defined contribution; GDP = linked to gross domestic product; NDC = notional accounts.

1. Czech Republic: higher accrual rates on lower earnings, lower accruals on higher earnings.
2. Finland: higher accrual rates at older ages.
3. France and Greece: data shown combine two different programmes.
4. France: higher accrual rate on higher earnings under occupational plans.
5. Austria: valorisation assumed to move to earnings as the averaging period for the earnings measure is extended.
6. Germany: indexation and valorisation are both subject to a sustainability adjustment.
7. Greece: valorisation in line with pension increases for public-sector workers.
8. Denmark: 1% is for the mandatory special pension, 10.8% is the typical contribution rate for quasi-mandatory occupational plans.
9. Greece: effective ceiling calculated from maximum pension.
10. Czech Republic: pension ages for women vary with number of children.

The information on earnings-related schemes begins with the scheme type: defined benefit (DB), points or notional accounts (NDC). The main parameter accounting for differences in the value of these schemes is the accrual rate per year of contribution, that is, the rate at which a worker earns benefit entitlements for each year of coverage. The accrual rate is expressed as a percentage of the earnings that are "covered" by the pension scheme. Most pension schemes cover only part of workers' earnings to calculate pension benefits.

For points systems, the effective accrual rate shown in Table III.1 is the ratio of the cost of a pension point to the pension-point value, expressed as percentage of individual earnings. This, like the accrual rate in DB schemes, gives the benefit earned each year as a proportion of earnings in that year. In notional-accounts schemes, the effective accrual

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Table III.1. **Summary of pension-scheme parameters and rules** *(cont.)*

	Hungary	Iceland	Ireland	Italy	Japan	Korea	Luxembourg	Mexico	Netherlands	New Zealand
First tier (% average earnings)										
Resource-tested	–	18[11]	32	–	19	–	–	–	–	–
Basic	–	9	34	–	16	22	10	4.6	31	39
Minimum	16	–	–	–	–	–	38	28	–	–
Overall entitlement (full-career worker)	16	27	34	22	19	22	38	28	31	39
Second tier										
Earnings-related										
Type	DB	DB	None	n.acs	DB	DB	DB	None	DB	None
Accrual rate (% indiv. earnings)	1.22	1.40	–	1.75	0.55	1	1.85 [y][12]	–	1.75[13]	–
Earnings measure	L	L	–	L	L	L	L	–	L[14]	–
Valorisation	w	(fr)	–	GDP	w	w	w	–	w (c)	–
Indexation	50 w/50 p	p	–	p[15]	p	p	w	–	w (c)	–
Defined contribution										
Contribution rate (% indiv. earnings)	8	–	–	–	–	–	–	6.5[16]	–	–
Ceilings (% average earnings)										
Public	220	–	–	367	149	142	231	–	–	–
Private/occupational	220	None	–	–	–	–	–	607	None	–
Pension age										
Normal	62	67	66	65	65	65	65	65	65	65
(women)				60						
Early			65	60	60	60	57	60	60	
(women)										

11. Iceland: includes two different programmes.
12. Luxembourg: higher accrual rate for longer contribution periods.
13. Netherlands: accrual rate varies between occupational schemes.
14. Netherlands: earnings measure is average salary for around two-thirds of occupational plans and final salary for one-third.
15. Italy: indexation is fully to prices for low pensions, 90% of prices or 75% of prices for higher pensions.
16. Mexico: additional contribution of 5.5% of minimum wage is shown as a basic pension. The lower value of the annuity calculated is for women.

rate is calculated in a similar way to obtain the annual pension entitlement as a proportion of earnings in a given year. The calculations, which depend on the contribution rate, notional interest rate and annuity factors, are described in detail in Queisser and Whitehouse (2006).

In a little under half of the countries with earnings-related plans (of all three types), the accrual rates are linear. In the other countries, the pension benefit earned for each year of coverage varies, either with individual earnings, with the number of years of contributions or with individual age.

In eight cases, the accrual rate varies with earnings (indicated in Table III.1 by [w]). In the public schemes of the Czech Republic, Portugal, Switzerland and the United States, the pattern is progressive, giving higher replacement rates to lower-income workers. In the United Kingdom, the accrual rates are U-shaped, highest for low earners, then smaller, then higher again. In Norway, accrual rates are lower at higher earnings. In the occupational plans of France and Sweden, the schemes are designed to offset the redistribution in the public scheme; they pay a higher replacement rate to high earners on their pay above the ceiling of the public plan.

In the occupational plans of Finland and Switzerland, pension accrual increases with age (shown as [a]).

Table III.1. **Summary of pension-scheme parameters and rules** *(cont.)*

	Norway	Poland	Portugal	Slovak Republic	Spain	Sweden	Switzerland	Turkey	United Kingdom	United States
First tier (% average earnings)										
Resource-tested	31	–	16	–	–	26	24	5	19	18
Basic	16	–	–	–	–	–	–	–	14	–
Minimum	–	24	32	22[17]	27	–	18	37	14[17]	–
Overall entitlement (full-career worker)	31	24	32	22	27	26	24	37	28	18
Second tier										
Earnings-related										
Type	Points	n.acs	DB	Points	DB	n.acs	DB	DB	DB	DB
Accrual rate (% indiv. earnings)	1.05 [w][18]	0.67	2.25 [w][19]	1.19	3.0 [y][20]	1.21 [w]	[w/a]	2.0	0.89 [w][21]	0.91 [w][19]
Earnings measure	b20	L	L	L	f15	L	L	L	L	b35
Valorisation	w	w[22]	25 w/75 p	w	p	w	fr (2.0%)	GDP	w	w[24]
Indexation	p	p[22]	p/GDP[23]	50 w/50 p	p	w–1.6 (c)	50 w/50 p	p	p	P
Defined contribution										
Contribution rate (% indiv. earnings)	2.0	7.3	–	9	–	2.5 + 4.5[25]	–	–	–	–
Ceilings (% average earnings)										
Public	188	250	None	300	164	111	106	265	105	240
Private/occupational	–	–	–	–	–	–	106	–	–	–
Pension age										
Normal	67	65	65	62	65	65	65	65	68	67
(women)		60					64			
Early			55		60	61	63			62
(women)							62			

17. Slovak Republic and United Kingdom: minimum benefit calculated from minimum credit.
18. Norway: lower accrual rate on higher earnings.
19. Portugal and United States: higher accrual rates on lower earnings, lower accruals on higher earnings.
20. Spain: higher accrual rate on early years of service and lower on later years.
21. United Kingdom: accrual rate highest for low earnings, then lower then higher again.
22. Poland: valorisation to real wage bill growth but at least price inflation. Indexation has been 80% prices and 20% wages but moved to prices from 2005.
23. Portugal: indexation will be higher relative to prices for low pensions and *vice versa*. Indexation will be more generous the higher is GDP growth.
24. United States: earnings valorisation to age 60; no adjustment from 60 to 62; prices valorisation from 62 to 67.
25. Sweden: The contribution rate is 2.5% for personal plans. For quasi-mandatory occupational plans the contribution rates are 4.5% on a lower slice of earnings and 30% on an upper slice (in the largest scheme for private-sector workers).

Source: Information provided by national authorities and OECD calculations. See country profiles below.

Two countries have accrual rates that vary with length of service ([y]). In Luxembourg, the accrual rate increases for people with a longer contribution history. In Spain, there are three accrual rates. The pattern is the reverse of that in Luxembourg: the highest accrual rate is for the first few years of coverage and the lowest for later years in longer contribution histories.

Measuring earnings to calculate benefits

DB pension entitlements depend on the past earnings of the individual worker but the way in which these are measured differs. Table III.1 shows whether lifetime average or a limited number of best or final years' salaries are used. It is important to remember that the information shown here relates to the long-term rules of the system.

Seventeen OECD countries use the full lifetime average of earnings to calculate benefits. In Canada, the Czech Republic and the United States earnings are averaged over the great majority of the career (30-35 years). In Austria, the duration taken into account to compute benefits is gradually increasing to 40 years. There are, however, some exceptions.

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Final salaries will be used to calculate benefits in Greece and Spain (over the past 5 and 15 years respectively). Benefits under public pension schemes in France and Norway will be based on the best 20 and 25 years' earnings respectively.

Valorisation

Closely linked with the earnings measure is the policy of valorisation or revaluation, whereby past earnings are adjusted to take account of changes in living standards between the time pension rights accrued and the time they are claimed. (This is sometimes called pre-retirement indexation.) If benefits are based on the final year's salary, there is no need for valorisation. But it is necessary to protect the value of pension entitlements when benefits are based on earnings over a longer period. The uprating of the pension-point value and the notional interest rate in points and notional-accounts systems, respectively are the exact corollaries of valorisation in DB plans (see Box 4 in Queisser and Whitehouse, 2006, for a detailed explanation).

The effect of valorisation policy on pension entitlements is large due to a "compound-interest" effect. On the baseline economic assumptions used in this report – *i.e.*, real wage growth of 2% and price inflation of 2.5% – prices valorisation for a full career (between age 20 and 65) results in a pension that would be 40% lower than a policy of full adjustment of earlier years' pay in line with economy-wide average earnings.

The most common practice – followed in 15 OECD countries – is to revalue earlier years' pay in line with the growth of average earnings in the economy. Belgium, France, Iceland and Spain, however, revalue earnings only with price inflation, although the effect in Spain is relatively small because only the final 15 years' salary enters the benefit formula, compared with 25 years in the French public scheme and the lifetime average in Belgium and the French occupational plans. Finland, Portugal and Turkey revalue earlier years' earnings to a mix of price and wage inflation.

Defined-contribution plans

The key parameter for DC plans is the proportion of earnings that must be paid into the individual account by employees, employers or the government. Contribution rates into these schemes vary substantially across countries. The mandatory DC schemes in the Nordic countries have relatively small contribution rates: 1% in Denmark, 2% in Norway and 2.5% in Sweden. However, occupational plans in Denmark and Sweden are categorised as "quasi-mandatory" because they cover nearly all the workforce. Contribution rates for these schemes are typically 10.8% of earnings in Denmark; and in Sweden, they are 4.5% on a lower slice of earnings and 30% on an upper slice (in the largest scheme for private-sector workers). The average contribution rate for the eight countries shown is 8.3%.

Ceilings on pensionable earnings

Most countries do not require high-income workers to contribute to the pension system on their entire earnings. Usually, a limit is set on the earnings used to calculate both contribution liabilities and pension benefits. This ceiling on the earnings covered by the pension system has an important effect on the structure, size and cost of the second-tier systems. The average ceiling on public pensions for 20 countries is 190% of average economy-wide earnings. (This average excludes eight countries where there is no public pension scheme for which a ceiling is relevant, such as basic or targeted programmes, and two countries that have no ceiling on earnings eligible for a public pension.)

Table III.1 also shows (separately) ceilings for mandatory private pension schemes and for the public, occupational plans in France and Finland. Of the nine countries with this type of programme, three have no ceiling: Finland, Iceland and the Netherlands. The ceilings of the occupational plans in France and Sweden are three and 2.8 times respectively the cap on pensionable earnings in the public programme. The overall ceiling on pensionable earnings in the 22 countries where this is relevant and there is a ceiling averages 230%, significantly higher than the ceiling on public schemes alone.

Pension eligibility ages

The majority of OECD member countries have a standard retirement age of 65 for men and women. Pension eligibility ages for women are still lower than men's in several countries but, in most of these, they will be equalised gradually with those of men (in Belgium, Hungary and the United Kingdom, for example). Only Italy, Switzerland and Poland plan to retain lower pension ages for women in the long term.

Iceland, Norway and the United States have a standard pension age of 67 and other countries, such as Denmark, Germany and the United Kingdom, will increase pension age above 65.

More than half of OECD countries, however, allow retirement before the normal pension age, although usually only with reduced benefits.

Indexation of pensions in payment

Indexation refers to the policy for the uprating of the value of the payment from the point of claim of the pension benefit onwards (see Whitehouse, 2009). Pension benefits are usually adjusted in line with an index of consumer prices. Five countries have mixed uprating of benefits, to a combination of price inflation and wage growth: the Czech Republic, Finland, Hungary, the Slovak Republic and Switzerland.

Austria, Greece, Italy and Portugal have adopted progressive indexation mechanisms, which give higher increases to low pensions than to higher benefits. Italy provides full price adjustment for low pensions while the percentage of the adjustment varies for higher pensions. In Portugal, pensions are adjusted to a mix of price inflation and GDP growth; the exact increases depend both on the level of pensions and on GDP growth rates.

Indexation of pension-system parameters

Indexation affects not only pensions in payment but also the parameters of pension systems. In resource-tested and basic pension schemes, the adjustment of benefit levels when they are first claimed is more important than the adjustment of benefits in payment.

Take the United Kingdom's basic pension scheme as an example. This has been linked to prices since 1981, when it was worth 24% of average earnings. Today, it is worth just 14% of average earnings. The change in indexation procedure reduced the entitlements not only of pensioners but also the benefits of all future workers. If the procedure were to continue, then the basic pension for new entrants would be worth a very low percentage of average earnings when they retire in 45 years' time.

Canada and Sweden also link their resource-tested schemes to prices (while the United Kingdom now links this to average earnings). The implication, over the long periods involved in pension policy, is that these programmes will all but disappear. For new entrants, the minimum retirement income in 45 years time would be very low. It is difficult

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to believe that it will be politically possible to pay such low incomes to poor, old people. As a result, these policies are unlikely to be sustainable or, indeed, sustained.

A similar argument applies to other parameters of the pension system as for example to the ceiling to earnings-related pension scheme that in some countries (*e.g.* Canada) is indexed on prices.

Therefore, the modelling in this report explicitly assumes that these benefits and parameters are linked to average earnings, and not prices, even though this is what legislation specifies. Obviously, this assumption has a big effect on the results when calculating the value of the pension promise.

Guide to the country profiles

The country profiles use a common framework. First, there is a brief summary of the national retirement-income system and a table of key indicators. This background table comprises average earnings, public pension expenditures, life expectancy and the dependency ratio (the number of pensioners for every 100 workers). Data both for the country in question and the average for the OECD as a whole are presented.

Secondly, there is a detailed description of the rules and parameters of the pension schemes that make up each country's retirement-income system. These are structured as follows.

- *Qualifying conditions:* pension eligibility (or "retirement") age and years of contributions required to receive a pension.
- *Benefit calculation:* the rules for each schemes making up the pension system, such as basic, resource-tested and minimum pensions as well as public, earnings-related and mandatory private plans.
- *Voluntary private pensions:* the parameters of typical voluntary plans are provided for the countries for which replacement rates under these schemes were modelled in the indicator of "Gross replacement rates from public and private pensions" in Part II.
- *Variant careers 1:* the rules and conditions under which workers can retire early or continue to work beyond the standard retirement age and the impact on pension entitlements.
- *Variant careers 2:* rules for protecting pensions for people who are out of paid work due to unemployment or caring for children.

The treatment of pensioners under the personal income tax and social security contributions, for reasons of space, is not described in this edition.[2] However, the on-line version of the country profiles, available at *www.oecd.org/els/social/pensions/PAG*, does include this information. For details on the taxes and social security contributions paid by workers, see OECD (2007).

Values of all pension parameters and other relevant figures such as minimum wages are given in national currencies and as a proportion of average earnings. (See the indicator of "Average earnings" in Part II.)

In each country profile, a table gives expected relative pension values, replacement rates and pension wealth at different individual levels of earnings for mandatory pension schemes. (See Part I of this report for definition and measurement of the different indicators.) These are given in both gross and net terms (the latter taking account of taxes and contributions paid when working and when drawing the pension).

Summary charts show the breakdown of the gross relative pension value into the different components of the pension scheme (the first row of the charts). As far as possible, the same, terminology is used to describe these schemes. The particular national scheme that is described can be found in the text of the country study. Some standard abbreviations are used in the legends of the charts:

- *SA:* social assistance.
- *Targeted:* separate resource-tested schemes for older people.
- *Minimum:* a minimum pension within an earnings-related scheme.
- *Basic:* a pension based only on number of years of coverage or residency.
- *Earnings-related:* all public earnings-related programmes, including notional accounts and points schemes as well as traditional defined-benefit plans.
- *DC:* defined-contribution, mandatory private plans.
- *Occupational:* mandatory or quasi-mandatory pensions, which can be provided by employers, industry-wide schemes (Netherlands), profession-based schemes (Sweden) or publicly (Finland, France).

The second row of country charts shows the effect of personal income taxes and social security contributions on relative pension values and replacement rates, giving the gross and net values.

The charts use a standard scale to ease comparisons between countries: the scale for replacement rates runs to 125% while that for relative pension values runs to 2.5 times average earnings. The charts show pension entitlements for people earning between 50% and 200% of economy-wide average earnings.

Notes

1. For information on benefits for such workers, see the discussion of old-age safety nets in Box 2.1 in the special chapter on "Incomes and poverty old older people" and the country profiles that follow here in Part III.
2. For all OECD countries, taxes and social security contributions paid by workers are those in force in the year 2006.

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Australia

Australia: Pension system in 2006

Australia's retirement income system has three components: a means-tested age pension funded through general taxation revenue; the superannuation guarantee, a compulsory employer contribution to private superannuation savings (mainly through defined-contribution plans); and voluntary superannuation contributions and other private savings, which are encouraged to support self-provision in retirement.

Key indicators

		Australia	OECD
Average earnings	AUD	55 200	47 600
	USD	41 600	35 800
Public pension spending	% of GDP	3.5	7.2
Life expectancy	At birth	81.1	78.9
	At age 65	84.9	83.4
Population over age 65	% of working-age population	21.5	23.8

Qualifying conditions

Age Pension is payable from age 65 for men. Women's pensionable age – currently 63 – will increase gradually to become 65 by 2014. The minimum age for withdrawing superannuation guarantee benefits is currently 55, but this will increase gradually to 60 by 2025.

Benefit calculation

Defined contribution

The superannuation guarantee was introduced in 1992. It consists of a mandatory employer contribution to a private pension plan. The pension plans may be operated by the employer, industry associations, and financial service companies or even by individuals themselves. The mandatory contribution rate has been 9% of employee earnings since the 2002-03 tax year.

Employers need not contribute for workers earning less than AUD 450 a month (equivalent to AUD 5 400 a year), but they can choose to contribute for these workers (note that this minimum has not been raised in the past). There is also a limit to the earnings covered by the superannuation guarantee: employers need not contribute for employees' pay above this threshold. For each quarter of the financial year 2004-05, this amount is AUD 32 180 and for each quarter of the year 2005-06, it is AUD 33 720. This limit is worth around 2½ times average wages and is indexed to a measure of average earnings.

The withdrawal stage of the superannuation guarantee complicates the calculations. Although there are some defined-benefit occupational plans, most employees are members of defined-contribution schemes. Members can take out the accumulated capital as a lump sum or some sort of income stream. Currently, most benefits are taken as a lump sum. For comparison with other countries (where defined-benefit plans predominate), the capital from the superannuation guarantee is assumed to be converted to a price-indexed annuity. The annuity calculation is based on mortality data for Australia.

Targeted

Age Pension is designed to provide a safety net for those unable to save enough through their working life and to supplement the retirement savings of others. The income and assets tests (means test) are used to target payments to those in need.

The value of the Age Pension is adjusted biannually and is paid fortnightly. In September 2005, the maximum single rate of pension was AUD 489 a fortnight, increasing to AUD 500 in March 2006 and AUD 512 in September 2006. (All values have been rounded to the nearest dollar.) This gives an average for the tax year of an annual benefit of AUD 12 737, equivalent to 23% of average earnings.

Age Pension's value is increased in line with price increases as measured by the Consumer Price Index (CPI). Where necessary, a further increase is made to ensure that it does not fall below 25% of the average of pre-tax Male Total Average Weekly Earnings on the national definition (which is slightly different from the earnings measure used in OECD analysis).

The Age Pension is withdrawn once annual income from other sources exceeds a threshold known as the "free area". This is adjusted annually in July. The values for 2006 were AUD 124 in the first half and AUD 128 in the second half of the year (again calculated fortnightly). The tax year figure for 2006 was therefore AUD 3 224, or 5.8% of average earnings. The withdrawal rate is 40% (single or couples combined). There is also an assets test. However, over 90% of pensioners affected have their benefits reduced by the income rather than the assets test (and so it has been assumed in the modelling that the income test is binding). Almost 40% of pensioners have their benefit reduced by the means test, and are therefore on part-rate Age Pension. Just over 60% of pensioners are on the maximum rate Age Pension.

Variant careers

Early retirement

Access to superannuation benefits (including superannuation guarantee benefits) is currently possible for retirement on or after age 55 (increasing to age 60). Individuals who are still working can also access their benefits from age 55, but only in the form of a non-commutable income stream. Age Pension is not paid earlier than the qualifying age for men (age 65) and women (age 63, increasing to 65 by 2014).

Late retirement

It is possible to defer claiming superannuation after 65. Employers are required to make superannuation contributions under the superannuation guarantee arrangements for their eligible employees up to the age of 70.

It is also possible to defer claiming the Age Pension after 65. The pension bonus scheme pays a once-only, tax-free lump sum to eligible members who defer claiming age pension and continue to work. The bonus is paid when the eligible member claims and receives age pension. A person must register and work a minimum of 12 months from date of registration, and must complete at least 960 hours of gainful work each year. The bonus can be accrued for up to five years. The amount of bonus depends on the rate of Age Pension a person qualifies for when they eventually claim and receive it. The bonus is 9.4% of the basic age pension entitlement for the first year of deferral. For two years, the bonus

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is four times that amount, nine times for three years, 16 times for four years and 25 times for five years. The maximum, five-year bonus is equivalent to 2.35 times one year's maximum Age Pension entitlement.

Childcare

There is no specific protection for periods out of work in the superannuation guarantee. Voluntary contributions are possible for periods out of paid work.

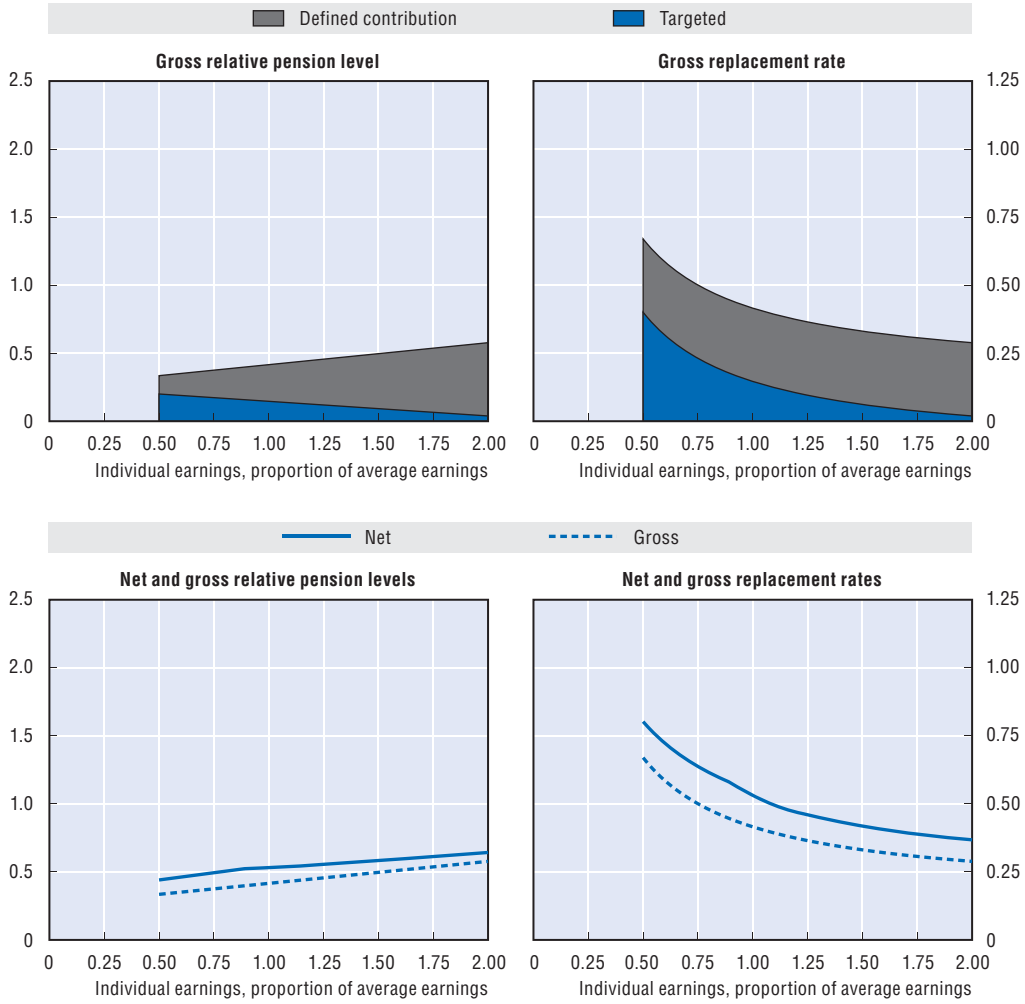
The means-tested structure of the Age Pension provides some protection for people with periods out of the workforce, in that it provides a safety net and supplements the retirement incomes of those unable to save enough during their working life.

Unemployment

There is no specific protection in the superannuation guarantee for periods out of work. Voluntary contributions are possible for periods out of paid work.

There are no credits in the superannuation scheme for periods of unemployment.

Pension modelling results: Australia



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	39.3	33.5	37.5	41.6	49.7	57.7
(% average gross earnings)						
Net relative pension level	51.7	44.1	49.4	53.1	58.3	64.3
(% net average earnings)						
Gross replacement rate	45.7	67.0	50.0	41.6	33.1	28.9
(% individual gross earnings)						
Net replacement rate	59.2	80.2	63.7	53.1	41.8	36.8
(% individual net earnings)						
Gross pension wealth	7.7	11.7	8.5	6.9	5.3	4.5
(multiple of individual gross earnings)	*9.0*	*13.7*	*9.9*	*8.1*	*6.2*	*5.2*
Net pension wealth	7.7	11.7	8.5	6.7	4.8	3.8
(multiple of individual gross earnings)	*9.0*	*13.7*	*9.9*	*7.8*	*5.5*	*4.4*

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Austria

Austria: Pension system in 2006

The pension system consists of a defined-benefit public scheme with an income-tested top-up for low-income pensioners.

Key indicators

		Austria	OECD
Average earnings	EUR	36 700	28 600
	USD	46 100	35 800
Public pension spending	% of GDP	12.6	7.2
Life expectancy	At birth	79.9	78.9
	At age 65	83.9	83.4
Population over age 65	% of working-age population	27.1	23.8

Qualifying conditions

Normal pension age is 65 for men. For women, retirement age is currently 60 years but will be increased to 65 between 2024 and 2033. There is a coverage condition: 180 months (15 years) in the last 30 years or 300 months (25 years) during the full lifetime. Alternatively, 180 months of contributions actually paid (as opposed to coverage alone) are sufficient. Insured months are either contributory months (from employment or voluntary contributions) or supplementary (*i.e.*, credited months, known as *Ersatzzeiten*) for which only limited contributions are paid. Within the pension reform of 2005 the number of contribution years due to gainful employment required for old-age-pension has been reduced from fifteen to seven years. The remaining minimum insurance period of eight years can be reached *e.g.* by child raising periods.

Benefit calculation

Earnings-related

The pension benefit currently accrues at 1.88% of earnings for each year of contributions but this will fall gradually, reaching 1.78% by 2009.

The earnings measure is currently the best 18 years' earnings. The valorisation procedure is complex although in practice adjustments have been closer to price inflation than to earnings growth. The averaging period is being extended; it will reach 40 years from 2028. Valorisation under this new procedure is still under discussion. The modelling takes this full-career measure and assumes that earlier years' earnings are revalued in line with earnings growth.

Contributions are payable up to a ceiling of EUR 52 500 a year, corresponding to 143% of average earnings.

In 2005, pensions in payment were adjusted in line with prices up to the median pension; pensions above this threshold were increased by a flat amount, which was equal to the absolute increase given to the median pensioner. From 2006 to 2009, it is envisaged that pensions will be fully indexed to prices up to 15 times the daily contribution ceiling which for 2006 was EUR 125 × 15 = 1 875. The modelling assumes that this practice will continue.

Targeted

There is a means-tested top-up (*Ausgleichszulage*) that ensures a minimum retirement income of EUR 690 per month for single people and EUR 1 056 for a couple. There are fourteen annual payments. Again, adjustment of the safety-net income is discretionary; the modelling implicitly assumes that it will rise in line with average earnings.

Variant careers

Early retirement

Retirement is currently possible from 62 for men and from 57 for women, subject to 37.5 years of contributions or credits. From 2017 on, the earliest retirement age for women will be 60. Pensions taken before the age of 65 are reduced by 4.2% for each year that the pension is claimed early.

Late retirement

For retirement between the ages of 65 and 68 the pension is increased by 4.2% per year and there is no such increment after 68. Workers who defer their pension continue to pay contributions thereby increasing their pension entitlements.

Combining work and pensions is possible but there is an earnings limit. If pensioners below the age of 65 earn more than EUR 333.16 (in 2006), the pension is fully withdrawn. After age 65, unlimited earnings from work and pension receipt are permitted.

Childcare

Periods spent out of paid work for childcare are taken into account in two different ways. Childcare periods of up to four years per child are credited on the basis of a fictitious pensionable salary of EUR 1 350 per month. But only two years per child are covered years and count towards the qualifying period for pension entitlement.

Unemployment

Periods of receiving unemployment insurance benefits and unemployment assistance (at 70% of the assessment base) count as contribution years.

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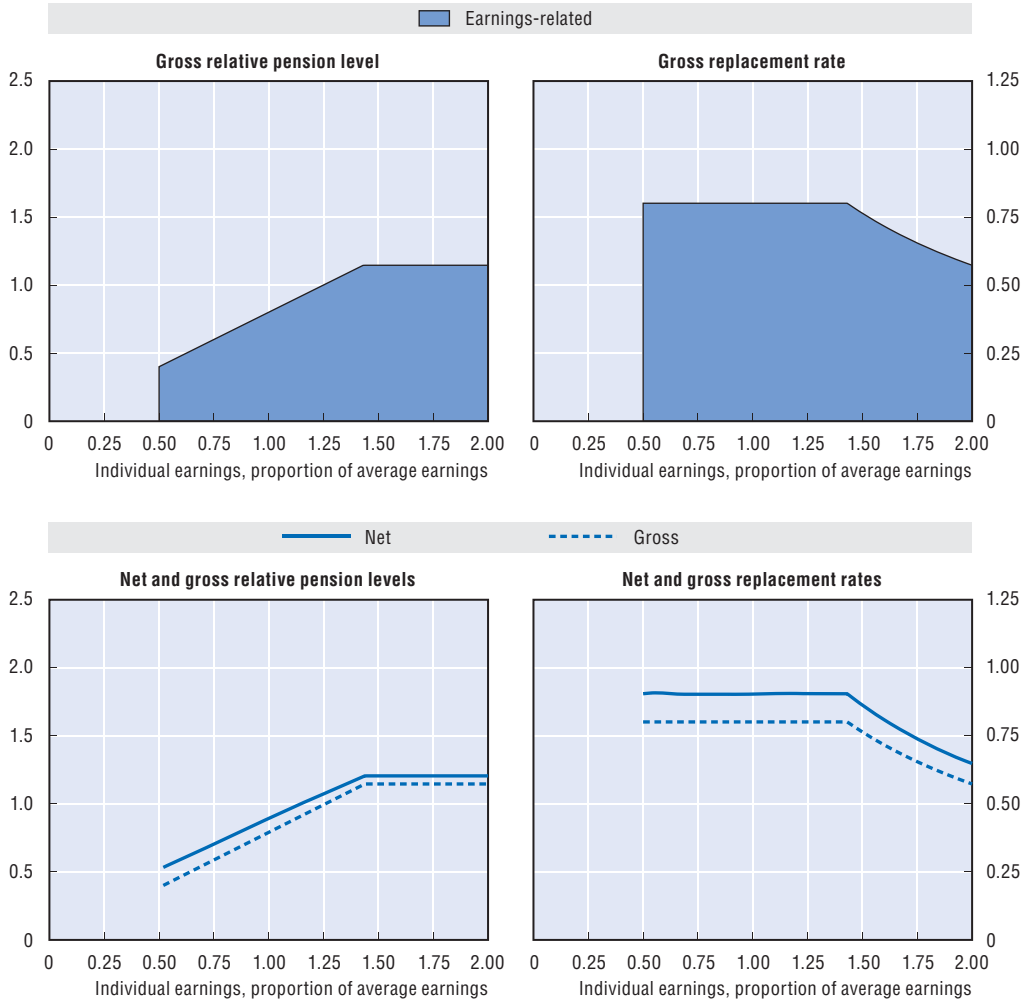
Pension modelling results: Austria



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	68.1	40.0	60.1	80.1	114.6	114.6
(% average gross earnings)						
Net relative pension level	79.1	53.3	71.7	90.3	120.6	120.6
(% net average earnings)						
Gross replacement rate	80.1	80.1	80.1	80.1	76.4	57.3
(% individual gross earnings)						
Net replacement rate	90.3	90.5	90.3	90.3	86.3	64.8
(% individual net earnings)						
Gross pension wealth	12.0	12.2	12.2	11.6	10.5	7.9
(multiple of individual gross earnings)	*13.9*	*14.2*	*14.2*	*13.5*	*12.1*	*9.1*
Net pension wealth	9.3	10.9	9.7	8.8	7.4	5.6
(multiple of individual gross earnings)	*10.8*	*12.6*	*11.3*	*10.1*	*8.5*	*6.4*

Belgium

Belgium: Pension system in 2006

The pension system has two components: an earnings-related public scheme with a minimum pension and a means-tested safety net.

Key indicators

		Belgium	OECD
Average earnings	EUR	37 700	28 600
	USD	47 300	35 800
Public pension spending	% of GDP	9.0	7.2
Life expectancy	At birth	79.5	78.9
	At age 65	83.8	83.4
Population over age 65	% of working-age population	28.7	23.8

Qualifying conditions

Normal pensionable age is 65 for men. For women, the eligibility age is 64 since 1.1.2006. It will increase to the age of 65 starting from 1.1.2009. Following legal rules in Belgium a full career requires 45 years for a man and 44 years for a woman (since 1.1.2006). As of 1.1.2009 a full career will also require 45 years for women.

Men and women can be eligible for early retirement from the age of 60, when they meet career length conditions. Since 1.1.2005, with 35 years' contributions, the pension can be claimed at 60.

Benefit calculation

Earnings-related

The full rate for the calculation of the pension for a single pensioner is 60% and for those with a dependent spouse, 75%. The annual accrual rate is therefore 60%/45 = 1.33% for men (and starting from 2009 for women). The earnings measure is average lifetime pay. Earlier years' earnings are revalued in line with prices and at the same time a revaluation coefficient is applied in order to revalue elderly wages in line with the increase of living standards (different coefficient for each year). This application of this revaluation coefficient is not modelled.

The full pension is paid provided the qualifying conditions above are met. For shorter contribution histories, the pension will be provided, but calculated on the lower number of career years.

There is a ceiling to yearly pensionable earnings of EUR 44 081.27 for 2006 (around 117% of average earnings).

Pensions in payment are uprated in line with a consumer price index (that excludes some goods). There have also been discretionary real increases (called "adaptations to well-being"). However, these increments have recently been more targeted to the lowest or the longest-running pensions. From 2008 onwards, legislation obliges the government to make decisions on uprating of all pensions every two years, based on advice of the social partners.

There are additional payments ("holiday" and "supplementary" allowances) payable once a year. These are equal to the value of the monthly pension up to a ceiling of EUR 525.50 for a single person and EUR 656.88 for pensioners with a dependent spouse (amounts payable in May 2006).

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Minimum annual credit

In cases of pensioners with low earnings or part-time work throughout their career, there is a minimum annual credit designed to increase the attributed pension entitlements for them. Annual earnings of less than EUR 14 810.70 (level applicable on 1.1.2006, equivalent to 39% of average earnings) are inflated to this level. From 1.10.2006 onwards, this minimum annual credit was raised to EUR 17 674.73 following the so-called "Generation pact"-measures. To qualify for the minimum credits, at least 15 years' insurance is necessary, for an equivalent of at least one-third of a full time employment. (This gives an effective minimum pension for a full-career worker for a single person with a 45 year contribution history raised to this level for each year of the career.) The application of this minimum annual credit cannot lead to the attribution of a pension superior to EUR 15 553.48 for a pension at "family pension" rate or EUR 12 442.78 for a pension at "isolated person" rate. If the pension calculation should result into such a pension, the "minimum annual credit" application will not be applied for all eligible career years, until the pension passes under this ceiling.

Minimum earnings-related pension

There is also a minimum earnings-related pension which corresponded to EUR 10 232.50 at 1.1.2006 (EUR 10 603.65 from 1.10.2006 onwards) for a single person or EUR 12 990.85 with a dependent spouse (EUR 13 250.39 as of 1.10.2006) meeting the full contribution condition (45 years). For a single person, this is around 28% of average earnings. The benefit will be a proportion of this minimum in the case of less-than-full careers, if the beneficiary has at least two-thirds of the full number of years. In the other case, the benefit value will simply be obtained through the application of the benefit formula (there will be no "levelling up" of the benefit in line with the minimum pensions).

The minimum pension is indexed to prices, excluding certain goods. Benefits are increased by 2% each time cumulative inflation exceeds a certain threshold (2%) since the last adjustment.

Pensioners will receive the higher of the minimum pension described here and the pension calculated according to minimum annual credit.

Safety-net income: targeted

In the case of elderly people, who have no pension rights based on a professional activity or whose pension rights are very low, a means tested safety net income can be attributed. This so called GRAPA (*Garantie de revenu aux personnes âgées*) is a part of the social assistance measures, which are complementary to the social security provisions (*e.g.* legal pension for workers of the private sector as modelled).

The means tested safety-net income for the elderly is EUR 8 234.87 (EUR 8 399.39 from 1.10.2006) for a pensioner living alone (22% of average earnings) and EUR 5 489.91 (EUR 5 599.59 from 1.10.2006) for an older person living with others. Indexation is again to prices excluding certain goods. For the means test, "normal" pension revenue is taken into account for only 90% of its real amount.

Age limits correspond to the legal age: 65. During a transitional period (for GRAPA attributed between 1.1.2006 and 31.12.2008) it is possible to apply for GRAPA at the age of 64 (for women). From 1.1.2009 onwards, the age limit will be 65 in all cases.

Voluntary private pensions

A new scheme of "sectoral complementary pensions" was introduced in 2003 to further extend the 2nd pillar pension system. The contribution rates are fixed through (sectoral) collective labour agreements, and can vary between economic sectors. These occupational plans are defined-contribution and around 56% of employees have them. The modelling assumes a contribution rate of 4.25%, which is around the national average.

Variant careers

Early retirement

Since 2005, early retirement is possible from age 60, subject to 35 years contributions. There is no actuarial reduction in the pension calculation. The pension, however, can be incomplete, due to the possible incompleteness of the career (less than 45 years). There is an earnings test limiting the opportunity to combine an early retirement pension with work. This is stricter than the earnings test applied after normal pension age (see below).

For pensions starting from 1.1.2007 onwards and before 2013, work after the age of 62 or beyond 44 years of contributions will be credited with a bonus (EUR 2 for each day worked, limited to EUR 624 (not indexed) for each full year of work), following the "generation pact".

Late retirement

It is possible to defer pension after the normal retirement age. For people who continue working after normal retirement age, this can permit to plug career gaps to obtain a full(er) pension or can improve the pension amount, since only the 45 last years (44 years for women) are used in the calculation of the pension benefit.

Otherwise, it is possible to combine pensions and earnings (after normal pension age) within limits. For annual earnings under EUR 15 590.18 (single) or EUR 19 300.98 (with a dependent child), the pensions will not be reduced. Above this ceiling, the pension will be reduced by the amount that earnings surpass these limits. If actual earnings are 15% above the limits mentioned above then the pension will be completely withdrawn.

Before the legal (normal) pension age, the limits for cumulating pensions and earnings are limited to EUR 7 421.57 or EUR 11 132.37 respectively, with the same 15% earnings restriction.

Childcare

A maximum of three years in total caring for children may count as gainful employment, if the person benefits from the so called "tijdskrediet". *Tijdskrediet* is a right for all employees in the private sector and they could benefit from a full suspension of labour activities or of a half-time reduction of labour time if they had worked more than three-fourths of full time for at least 12 months preceding the start of *tijdskrediet*. They also need to have worked for the same employer for more than a year, during the 15 months before the application for the "*tijdskrediet*". When a person withdraws totally from the labour market, no compensation is made. These years count in the numerator of the benefit formula. The value for earnings in the formula is the last earnings before the labour-market absence.

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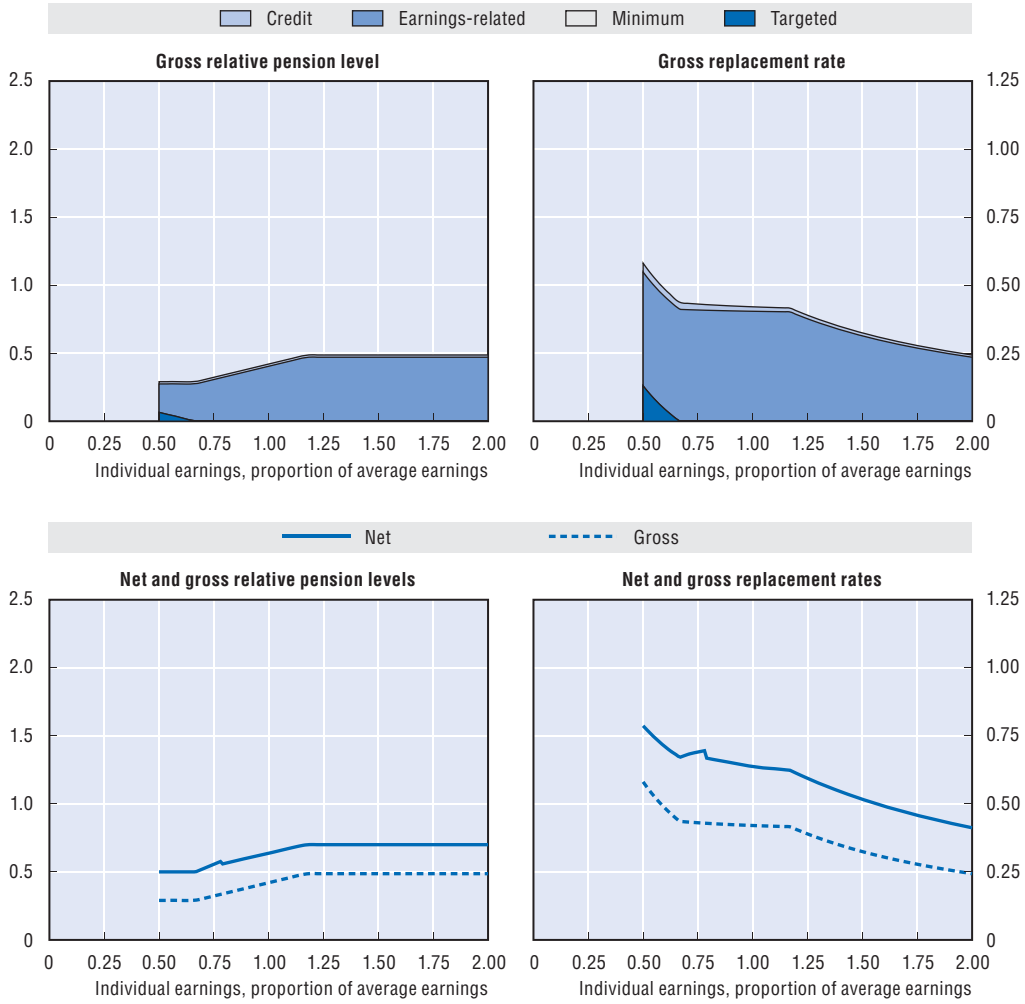
Unemployment

Periods on unemployment insurance benefits are credited under the pension system. The unemployment years count in the numerator of the benefit formula and earnings prior to the period of unemployment are used in the calculation base for the entire unemployment period. There is no limit on the number of years credited. The application of this crediting however, will lead to a slightly lower pension benefit than in case of a full active career as this credit amount does not necessary follow completely the full real wage growth over the credited period. Unemployment above the age of 62 or after 42 years of career will not allow for the application of the "pension bonus" for these years.

Pension modelling results: Belgium



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	37.8	29.0	32.3	42.0	48.7	48.7
(% average gross earnings)						
Net relative pension level	59.7	50.0	55.6	63.7	70.0	70.0
(% net average earnings)						
Gross replacement rate	42.4	58.1	43.1	42.0	32.5	24.3
(% individual gross earnings)						
Net replacement rate	65.3	78.7	69.0	63.7	51.7	41.2
(% individual net earnings)						
Gross pension wealth	6.5	8.9	6.6	6.4	5.0	3.7
(multiple of individual gross earnings)	*7.5*	*10.3*	*7.6*	*7.5*	*5.8*	*4.3*
Net pension wealth	6.0	8.9	6.6	5.7	4.1	3.1
(multiple of individual gross earnings)	*6.9*	*10.3*	*7.6*	*6.6*	*4.8*	*3.6*

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Canada

Canada: Pension system in 2006

The pension system offers a universal flat-rate benefit, which can be topped up with an income-tested benefit, and earnings-related public schemes.

Key indicators

		Canada	OECD
Average earnings	CAD	40 600	40 500
	USD	35 800	35 800
Public pension spending	% of GDP	4.1	7.2
Life expectancy	At birth	80.4	78.9
	At age 65	84.5	83.4
Population over age 65	% of working-age population	21.1	23.8

Qualifying conditions

The basic old age security (OAS) pension is subject to a residence test, with 1/40th of the maximum pension earned for each year of residence after age 18 up to a maximum of 40 years. A minimum of ten years' residence is required to receive any benefit. It is payable from age 65.

For the earnings-related scheme, a full pension requires about 40 years' contributions but a single valid contribution is sufficient to generate an entitlement. Normal pension eligibility age is 65 but an early pension can be claimed from age 60.

Benefit calculation

Basic

The 2006 full pension level for the OAS pension was CAD 5 846.19. The value of the basic pension is price-indexed.

This pension is subject to an income test operated through the tax system (a "claw-back"). For income above CAD 62 144 a year, the basic pension in 2006 was withdrawn at a 15% rate. It is also indexed to prices.

Targeted

The guaranteed income supplement (GIS) is added to the basic OAS pension. The combination gave a maximum benefit of CAD 13 011.33 in 2006.

The GIS is reduced against income other than the basic pension at a 50% rate. The target benefit level is price-indexed.

Earnings-related

Earnings-related pensions and benefits are provided by the Canada Pension Plan (CPP)/ Québec Pension Plan (QPP). The CPP and QPP offer broadly similar benefits. The scheme targets a replacement rate of 25% of earnings, based on average lifetime salary (excluding the 15% of years with the lowest earnings). Earlier years' pay is revalued in line with economy-wide earnings. As noted previously, the full benefit requires about 40 years' contributions with proportional reductions for shorter work histories. The maximum earnings-related retirement pension for 2006 was CAD 844.58 a month.

People earning less than CAD 3 500 a year are not required to contribute. There was a ceiling of CAD 42 100 in 2006 to contributions. The ceiling is indexed to increases in average earnings while the contribution floor is frozen in nominal terms.

The value of the earnings-related pension after retirement is uprated annually in line with prices.

Voluntary private pensions

Around 40% of employees are covered by occupational pension schemes. In 2003, around 80% of these were defined-benefit plans. The defined-benefit plan modelled, based on the results of a national survey of schemes, has an accrual rate of 1.3% of earnings up to the ceiling of the public scheme and 2% thereafter. Pensions are based on final salaries.

Overall coverage of voluntary private pensions – including both personal and occupational plans – is around 57%. For calculating defined-contribution pension values, a contribution rate of 8.5% of earnings is assumed.

Variant careers

Early retirement

Early retirement beginning at age 60 is possible in the state earnings-related scheme subject to a benefit reduction of 6% per year. Early retirement is not possible in the other two public schemes (basic and means-tested).

Late retirement

The earnings-related pension can be deferred earning a 6% increment for each year after age 65 – up to a maximum of five years. The basic and income-tested benefits cannot be deferred. The income-test for the latter includes earnings, for the former there is a claw-back against large incomes, again including earnings.

Childcare

Years of caring for children under the age of 7 are excluded from the averaging period in the pension calculation and these years are excluded from the contributory period under the earnings-related scheme.

Unemployment

Up to 15% of the contributory period may be excluded in calculating average earnings. This drop-out is intended to compensate for periods of unemployment, illness, schooling, etc. There are no credits for periods of unemployment.

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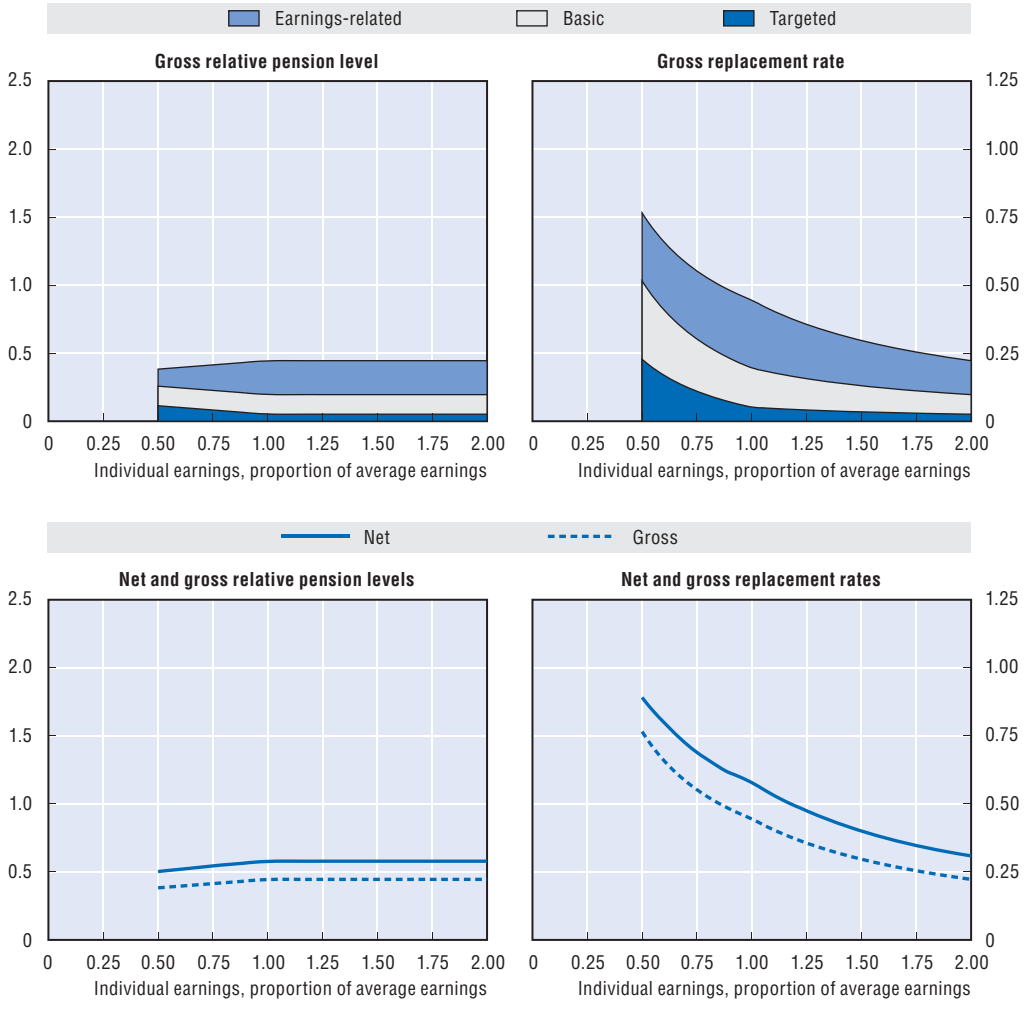
Pension modelling results: Canada



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	42.6	38.3	41.4	44.5	44.5	44.5
(% average gross earnings)						
Net relative pension level	55.9	50.3	54.4	57.9	57.9	57.9
(% net average earnings)						
Gross replacement rate	50.2	76.5	55.2	44.5	29.7	22.2
(% individual gross earnings)						
Net replacement rate	63.6	89.1	68.9	57.9	40.0	30.9
(% individual net earnings)						
Gross pension wealth	7.7	11.7	8.4	6.8	4.5	3.4
(multiple of individual gross earnings)	*8.9*	*13.6*	*9.8*	*7.9*	*5.3*	*4.0*
Net pension wealth	7.6	11.7	8.4	6.7	4.5	3.4
(multiple of individual gross earnings)	*8.9*	*13.6*	*9.8*	*7.8*	*5.2*	*3.9*

Czech Republic

Czech Republic: Pension system in 2006

The public pension scheme has a basic element and an earnings-related part calculated according to a progressive formula. There is also a minimum pension.

Key indicators

		Czech Republic	OECD
Average earnings	CZK	234 800	808 700
	USD	10 400	35 800
Public pension spending	% of GDP	7.3	7.2
Life expectancy	At birth	76.7	78.9
	At age 65	81.6	83.4
Population over age 65	% of working-age population	22.1	23.8

Qualifying conditions

The standard retirement age will be gradually increased to 65 for men under phase 1 of the new pension reform. The pension eligibility age will be 62-65 for women with children (depending on the number of children that they raised) and 65 for women without children. A minimum required 25 years' coverage will be gradually increased to 35 years (by one year per year from 2010) but people with 15 years' coverage (gradually increasing to 20 years) can receive a pension from 65.

Benefit calculation

Basic

The value of the basic pension is CZK 1 470 per month, equivalent to 7.5% of average earnings. There is no statutory indexation requirement for the value of the basic benefit alone. However, total pensions in payment must be increased by at least prices plus one-third of real wage growth (see below).

Earnings-related

The earnings-related pension gives 1.5% of earnings for each year of contributions. The earnings measure currently averages across all years since 1985, but it will gradually reach 30 years (in 2015). Earlier years' earnings are valorised by the growth of economy-wide average earnings.

There is a progressive benefit formula, with the first CZK 9 100 per month replaced at 100%, the slice of earnings between this limit and CZK 21 800 at 30%, with a 10% replacement above this level. The first threshold, below which there is 100% replacement, is equivalent to 46.5% of average earnings, while the second threshold is 111.4% of average earnings. There is no statutory indexation requirement for these thresholds, but both these thresholds have changed annually.

There is no specific statutory indexation requirement for the earnings-related pension component in payment. However, the combined total pension benefit (flat-rate and earnings-related components) is adjusted at least to price inflation plus at least one-third of real wage growth.

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Minimum

The total value of the minimum monthly pension benefit is CZK 2 240, which is made up of a minimum earnings-related pension of CZK 770 plus the basic component of CZK 1 470. This combined minimum pension is indexed in the same way as described above. It is worth 11.4% of average earnings.

Social assistance

Older people are covered by the general social-assistance scheme and related benefits in kind. The target safety-net income for a single-person household is CZK 4 420 per month, or 22.6% of average earnings. This is made up of a personal needs amount of CZK 2 400 plus a household needs amount of CZK 2 020.

Voluntary private pensions

Around 45% of employees have a voluntary occupational or personal pension. Because of limits on the tax incentives for these plans, contributions tend to be small. For the modelling a contribution rate of 2.8% of earnings is assumed.

Variant careers

Early retirement

It is possible to retire three years (increasing to five years, but no earlier than age 60) before the standard retirement ages, *i.e.* at 60 for men and 59-60 for women subject to 25 years' coverage (increasing in line with general qualification conditions to 35 years). The total accrual factor (*i.e.*, number of years of contributions multiplied by the accrual rate) is permanently reduced by 0.9% for each 90 days for the first 720 day of early retirement (3.6% per year), and 1.5 % for each 90 days thereafter (6 % per year from 2010). For a full-career worker, this is equivalent to a decrement in the pension level (rather than the replacement rate) for early retirement of 3.6/64.5 (1.5% times 43 years) = 5.6%.

Late retirement

It is possible to defer claiming the pension beyond the normal pension age. The total accrual factor (see section on early retirement above) is increased by 1.5% for each 90-day period of deferral (6% per year). There is no additional pension accrual for deferred retirement. It is also possible to combine pension receipt while continuing to work.

Childcare

Women are entitled to retire earlier depending on the number of children they have had:

Number of children	1	2	3	4+
Early retirement (years)	0	1	2	3

In addition, there are credits for labour-market absences during periods caring for children up to four years old (or older in case of severe disability). These years are then ignored in the calculation of earnings for pension purposes so that these absences do not reduce the assessment base. (This approach is used for all non-contributory periods.)

Unemployment

Periods on earnings-related unemployment insurance are credited in the pension system. The duration of unemployment insurance entitlement varies with age: six months up to age 50, nine months from 50 to 55 and 12 months for over 55s. In addition, up to three years spent unemployed without entitlement to unemployment insurance are also credited. The unemployment period used for the pension calculation is reduced to 80%, meaning that if an individual had five years' unemployment over the career, this would count as four years for pension purposes. If the unemployment period is in the decisive (reference) period (last 30 years before retirement starting 1986) for the average assessment base calculation, this period is excluded from the calculation and only the income from which the premium is paid is used.

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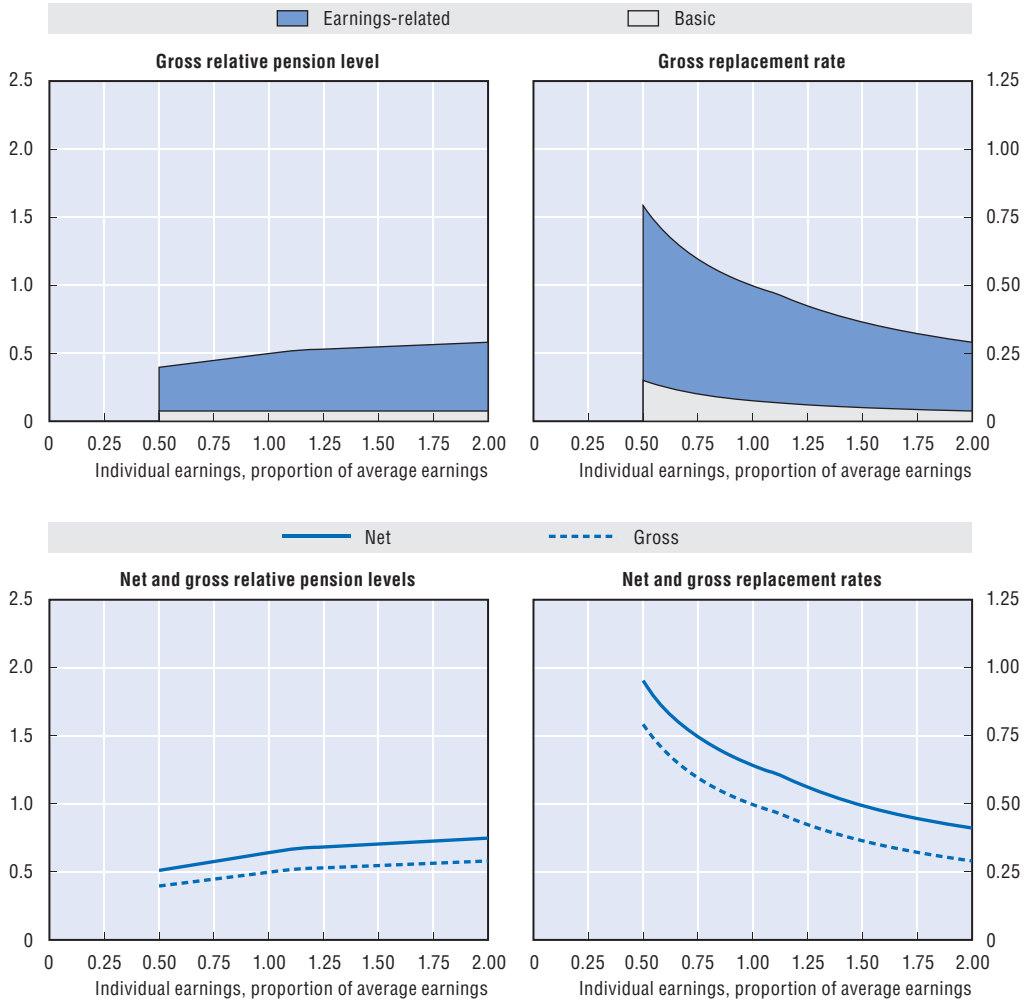
Pension modelling results: Czech Republic



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	46.7	39.6	44.7	49.7	54.7	58.0
(% average gross earnings)						
Net relative pension level	60.2	51.1	57.6	64.1	70.5	74.8
(% net average earnings)						
Gross replacement rate	54.9	79.2	59.6	49.7	36.4	29.0
(% individual gross earnings)						
Net replacement rate	69.8	95.3	74.7	64.1	49.4	41.1
(% individual net earnings)						
Gross pension wealth	8.4	12.1	9.1	7.6	5.6	4.4
(multiple of individual gross earnings)	*9.9*	*14.3*	*10.8*	*9.0*	*6.6*	*5.2*
Net pension wealth	8.4	12.1	9.1	7.6	5.6	4.4
(multiple of individual gross earnings)	*9.9*	*14.3*	*10.8*	*9.0*	*6.6*	*5.2*

Denmark

Denmark: Pension system in 2006

There is a public basic scheme (public old age pension, "folkepension") which consists of a basis amount and an income-tested pension supplement. A means-tested supplementary pension benefit is paid to the financially most disadvantaged pensioners. There are also two schemes based on individuals' contribution records, the ATP (the Danish labour market supplementary pension) and the SP (the special pension savings scheme). In addition, compulsory occupational schemes negotiated as part of collective agreements cover about 90% of the full-time employed workforce.

Key indicators

		Denmark	OECD
Average earnings	DKK	330 900	212 700
	USD	55 700	35 800
Public pension spending	% of GDP	5.4	7.2
Life expectancy	At birth	78.4	78.9
	At age 65	82.7	83.4
Population over age 65	% of working-age population	25.3	23.8

Qualifying conditions

The normal pension age is currently 65 but will be increased gradually to age 67 in the period 2024-27. A full public old-age pension requires 40 years' residence. Shorter periods qualify for a pro-rated benefit.

A full entitlement under the labour-market supplementary pension (ATP) and the special saving scheme (SP) requires a full career of contributions. The ATP scheme was established in 1964. The ATP scheme is a collective insurance-based DC scheme. The SP scheme was established in 1999. SP is a statutory, purely savings-based scheme, where contributions are paid to individuals accounts.

Benefit calculation

Basic

The full basic pension amount is DKK 4 836 per month or DKK 58 032 per year, equivalent to 17.5% of average earnings. There is an individual earnings test which means that the basic pension will be reduced if work income exceeds DKK 246 500 (approximately three-quarters of general earnings per year for an average production worker). The benefit is reduced at a rate of 30% against earned income above this level.

Targeted

The full pension supplement is DKK 4 868 per month or DKK 58 416 per year for single persons and DKK 27 276 per year for couples. The actual amounts are tested against all sources of personal income (including ATP, SP and occupational pensions) apart from public pension. If personal income exceeds DKK 54 400, the targeted pension supplement is reduced by 30% of the excess income for single persons. For couples this income test is calculated of income beyond DKK 109 200 at a rate of 15%.

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Connected with the public old-age pension, a new supplementary pension benefit of DKK 6 300 (2006) was introduced in 2004. The supplementary pension benefit is taxable and paid once a year. The benefit is means-tested and targeted to the poorest pensioners without significant cash savings (max cash savings DKK 56 800).

The public old-age pension (the basic and targeted amounts plus the pension supplement) and the supplementary pension benefit are adjusted annually in line with average earnings. The adjustment is based on an index of wage increases during the two preceding years. If nominal earnings growth exceeds 2%, a maximum of 0.3 percentage points of the excess increase is allocated to a social spending reserve. Thus, indexation of pensions and other social benefits is based upon wage increases less any allocation to the reserve.

Occupational

These schemes are fully funded defined-contribution schemes agreed between the social partners. Coverage of these schemes is almost universal. Contributions are typically between 9% and 17% of earnings. In 2006, the percentage for the majority of Danish workers has been raised to 10.8% and this contribution rate is used for the modelling. Benefits are usually withdrawn as an annuity. The assumed interest rate is 1.5% for recent contributions or new schemes. However, the schemes operate on a "with-profit" basis, with pension increases depending on the return on assets and mortality experience of the fund. Many schemes also allow lump sum withdrawals. Since 2000, the annuity calculation must use unisex mortality tables.

Defined contribution

ATP is a statutory, fully funded, collective insurance based, defined-contribution scheme. ATP provides a lifelong pension from the age of 65 and a survivors' lump sum benefit for dependents in the case of the death of the individual member. ATP covers all wage earners and almost all recipients of social security benefits. ATP membership is voluntary for the self-employed. ATP covers almost the entire population and comes close to absolute universality.

Technically, the old age pension of ATP is a guaranteed deferred annuity. The contribution is a fixed amount – as opposed to a percentage of income – varied only against the number of hours worked. A full-time employee paid DKK 2 924 in 2006. Contributions are split with two-thirds paid by the employer and one-third by the worker. The contribution schedule (the sum of employer and employee contribution) against hours worked is shown in the following table (for monthly paid workers):

Monthly hours	< 39	39-77	78-116	> 116
Contribution, DKK/month up until 2009	0	81.3	162.6	243.9
Contribution, DKK/month as from 2009	0	90	180	270

The contribution is adjusted if and when the social partners decide to do so as part of collective agreements. Over the past 20 years the contribution has been increased in steps more or less in line with average earnings. The modelling assumes that the contribution will increase in line with average earnings. An increase of approximately 10% has been agreed for 2009.

Until 2002, each DKK 396 of contributions earned DKK 100 of pension benefits paid from 65 regardless of the age at which they were made. This implied an average (across all accruing cohorts) interest rate of around 4.5%. From 2002, a nominal interest rate of 1.5% has been assumed. In the model, it is assumed that the ATP earns the same interest rate as assumed for funded defined-contribution schemes in other OECD countries.

The ATP scheme increases pensions in payment and pension rights alike if its financial condition allows. This is done in the form of bonus allowances. Increases are guaranteed as are earned rights.

The modelling assumes full indexation to price inflation.

An entirely new ATP pension accrual system has been introduced as from 2008. The model is based on swap interest rates as opposed to a fixed nominal interest rate of *e.g.* 1.5%.

Defined contribution (Special pension, SP)

Employees, self-employed and recipients of unemployment and sickness benefits contribute 1% of earnings to this mandatory individual retirement savings scheme. Investments are currently managed centrally. As from 2005, members have been able to choose their manager and portfolio. There is no ceiling to earnings covered by this scheme. Benefits are paid at normal pension age. If the account balance is less than DKK 15 000, it is paid as a lump sum and taxed at 40%. If it is between DKK 15 000 and DKK 120 000, the balance is paid out over a period of ten years. If the balance is more than DKK 120 000 at normal pension age, the balance is paid out periodic monthly over ten years Periodic payments are taxed as personal income.

As part of agreements, contributions to the SP scheme have been suspended since 2004. The model takes a long-term perspective and so assumes that SP contributions resume.

Variant careers

Early retirement

There is a partial early retirement pension for workers aged between 60 and 65 who continue to work for 12 to 30 hours a week. The scheme is being phased out. It now applies only for workers born before 1 January 1959. The beneficiary must reduce weekly hours worked by at least seven hours a week or at least one quarter of total hours worked in an average week. The partial pension is calculated as a fixed amount for every hour that is reduced. The amount is approximately DDK 76 an hour for 2007. Since 1999 beneficiaries are subject to a pension deduction.

There is also a voluntary early retirement programme linked with unemployment insurance, which pays benefits between ages 60 (gradually increased to age 62 in the period 2019-22) and until the normal pension age. To qualify, individuals must have been members of the unemployment insurance fund for at least 25 years within the last 30 years and have paid voluntary early-retirement contributions during this period. They must also satisfy the conditions for entitlement to unemployment benefits in the event of unemployment at the time of transition to the voluntary early-retirement scheme. The benefit amount corresponds to the rate of unemployment benefits, subject to a limit of 91% of the maximum rate of unemployment benefit, equivalent to DKK 3 110 per week for full-time workers and DKK 2 075 or part-time workers (2006 figures). It is not possible to combine receipt of voluntary early-retirement benefits with the social pension.

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People who defer the take up of voluntary early-retirement benefits for at least two years after they have become entitled to the benefit and are still working receive a higher rate of voluntary early-retirement benefit that is equivalent to the maximum rate of unemployment benefit (or DKK 3 415 per week in 2006). For three years' full-time work when an individual qualifies for voluntary early retirement or the equivalent, a one-off lump-sum is paid up to a maximum of DKK 124 860 in 2006.

People covered by either early-retirement programme revert to the standard old-age pension once they reach the normal retirement age of 65 (due to their age they will not be affected by the legislated rise in the retirement age in the period 2024-27).

Late retirement

It is possible to defer the public old age pension for up to ten years. The increment for deferring pension for a year is the ratio of the period of deferral to average life expectancy at the time the pension is drawn. For example, the World Bank/UN population projections show life expectancy for a 68-year old to be 17.1 years. Thus, the increment for deferring for a year from age 67 would be 1/17.1 = 5.8%.

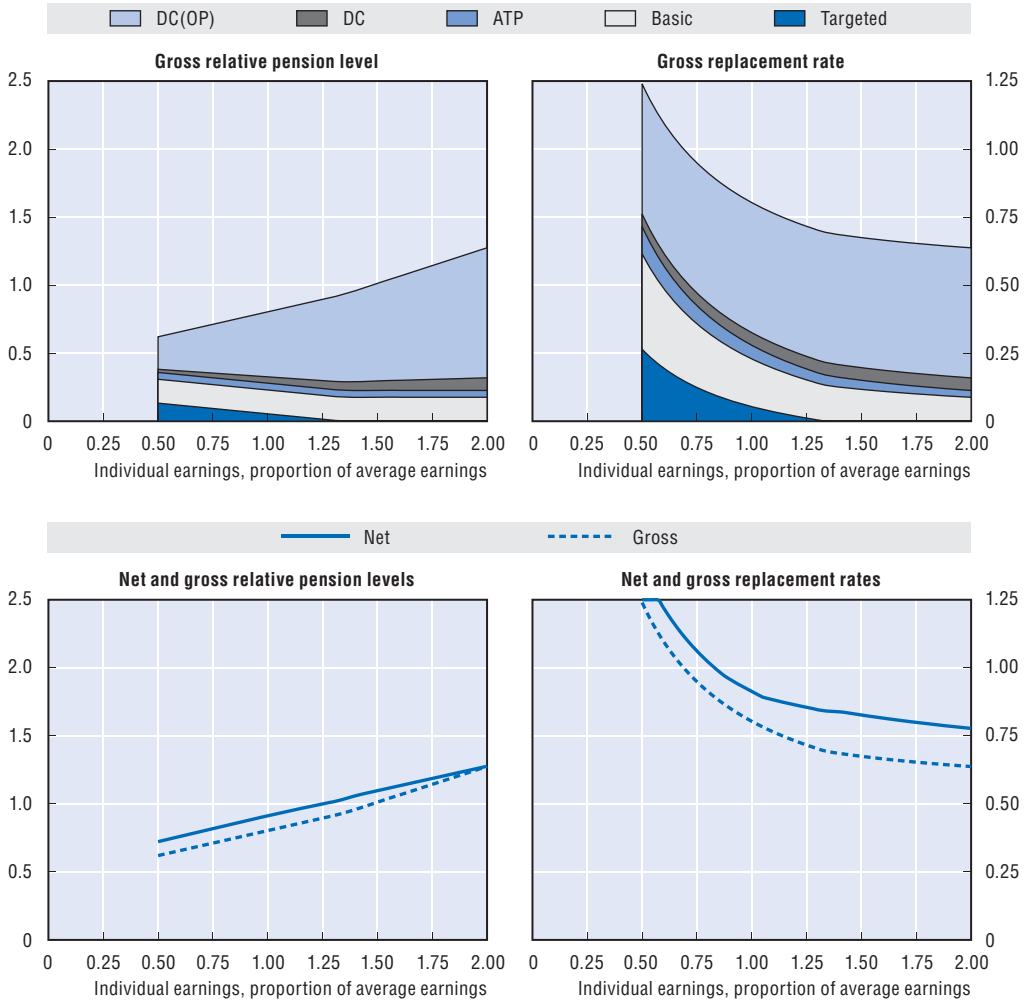
Childcare

For periods on maternity/paternity/parental benefits, the double amount of contributions is paid for ATP. The beneficiary will pay one-third of the contribution, two-thirds is paid by the government/municipality. Maternity/paternity/parental benefits can be paid for up to 52 weeks in total. Four weeks prior to the birth and the first 14 weeks after the birth are reserved for the mother. The father is entitled to two weeks of leave during the first 14 weeks after the birth (paternity leave). The last 32 weeks can be divided or shared between the father and the mother (parental leave). Those out of the labour market caring for children beyond the maternity period typically switch to another scheme which also carries an ATP contribution. Young parents usually resume work when the leave period ends unless the child is *e.g.* ill or disabled in which cases there normally will be possibilities for drawing on some sort of public benefit with contribution to ATP. Parents on maternity/paternity/parental benefits have contributed to SP and will do so again when the SP contributions resume. There are no credits or contributions for occupational pension schemes for periods out of paid work caring for children.

Unemployment

During unemployment, the unemployment insurance (or municipality if not insured) take over the payment obligation of employer and ATP contributions are paid at the double rate when receiving benefit from the unemployment insurance (normal rate if social assistance benefit). The government pays two-thirds of the payment when unemployment insurance is exhausted and the individual is on unemployment/social assistance. There are no credits or contributions for occupational pension schemes for periods of unemployment.

Pension modelling results: Denmark



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	74.8	62.0	71.2	80.3	101.2	127.4
(% average gross earnings)						
Net relative pension level	85.6	72.2	81.8	91.3	109.7	127.6
(% net average earnings)						
Gross replacement rate	88.0	124.0	94.9	80.3	67.5	63.7
(% individual gross earnings)						
Net replacement rate	98.7	137.0	106.2	91.3	82.7	77.7
(% individual net earnings)						
Gross pension wealth	12.8	18.5	13.9	11.6	9.6	9.0
(multiple of individual gross earnings)	*14.7*	*21.3*	*16.0*	*13.3*	*11.0*	*10.3*
Net pension wealth	8.6	12.7	9.4	7.8	6.1	5.3
(multiple of individual gross earnings)	*9.9*	*14.6*	*10.8*	*8.9*	*7.0*	*6.1*

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Finland

Finland: Pension system in 2006

The two-tier pension system consists of a basic state pension (national pension), which is income-tested, and a range of statutory earnings-related schemes, with very similar rules for different groups. The schemes for private-sector employees are partially pre-funded while the public-sector schemes are pay-as-you-go financed (with buffer funds to even out future increases in pension contributions). Major pension reform was introduced in Finland in 2005 and all rules presented here take account of these reforms.

Key indicators

		Finland	OECD
Average earnings	EUR	33 500	28 600
	USD	42 100	35 800
Public pension spending	% of GDP	8.4	7.2
Life expectancy	At birth	79.5	78.9
	At age 65	84.1	83.4
Population over age 65	% of working-age population	26.9	23.8

Qualifying conditions

The national pension is subject to a residency test (but no contribution requirements), withdrawn against pension income from the earnings-related schemes. The national old-age pension is payable from age 65. The full old-age national pension benefit is payable with 40 years residence as an adult, with pro rata adjustments for shorter periods of residence. It is possible to retire to early old-age national pension between ages of 62 and 65 (early old-age pension is available from the beginning of the month following one's 62nd birthday).

From 2005 the retirement age of earnings-related old-age pension is flexible between the ages of 63 and 68 (*i.e.* including the month of the 68th birthday). It is possible to retire to early old-age pension between ages of 62 and 63 and it is possible to take a deferred old-age pension after 68. There are no waiting periods or euro limits to obtain a right to earnings-related pension, even though there are minimum earning levels for pension insurance. Pension accrues only after the age of 18.

Benefit calculation

Earnings-related

Among different earnings-related schemes, the scheme for private sector employees (TEL) is covered here.

From 2005, the accrual rate is 1.5% of pensionable earnings at ages 18-52, 1.9% at ages 53-62 and 4.5% at ages 63-67. For a full-career worker working from age 20 until retirement at age 65, the total lifetime accrual will be 77.5% of pensionable earnings (if pensionable earnings are assumed to remain constant the whole career).

Pensionable earnings are, from 2005, based on average earnings of the whole career. However, as pension accrues differently in different age groups (see above), the earnings received by older workers have more weight in the total pension. When the pensionable earnings are calculated the amount corresponding to employee's pension contribution is deducted from the earnings. In 2006, the employee's pension contribution was 4.3% for employees under 53 years old and 5.4% for employees 53 years old or older. Note, however, that the replacement rates are shown relative to total gross earnings (for comparison with other countries) rather than this measure of pensionable earnings.

Earlier years' earnings are revalued in line with a mix of economy-wide earnings and prices. From 2005, wage growth has an 80% weight and price inflation, 20%. At the baseline assumptions for prices and wages growth, this policy reduces the value of the pension to 91.5% compared with a policy of full earnings valorisation of earlier years' pay. After retirement, the earnings-related pension is uprated using a formula of 20% of earnings inflation and 80% of price inflation.

From 2010 new earnings-related pensions will be reduced according to increases in life expectancy from 2009. (The calculations use lagged mortality data: for 2010, for example, the data are the average for 2004-08 compared to base year which is based on data for 2003-07.) Between 2002 and 2040, the UN/World Bank mortality projections imply an increase in life expectancy at age 65 from 16.8 years to 20.4 (calculated from unisex mortality rates). The adjustment takes the form of an annuity calculation using a discount rate of 2% per year. The adjustment expected in the year 2040, based on the mortality projections, is to reduce benefits to 83.1% of their value under the pre-reform rules. The life expectancy coefficient is calculated for each cohort at the age of 62.

There is no contribution floor and no ceiling to contributions or pensionable earnings, which means there is no pension ceiling either. However, there are minimum earnings limit for pension insurance.

The Finnish Centre for Pensions co-ordinates the schemes, resulting in a single pension payment even for people who have been members of different plans.

Targeted (national pension)

The parameters of the system differ from one municipality group to another to reflect regional differences in the cost of living. The full basic monthly benefit for a single pensioner in 2006 was EUR 510.80 until September and EUR 515.86 thereafter in the first municipality group and EUR 489.85/494.91 in the second municipality group (around a fifth of average earnings). For couples, the corresponding amounts were EUR 450.29/455.34 and EUR 432.44/437.50 per month. The national pension is reduced by 50% of the difference between other pension income and a small disregard which in 2006 was EUR 567 per year. No pension is payable once other pension income exceeds EUR 1 046.08/1 056.17 or EUR 1 004.17/1 014.25 per month (singles depending on municipality group). Note that the modelling uses the higher value for the national pension.

From 2005 on, earnings-related (employment) pension accrued after the age of 63 will be disregarded when national pension entitlement is calculated.

The basic pension benefit, the parameters of the means test and pension payable are uprated annually in line with prices. In practice there have been additional increases based on separate decisions.

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Variant careers

For interrupted careers a salary base is used when calculating pension for unpaid periods. If the pension accrual is based on the salary on which the benefit is based there is no deduction of pension contribution (see benefit calculation/earnings-related above). Usually the corresponding amount has already been deducted when the wage for the calculation of the benefit has been calculated.

Early retirement

Early national old-age pension is available from the beginning of the month following one's 62nd birthday. Its amount is permanently reduced (in comparison with the ordinary old age pension) by 0.4% for each month the pension is to be paid before the normal pensionable age of 65 years. The pension will not rise to its regular level when the recipient reaches the age of 65. These rules operate from 2005.

Early retirement is possible at age 62 under the earnings-related scheme, subject to a 0.6% benefit reduction per month of early retirement until the age of 63. After the age of 63 there is no reduction in pension. However, there is more rapid accrual of earnings-related benefits after this age (see above).

Late retirement

From 2004 the national pension can be deferred after the age of 65 and the pension is then increased by 0.6% for each month by which retirement is postponed.

From 2005 onwards, the increment for late retirement is reduced to 0.4 % for each month (4.8% per year) in the earnings-related scheme after age 68. There is no adjustment between ages 63 and 68 because of the accelerated accrual of pension at those ages.

It is possible to combine receipt of pension and earnings from work. From 2005 after taking the old-age pension, earnings accrue additional pension and the accrual rate is 1.5% per year until the age of 68.

Childcare

From 2005 onwards, during periods of maternity, paternity and parent's allowance, the pension accrues based on 1.17 times the salary, on which the family benefit is based. The maximum paid parental leave period is 11 months.

For unpaid periods of childcare by either parent during which child home-care allowance is claimed, pensions accrue as if the person received a salary of EUR 556.60 per month (2006), which is around a fifth of average earnings. This is the case until the child reaches the age of 3.

People on parental leave are not liable for pension contributions. The pension accruing for paid parental leave is paid by the earnings-related pension system. The state finances the pension for periods of unpaid childcare leave.

The part of the pension that is based on unpaid periods of child care (and studies) is not included in the income test of the national pension.

Unemployment

Following the 2005 reform, earnings-related unemployment benefits accrue pension rights based on the proportion of the salary (75%) on which the benefit is based. Only unemployment benefits received before the age of 63 generate a pension credit.

Unemployment-insurance benefits are paid for 500 days (around 23 months, in average 21.5 days per month). If an unemployed person reaches age 59 before the 500 days have accrued, earnings-related unemployment can be paid until age 65. (Due to age limits these rules will not be applied before 2009.) Individuals receiving allowance after 500 days are entitled to choose claiming old age pension from age 62. In such case, there is no reduction for early retirement and earnings-related unemployment benefits cease. After the period with earnings-related unemployment benefits, flat-rate or income-tested (under various conditions) unemployment assistance could be claimed but the period under these benefits are not credited for the pension entitlement.

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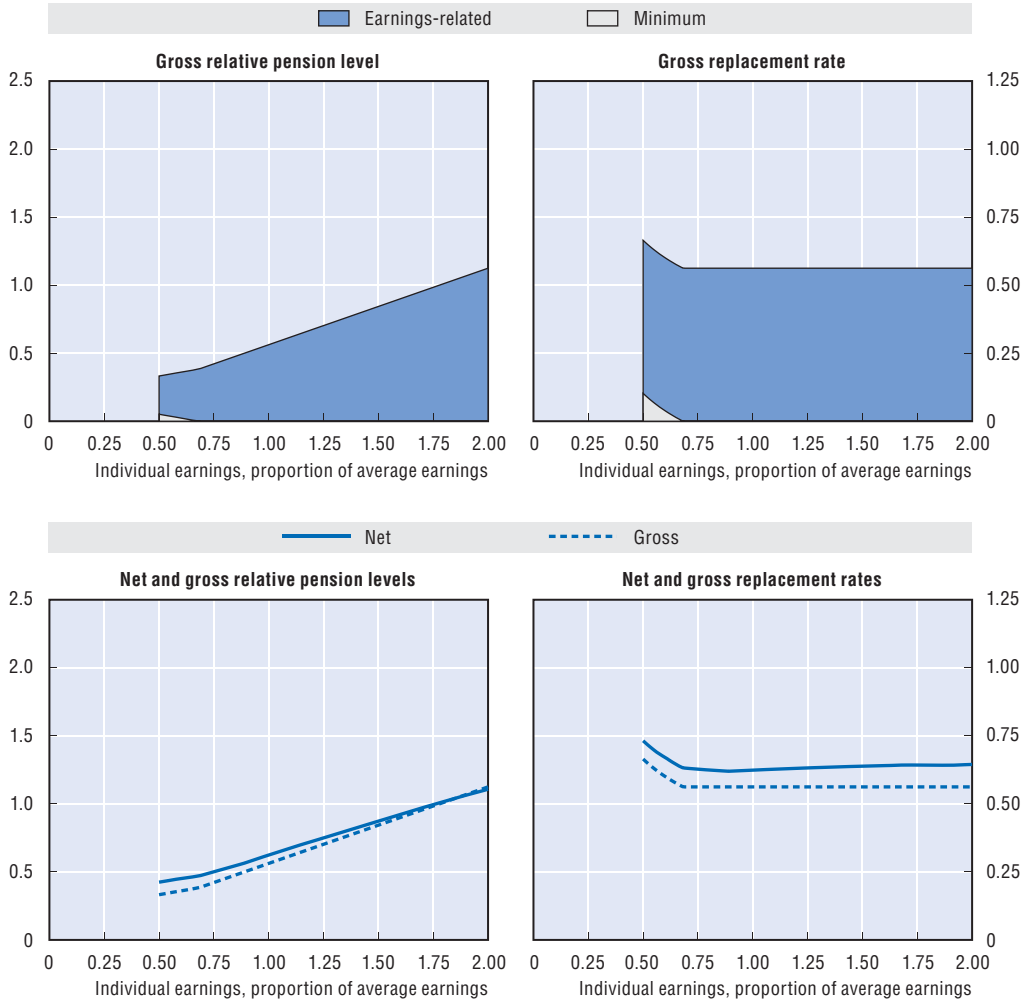
Pension modelling results: Finland



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	49.5	33.2	42.2	56.2	84.3	112.5
(% average gross earnings)						
Net relative pension level	56.0	42.5	50.1	62.4	87.3	110.7
(% net average earnings)						
Gross replacement rate	56.2	66.5	56.2	56.2	56.2	56.2
(% individual gross earnings)						
Net replacement rate	62.0	73.2	62.7	62.4	63.8	64.5
(% individual net earnings)						
Gross pension wealth	8.8	10.4	8.8	8.8	8.8	8.8
(multiple of individual gross earnings)	*10.5*	*12.3*	*10.5*	*10.5*	*10.5*	*10.5*
Net pension wealth	6.8	9.0	7.1	6.6	6.2	5.9
(multiple of individual gross earnings)	*8.0*	*10.6*	*8.4*	*7.9*	*7.3*	*7.0*

France

France: Pension system in 2006

In the private sector, the pension system has two tiers: an earnings-related public pension and mandatory occupational schemes, based on a points system. The public scheme also has a without means test minimum contributory pension ("*minimum contributif*"). In addition there is a targeted minimum income for the elderly ("*minimum vieillesse*").

Key indicators

		France	OECD
Average earnings	EUR	31 000	28 600
	USD	38 900	35 800
Public pension spending	% of GDP	12.4	7.2
Life expectancy	At birth	80.9	78.9
	At age 65	85.4	83.4
Population over age 65	% of working-age population	28.0	23.8

Qualifying conditions

A full first-stage public pension requires 40 years' contributions since 2003, compared with 37.5 years previously. Between 2008 and 2012, this is planned to increase gradually to 41 years (to be reviewed in 2008). After 2012, the minimum contribution period to reach a full pension is planned to increase in line with increases in life expectancy, so that the ratio of period of pension payment to the working period remains constant.

Normal pension age for the earnings-related public pension is from 60. The minimum contributory pension ("*minimum contributif*") is paid when the retiree reaches the full contribution condition or is aged 65 and over. In the modelling, entry in the labour market occurs at 20 and a full contribution period (41 years) is assumed. These assumptions correspond to a pension age of 61.

Benefit calculation

Earnings-related

The public pension targets a replacement rate of 50% after a full career (which is 40 years' contributions and then increased further as described above). For each missing quarter, the pension is reduced by two means:

- the pension rate is reduced by 1.25% for one missing quarter (or by 5% for each missing year), these rates ("décote") concern people born after 1952;
- in addition, the pension amount is reduced pro rata (0,625% – 1/160 for one missing quarter).

The earnings measure is based on a number of best years of earnings, valorised in line with price inflation. From 2008 onwards, pay will be averaged over 25 years, whereas it is over 24 years in 2007, and was over 23 years in 2006.

Because of the limited number of years included in the earnings measure for calculating pension benefits and the policy of valorisation in line with prices, the replacement rate in the French public system is very sensitive to the time profile of earnings throughout the worker's career. Given the baseline assumption of continuous real earnings growth of 2% over a worker's career, combined with the fact that the OECD calculations use the lifetime revalued

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average earnings as reference salary, the replacement rates calculated are lower than those calculated using the observed salary progression in France, where increases are concentrated primarily in the first half of the career. The 2003 reform introduced an objective from 2008 for people with a full career on the minimum wage to receive a pension equivalent of at least 85% of the net minimum wage.

There is a ceiling on eligible earnings, which in 2006 was EUR 31 068. This is approximately equal to average earnings on the OECD measure (EUR 31 269). Benefits in payment are indexed to prices.

Contributory minimum pension ("minimum contributif")

There is an untargeted minimum pension in the "régime général" – regardless of the amount of pension received from other basic or supplementary schemes –, which was EUR 6 760.82 from 65 years old with at least a one quarter registered career – EUR 7 172.54 if the recipient has at least 40 actually contributed years – for the calendar year 2006. This is worth 23% of average earnings on the OECD measure. To be eligible for the full benefit, 40 years (planned to be extended to 41 years in 2012) of contributions, or being aged 65 and over are needed (the minimum pension is pro-rated for shorter periods). The value of the minimum pension is indexed to prices.

Mandatory occupational

The ARRCO scheme covers the majority of private-sector employees. Different rules apply to "cadres" (those in professional or managerial positions) under the AGIRC programme; the following regulations apply to non-cadres.

Although actual contributions are higher, benefits are only earned on 6% of earnings under the ceiling of the public scheme. Between one and three times the public-scheme ceiling, benefits are earned on 16% of pay. Thus, the ARRCO ceiling is three times that of the public pension scheme: EUR 93 204. (Note that there is no ceiling for the AGIRC scheme for cadres.)

Each year, the number of points earned is the value of contributions divided by the cost of a pension point. At retirement, the accumulated number of points is converted into a pension benefit by multiplying them by the value of a pension point. The pension-point value was EUR 1.1104 from April 2005 to April 2006 and EUR 1.1287 from April 2006, giving an annual figure for calendar 2006 of EUR 1.1241. The pension-point cost was EUR 13.027 for calendar year 2006.

Uprating of the cost and value of pension points is agreed between the social partners. The current agreement, valid until 2008, is to increase the cost of pension points in line with earnings and the value of pension points in line with prices. The modelling assumes that this differential uprating between the cost and value of a point will continue. Again, this policy of effective valorisation of earlier years' entitlements to prices results in lower benefits than valorisation to earnings. At the baseline assumptions, the reduction is to 69% of the pension entitlement under earnings valorisation.

It is important to note that the uprating policy for these two parameters affects both the path of pensions in payment (here termed "indexation") and the change in value of pension entitlements between the time they were earned and the time they are withdrawn (akin to the process of "valorisation" in earnings-related schemes).

Targeted minimum pension ("minimum vieillesse")

There is a means tested minimum income benefit for people aged 65 worth EUR 7 323.48 a year for a single person (EUR 13 137.69 for a couple) in 2006. This benefit, equivalent to 23% of average earnings (on the OECD measure) is adjusted in line with prices. Full-career workers will rarely be eligible for the old-age assistance programme ("*minimum vieillesse*"), since the mandatory occupational pension supplements the public pension benefit.

Variant careers

Early retirement

Pre-retirement operates through a separate programme administered by the employment fund (FNE). Early retirement is possible from 57 and from 56 under certain circumstances related to working conditions. The replacement rate is around 80%. At the normal pension age (or at the age when workers become eligible for a full regular old age pension up to 65), individuals switch to the public pension. The period on FNE benefits is fully credited for the public pension.

Early retirement, namely before 60, is allowed in the public pension scheme, in the following conditions:

- at 56 for people who have entered the labour force before 16 and have validated at least 42 years, among them at least 42 years with effective contribution;
- at 58 for people who have entered the labour force before 16 and have validated at least 42 years, among them at least 41 years with effective contribution;
- at 59 for people who have entered the labour force before 17 and have validated at least 42 years, among them at least 40 years with effective contribution.

Under the occupational pension, early retirement is also possible, often subject to reductions related either to age of retirement or years of contributions or both. Retirement is possible at age 60 with 40 years' coverage without a reduction. With fewer than 40 years' coverage, the pension is adjusted as shown in the table with the adjustment being that which is more favourable: relating to the retirement age or to the number of missing years. For retirement at age 61, for example, the pension is reduced to 83% of the full value. However, if the individual retires at 61 with 39 years' contributions, the reduction is only to 96%, because there is only one missing year.

Retirement age	55	56	57	58	59	60	61	62	63	64
Missing years						5	4	3	2	1
Coefficient	0.43	0.50	0.57	0.64	0.71	0.78	0.83	0.88	0.92	0.96

Late retirement

If people work after age 60 and have reached the qualifying conditions for a full pension (which is 40 years' coverage), each additional year increases the benefit under the public scheme by 3%. From 2007 onwards, this incentive to delay retirement age is increased to 4% per year from the second year of deferment and 5% per year from age 65. For the period of deferred retirement, people continue to accumulate ARRCO points. Work and pension receipt can be combined subject to some limits, provided people leave their usual job.

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Childcare

A mother raising a child for at least nine years (before the child reaches 16) is credited with two years' coverage per child in the public scheme, whether she continued to work or not during that time, provided she does not have a full contribution period. Both parents can receive a 10% increase in final pension payout in the public plan if they have raised three or more children for at least nine years before age 16.

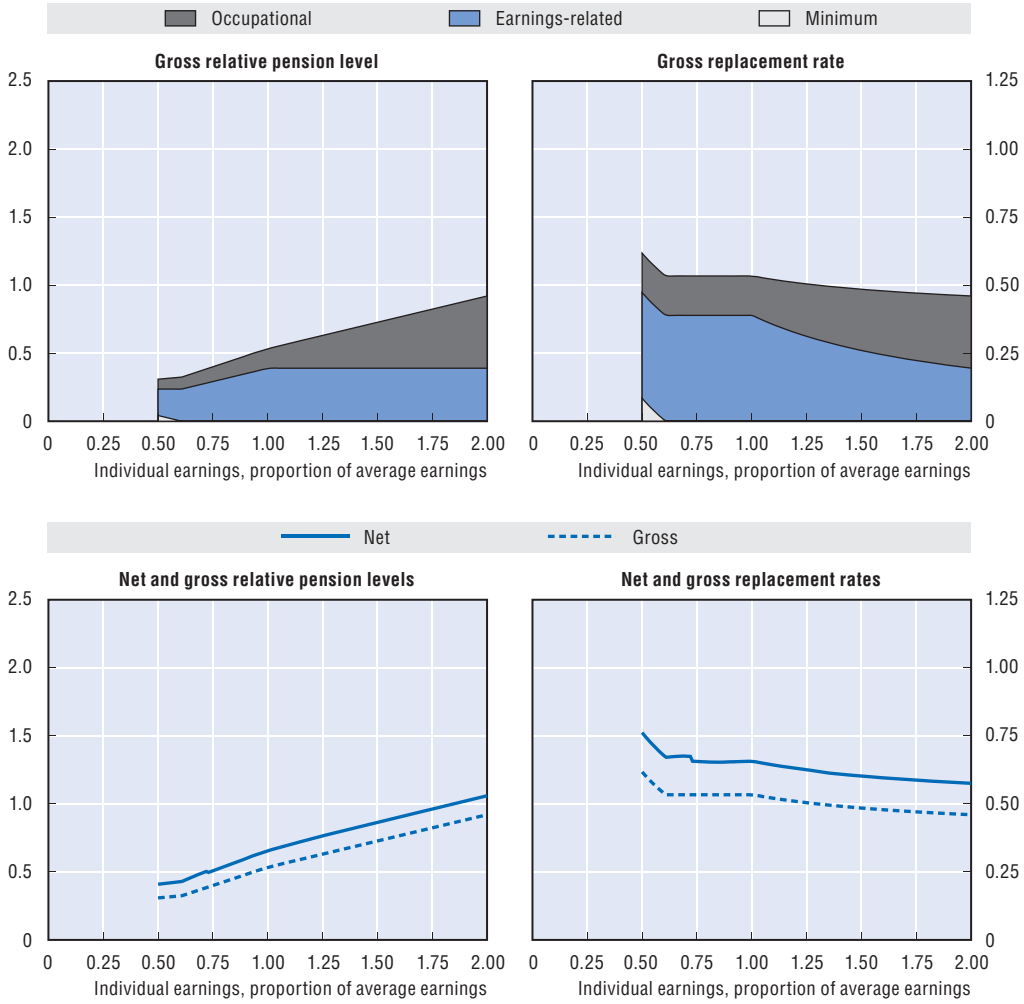
Periods out-of-work or working part time caring for a child under three are also credited in the public and occupational pension schemes. Credits are awarded as if the parent had earned the minimum wage. The three-year maximum applies to the first two children: credited periods are longer for subsequent children. To qualify, parents must be entitled to family benefits and have earnings below thresholds (EUR 17 600 for the first child and 30% more for subsequent children). This credit is cumulated with the two years credited per child in the public scheme.

Unemployment

Periods of involuntary unemployment are fully credited towards the state pension when unemployment benefits are received, including the following programmes: *allocation unique dégressive*, *allocation chômeurs âgés*, *allocation formation reclassement*, *allocation de solidarité spécifique*, *allocation spécifique d'attente* and *allocation d'insertion*. For each completed 50 days of unemployment per year, one quarter of contributions is attributed (with a maximum of four quarters per year). These periods enter the pension calculation assuming earnings of EUR 1 438 per quarter or EUR 5 752 per year.

There is also a credit for the first period of unemployment without unemployment benefits to a maximum of one year. Subsequent periods of involuntary unemployment without unemployment benefits are credited to a maximum of one year only if this follows a period of unemployment with unemployment benefits. There is no credit for periods in receipt of social assistance (*revenu minimum d'insertion*).

Pension modelling results: France



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	45.3	30.9	40.0	53.3	72.7	92.0
(% average gross earnings)						
Net relative pension level	56.7	40.9	50.8	65.7	86.4	106.0
(% net average earnings)						
Gross replacement rate	53.3	61.7	53.3	53.3	48.5	46.0
(% individual gross earnings)						
Net replacement rate	65.3	76.2	65.6	65.7	60.2	57.5
(% individual net earnings)						
Gross pension wealth	9.3	10.8	9.3	9.3	8.5	8.0
(multiple of individual gross earnings)	*10.8*	*12.5*	*10.8*	*10.8*	*9.8*	*9.3*
Net pension wealth	8.3	10.2	8.4	8.2	7.1	6.6
(multiple of individual gross earnings)	*9.6*	*11.7*	*9.7*	*9.4*	*8.2*	*7.6*

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Germany

Germany: Pension system in 2006

The statutory public pension system has a single tier and is an earnings-related PAYG system. Calculation of pensions is based on pension points. There is a social assistance safety net for low-income pensioners.

Key indicators

		Germany	OECD
Average earnings	EUR	42 400	28 600
	USD	53 200	35 800
Public pension spending	% of GDP	11.4	7.2
Life expectancy	At birth	79.8	78.9
	At age 65	83.9	83.4
Population over age 65	% of working-age population	32.2	23.8

Qualifying conditions

The pension is payable from age 67 with five years' contributions and from age 63 with 35 years' for those born 1964 and later. Fewer than five years' contributions earn no benefit.

Benefit calculation

Earnings-related

A year's contribution at the average earnings of contributors earns one pension point. The relevant average earning is approximately identical to National Accounts average earnings. Contributions based on lower or higher income earn proportionately less or more pension points. Contributions are levied on annual earnings up to EUR 63 000 in 2006. The ceiling is equivalent to 214% of the relevant average earnings. The relevant earnings were EUR 29 494 in 2006, equivalent to 70% of the OECD average earnings measure.

At retirement, the pension points of every year are summed up. The sum of pension points is multiplied by a "pension-point value", which was EUR 313.56 in calendar year 2006. The pension point value is valid for newly retired and already retired pensioners. It is uprated annually in line with gross wages as a starting point but depends on two additional factors. The first factor incorporates changes of the contribution rates to the statutory pension scheme and to the subsidised voluntary occupational and personal pension schemes. An increase of contribution rates will reduce the adjustment of pension point value. The second, so-called sustainability factor, links the adjustment of the pension-point value to changes in the system dependency ratio, that is, the ratio of pensioners to contributors.

These factors were integrated into the indexation rules with the aim to limit the increase of the contribution rate from currently 19.9% to 22%. The increase of the pensioner/contributor ratio will result in indexation to less than average wages. In the long run, the adjustment of the pension-point value is expected to be 18% below the increase of average earnings.

The relevant average earnings for calculating the pension points as well as the pension-point value are slightly different in the new Länder. This difference is assumed to disappear in the long run as wages will align.

Social assistance

For people with low income there is a social assistance which is also applicable for pensioners. The social-assistance amounts in the western Länder in 2006 to EUR 8 172 per year including average benefits for housing and fuel costs; this is equivalent to 19.3% of average earnings.

Voluntary private pensions

There is an additional voluntary private pension which can be provided by banks, insurance companies or investment funds. The contribution rate for this *Riester* pension is gradually increasing to 4% by 2008. Coverage of occupational plans is 64% of employees and coverage of personal schemes is 44%. There are numerous types of voluntary personal and occupational plans in Germany and there is significant double-counting of individuals between these two categories. Most provision now is provided on a defined-contribution basis and a contribution rate of 4% is assumed: this is the most common because it is the maximum that attracts a significant public subsidy.

Variant careers

Early retirement

For those born 1964 or later, early retirement is possible from 63 with 35 years' contributions and eight years of contribution immediately before retirement with reductions. If retiring before the age of 67, benefits are reduced by 3.6% per year of early retirement. In addition, compared to someone retiring at 65, pension entitlements are significantly lower due to working two years less and not earning additional pension points. Early retirement without reductions at the age 65 is possible with 45 years of contributions.

Late retirement

Deferring the pension after 67 earns a 6% increment for each year of additional work.

Childcare

The state pays pension contributions for three years per child born in 1992 or later. This can be taken by either employed or non-employed parent or shared between parents. These years are credited with one pension point (equal to contributions based on average earnings) per child. There are also credits for periods caring for children up to age 10. These years count toward the number of years needed to qualify for a pension (*Berücksichtigungszeit*) and in addition have an effect on the pension entitlement. If people work and contribute when their children are under 10 or if at least two children under 10 are parented, they receive a bonus of up to 0.33 pension points per year. However, this cannot result in a total accrual exceeding one pension point per year.

Unemployment

The unemployment insurance contributes to the pension scheme on behalf of the unemployed. During the first period of unemployment benefits (*Arbeitslosengeld I*), contributions are paid on the basis of 80% of previous gross earnings. The first period lasts between six and 24 months depending both on age and contribution years. Thereafter, the unemployed person moves to the second type of unemployment benefit (*Arbeitslosengeld II*), which is both paid at a lower rate and means-tested. For this period, the unemployment insurance pays contributions on the basis of EUR 205 per month, so that 0.0834 pension-points are earned for each year during the second period of unemployment.

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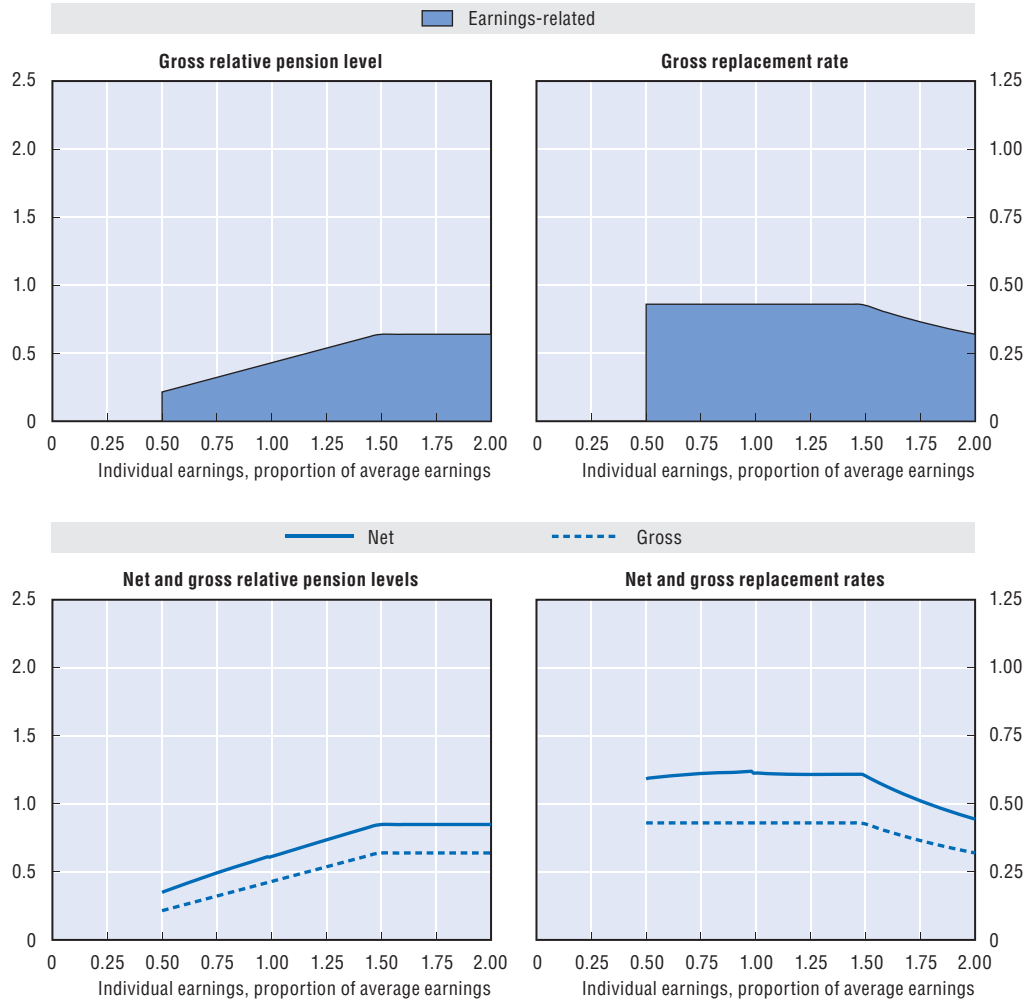
Pension modelling results: Germany



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	38.3	21.5	32.3	43.0	63.9	63.9
(% average gross earnings)						
Net relative pension level	56.5	34.9	49.3	61.3	84.8	84.8
(% net average earnings)						
Gross replacement rate	43.0	43.0	43.0	43.0	42.6	32.0
(% individual gross earnings)						
Net replacement rate	61.5	59.2	61.1	61.3	60.3	44.4
(% individual net earnings)						
Gross pension wealth	7.2	7.2	7.2	7.2	7.1	5.3
(multiple of individual gross earnings)	*8.5*	*8.5*	*8.5*	*8.5*	*8.4*	*6.3*
Net pension wealth	6.0	6.6	6.2	5.8	5.3	4.0
(multiple of individual gross earnings)	*7.1*	*7.8*	*7.3*	*6.8*	*6.3*	*4.7*

Greece

Greece: Pension system in 2006

Pensions are provided through an earnings-related public scheme with two components plus a series of minimum pensions/social safety nets.

Key indicators

		Greece	OECD
Average earnings	EUR	23 000	28 600
	USD	28 900	35 800
Public pension spending	% of GDP	11.5	7.2
Life expectancy	At birth	79.6	78.9
	At age 65	83.5	83.4
Population over age 65	% of working-age population	30.0	23.8

Qualifying conditions

The normal pension age is 65 for both men and women. A pension from this age requires a minimum of 4 500 days of contributions (equivalent to 15 years). Workers with a contribution record of 11 100 working days (37 years) can retire on a full benefit regardless of age. There are concessions for people who work in arduous or unhygienic occupations and for women with dependant or disabled children.

The minimum social pension requires 15 years' contributions.

Benefit calculation

Earnings-related scheme: main component

For labour-market entrants from 1993, the pension is 2% of earnings for each year of contributions up to 35 years. There is therefore a maximum replacement rate of 70% for people retiring at the normal age or earlier. However, for working after the age of 65 and a contribution period of 35 years, there is a higher accrual of 3.3% per year, for a maximum of three years, while there is no accrual rate for those working after this period (maximum replacement rate of 80%).

The earnings measure is the average over the last five years before retirement. Earlier years' pay is adjusted in the pension value ("valorised") in line with increases defined in national incomes policy.

There is a maximum pension, calculated as four times the 1991 GNP per capita (this is a fixed amount of 105.000 drachmas, equal at that time to the amount of the average GNP per capita), linked to the increases on pensions each year according to the income policy. For 2006, this cap on pension benefits was EUR 2 538.28 per month. The calculations indicate that, for a full-career worker, this is equivalent to a ceiling on pensionable earnings of 325% of average earnings.

Adjustment of pensions in payment is discretionary. Pension increases have been progressive in the years 1999-2004. Since 2005, all pensions are increased by the same proportion (see below). In 1999-2001, increases of low pensions were substantially larger than price inflation. However, in 2002, they lagged behind. Given the lack of consistent practice in recent benefit adjustments, pension wealth calculations are based on price indexation.

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	1999	2000	2001	2002	2003	2004	2005	2006
Inflation	2.60%	3.20%	3.40%	3.60%	3.00%	2.90%	3.50%	2.90%
Increases	3.9% (< EUR 733)	4.00%	5.5% (< EUR 352)	3.5% (< EUR 400)	4.0% (< EUR 500)	5.0% (< EUR 500)	4.0%	4.0%
	3.4% (> EUR 733)		2.75% (< EUR 587)	1.5% (< EUR 620)	2.0% (< EUR 1 000)	3.0% (< EUR 1 000)		
			1.4% (< EUR 880)	0.75% (< EUR 910)	0% (> EUR 1 000)	0% (EUR 1000)		
			0% (> EUR 880)	0% (> EUR 910)				

Earnings-related scheme: supplementary component

The full supplementary pension is 20% of the earnings measure under the main component of the earnings-related scheme for workers with 35 years of contributions. The pension is proportionally reduced for shorter contribution periods, implying a linear accrual rate of 0.57%. The value is increased by ?5th for each year of contributions (300 days) beyond 35 years.

Minimum pension

For 2006, the value was EUR 445.37 per month, equivalent to 27.1% of average earnings. This value is adjusted annually as part of the incomes policy. The minimum supplementary pension was EUR 111.25.

Income-tested scheme: social solidarity benefit

This scheme, introduced in 1996, is a non-contributory, means-tested benefit payable to low-income pensioners eligible under most schemes (apart from the farmers' pension programme).

Eligibility for benefits under this scheme, known as EKAS, requires that total net income from all sources is less than EUR 7 165.71 (2006). Total taxable income must not exceed EUR 8 360.00 and the total taxable family income, EUR 13 009.20.

Income level, lower limit	0	EUR 6.525.91	EUR 6 781.87	EUR 6 952.44	EUR 7 165.71
Benefit per month	EUR 160.15	EUR 120.11	EUR 80.08	EUR 40.04	0

Variant careers

Early retirement

Early retirement is possible subject to reductions, as shown in the table below. The adjustment is 1/200 per month of early retirement, which is equivalent to 6% per year.

Number of years	Eligibility	Conditions
15	65	No reduction
15	60	With reduction (1/200)
35	55	With reduction (1/200)
37	Any	No reduction

Late retirement

It is possible to retire after the normal pension age of 65 and a contribution period of 35 years. An increased accrual rate of 3.3% is applied in the main component up to 68 years of age and for a maximum of 3 extra years; there is no accrual rate for those working after this period (maximum replacement rate of 80%). The supplementary component also continues to accrue.

It is possible to combine work and pension receipt as long as the people are no younger than 55 years of age. In that case the part of their monthly pension income that exceeds EUR 733 is reduced by 70%; there is an increment for dependent children.

Childcare

As of 2003, there is a credit towards the pension qualifying conditions of one year for the first child, and two years for each subsequent child to a maximum of three children (at a rate of 300 days insurance per year). This credit can be claimed by either parent and cannot count towards the minimum required insurance period, or for the cases of 37 years, 4 500 days or 3 500 days of insurance.

Unemployment

Periods of unemployment can be credited up to 200 days during the lifetime. If the unemployment period overlaps with the final five years used as a base for the calculation of pensionable earnings, it is omitted and the period used for computing pensionable earnings is extended backwards.

Long term unemployed (*i.e.* unemployed for at least 12 consecutive months) aged at least 60 (men) or 55 (women) (or 55 and 50, respectively, when employed in arduous and unhealthy jobs) who lack up to a maximum of 1 500 days for qualifying for an old age and/or supplementary pension by IKA-ETAM, may optionally continue their insurance until they fulfil the minimum pension requirements. The corresponding social contributions are paid by a special account of the Labour Employment Office (LAEK).

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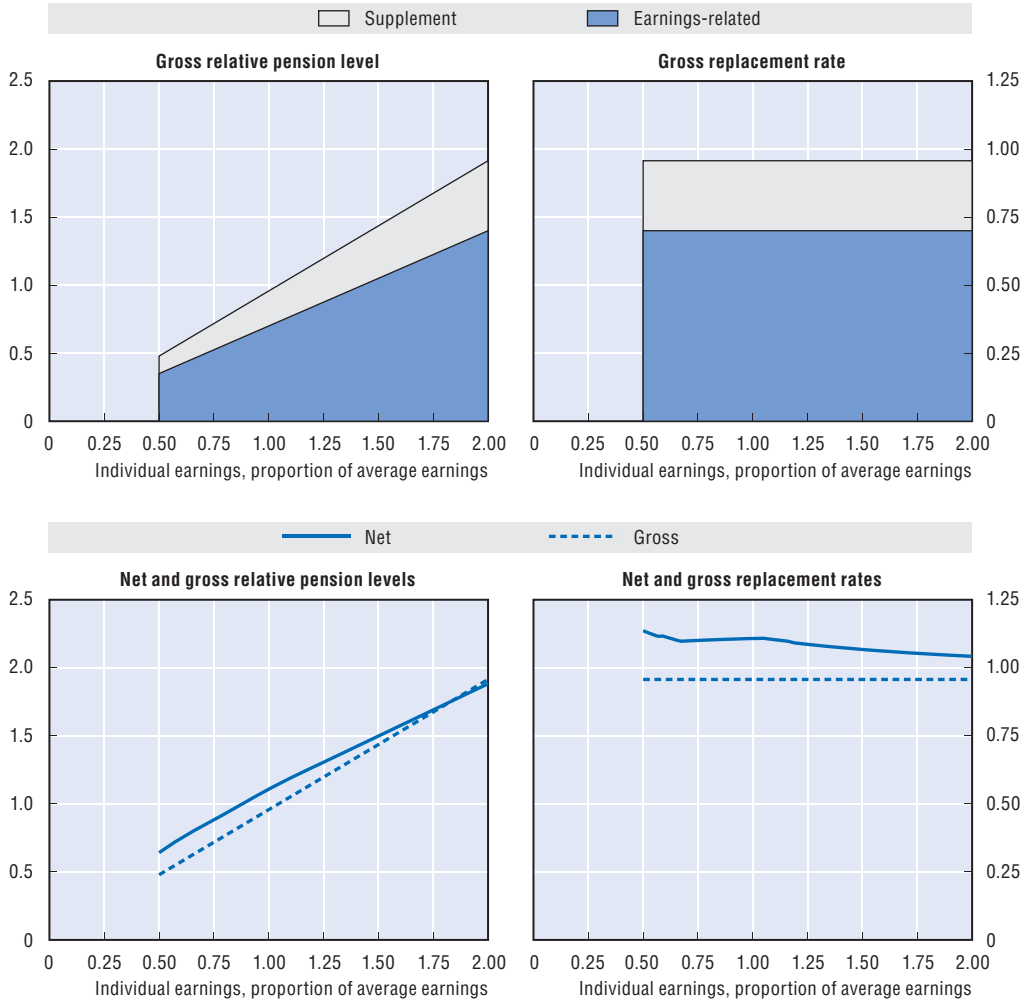
Pension modelling results: Greece



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	81.4	47.9	71.8	95.7	143.6	191.4
(% average gross earnings)						
Net relative pension level	97.3	64.1	88.3	110.8	149.8	188.3
(% net average earnings)						
Gross replacement rate	95.7	95.7	95.7	95.7	95.7	95.7
(% individual gross earnings)						
Net replacement rate	110.4	113.6	110.1	110.8	106.7	104.2
(% individual net earnings)						
Gross pension wealth	14.3	14.3	14.3	14.3	14.3	14.3
(multiple of individual gross earnings)	*16.6*	*16.6*	*16.6*	*16.6*	*16.6*	*16.6*
Net pension wealth	12.8	14.3	13.1	12.3	11.1	10.5
(multiple of individual gross earnings)	*14.7*	*16.5*	*15.2*	*14.3*	*12.9*	*12.1*

Hungary

Hungary: Pension system in 2006

The new system combines an earnings-related public pension with mandatory fully funded defined contribution schemes. This applies to new labour-market entrants and people aged 42 or under at the time of reform. Older workers could choose between this mixed system or a pure pay-as-you-go, public pension. The modelling assumes that workers are covered by the mixed system.

Key indicators

		Hungary	OECD
Average earnings	HUF (million)	1.99	7.53
	USD	9 500	35 800
Public pension spending	% of GDP	8.5	7.2
Life expectancy	At birth	73.2	78.9
	At age 65	80.3	83.4
Population over age 65	% of working-age population	25.3	23.8

Qualifying conditions

A phased increase in the pension eligibility age will equalise this at 62 for both men and women (from 60 and 55 respectively). The age for men reached 62 in 2000 and will reach 62 for women from the end of 2009. In addition, 20 years' service is required for both the earnings-related pension and the minimum pension. For those retiring before the start of 2009, 15 years' service is required to receive a partial pension.

The reformed system was introduced in January 1998. People who switched voluntarily to the new, mixed system were allowed to return to the pure pay-as-you-go system until the end of 2002. Moreover, the obligation for new entrants to join a private pension fund was suspended 2002 but reintroduced in 2003.

Benefit calculation

Earnings-related

For those covered by the mixed system, the accrual rate is 1.22% of earnings for each year of service (subject to the contribution ceiling, see below). This compares with an accrual rate of 1.65% for those covered by the pay-as-you-go system alone.

The earnings base is currently net-gross pay (*i.e.* gross wage less employee's contribution) in all years since 1988, moving towards the full lifetime. This will be changed into net pay from 2008. Earlier years' earnings are valorised with economy-wide average earnings to a point two years before retirement. The last three years' earnings prior to retirement are entirely unvalorised. This will be changed from January 1, 2008, to full valorisation (to the year preceding retirement). The summary effect of the two changes will be about 8% reduction.

A ceiling to pensionable earnings was introduced in 1992. Roughly speaking, the ceiling is about three times the gross wage since 2005 but it is set in advance. The ceiling was HUF 17 330 per day in 2006.

The pension in payment has been indexed half to wages and half to prices since 2001 but further *ad hoc* increases were applied.

There is currently an additional month's pension from 2006.

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Minimum

There is a minimum pension, which was worth HUF 25 800 per month in 2006 (around 16% of gross average earnings and it is around 30% of net average monthly earnings). The value is indexed in the same way as benefits under the earnings-related scheme, that is, half prices and half average earnings.

Defined contribution

Some 8% of gross pensionable earnings are diverted to the funded plan from 2004 for people covered by the mixed public-private pension option (either by choice or by mandate). This represents an increase from 6% (1998-2002) and 7% (2003). The accumulated capital must be converted into an annuity on retirement. According to the current legislation the annuity must provide at least the same Swiss indexation of the pension in payment as the public pension scheme. Unisex life tables must be used to calculate annuity rates. Since 2007, the employer' pension contribution rate has been raised from 18 to 21%, while employee's part has remained unchanged: 8.5%.

Variant careers

Early retirement

Early retirement is currently possible at age 60 for men and at age 57 for women without actuarial reduction. When pension ages are equalised at 62, early retirement will be available from 59 for both men and women. This early-retirement age will increase to 60 from 2013 subject to at least 37 years of service.

The reduction per month until reaching 62 years of age is as follows:

- After reaching 61 until reaching 62: 0.3% reduction per missing month.
- 3.6% + 0.4% per missing month until reaching 61.

Late retirement

It is possible to defer the earnings-related pension. The pension is increased by 0.5% for each month of deferral.

Childcare

The pension systems provide varying degrees of protection for both periods of pregnancy and childcare. The benefits existing are: pregnancy confinement benefit, child care fee and child care allowance. Pension contributions now have to be paid when receiving these benefits, and if it is favourable the amount of benefit is included in the calculation of the pension base.

The pregnancy confinement benefit (*terhességi gyermekágyi segély*) is paid for 24 weeks (168 days) during pregnancy and after birth. The benefit is 70% of the daily average gross earnings of the previous year. The child care fee (*gyermekgondozási díj*) can be claimed by one of the parents after the expiry of the pregnancy confinement benefit; the entitlement runs to the second birthday of the child (maximum 24 months). The benefit amount is 70% of the daily average gross earnings of the previous year up to the maximum of twice of the minimum wage (HUF 87 500 per month in 2006). Child care allowance (*gyermekgondozási segély*) is paid to one of the parents who care for the child until the child's third birthday (maximum 36 months). The monthly amount is equal to the minimum old-age pension of HUF 25 800 in 2006, irrespective of the number of children in the family.

In 2006, pension contributions for child care benefits are paid by:

	Individual	Employer	Government
Child care fee	X	–	X
Child care allowance	X	–	X

Unemployment

The unemployed are covered by the earnings-related pension system. All periods of unemployment are qualified as a pensionable service. The earnings measure for the period of unemployment is the most favourable of: *i)* the amount of unemployment benefits; or *ii)* the average of previous and subsequent earnings.

The early pension scheme (*Előnyugdíj*) was paid to many long-term unemployed older workers during the economic transition but this is no longer significant. However, older unemployed people can receive special pre-retirement benefits if they satisfy a number of conditions: they have received unemployment insurance benefits for 140 days, will reach pensionable age within five years, exhausted their unemployment benefit entitlement within eight years before pensionable age and have contributed to the pension scheme for at least 20 years.

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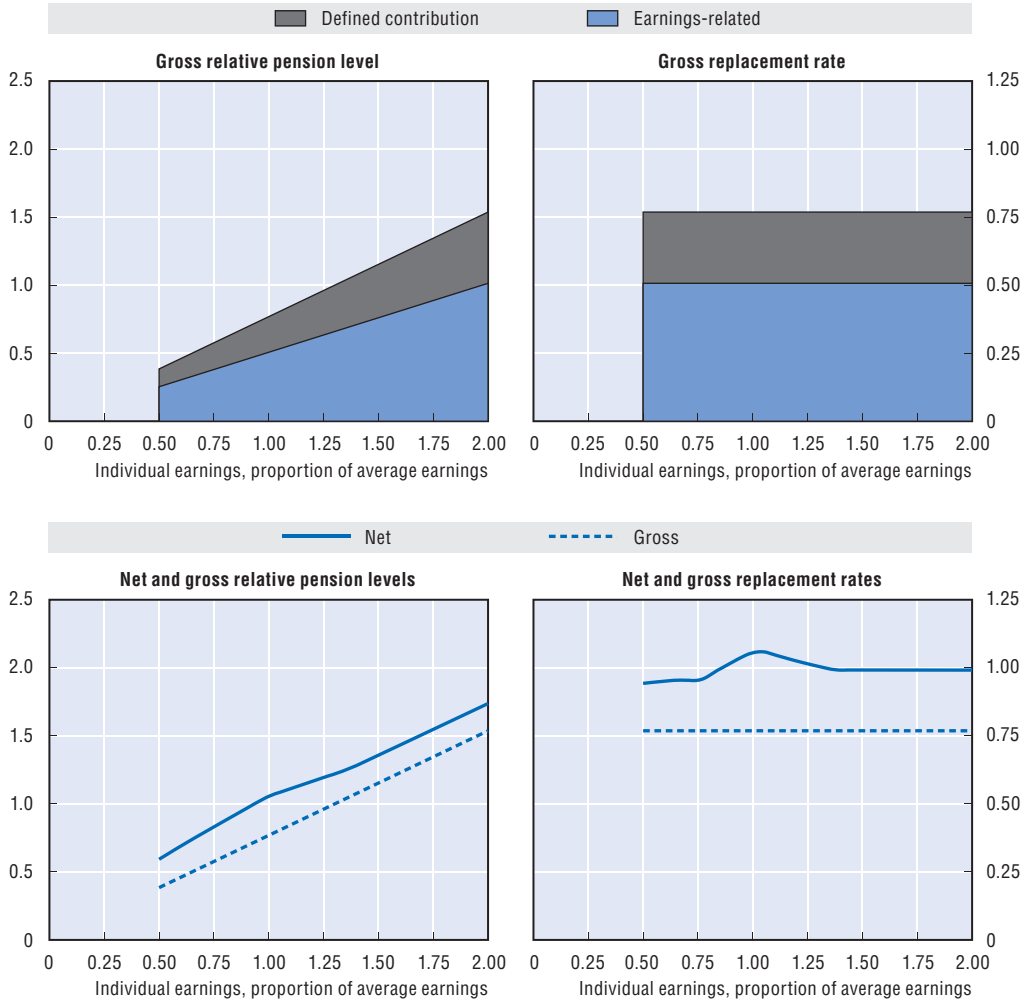
Pension modelling results: Hungary



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	56.9	38.4	57.6	76.9	115.3	153.7
(% average gross earnings)						
Net relative pension level	82.1	59.3	83.1	105.5	135.7	173.7
(% net average earnings)						
Gross replacement rate	76.9	76.9	76.9	76.9	76.9	76.9
(% individual gross earnings)						
Net replacement rate	95.4	94.3	95.4	105.5	99.2	99.2
(% individual net earnings)						
Gross pension wealth	12.4	12.4	12.4	12.4	12.4	12.4
(multiple of individual gross earnings)	*15.4*	*15.4*	*15.4*	*15.4*	*15.4*	*15.4*
Net pension wealth	11.6	12.4	11.6	11.0	9.5	9.1
(multiple of individual gross earnings)	*14.3*	*15.3*	*14.3*	*13.6*	*11.7*	*11.2*

Iceland

Iceland: Pension system in 2006

The public pension has three components: a basic and two income-tested schemes. There are also mandatory occupational pensions with a hybrid (albeit mainly defined-benefit) formula.

Key indicators

		Iceland	OECD
Average earnings	ISK (million)	3.48	2.50
	USD	49 800	35 800
Public pension spending	% of GDP	2.0	7.2
Life expectancy	At birth	81.2	78.9
	At age 65	84.5	83.4
Population over age 65	% of working-age population	19.5	23.8

Qualifying conditions

The normal pension age is 67. A full basic pension is earned with 40 years' residency. The pension is proportionally reduced for shorter periods of residency, with a minimum of three years required. The pension age is also 67 for members of private-sector occupational plans but is 60 for seamen who have been working in this occupation for at least 25 years.

Benefit calculation

Basic

The full basic pension value is ISK 24 131 per month, equivalent to around 8% of average earnings. This benefit is income-tested: withdrawal begins once income (from sources other than the supplementary pension) exceeds ISK 1 998 438, equivalent to 57% of average earnings, and lapses at ISK 2 963 678. This income test applies only to non-pension income, such as earnings from work or social assistance as well as 50% of capital income.

Targeted

A second element is the pension supplement. The maximum value of this benefit is ISK 44 838 per month for a single person, some 15% of average earnings. This benefit is withdrawn against income above ISK 607 850 per year (around 17% of average earnings). The basic pension, however, does not affect the value of the pension supplement. The withdrawal rate for the income test in the pension supplement is 45%.

Finally, there is an additional pension supplement with a maximum entitlement of ISK 22 109 per month, just under 8% of average earnings. This is withdrawn against all other income at a rate of 45% and lapses at a level of 589 573.

The benefit levels are adjusted annually in accordance with the current State Budget. Adjustments are to take account of public-sector pay (which is assumed here to be equal to the standard assumption of economy-wide earnings growth) and the price level pursuant to the cost-of-living index.

Mandatory occupational

Employer schemes are mandatory. The law requires schemes to target a replacement rate of 56% with 40 years' contributions, giving an accrual rate of 1.4% for each year of service. Coverage is mandatory for people aged 16 to 70. The earnings base in this

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calculation is average lifetime salary for each year of membership. There is no ceiling to pensionable earnings. Past earnings are valorised in line with price inflation plus 3.5% interest rate.

Occupational pensions in payment must by law be increased in line with consumer price inflation.

In practice, many schemes pay more than the legal minimum outlined above, typically introducing a hybrid defined-contribution/defined-benefit element into the system. There is a minimum contribution to occupational schemes of 12% of earnings. The employee pays 4% and the employer 8%. Contributions above the level needed to finance the statutory benefits described above can be used either to increase defined-benefit entitlements or diverted to individual accounts thus delivering a defined-contribution pension. However, the modelling covers only the mandatory component and not these extra-statutory benefits as they are not guaranteed.

Variant careers

Early retirement

Under the mandatory occupational scheme, early retirement rules vary between funds, depending on the structure of fund membership. In the private sector, the normal retirement age is 67 and the pension can be claimed from 62. In general, pensions are reduced by 7% for each year that pension is claimed early.

It is not possible to claim the basic or targeted pensions before the normal pension age.

Late retirement

Under the mandatory occupational scheme, workers can postpone retirement until the age of 70 with a pension increase of 9% for each year of deferral. Workers who defer their pension continue to contribute and earn extra pension entitlements. In some cases, the total contribution period is limited to 32 years.

It is not possible to defer the basic or targeted pension after normal pension age. The basic pension is subject to an earnings test (see above), while the targeted schemes are tested against all income, including earnings.

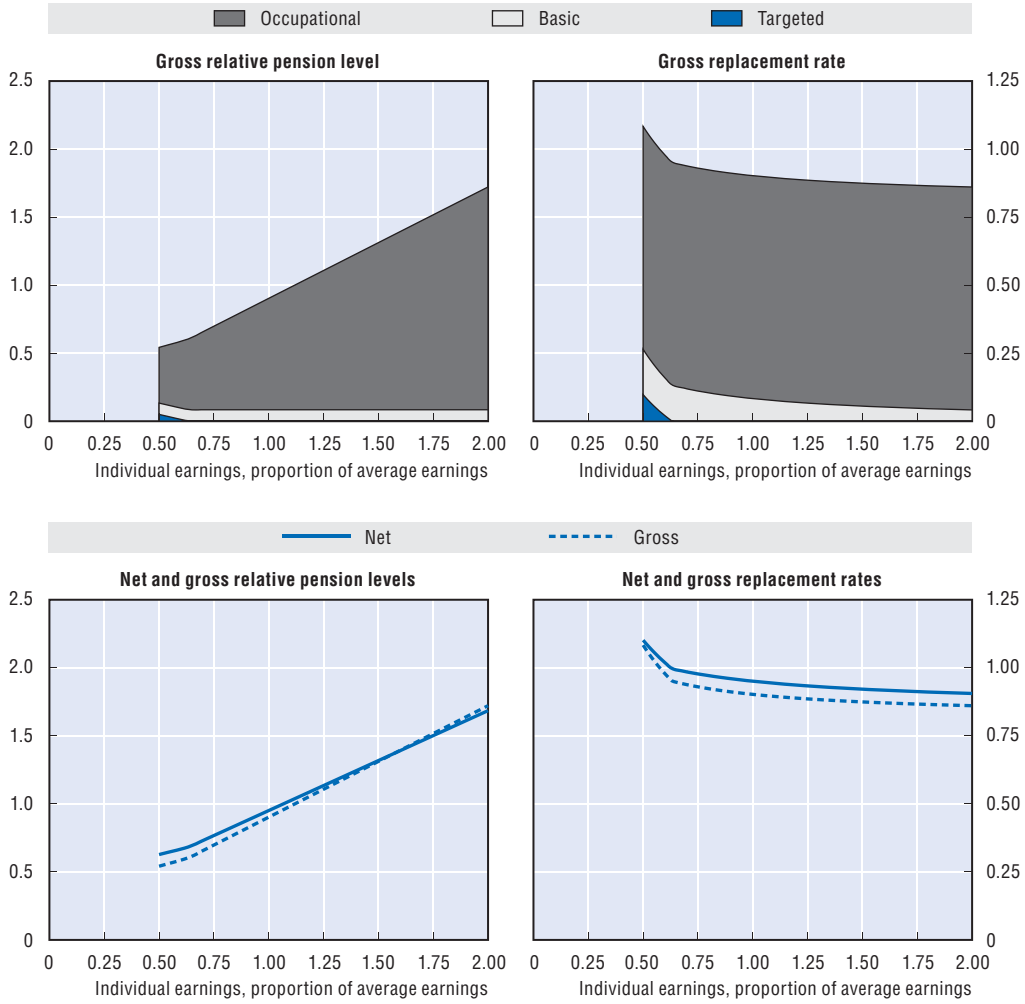
Childcare

The residency-tested basic pension and the targeted schemes automatically protect women who leave paid work to care for children. There are no specific credits for childcare absences. The occupational pension funds themselves make no provisions for women who must leave work to care for children. The government social assistance scheme contains benefits for parents (men or women) who must take care of children with long-term illnesses or disabilities. Such benefits are also provided in cases where people must take care of close relatives (*e.g.* adult son or daughter taking care of aged parent).

Unemployment

The contribution base, on which the minimum 10% contribution is levied, includes unemployment insurance benefits as well as earnings but excludes all other benefits.

Pension modelling results: Iceland



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	77.9	54.2	69.8	90.2	131.2	172.1
(% average gross earnings)						
Net relative pension level	84.1	62.7	76.7	95.1	131.8	168.5
(% net average earnings)						
Gross replacement rate	91.7	108.3	93.0	90.2	87.5	86.1
(% individual gross earnings)						
Net replacement rate	96.5	110.1	97.7	95.1	92.1	90.6
(% individual net earnings)						
Gross pension wealth	14.0	17.0	14.2	13.7	13.2	12.9
(multiple of individual gross earnings)	*15.7*	*19.1*	*15.9*	*15.4*	*14.8*	*14.5*
Net pension wealth	10.6	13.9	11.0	10.2	9.3	8.9
(multiple of individual gross earnings)	*11.9*	*15.6*	*12.4*	*11.4*	*10.5*	*10.0*

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Ireland

Ireland: Pension system in 2006

The public pension is a basic scheme paying a flat rate to all who meet the contribution conditions. There is also a means-tested pension to provide a safety net for the low-income elderly. Voluntary occupational pension schemes have broad coverage: around half of employees.

Key indicators

		Ireland	OECD
Average earnings	EUR	30 000	28 600
	USD	37 600	35 800
Public pension spending	% of GDP	3.4	7.2
Life expectancy	At birth	79.7	78.9
	At age 65	83.5	83.4
Population over age 65	% of working-age population	17.7	23.8

Qualifying conditions

The state pension (contributory) is payable from age 66 while the state pension (transition) is paid from 65. Full entitlement to both benefits requires an average of 48 weeks contributions or credits per year throughout the working life. The pension value is proportionally reduced for incomplete contribution histories. However, the old-age contributory pension requires a minimum average of ten weeks' contributions per year and the retirement pension, 24 weeks per year. There is also a minimum total period of contributions of 260 weeks (equivalent to five years' full coverage).

The means-tested pension is payable from age 66.

Benefit calculation

Basic

The values of the State Pension (contributory) old-age pension and the State Pension (transition) are both EUR 193.30 per week (paid for 53 weeks per year) for 2006, which is 34.2% of average earnings (on the OECD measure of average earnings). There is an addition of EUR 128.80 for a dependant adult of working age and EUR 149.30 for a dependant age 66 or over. Pensions are increased on an annual basis, decided by Government in the context of the annual budget. In recent years, increases have been in excess of earnings growth.

Pensioners are entitled to many benefits-in-kind. The government estimates that the price of these goods and services would be EUR 950 per year, excluding health benefits. (Note that the modelling covers only cash benefits and not benefits-in-kind.)

Targeted

The maximum value of the means-tested benefit is EUR 182 per week for a single person with an extra EUR 120.30 for an adult dependant for 2006. The single person's benefit is worth 32% of average earnings. There is a small weekly disregard of EUR 20 in the means test, and as from 2006 there is an additional earnings disregard of EUR 100: otherwise, the benefit is withdrawn at 100% of income. There is also an assets test, with capital of more than EUR 35 000 being converted to income using a standard formula.

The value of the target safety-net income in the means-tested scheme broadly follows the uprating of the basic schemes.

Voluntary private pensions

Around 43% of employees have an occupational pension plan. Of members working in the private sector, around 50% of these are in defined-contribution and 50% in defined-benefit plans. (This relates to schemes subject to funding regulations, which are mainly in the private sector.) The defined-benefit plan is assumed to pay 1/60th of final salary for each year of service, a contribution rate of 1.67%. It is assumed that the defined-benefit scheme is "integrated with the public scheme", meaning that the value of the basic pension is deducted from the entitlement. When people change jobs, the value of the deferred occupational pension is indexed to price inflation.

For defined-contribution occupational plans, the average contribution rate is about 10% of earnings. In addition, around 15% of people have defined-contribution personal plans.

Variant careers

Early retirement

Pensions cannot be claimed before the normal eligibility age.

Late retirement

Work and pension can be combined subject to earnings being less than EUR 38 per week under the state pension (transition), which is payable for one year. However, the state pension (contributory) is not subject to an earnings test. It is not possible to defer claiming the pension.

Childcare

Eventual public pension entitlement is not affected by periods out of paid work for caring purposes.

Unemployment

Eventual public pension entitlement is not affected by periods of unemployment.

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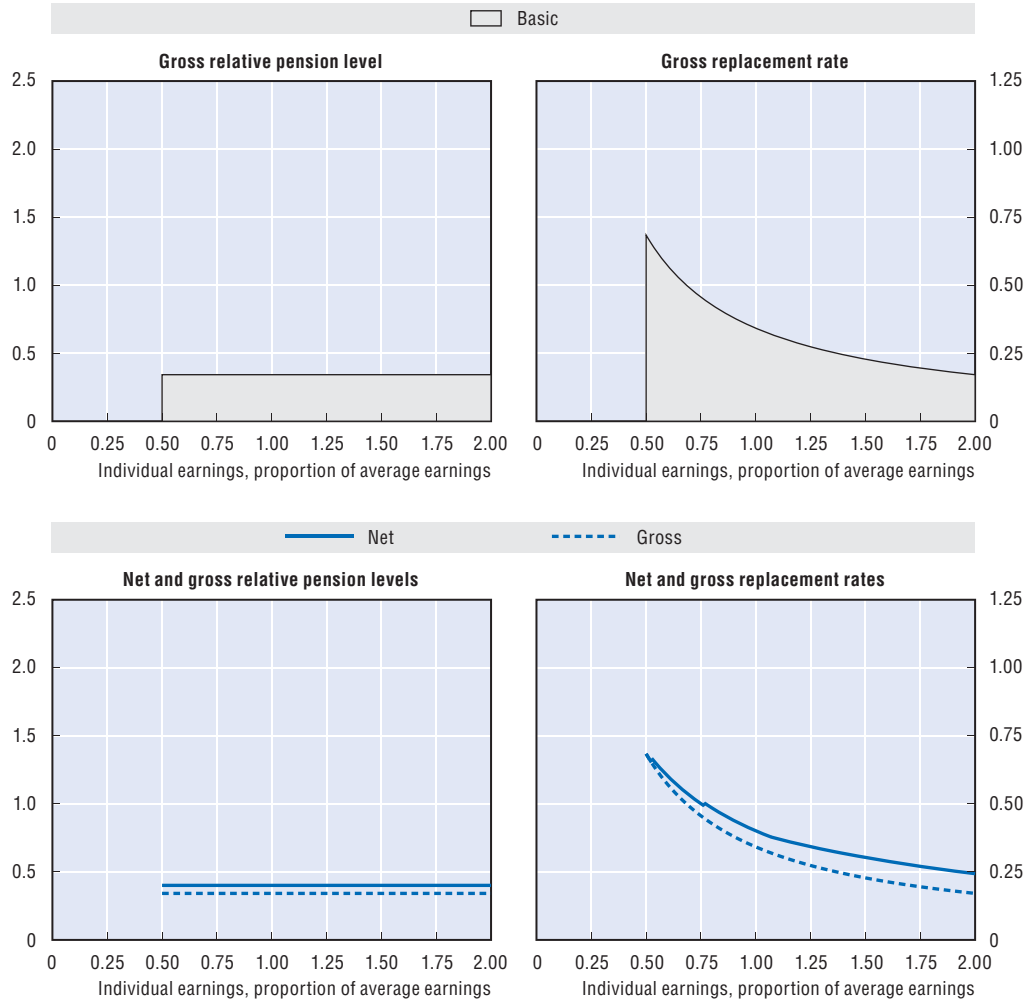
Pension modelling results: Ireland



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	34.2	34.2	34.2	34.2	34.2	34.2
(% average gross earnings)						
Net relative pension level	40.1	40.1	40.1	40.1	40.1	40.1
(% net average earnings)						
Gross replacement rate	39.8	68.4	45.6	34.2	22.8	17.1
(% individual gross earnings)						
Net replacement rate	45.6	68.4	50.1	40.1	30.3	24.4
(% individual net earnings)						
Gross pension wealth	7.1	12.1	8.1	6.1	4.0	3.0
(multiple of individual gross earnings)	*8.4*	*14.5*	*9.6*	*7.2*	*4.8*	*3.6*
Net pension wealth	7.1	12.1	8.1	6.1	4.0	3.0
(multiple of individual gross earnings)	*8.4*	*14.5*	*9.6*	*7.2*	*4.8*	*3.6*

Italy

Italy: Pension system in 2006

The new Italian pension system is based on notional accounts. Contributions earn a rate of return related to GDP growth. At retirement, the accumulated notional capital is converted into an annuity taking account of average life expectancy at retirement. It applies in full to labour-market entrants from 1996 onwards.

Key indicators

		Italy	OECD
Average earnings	EUR	24 600	28 600
	USD	30 900	35 800
Public pension spending	% of GDP	14.0	7.2
Life expectancy	At birth	80.9	78.9
	At age 65	84.5	83.4
Population over age 65	% of working-age population	32.5	23.8

Qualifying conditions

The normal pension age under the new system will be 65 for men and 60 for women from 2008 onwards. However, early retirement will still be possible under various contribution conditions (see below). The baseline modelling assumes that men retire at 65 and women at 60.

Benefit calculation

Earnings-related scheme

Under the contribution-based regime the private and public employees contribution rate is 33%, of which about one-third is paid by the employee and two-thirds by the employer; the amount of pension is calculated as a product of two factors: the total lifelong contributions, capitalised with the nominal GDP growth rate (in line with a five-year moving average) and the transformation coefficient whose calculation is mainly based on the probabilities of death, the probabilities of leaving any widow or widower and the number of years that a survivor's benefit will be withdrawn. As a consequence, benefits are strongly related to retirement age – the lower the age, the lower the pension.

The transformation coefficients are reviewed every three years. They are available for the age bracket 57-65, but workers may not retire earlier than 65 unless they have reached the eligibility requirements stated by the current legislation and an amount of pension not less than 1.2 times the old age allowance.

Age of retirement	57	58	59	60	61	62	63	64	65+
Transformation coefficient (%)	4.014	4.113	4.217	4.328	4.446	4.572	4.705	4.847	4.999

Note: The coefficients above are based on ISTAT 2001 demographic forecasts.

The baseline assumption in modelling all countries is 2% annual real wage growth. Given the projected decline in the Italian labour force, a consistent assumption is that real GDP growth is 1.6% per year.

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For employees, in 2006, minimum pay for contribution purposes is EUR 171.03 per week (36% of average earnings). Maximum earnings for benefits are EUR 85 478 per year under the new scheme, or just under 347% of average earnings.

The indexation of pensions in payment is complex, since smaller pensions are accorded a more generous treatment than larger pensions. For benefits up to three times the minimum pension, there is full price indexation of pensions in payment. This threshold is EUR 1 260 per month for 2005 (which is used to index pensions in 2006) and EUR 1 283 for 2006 (for 2007 indexation) or approximately two-thirds of economy-wide average earnings. For benefits between three and five times the minimum pension, pensions in payment are uprated by 90% of price inflation. Above this threshold, indexation falls to 75% of prices. Note that the indexation applies separately to each slice of a large pension.

Social assistance

The minimum pension (see below) is abolished for people covered only under the new system; *i.e.*, entrants after 1996. However, pensioners with incomes below the social-assistance level can claim a means-tested benefit from age 65. Including supplements, the 2006 value of the social-assistance benefit (*assegno sociale*) was EUR 5 130. There is a higher benefit of EUR 7 167 for over 70s. These are equivalent to 21% and 29% of average earnings, respectively.

Voluntary private pensions

There is an additional voluntary, supplementary occupational system. It consists of both open funds and closed collectively agreed funds. The closed funds can be funded by both employers and employees as well as from the TFR. The open funds provide an annuity based on contributions. The current TFR contribution rate is 6.91%. The number of workers enrolled in a private pension fund is still low. For this reason, the Finance Act for 2007 has anticipated (with some changes) the pension reform recently passed (Law 243/2004 and legislative decree 252/2005) which introduced further measures in order to speed up the development of the second pillar: *a)* higher fiscal incentives; and *b)* silence-as-assent for the transfer of the private severance pay (TFR).The latter means that the current severance pay accumulation will be transferred to a private pension fund, unless the worker communicates his or her refusal. However, enrolment in the private pension funds remains voluntary.

Occupational pension coverage in Italy remains low: around 11% of employees. The government has encouraged workers and employers to switch severance pay schemes (known as the *Trattamento di Fine Rapporto*) to occupational pension schemes, though the coverage figures show that few have done so.

Given the low coverage, these plans are not included in the modelling of voluntary private pensions.

Variant careers

Early retirement

Under the previous system, workers could retire at age 57 if they had contributed to the system for 35 years. From January 2008, minimum age has been increased to 58 years (59 years if self employed). A recent reform, approved as part of the 2008 budget process, has

introduced a quota system based on a combination of age and seniority, so the minimum age to request early retirement (seniority pensions) will increase from 57 to 61 years old by 2013. However, it will remain possible to retire at any age with 40 years' contributions.

Late retirement

Women have the right to continue working until the normal pension age for men. Retirement is not compulsory at 65 but employers have the right to dismiss employees reaching that age. From January 2009 it is possible to totally combine employment and pension receipts. Referring to pensions under the contribution-based regime: *a)* it is possible to totally combine employment and anticipated old-age pension receipts for pensioners who have 40 or more years of seniority; *b)* it is possible to totally combine employment and old-age pension receipts for pensioners who are 65 years old or more, if male, and 60 years old or more, if female.

It is possible to defer the pension claim after age 65, however the transformation coefficient (see above) remains the same, and benefits increase only because of the accumulation of further contributions and their (notional) capitalisation for one or more further years.

Childcare

The pension is increased for mothers by giving them a more generous transformation coefficient. For mothers of one or two children this is the transformation coefficient of their actual retirement age plus one year. For three or more children this is the actual retirement age plus two years. Thus, according to the projected transformation coefficients, the effect is to increase the pension by around 3% for one or two children, and 6% for three or more children.

Unemployment

All the unemployment insurance schemes – *cassa integrazione guadagni* (CIG), *indennità di mobilità* and *indennità di disoccupazione* – give rise to credited contributions for the time the benefit is received. Previous earnings are used as a base for pension calculation.

The maximum credit period is five years over the lifetime for people that entered the labour market from 1993 onwards. This affects only the right to receive a seniority pension. Furthermore, credited contributions for *indennità di disoccupazione* – the general unemployment scheme – cannot be counted towards the 35-year contribution requirement although they do count (under the 5-year limit) towards the 40-year requirement.

Contributions are normally paid by the government, with the exception of *indennità di mobilità* in the first year of receipt and CIG, which are partially paid by the employee at a reduced rate of 5.54%.

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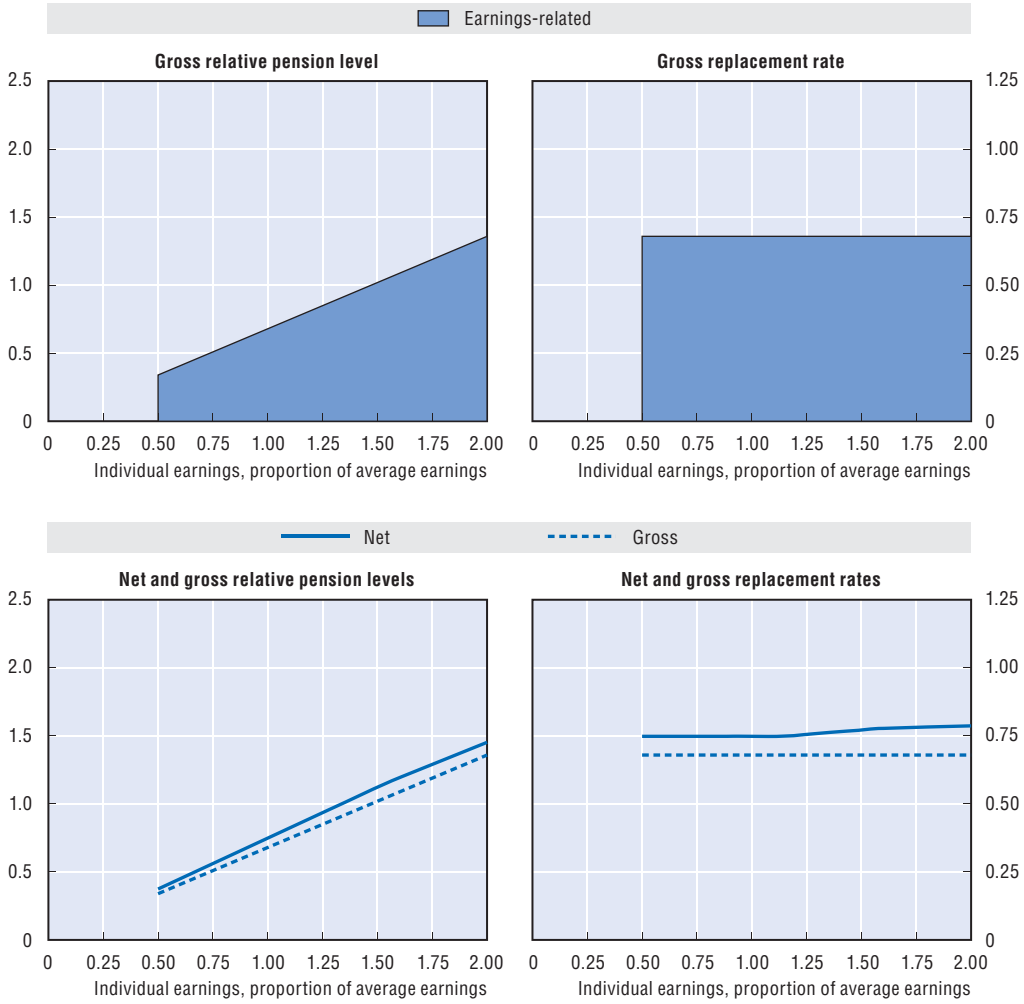
Pension modelling results: Italy



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	59.8	34.0	51.0	67.9	101.9	135.9
(% average gross earnings)	*46.5*	*26.4*	*39.6*	*52.8*	*79.2*	*105.6*
Net relative pension level	65.8	37.4	56.1	74.8	112.2	145.2
(% net average earnings)	*51.2*	*38.3*	*43.6*	*58.1*	*87.2*	*116.3*
Gross replacement rate	67.9	67.9	67.9	67.9	67.9	67.9
(% individual gross earnings)	*52.8*	*52.8*	*52.8*	*52.8*	*52.8*	*52.8*
Net replacement rate	74.8	74.8	74.8	74.8	77.1	78.7
(% individual net earnings)	*58.1*	*76.6*	*58.1*	*58.1*	*59.9*	*63.0*
Gross pension wealth	10.0	10.0	10.0	10.0	9.9	9.8
(multiple of individual gross earnings)	*10.7*	*10.7*	*10.7*	*10.7*	*10.7*	*10.6*
Net pension wealth	7.6	7.6	7.6	7.6	7.5	7.2
(multiple of individual gross earnings)	*8.1*	*10.7*	*8.1*	*8.1*	*8.1*	*8.0*

Japan

Japan: Pension system in 2006

The public pension system has two tiers: a basic, flat-rate scheme and an earnings-related plan (employees' pension scheme).

Key indicators

		Japan	OECD
Average earnings	JPY (million)	4.99	4.17
	USD	42 900	35 800
Public pension spending	% of GDP	8.7	7.2
Life expectancy	At birth	82.4	78.9
	At age 65	86.0	83.4
Population over age 65	% of working-age population	34.4	23.8

Qualifying conditions

The old-age, basic pension is paid from age 65 with a minimum of 25 years' contributions. The full basic pension requires 40 years of contributions, with benefits adjusted proportionally for shorter or longer contribution periods.

The earnings-related pension is paid in addition to basic pension, with a minimum of one month contribution, provided a pensioner is entitled to the basic pension. The pension age is gradually being increased from 60 to 65 years (between 2001 and 2013 for men and between 2006 and 2018 for women) for the flat-rate component and from 60 to reach 65 years for men in 2025 and for women in 2030 for the earnings-related component. The earnings-related component of the employees' pension scheme is adjusted for shorter or longer contribution periods.

Benefit calculation

Basic

The full basic pension for 2006 was JPY 792 100 per year, corresponding to 15.9% of average earnings. The basic pension is price indexed.

Social assistance

Older people are covered by the general social assistance scheme. The social assistance amount for single household aged 60-69 in Tokyo in 2006 is JPY 969 810 (*i.e.* 19% of average earnings) per year excluding housing benefit and other relevant benefit.

Earnings-related

The employees' pension scheme has a flat-rate and an earnings-related component, of which the earnings-related part is by far the most important. The accrual rate was 0.75% of earnings excluding bonuses until fiscal year 2002. From fiscal year 2003, the base for calculating pension was extended to include bonuses. With the extension of the base for calculating the pension, the accrual rate has been reduced to 0.5481% of earnings (including bonuses).

Earlier years' earnings are valorised in line with economy-wide average net earnings.

There is a ceiling on earnings subject to contributions of JPY 620 000 a month equivalent to 149% of average earnings.

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The flat-rate benefit depends on year of birth. In 2006, it ranged between JPY 1 676 and JPY 3 143 per month of contributions. This is paid only to pensioners between 62 and 64 years and this benefit will be phased out by 2013 for men.

The employees' pension in payment is price indexed.

Contracting out

Employers, who have at least 1 000 employees, may "contract out" a portion of the earnings-related pension (substitution part) if they cover their employees themselves; around 15% of employees participate in these schemes. Contracting-out requires that employers offer at least 150% (before 2005: 110%) of the benefit that the public earnings-related scheme would have provided. The calculation of the pension required for contracting out is based on lifetime average nominal earnings. Indexation of pensions in payment and valorisation of past earnings is financed by the government.

The contribution rate in contracted-out schemes is determined by the government depending on the age structure of the covered employees and the actuarial assumption. Until 1996, however, the rate was uniform across plans. Since 2005, the rate ranges between 2.4% and 5% of total remuneration.

Since 2001, the government has also been promoting defined-contribution pension schemes and defined-benefit occupational pension schemes. As a consequence, several employees' pension funds have been dissolved.

Variant careers

Early retirement

Until 2001, a "specially provided" employees' pension was available at age 60. This is being phased out and retirement with a full benefit will not be possible before age 65.

Early retirement at a reduced benefit is possible in both the basic and earnings-related schemes. The benefit is reduced by 0.5% per month of early retirement, *i.e.* 6% per year. Individuals can claim the flat-rate component of the employees' pension between 60 and 65. The pension in payment is indexed to net average earnings until the pensioner reaches age 65 and price-indexed after age 65.

Late retirement

It is possible to defer receipt of the basic and earnings-related pensions. Deferral increases the pension benefit by 0.7% per month, *i.e.* 8.4% per year. Pension rights continue to accrue for each year of contributions beyond 65.

From 2006, combining work and pension after age 65 became possible provided total income (from earnings and pension) does not exceed JPY 480 000. Above this limit, half of the excess will be reduced from the full earnings-related pension payment but the basic pension will be paid in full. From April 2007, the reduction has also been applied to workers over 70 but they do not need to pay a contribution.

Childcare

Periods spent out of paid work for childcare are credited in the earnings-related scheme. As of 2005, the maximum period has been extended from one to three years. If additional children are born while caring for a child, this period is extended until when the last child becomes three years old. During this period, contributions are considered to be

made fully based on the earnings just before leave, and in calculating the benefit and qualifying conditions the entire exemption period is credited. In case parents work part-time because of childcare responsibilities, the contribution will be made based on the current earnings but the pension benefits will be calculated based on their full-time previous earnings.

If people stay out of paid work after three years and income level drops, the rule under unemployment below also applies.

Unemployment

Workers who become unemployed or whose income is below a certain level do not need to contribute to the earnings-related scheme but they need to contribute to the basic scheme. Unemployed people may be exempted from paying all, three-quarters, a half or one-quarter of contributions, depending on the household income level. A single person with previous year's income less than JPY 570 000 is exempted from paying any contribution. People with income less than JPY 930 000 are entitled to one-quarter of contributions, those with income lower than JPY 1 410 000 pay one-half of contributions and those with income less than JPY 1 890 000 pay three-quarters of contributions.

For the periods of full exemption, people are entitled to one-third of the basic pension and for the period with one-quarter of contribution, one-half the basic pension. For the periods with one-half contribution, people gain two-thirds of the basic pension and for the period with three-quarters of contribution, five-sixths of the basic pension is credited. The exempted period is counted as full contribution period in assessing the qualifying conditions.

It is possible to pay contributions later to receive higher pension after retirement.

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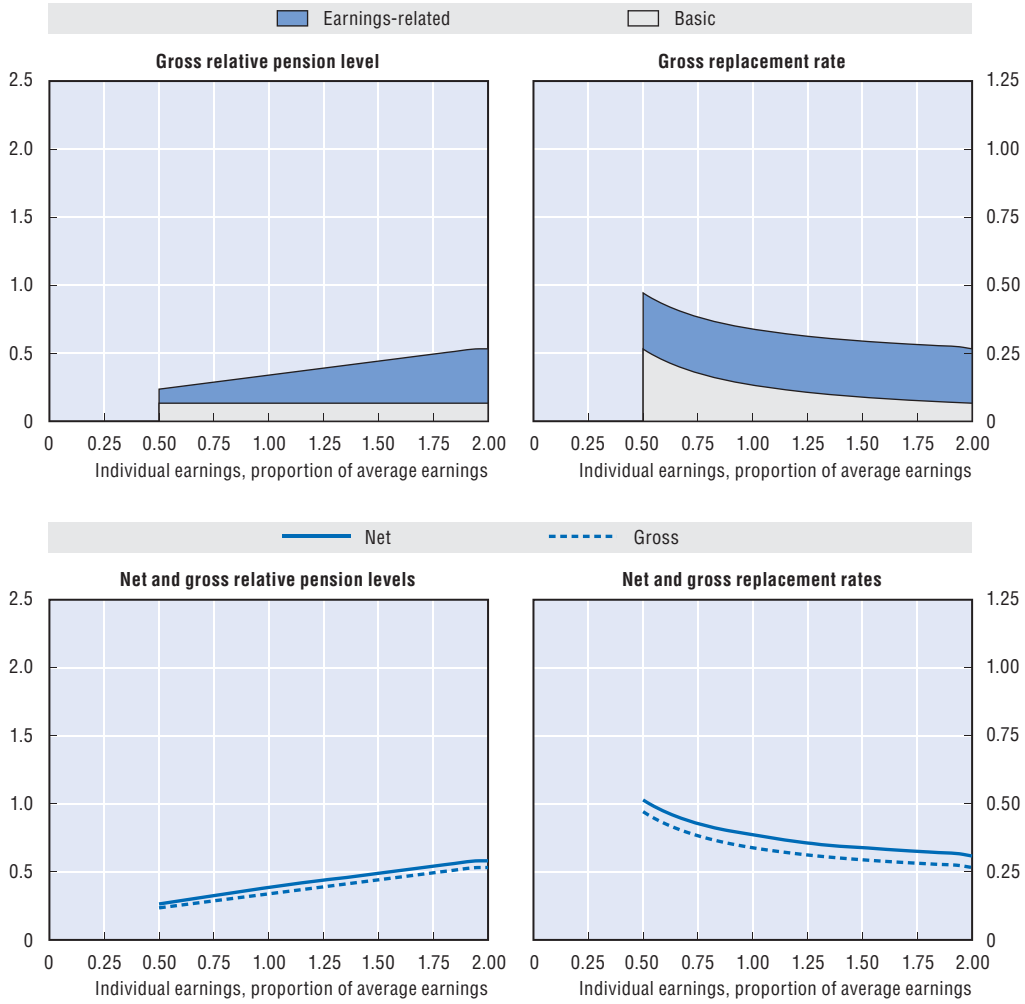
Pension modelling results: Japan



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	31.4	23.6	28.7	33.9	44.2	53.2
(% average gross earnings)						
Net relative pension level	35.8	26.4	32.6	38.7	48.9	58.1
(% net average earnings)						
Gross replacement rate	35.7	47.1	38.3	33.9	29.4	26.6
(% individual gross earnings)						
Net replacement rate	40.3	51.4	42.8	38.7	33.9	30.8
(% individual net earnings)						
Gross pension wealth	5.9	7.8	6.3	5.6	4.9	4.4
(multiple of individual gross earnings)	*6.7*	*8.8*	*7.1*	*6.3*	*5.5*	*5.0*
Net pension wealth	5.4	7.1	5.8	5.2	4.4	3.9
(multiple of individual gross earnings)	*6.1*	*7.9*	*6.5*	*5.8*	*4.9*	*4.4*

Korea

Korea: Pension system in 2006

The Korean public pension scheme was introduced relatively recently. It is an earnings-related scheme with a progressive formula, since benefits are based on both individual earnings and the economy-wide average of earnings.

Key indicators

		Korea	OECD
Average earnings	KRW (million)	30.44	34.08
	USD	32 000	35 800
Public pension spending	% of GDP	1.6	7.2
Life expectancy	At birth	79.1	78.9
	At age 65	83.1	83.4
Population over age 65	% of working-age population	14.5	23.8

Qualifying conditions

The pension is currently available from age 60 provided the individual has contributed for ten years or more. A reduced, early pension can be drawn from age 55.

The normal pension age is gradually being increased and will reach 65 from 2033. The modelling assumes the long-term pension age of 65 and that the early pension age will also be raised from 55 to 60.

Benefit calculation

Earnings-related

The earnings replacement rate of the pension for 40 years of contributions is 60% of the earnings in 2007, but it will be reduced to 50% in 2008 and then will be reduced by 0.5 percentage points every year until making 40% from 2009 to 2028. The model assumes that the 40% is calculated over a 45-year period. The earnings measure is the average of individual lifetime average earnings, valorised in line with wage growth, and average earnings of the insured of the national pension, measured over the previous three years and valorised in line with prices. There is a ceiling on pensionable earnings of KRW 3.6 million per month, equivalent to 142% of average earnings of the insured in whole in 2006.

The maximum level of benefit is 100% of individual earnings. The benefit is indexed to prices after retirement. People aged 60 and over do not pay contributions and benefits are not accrued after this age.

Basic age pension

Some 60% of the aged 65 and over can get the means tested "basic age pension" from 2008. It was planned that the beneficiaries-to-be would be increased to 70% in 2009. This benefit is a flat rate of 5% of the three-year average earnings of the insured of the national pension every year. The benefit is reduced in phases according to income and assets of the aged. Couple rate is 80% of single rate each.

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Variant careers

Early retirement

When, starting in 2013, the normal pension age increases from 60 to 65, the early pension age is assumed to increase from 55 to 60. At 60, the early old-age pension will then be 70% of the normal old age pension. The benefit is increased by 6% every year, so a person who retires at age 64 will be entitled to 94% of the full old age pension.

Late retirement

People can earn extra pension from retiring late. The benefit is increased by 6% every year and the maximum of deferral is 5 years until age 70.

If the pensioners between 65 and 69 get income-earnings higher than the average earnings of the insured in whole, their pension paid at 65 will be 50% of full old age pension with the benefit increasing by 10% according to age increase, which is known as the "active old-age pension". Therefore, if the pensioner between 65 and 69 is working, (s)he can choose either the "deferred pension" or the "active old-age pension".

Childcare

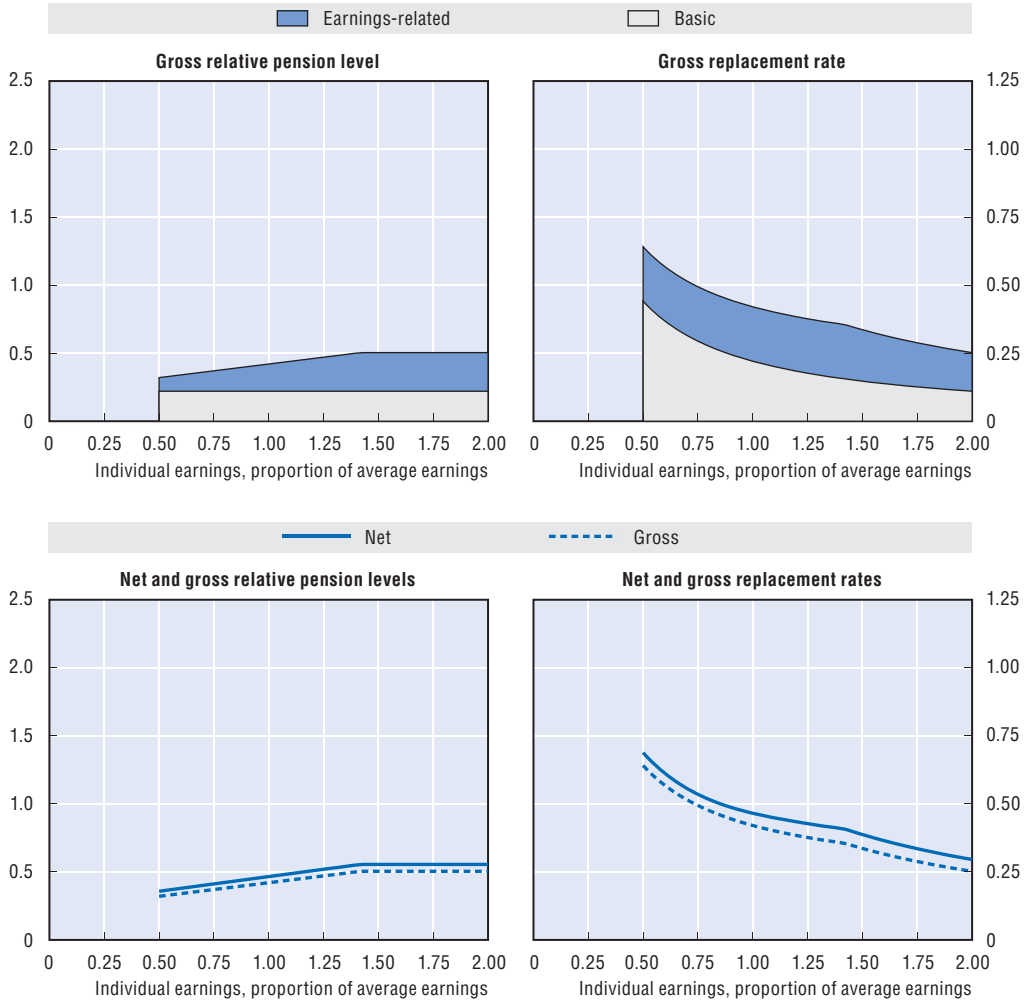
A person who is not working due to childcare can be exempted from payment of contributions during the period requested. The insured period can be increased by paying the exempted contributions (total, including the one for employers) after resuming work.

An insured woman who gives birth to a child (except for the first child) after January 2008 can get pension credits. The credits given are 12 months to a maximum of 50 months according to number of children born after that time.

Unemployment

An unemployed person can be exempted from payment of contributions during the period requested. The insured period can be increased by paying the exempted contributions (total, including the one for employers) after resuming work.

Pension modelling results: Korea



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	39.7	32.1	37.1	42.1	50.4	50.4
(% average gross earnings)						
Net relative pension level	44.0	35.8	41.2	46.6	55.5	55.5
(% net average earnings)						
Gross replacement rate	45.1	64.1	49.4	42.1	33.6	25.2
(% individual gross earnings)						
Net replacement rate	49.2	68.8	53.5	46.6	38.7	29.6
(% individual net earnings)						
Gross pension wealth	6.3	8.9	6.9	5.9	4.7	3.5
(multiple of individual gross earnings)	*7.5*	*10.7*	*8.2*	*7.0*	*5.6*	*4.2*
Net pension wealth	6.2	8.9	6.8	5.8	4.6	3.4
(multiple of individual gross earnings)	*7.4*	*10.6*	*8.1*	*6.9*	*5.5*	*4.1*

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Luxembourg

Luxembourg: Pension system in 2006

The public pension scheme has two components: a flat-rate part depending on years of coverage and an earnings-related part. There is also a minimum pension.

Key indicators

		Luxembourg	OECD
Average earnings	EUR	43 600	28 600
	USD	54 800	35 800
Public pension spending	% of GDP	7.2	7.2
Life expectancy	At birth	79.4	78.9
	At age 65	83.7	83.4
Population over age 65	% of working-age population	22.8	23.8

Qualifying conditions

An early pension is payable from age 57 with 40 years' (compulsory or voluntary) contributions. With 40 years' coverage of compulsory, voluntary or credited contributions, the pension can be paid from age 60. Since the modelling assumes a full career from age 20, it is assumed in the base case that workers retire at age 60. Otherwise, the normal pension age is 65 (subject to at least ten years' contributions).

Benefit calculation

Basic

This was worth EUR 362 per month in 2006, subject to 40 years' coverage. This is equivalent to around 10% of average earnings. For incomplete insurance, the benefit is reduced proportionally. (Formally, the basic pension is 23.5% of a reference amount, which was EUR 1 541 in 2006.)

There is also an "end-of-year allowance", which adds EUR 49 per month to the pension for 40 years' contributions. This is proportionally reduced for insurance periods under 40 years, implying around EUR 1.23 per month for each year covered. The end-of-year allowance is indexed to nominal earnings (see below).

Earnings-related

The accrual rate for the earnings-related pension is 1.85%. The earnings measure used in the formula is lifetime average pay revalued in line with nominal earnings.

The accrual rate is higher for older workers and those with longer contribution periods. For each year of work after age 55, the accrual rate is increased by 0.01 percentage points. Furthermore, each year of contributions beyond 38 also attracts an additional accrual of 0.01 percentage points. The maximum accrual rate is 2.05% per year. Under the standard assumption of a full career starting at age 20, the accrual rate is 2.01%.

The maximum pension in 2006 was EUR 6 422 per month (formally specified as 25/6 of the reference amount). This is just under 177% of average earnings.

Benefits are automatically indexed to changes in the cost of living (if cumulative inflation is at least 2.5%). In addition, adjustments to increases in real wages must be considered every two years. Recent practice has seen increases close to earnings and the modelling assumes that this practice continues.

Minimum

The minimum is EUR 1 387 per month (defined as 90% of the reference amount), conditional on 40 years' coverage, equivalent to about 38% of average earnings. This is proportionally reduced for shorter periods subject to a minimum of 20 years of service periods (compulsory, voluntary or credited contributions).

Social assistance

The social-assistance safety-net level is EUR 1 098 per month for a single person.

Variant careers

Early retirement

It is possible to retire at 57 with 40 years' paid contributions and at 60 with 40 years' paid or credited contributions. Early retirees may work periodically provided earnings do not exceed one third of the minimum social income. There is no actuarial adjustment to benefits for early retirement.

In addition, there are a number of pre-retirement programmes. Relevant here are the pre-retirement solidarity and pre-retirement adaptation schemes. The first allows early retirement on the condition that the employer hires a job seeker assigned by the employment administration. The second allows early retirement for older workers losing their jobs due to restructuring or bankruptcy. Both schemes apply from age 57 up to age 60. The pre-retirement benefit is 85% of prior earnings in the first year, 80% in the second year, and 75% in the third. The earnings measure is pay in the final three months.

Late retirement

The pension has to be claimed at the retirement age of 65. After this age, it is possible to combine work and pension benefits without reductions in the pension benefit.

Childcare

"Baby years" (two years for one and four years for two children) are credited as insured time. Pensionable earnings are based on pay immediately before the baby years are claimed. The period counts as qualifying conditions and enters in the flat rate component of the pension formula.

Employees who could not claim baby-years due to insufficient contribution period have the right to a special monthly allowance in retirement of EUR 89 per child.

Non-contributory periods bringing up children under 6 count towards the qualifying conditions.

Unemployment

Periods of receiving unemployment benefits are credited: pension contributions from the benefits are paid by state (2/3) and beneficiary (1/3). The period unemployed counts towards the qualifying conditions and enters in the earnings-related component of the pension formula. For this period, unemployment benefit is used as a base for pension calculation.

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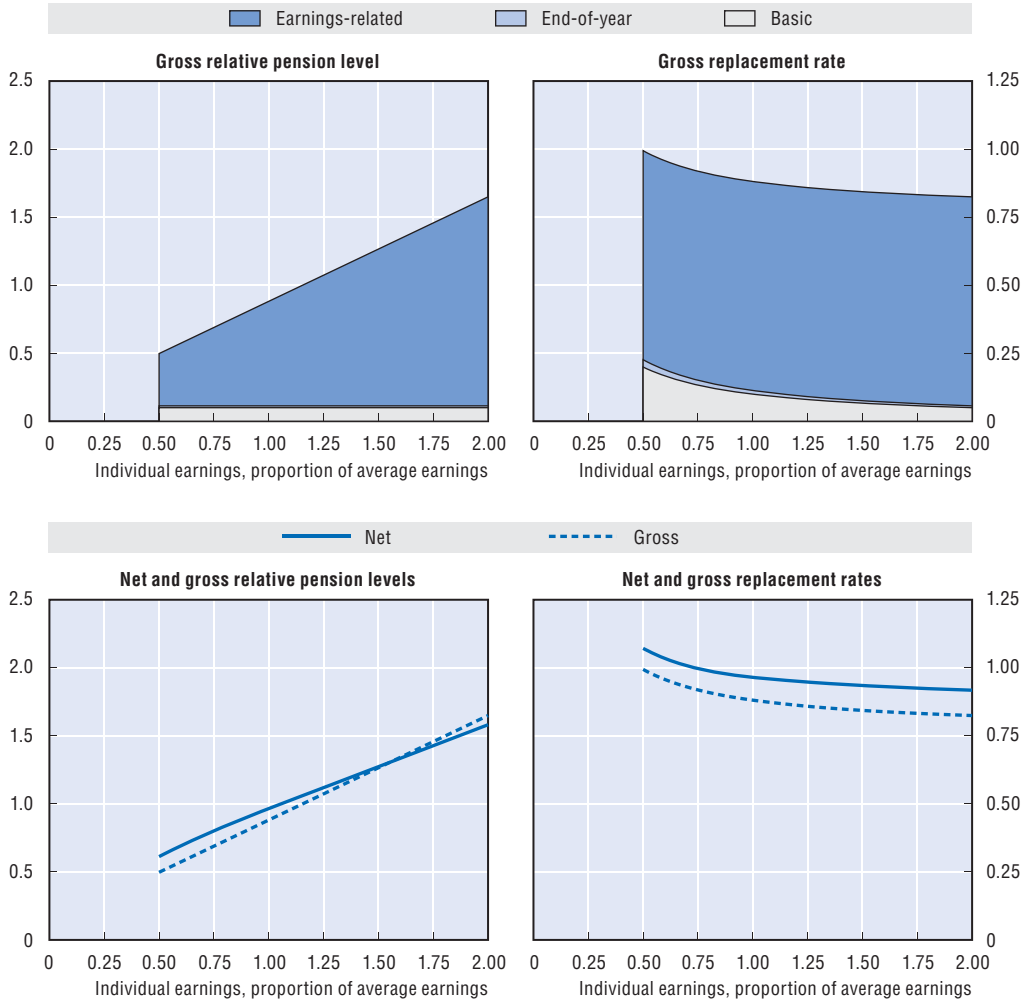
Pension modelling results: Luxembourg



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	76.6	49.7	68.9	88.1	126.5	164.9
(% average gross earnings)						
Net relative pension level	87.0	61.2	80.1	96.5	127.3	158.2
(% net average earnings)						
Gross replacement rate	90.1	99.4	91.9	88.1	84.3	82.5
(% individual gross earnings)						
Net replacement rate	98.1	107.1	99.7	96.5	93.5	91.8
(% individual net earnings)						
Gross pension wealth	19.7	21.7	20.0	19.2	18.4	18.0
(multiple of individual gross earnings)	*24.0*	*26.5*	*24.5*	*23.5*	*22.5*	*22.0*
Net pension wealth	16.1	19.2	16.8	15.2	13.3	12.4
(multiple of individual gross earnings)	*19.6*	*23.5*	*20.5*	*18.5*	*16.3*	*15.2*

Mexico

Mexico: Pension system in 2006

Old-age pensions are covered under a defined contribution scheme mandatory for private sector workers, privately managed and funded. The contributions are made by workers, employers and government. There is a minimum pension for those who listed at least 24 years.

Key indicators

		Mexico	OECD
Average earnings	MXN	73 200	390 200
	USD	6 700	35 800
Public pension spending	% of GDP	1.3	7.2
Life expectancy	At birth	75.7	78.9
	At age 65	83.0	83.4
Population over age 65	% of working-age population	9.9	23.8

Qualifying conditions

Normal retirement age is 65 for men and women subject to 1 250 weeks (around 24 years) of contribution.

Benefit calculation

Funded scheme

Workers and employers contribute a total of 6.275% of earnings to an individual account to which is added a government contribution equivalent to 0.225% of earnings. An additional 5% contribution is made to an individual housing account (a scheme known as Infonavit) which reverts to the retirement account when it is not used. Finally, the government contributes 5.5% of the 1997 real minimum wage indexed to inflation into all individual retirement accounts; this is considered to be the equivalent of a basic pension component here, amounting to 1.4% of average earnings.

There is a ceiling on contributions which is 24 times the minimum wage (July 2006-June 2007) and 25 times the minimum wage thereafter.

The calculations assume that the individual converts the accumulated account balance (discounting a survival insurance that must be bought to cover the survivors' benefits) into a price-indexed annuity at normal pension age. Annuity rates are sex-specific.

Minimum pension

The minimum pension is equivalent to the same 1997 real minimum wage value indexed to inflation (MXN 20 225.40 in 2006). The link to the real minimum wage means that the minimum pension is effectively price-indexed.

Variant careers

Early retirement

Early retirement is possible from age 60 for men and women. Conditions are that the worker is not employed and that at least 1 250 weekly contributions have been made.

Workers who leave the labour market permanently and who have not met the minimum pension requirements may withdraw the entire balance from their defined contribution (Afore) account.

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Late retirement

It is possible to defer the pension after age 65.

Childcare

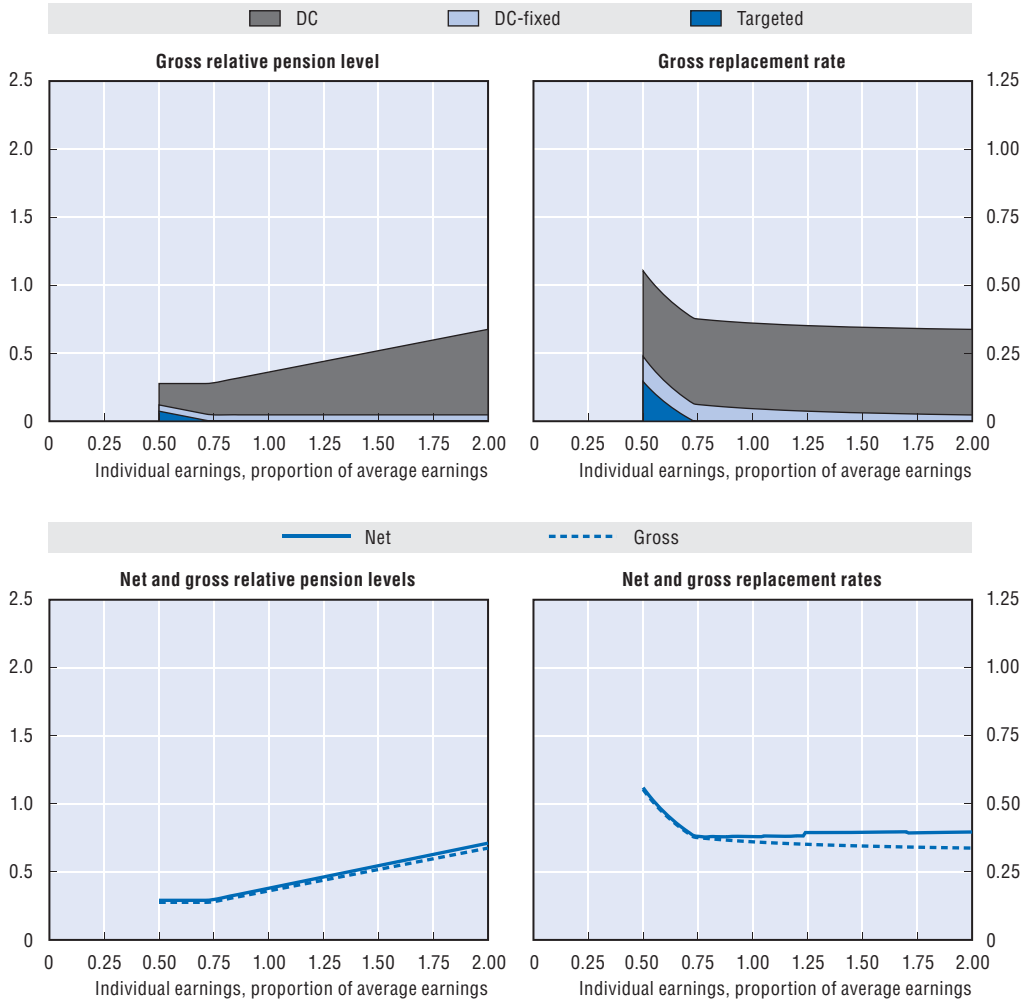
There are no credits for periods spent out of paid work due to childcare responsibilities.

Unemployment

There are no credits for periods of unemployment.

However, Article 191, Fraction II, of the Mexican Social Security Law, states that when a worker is unemployed, he/she will have the right to withdraw some money from his/her old age/retirement sub-account. The amount permitted to withdraw is the smaller of 75 days of the worker's wage base of quotation of the last 250 weeks, or 10% of the balance of his/her old age/retirement sub-account. The workers can claim this amount from the forty-sixth day of unemployment. Workers are eligible for this benefit, if they have credit in their corresponding account statements, and have not made any withdrawals in the last five years.

Pension modelling results: Mexico



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	31.3	27.6	28.2	36.1	51.8	67.5
(% average gross earnings)	*27.6*		*27.6*	*29.9*	*42.9*	*56.0*
Net relative pension level	33.0	29.1	29.7	38.0	54.6	71.2
(% net average earnings)	*29.1*		*29.1*	*31.5*	*45.3*	*59.0*
Gross replacement rate	36.9	55.3	37.6	36.1	34.5	33.7
(% individual gross earnings)	*32.5*		*36.8*	*29.9*	*28.6*	*28.0*
Net replacement rate	38.0	56.0	38.1	38.0	39.6	39.7
(% individual net earnings)	*33.5*		*37.3*	*31.5*	*32.8*	*32.9*
Gross pension wealth	4.9	7.3	5.0	4.8	4.6	4.5
(multiple of individual gross earnings)	*5.2*	*8.9*	*5.9*	*4.8*	*4.6*	*4.5*
Net pension wealth	4.9	7.3	5.0	4.8	4.6	4.5
(multiple of individual gross earnings)	*5.2*	*8.9*	*5.9*	*4.8*	*4.6*	*4.5*

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Netherlands

Netherlands: Pension system in 2006

The Dutch pension system has two main tiers, consisting of a flat-rate public scheme and earnings-related occupational plans. Although there is no statutory obligation for employers to offer a pension scheme to their employees, industrial-relations agreements mean that 91% of employees are covered. These schemes are therefore best thought of as quasi-mandatory.

Key indicators

		Netherlands	OECD
Average earnings	EUR	39 700	28 600
	USD	49 900	35 800
Public pension spending	% of GDP	5.0	7.2
Life expectancy	At birth	79.8	78.9
	At age 65	83.4	83.4
Population over age 65	% of working-age population	23.4	23.8

Qualifying conditions

The basic old age pension is payable from age 65. Normal retirement age is typically also 65 in occupational plans. All residents are eligible for this benefit.

Benefit calculation

Basic

For a single person, the gross pension benefit in 2006 was EUR 942.33 in the first half of the year and EUR 948.21 in the second half. There was an additional holiday allowance of EUR 53.22 and EUR 53.15, respectively. This gives an annual total of EUR 12 017 or 30% of average earnings. For a couple, the total yearly benefit would be EUR 16 477. The benefit value is linked to the net minimum wage, which is uprated biannually.

The basic benefit accrues at 2% of the full value for each year a worker lives or works in the country. There is also a social-assistance scheme for older people. Its value is equal to the net basic pension.

Occupational schemes

The Netherlands also has a private pension system with broad coverage. The system consists of 767 pension funds (end of 2006); 103 of these funds concern industry-wide schemes. Under certain conditions, Dutch companies may opt out of these plans if they offer their own scheme with equivalent benefits. Furthermore, there are around 700 single-employer plans. Another 46 000 (in the year 2005) mainly smaller employers offer schemes operated by insurance companies.

Approximately 94% of the employees in pension funds are covered by a defined-benefit scheme. The remaining employees in pension funds are covered by a defined contribution scheme.

For about 77% of participants in defined benefit schemes, the earnings measure is based on lifetime average earnings, and for 10% on the final salary. For the remainder it is either a combination of the two (8%) or a fixed amount (1%).

There is no statutory requirement for entry ages for occupational plans. In 2006, approximately 55% of the employees in a pension scheme were in schemes with no entry age, 7% in schemes with an age of 16-20 and 36% with an age of 21-25.

Most final-salary schemes give 1.75% of those earnings for each year of service, implying a replacement rate of 70% after a complete 40-year career. In most average-salary schemes the accrual rate varies from 1.75% to 2% per year of service.

There are no legal requirements for valorisation of earlier years' pay and practice varies between schemes according to rules agreed upon by the social partners. For approximately 75% of the participants in average wage schemes, past earnings are valorised in line with growth of average earnings while for 8% the rate of inflation is used. The modelling assumes an average-salary scheme with valorisation to average earnings.

Although there is no legal uprating requirement, most pensions in payment are raised on an annual basis as well. Nearly half of the pensions in payment are indexed to wage growth in the respective industry. 27% of the pensions are indexed to prices.

Pension rights are fully transferable when people change jobs. There is a legal requirement to index pension rights of people leaving a scheme before retirement in exactly the same way as pensions in payment are indexed. Vesting periods are very short.

There is no ceiling to pensionable earnings.

Occupational pensions are integrated with the public pension system. The current tax rules allow a maximum benefit of 100% of final pay at 65 from both public and private systems. Most schemes have a target total replacement rate of 70% of final pay, so private benefits are reduced by a franchise amount. In 2006, the average franchise amount was EUR 12 019.

Variant careers

Early retirement

The basic pension is not payable before age 65.

In 2005, the tax-favoured status of separate early retirement programmes (called "VUT") and which led to pre-pension benefits between ages 60 and 65 was abolished to stimulate labour-market participation of older workers.

Late retirement

It is not possible to defer the basic old age pension scheme after 65. It is possible to combine the basic pension receipt with work.

The rules on pension deferral vary between occupational plans. It is possible to combine the occupational pension scheme with work. Indeed, some schemes allow a member to draw a pension and continue to work with the same employer. There is no legislation regarding this issue.

Childcare

In the basic old age pension scheme, periods out of paid work are automatically covered. In the occupational schemes, there are no credits for childcare periods during which people are out of paid work but the accrual of pension rights continues over remaining working years. However, many schemes allow voluntary contributions to cover the aforementioned periods of absence.

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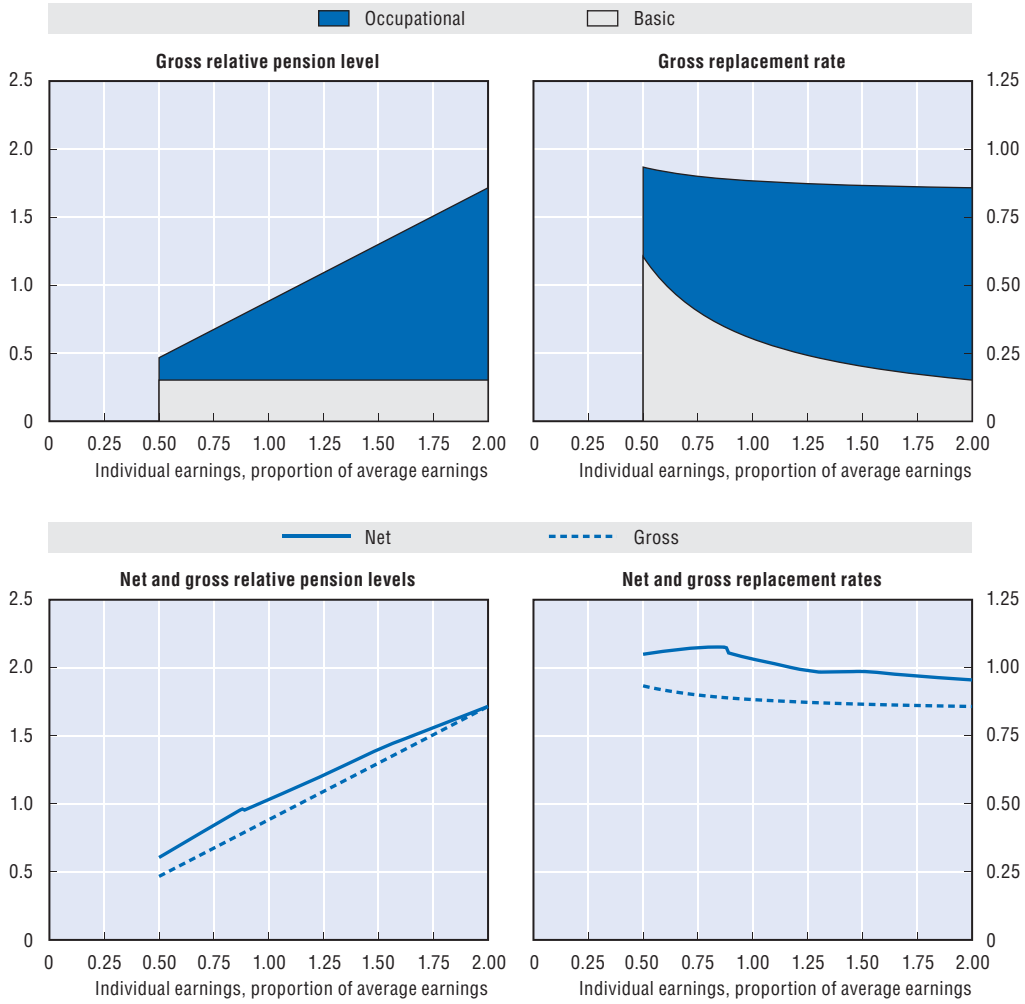
Unemployment

There are no credits in the occupational plans for periods of unemployment. Again, the basic old age scheme covers such periods automatically. In addition, the social partners administer a fund (FVP) which makes it possible for older workers to extend their pension accrual for a certain period during unemployment. The government has no formal relationship with this fund.

Pension modelling results: Netherlands



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	79.2	46.7	67.5	88.3	129.9	171.6
(% average gross earnings)						
Net relative pension level	95.4	60.6	84.3	103.2	140.0	171.6
(% net average earnings)						
Gross replacement rate	88.9	93.4	90.0	88.3	86.6	85.8
(% individual gross earnings)						
Net replacement rate	105.5	105.0	107.4	103.2	98.6	95.5
(% individual net earnings)						
Gross pension wealth	16.4	17.2	16.6	16.3	16.0	15.8
(multiple of individual gross earnings)	*19.2*	*20.1*	*19.4*	*19.1*	*18.7*	*18.5*
Net pension wealth	12.6	14.2	13.2	12.1	11.0	10.1
(multiple of individual gross earnings)	*14.7*	*16.6*	*15.4*	*14.2*	*12.8*	*11.8*

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New Zealand

New Zealand: Pension system in 2006

The public pension is flat rate based on a residency test. Occupational schemes exist but have decreased in coverage since 1990 from 22.6% of the employed workforce to 14.7% for the year ended 30 June 2006.

Key indicators

		New Zealand	OECD
Average earnings	NZD	43 000	55 100
	USD	27 900	35 800
Public pension spending	% of GDP	4.4	7.2
Life expectancy	At birth	80.2	78.9
	At age 65	84.4	83.4
Population over age 65	% of working-age population	20.7	23.8

Qualifying conditions

Ten years' residency since the age of 20 (including five years after age 50) entitles people to the public pension at 65 years of age.

Benefit calculation

Basic

The pension for a single person living alone was NZD 336.65 gross per week from 1 April 2007. For 2006/07, the rate was NZD 320.13. The increase is due in part to the normal adjustment process, outlined below and in part to the government's confidence and supply agreement with the NZ First political party, also outlined below. This gives a total pension for the tax year 2007 of NZD 17 506, equivalent to around 41% of average earnings.

State pension entitlements from other countries are taken into account in calculating the total payable.

The rate of public pension is indexed to prices, but is subject to a floor and ceiling linked to movement in wages. For a couple, the governing legislation requires that the net-of-tax rate at each 1st April must be not less than 65% and not more than 72.5% of a net-of-tax surveyed weekly earnings measure. The net-of-tax rates for single people are set at 65% (living alone) and 60% (sharing accommodation) of the net-of-tax couple rate. If movements in prices remain consistently below movements in the net-of-tax surveyed weekly earnings, effectively the latter becomes the index.

As the result of a confidence and supply agreement between the government and the NZ First political party after the 2005 election, the net-of-tax rate at each 1 April is to be 66% rather than 65% of the net-of-tax earnings measure for the duration of the agreement.

Voluntary private pensions

Coverage of occupational pension plans has been falling for some time, and is currently around 13% with around 5% of people of working age contributing to personal pensions. The new KiwiSaver scheme, however, achieved coverage of 44% within its first year of operation (from July 2007). The default contribution rate for this scheme is 4% of earnings, divided equally between employees and employers.

Variant careers

Early retirement

It is not possible to claim the pension before the normal eligibility age of 65.

Late retirement

Receipt of the public pension is not dependent on retirement. It is therefore possible to combine pension and employment.

While people are not obliged to claim the public pension on reaching the qualifying age, there is no advantage in deferring a claim.

Childcare

Eventual public pension entitlement is not affected by periods out of paid work for caring purposes.

Unemployment

Eventual public pension entitlement is not affected by periods of unemployment.

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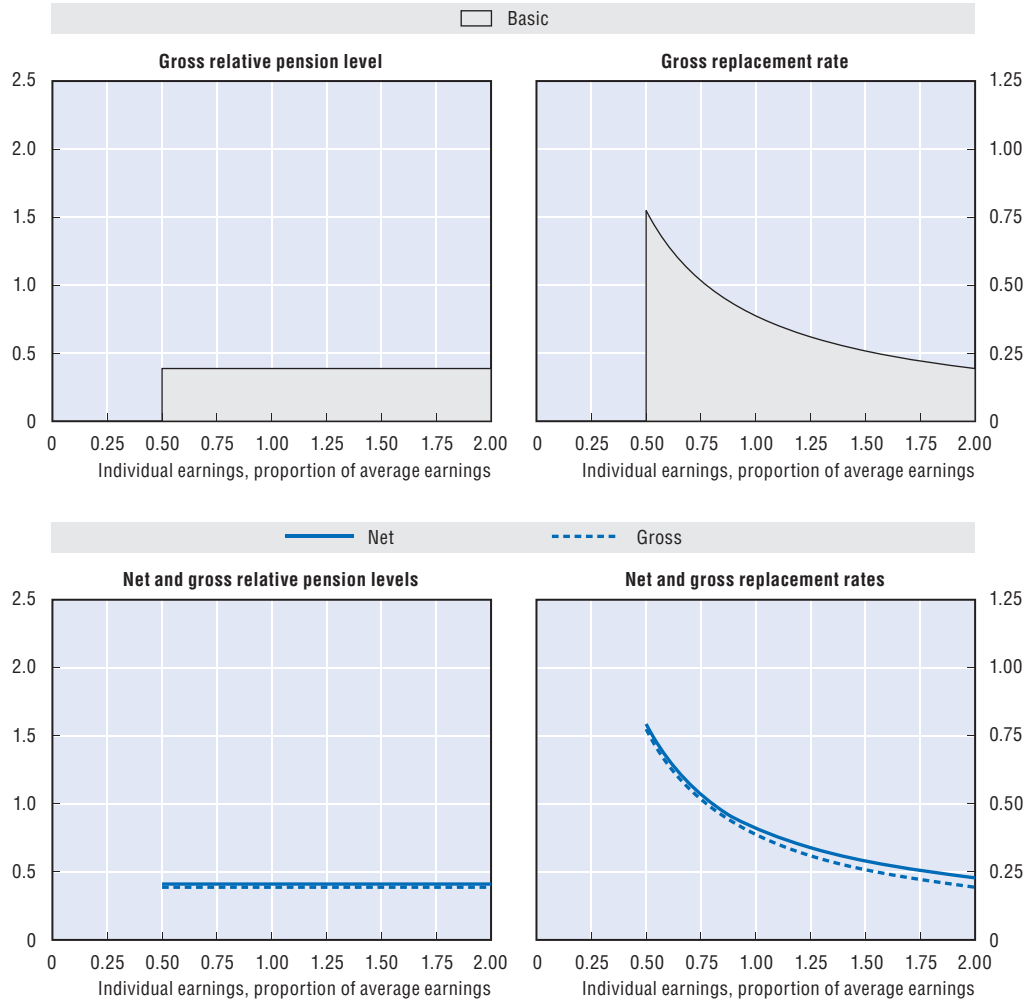
Pension modelling results: New Zealand



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	38.7	38.7	38.7	38.7	38.7	38.7
(% average gross earnings)						
Net relative pension level	41.1	41.1	41.1	41.1	41.1	41.1
(% net average earnings)						
Gross replacement rate	45.6	77.5	51.6	38.7	25.8	19.4
(% individual gross earnings)						
Net replacement rate	47.3	79.3	53.5	41.1	29.0	22.8
(% individual net earnings)						
Gross pension wealth	8.4	14.3	9.6	7.2	4.8	3.6
(multiple of individual gross earnings)	*9.9*	*16.8*	*11.2*	*8.4*	*5.6*	*4.2*
Net pension wealth	6.9	11.8	7.9	5.9	3.9	3.0
(multiple of individual gross earnings)	*8.2*	*13.9*	*9.2*	*6.9*	*4.6*	*3.5*

Norway

Norway: Pension system in 2006

The public pension system in Norway consists of a flat-rate basic pension and an earnings-related (supplementary) pension. Pensioners who have no, or only a small, supplementary pension, are entitled to a special supplement. The special supplement is income-tested against the earnings-related pension. Recently, a mandatory occupational pension was introduced.

Key indicators

		Norway	OECD
Average earnings	NOK	397 800	229 500
	USD	62 000	35 800
Public pension spending	% of GDP	4.8	7.2
Life expectancy	At birth	80.6	78.9
	At age 65	84.3	83.4
Population over age 65	% of working-age population	24.7	23.8

Qualifying conditions

The current public system was introduced in 1967. As the required earnings period for a full pension is 40 years, the first cohort of old age pensioners that fulfilled the insurance period was the one that retired in 2007.

The normal pension age is 67. Persons with a residence period in Norway of at least three years between the ages of 17 and 67 (inclusive) are entitled to the minimum pension, consisting of basic pension and special supplement. Full benefits are granted after a 40 year long residence period. The requirement for a supplementary pension is minimum three years of annual pension point earnings and a full pension is granted after 40 years. Both benefits are proportionally reduced for shorter earnings histories.

Benefit calculation

Basic pension

Many benefits under the National Insurance Scheme are determined in relation to the *basic amount*, G, that was NOK 62 161 in 2006. The full basic pension for a single person equals the basic amount. This is equivalent to 15.6% of average earnings. Historically, indexation of the basic amount has been lower than average wage growth. However, the government has since 2003 linked the value of the basic amount to average earnings. The modelling assumes that this practice continues.

Minimum pension

The basic pension above and a special supplement form the minimum pension. The minimum pension has been upgraded intermittently, as the special supplement has been increased in real terms. It has over time tended to increase more than earnings growth. Since 2003 the minimum pension has been indexed to average earnings.

In 2008 however a new increase in the special supplement from 79.33% of the basic amount in 2007 to 94% in 2008 was decided. It is agreed to increase the special supplement further to 100% of the basic amount by 2010. This supplement is income-tested against the earnings-related supplementary pension and the minimum pension is worth about 31% of average earnings.

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Earnings-related

Since the basic pension replaces the first slice of earnings, the earnings-related scheme only covers earnings above the value of the basic amount. The special supplement then replaces a further slice of earnings, up to 3.38 times the basic amount. The earnings-related scheme has a regressive formula, *i.e.*, the replacement rate falls for higher earnings. Annual earnings between 3.38 times the basic amount and six times the basic amount are replaced at a 42% rate (the rate was lowered from 45 % in 1992 and is for each pensioner the average of these two weighted by the number of years with annual points prior to 1992). Between six and 12 times the basic amount, the replacement rate is one third of that level. Given that 40 years' contributions are needed for a full pension, these are equivalent to annual accrual rates (for those with all entitlements earned after 1992) of 1.05% and 0.35% respectively. The first threshold, where the accrual rate declines, is a little under average earnings (94%). The ceiling on earnings eligible for benefits is therefore a little under double average earnings (188%).

The calculation of the pension uses the best 20 years of point earnings. The valorisation of earlier years' accruals depends on the adjustment procedure for the value of the basic amount (G). As discussed previously, the modelling assumes that the basic amount will in future be uprated in line with average wage earnings.

Defined-contribution scheme

From 2006, employers must make a minimum contribution of 2% of the earnings of their employees to a defined-contribution pension plan. (If employers offer a defined-benefit scheme instead, then the benefits must be at least the same level as the expected benefits under the mandatory 2% contribution.) Contributions are only required on earnings between the basic amount (G) and 12 times the basic amount.

Benefits can currently only be taken at age 67. They must be withdrawn over a minimum period of ten years. For comparison with the results for other countries, it is assumed that the benefit is taken as a price-indexed annuity calculated using unisex mortality tables.

Voluntary private pensions

Around 60% of employees are covered by voluntary occupational pension schemes. Including the 2% mandatory employer contribution, a typical large scheme would have a total contribution rate of 5% of earnings between 1G and 6G and 8% of earnings between 6G and 12G.

Variant careers (public scheme)

Early retirement

About two-thirds of employees work in businesses participating in early retirement programmes under the Contractual Early Retirement Scheme (AFP). This scheme, which was introduced in 1989, allows retirement from age 62. The pension level under this scheme is about the same as the ordinary old-age pension from 67 years of age, *i.e.* if the person had continued until that age in the job he/she was holding at the time he/she actually retired.

The calculation of AFP pensions differs between sectors. In the private sector, AFP pensions are calculated in the same manner as the permanent disability pension (granting pension points for the remaining years until 67). In addition, these pensioners receive a so-called AFP-supplement of NOK 11 400 per year. This supplement is not taxed.

There are some qualifying conditions (the listing is not complete). First, the pensioner must be employed in the same firm for the last three years (alternatively covered in an AFP scheme for the last five years). Second, the annual earnings must be at least the basic amount (G) at the time of retirement. The annual wage must also exceed one basic amount (G) during at least ten years after age 50. Earnings in the ten best years in the period from 1967 until the year prior to retirement have exceeded at least twice the basic amount.

Late retirement

People can defer their pension after 67 and continue to work and people can combine working with receiving a pension. There is no additional increment earned by deferring pension after 67.

Originally, the pension age was set at 70 but reduced to 67 in 1973. The opportunity to earn pension points based on labour income up to age 70 was kept, but for age groups 69-70 the pension is income-tested against labour income. This pension is reduced by 40% of income exceeding two basic amounts (G).

Childcare

Caregivers are credited with three pension points per year in the supplementary earnings-related pension scheme. This corresponds to pension point earnings from labour income of NOK 248 644. These caregivers comprise parents caring for children below seven years of age and individuals taking unpaid care of disabled, sick or elderly persons in the home.

Mothers with annual point earnings lower than 3 have these earnings topped up. Mothers with annual point earnings exceeding 3 do not get any top up. The family may apply for having the points granted to the father instead. For the other group, points are granted on the basis of individual applications.

Unemployment

Unemployment benefits, which are set at 62.4% of former earnings up to 6 times the basic amount, earn pension points in the same way as wage income.

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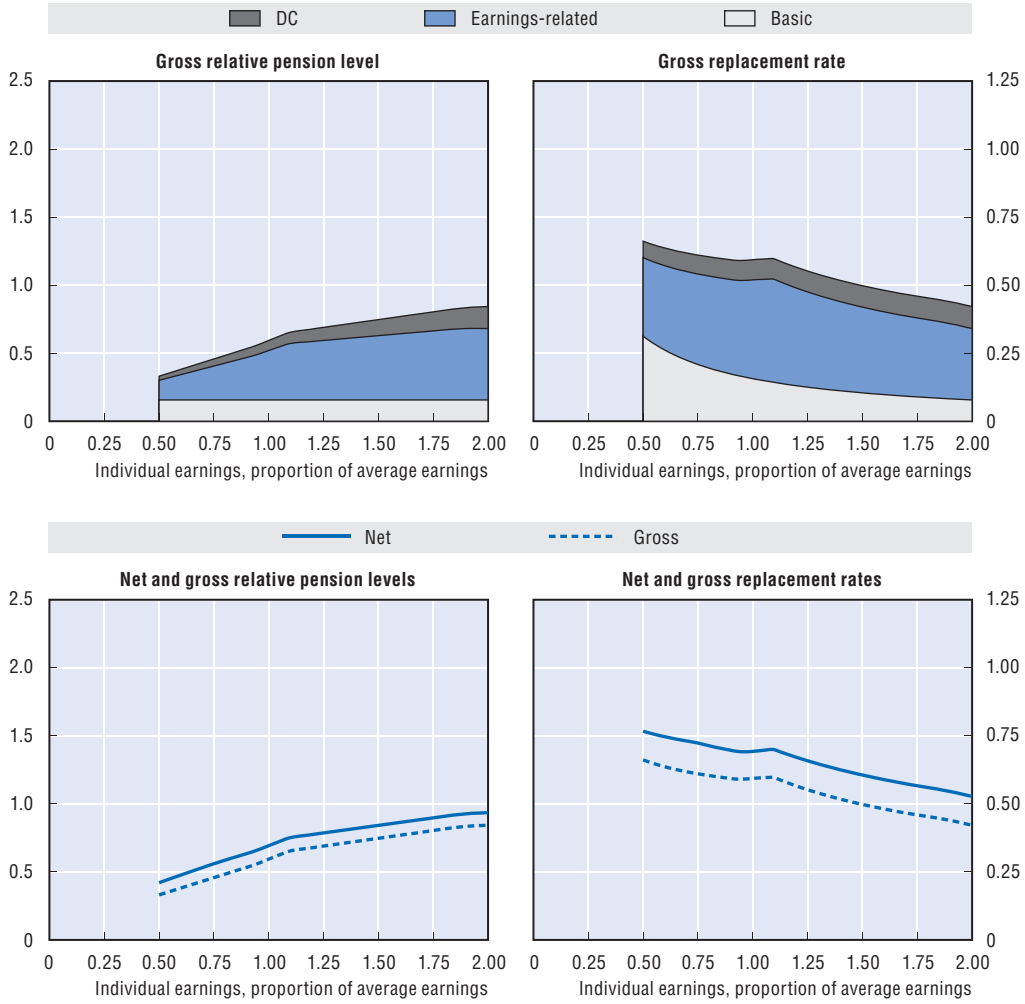
Pension modelling results: Norway



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	51.9	33.1	45.8	59.3	74.7	84.3
(% average gross earnings)						
Net relative pension level	62.0	42.1	56.1	69.3	84.2	93.6
(% net average earnings)						
Gross replacement rate	59.6	66.2	61.0	59.3	49.8	42.2
(% individual gross earnings)						
Net replacement rate	70.2	76.7	72.3	69.3	60.6	52.8
(% individual net earnings)						
Gross pension wealth	10.3	11.4	10.5	10.2	8.5	7.2
(multiple of individual gross earnings)	*12.0*	*13.4*	*12.3*	*11.9*	*9.9*	*8.4*
Net pension wealth	8.7	10.3	9.1	8.4	6.8	5.6
(multiple of individual gross earnings)	*10.2*	*12.1*	*10.7*	*9.9*	*7.9*	*6.6*

Poland

Poland: Pension system in 2006

The new pension system was introduced in 1999; it applies to people born in 1949 or after. The new public scheme is based on a system of notional accounts. People under 30 (born in 1969 and after) at the time of the reform must also participate in the funded scheme; people aged 30-50 (born between 1949 and 1968) could choose the funded option. However, the choice had to be made in 1999 and it was irrevocable, with exception of those who could retire early in years 2007-08 due to extension of possibility for early retirement granted by Parliament. This extension was a result of lack of proposed "bridging pensions" system. Additionally, from 2005 the miners have their early retirement pension system reinstated according to the pre-1999 rules.

Key indicators

		Poland	OECD
Average earnings	PLN	29 300	111 000
	USD	9 400	35 800
Public pension spending	% of GDP	11.4	7.2
Life expectancy	At birth	75.3	78.9
	At age 65	81.7	83.4
Population over age 65	% of working-age population	21.1	23.8

Qualifying conditions

The minimum pension age in the new system will be 65 for men and 60 for women. For the minimum pension, 25 and 20 years' contributions are required from men and women, respectively.

Benefit calculation

Earnings-related

A contribution of 12.22% of earnings (or 19.52% for workers born between 1949 and 1968 who do not choose the defined-contribution option) will be credited to individuals' notional accounts. Initially, these contributions were uprated between the time they are made and the time of retirement by price inflation plus 100% of the growth of the real covered wage bill. From 2004 onwards, the notional interest rate has been defined as 100% of the growth of the real covered wage bill and no less than price inflation. This notional interest rate is applied retrospectively to accounts from the year 2000.

At retirement, accumulated notional capital is divided by the "g-value" to arrive at the pension benefit. The g-value is average life expectancy at retirement age: this process is equivalent to the process of annuitisation in funded pension systems. The g-value is calculated using life tables published by the Central Statistical Office. In the modelling, actuarial data from the UN/World Bank population database is used.

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The ceiling to contributions and pensionable earnings is set at 2.5 times average earnings projected for a given year in the state budget law. It was PLN 68 700 or 2.5 times average earnings in 2004, PLN 72 690 in 2005, PLN 73 560 in 2006 PLN 78 480 in 2007, PLN 85 290 in 2008 and PLN 95 790 in 2009.

Between 1999 and 2004 pensions in payment were uprated in line with 80% of prices and 20% of average earnings, projected for a given year. Note, however, that from 2005 the minimum indexation is to prices from past years, in years when compounded inflation from the year preceding previous indexation is above 5%. From 2008 pensions in payment are uprated in line with at least 80% of prices and 20% of average earnings in the past year. Indexation of pensions above the minimum level is negotiated with the Tripartite Committee.

Minimum pension

There is a minimum pension under the pay-as-you-go scheme, which was PLN 597.46 per month from March 1, 2006, corresponding to 24% of average earnings.

Defined contribution

Some 7.3 percentage points of the total contribution are diverted to the funded scheme for those compulsorily covered or choosing this option. The law on annuities, adopted by the Parliament at the beginning of 2009 assumes that pension savings will be converted into the single annuity using unisex life tables at retirement age, but not before age of 65. Women, who retire before that year will receive payments based on programmed withdrawal until they reach age of 65. Annuities will be increased by 90% of returns from reserves on annuity companies

It is assumed that at retirement, the accumulated capital will be converted to an annuity, and at the minimum annuities will be price-indexed (used in the model calculation). It has been decided that annuity rates will have to be based on unisex life-tables.

Variant careers

Early retirement

There are no provisions for early retirement in the pension system. The old pension system (applicable to persons born before 1949) allowed various forms of early retirement for specific groups, such as miners, railway workers, teachers, people working in special conditions and women. Possibilities to early retirement have been postponed in years 2007-08 (previously 2006). This extension was a result of lack of proposed "bridging pensions" system. Additionally, from 2005 the miners have their early retirement pension system reinstated according to the pre-1999 rules.

The bridging pensions system that comes into force from 2009 assumes that people working in special conditions (*c.a.* 270 000 workers) will receive a bridging pension up to five years before retirement age. This benefit will be financed from state budget and calculated following the pension formula in the earnings-related system.

Late retirement

It is possible to defer both the notional and the funded, defined-contribution pension component without any age limits. People who defer claiming pension after normal pension age contribute and earn extra pension.

It is possible to combine work and pension receipt. For old-age pensioners below legal retirement age (in the old pension system), there are limits of income. If the work income is above 70% of average wage, the pension is reduced, if it is above 130% of average wage, the pension payment is suspended.

Childcare

During periods of maternity leave, contributions to the pension system are paid from the state budget based on the maternity benefit, which is the average wage over the past six months, net of social security contributions. From 2004, the averaging period has been extended to 12 months. Maternity leave period is 16 weeks for the first child, 18 weeks for the second child and 26 weeks for multiple births. From December 2006 maternity leave period is 18 weeks for the first child, 20 weeks for the second child and 28 weeks for multiple births. It has been decided that from January 1, 2009 maternity leave period will be 20 weeks for the first and the second child, while it will lasts 31 weeks, 33 weeks, 35 weeks, 37 weeks for multiple births depending on number of children.

Parental leave is possible for a period up to 36 months per child. During this time, pension contributions are paid for the schemes in which a person is a member and the amount of social welfare benefit which corresponds to about 18% of average earnings is used as a base.

In both cases, the government pays the contributions on behalf of the parent on leave.

All periods for which contributions are paid are qualified for minimum pension guarantee.

Unemployment

There is a scheme of pre-retirement benefits, available to unemployed people who were laid off (for example, due to liquidation, bankruptcy or restructuring). Pre-retirement benefits are paid from the state budget to women from 55 and men from 60 until reaching pension age. These rules are in force from May 2004. Earlier pre-retirement benefits were granted to women from 50 and men from 55. Pre-retirement benefits are not subject to contributions to the pension scheme.

During periods of unemployment benefit receipt, the government pays the contributions to the pension system based on the size of the unemployment benefit (12.22% of the benefit to notional account and 7.3% to defined contribution scheme). All the periods for which contributions are paid are qualified for minimum pension guarantee.

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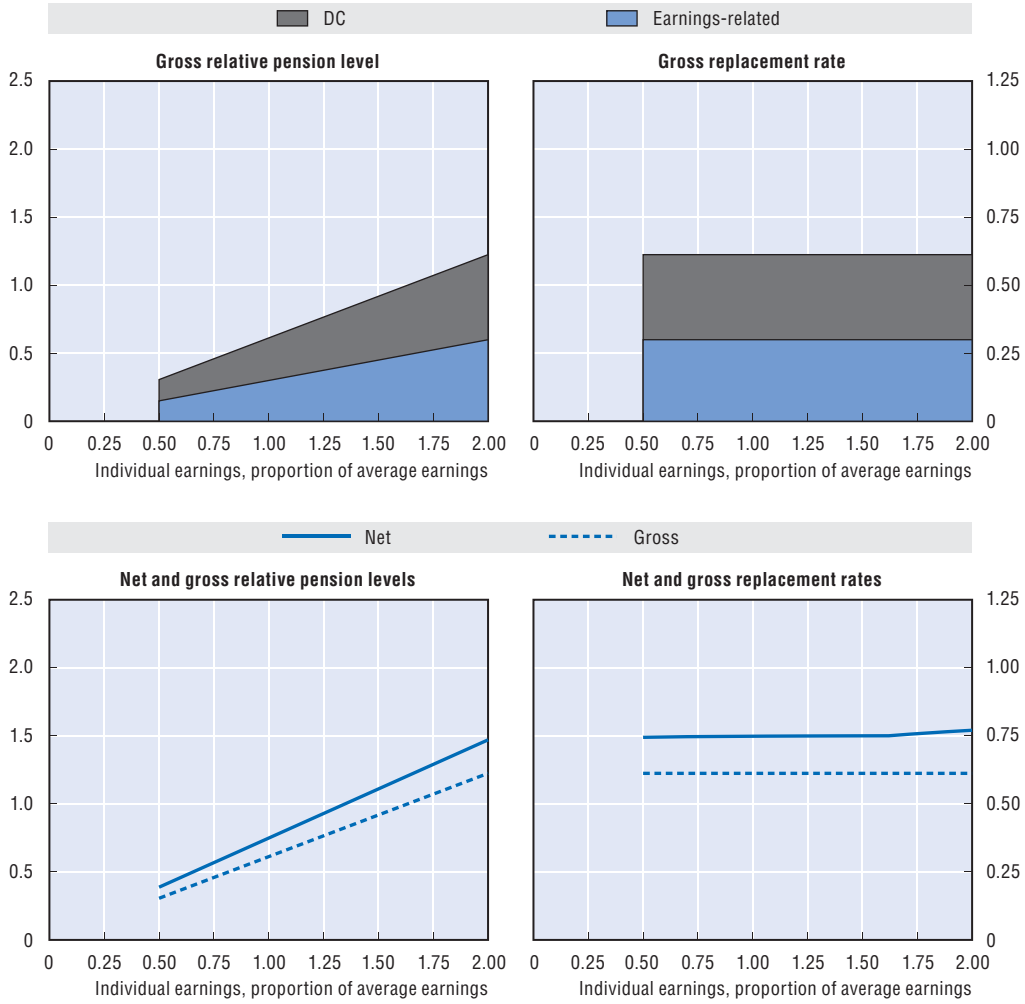
Pension modelling results: Poland



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	50.2	30.6	45.9	61.2	91.8	122.4
(% average gross earnings)	*36.5*	*24.5*	*33.4*	*44.5*	*66.8*	*89.0*
Net relative pension level	61.9	38.8	56.8	74.9	110.9	147.0
(% net average earnings)	*45.7*	*31.6*	*42.0*	*55.2*	*81.4*	*107.6*
Gross replacement rate	61.2	61.2	61.2	61.2	61.2	61.2
(% individual gross earnings)	*44.5*	*49.0*	*44.5*	*44.5*	*44.5*	*44.5*
Net replacement rate	74.8	74.4	74.7	74.9	75.0	77.0
(% individual net earnings)	*55.2*	*60.6*	*55.3*	*55.2*	*55.0*	*56.4*
Gross pension wealth	8.4	8.4	8.4	8.4	8.4	8.4
(multiple of individual gross earnings)	*8.6*	*9.5*	*8.6*	*8.6*	*8.6*	*8.6*
Net pension wealth	7.0	7.2	7.0	7.0	6.9	6.8
(multiple of individual gross earnings)	*7.3*	*8.3*	*7.3*	*7.2*	*7.1*	*7.1*

Portugal

Portugal: Pension system in 2006

Portugal has an earnings-related public pension scheme with a means-tested safety net.

Key indicators

		Portugal	OECD
Average earnings	EUR	15 300	28 600
	USD	19 300	35 800
Public pension spending	% of GDP	10.2	7.2
Life expectancy	At birth	78.9	78.9
	At age 65	83.4	83.4
Population over age 65	% of working-age population	27.8	23.8

Qualifying conditions

The standard pension age is 65 although early retirement is possible from age 55. A minimum of 15 years of contributions are required for retirement at 65. Early retirement is possible with 30 years of contributions.

The social pension is payable from age 65.

Benefit calculation

Earnings-related

The pension accrues at 2% of the earnings base for each year of contributions for 20 or fewer years' contributions. For beneficiaries with 21 or more years of contributions, the accrual rate ranges between 2% and 2.3% depending on earnings. The schedule for the accrual rate depends on individual earnings relative to the value of the national minimum wage (EUR 385.90). Each slice of earnings accrues pensions at a different rate.

Earnings/minimum wage	≤ 1.1	> 1.1-2.0	> 2.0-4.0	> 4.0-8.0	> 8.0
Accrual rate (%)	2.3	2.25	2.2	2.1	2.0

Pension accrues for a maximum of 40 years.

The earnings measure is presently the best 10 of the final 15 years. However, this base is currently being extended, such that it will reach lifetime average earnings from 2017. Those already paying contributions by 31 December 2001 and who met the eligibility conditions for old-age pension at that date will have their pension calculated from the most favourable of three possible formulas: 1) applying the previous rules (2% accrual for each year of contributions and earnings being those of the best ten years of the final 15 years); 2) applying the new rules above described to the entire contributory career; 3) or pro rata application of both rules according to the contributory career. Those already paying contributions by 31 December 2001, but who have not met the eligibility conditions for old-age pension at that date, will have their pension calculated from the most favourable of the above three possible formulas, if they retire between 2002 and 2016; or by the most favourable of formulas No. 2) and 3), if they retire after 2016. People who joined the system after 2002 will be fully covered by the new rules. For people with more than 40 years' contributions, only the best 40 count in the benefit formula.

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Valorisation of earnings for pension calculation from the beginning of 2002 is to a mix of earnings and prices. The weights are 75% price inflation and 25% earnings growth, subject to a maximum real increase of 0.5%.

Pensions in payment are indexed to prices, with larger increases on smaller pensions. In December 2006 the increases of pensions already in payment are: 3.1% for pensions not higher than EUR 596.79; 2.6% for those between EUR 596.79 and EUR 2 387.16; 2.4% for those between EUR 2 387.16 and EUR 4 774.32; and 0% for those equal or higher than EUR 4 774.32.

Minimum

For workers with up to 15 years of contributions there is a monthly minimum pension of EUR 223.24 from January to November 2006 and EUR 230.16 from December 2006. For workers with 15 to 40 years, the amount of the minimum pension varies between the lower limit of EUR 249.00 (January-November) and EUR 256.72 (December 2006 onwards-) and the upper limit of EUR 343.45 and EUR 354.10 for the same two periods, as described in the table below.

There are 14 monthly payments.

Years of contribution	Minimum pension (EUR)	
	January-November	December
15 to 20	249	256.72
21 to 30	274.76	283.28
31 and over	343.45	354.1

Targeted

For people who do not qualify for the earnings-related scheme, the monthly social pension was EUR 171.73 (January-November 2006) and EUR 177.05 (December-).

This is only paid if total income for a single person does not exceed 30% of the minimum wage or 50% of the minimum wage in case of couples. Again, there are 14 monthly payments.

Pensioners of the social pension are entitled to receive the Solidarity Extra Supplement on top of their pension (the monthly amount of this benefit being EUR 15.89 (EUR 16.38 after 1st December 2006) for those under 70 years old and EUR 31.77 (EUR 32.75 after 1st December 2006) for those with at least 70 years of age).

In the beginning of 2006, a new targeted benefit aimed at fighting poverty among the elderly came into effect: the Old-Age Solidarity Supplement (OSS). Eligibility conditions for this benefit are: 80 years of age or older in 2006 (extended in 2007 for those with 70 years of age or older and in 2008 to 65 years or older); receiving old-age or survivors pension (national citizens not entitled to the social pension because they don't fulfil its means test may also be eligible); and fulfilling the OSS means test.

The OSS resembles the Social Insertion Income as it is a supplement equal to the difference between the beneficiary's income and a given threshold, which is at the same time the means test condition. The OSS is therefore equal to the difference between the beneficiary's income and the following Reference Amounts (RA):

- EUR 4 200 per year for singles.
- EUR 7 350 per year for couples.

The beneficiary's income is composed of: his/her own income; the spouse's income; part of the income of their sons' households, denominated "family solidarity". The "family solidarity" component is added to the beneficiary's income to determine entitlement and the amount of the OSS.

To calculate the "family solidarity", for each son/daughter the total yearly income of his/her household is taken and divided by the number of adult equivalents in that household (scale of equivalence: 1 to the 1st adult; 0.7 for each subsequent adult and 0.5 for each minor) and then, according to the table below, the family solidarity is determined as a percentage of the equivalent income of the household. Those whose sons or daughters households' equivalent income is placed in the 4th tier are not eligible for the OSS.

Tier	Equivalent income of the household	Family solidarity (% of the equivalent income)
1st	2.5 × RA	0
2nd	> 2.5 × RA and ≤ 3.5 × RA	5
3rd	> 3.5 RA and ≤ 5 × RA	10
4th	> 5 × RA	Exclusion

Minimum pension amounts and other social benefits will be linked to the IAS according to the following table:

Benefits	Amount (% IAS)
Minimum pension (earnings-related)	
15 years of contributions	57.8
15 to 20 years of contributions	64.5
21 to 30 years of contributions	71.2
More than 30 years of contributions	89.0
Social pension	44.5

Variant careers

Early retirement

From August 2005 onwards, the early retirement scheme was suspended. Therefore, it is no longer possible to anticipate retirement except in the case of long term unemployment (see below under section "Unemployment").

Late retirement

It is possible to defer the pension until the age of 70. The benefit is increased by 12% per year of deferral to a maximum of five years.

Childcare

Maternity periods (both full leave and part-time work) count in calculating the pension entitlement. These are credited towards the qualifying conditions. Pensionable earnings for these periods are based on pay in the six months before the second month of the start of the leave.

From 2002, periods of up to 3 years caring for children under 12 working part time can be treated as if these were periods of full-time work.

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Unemployment

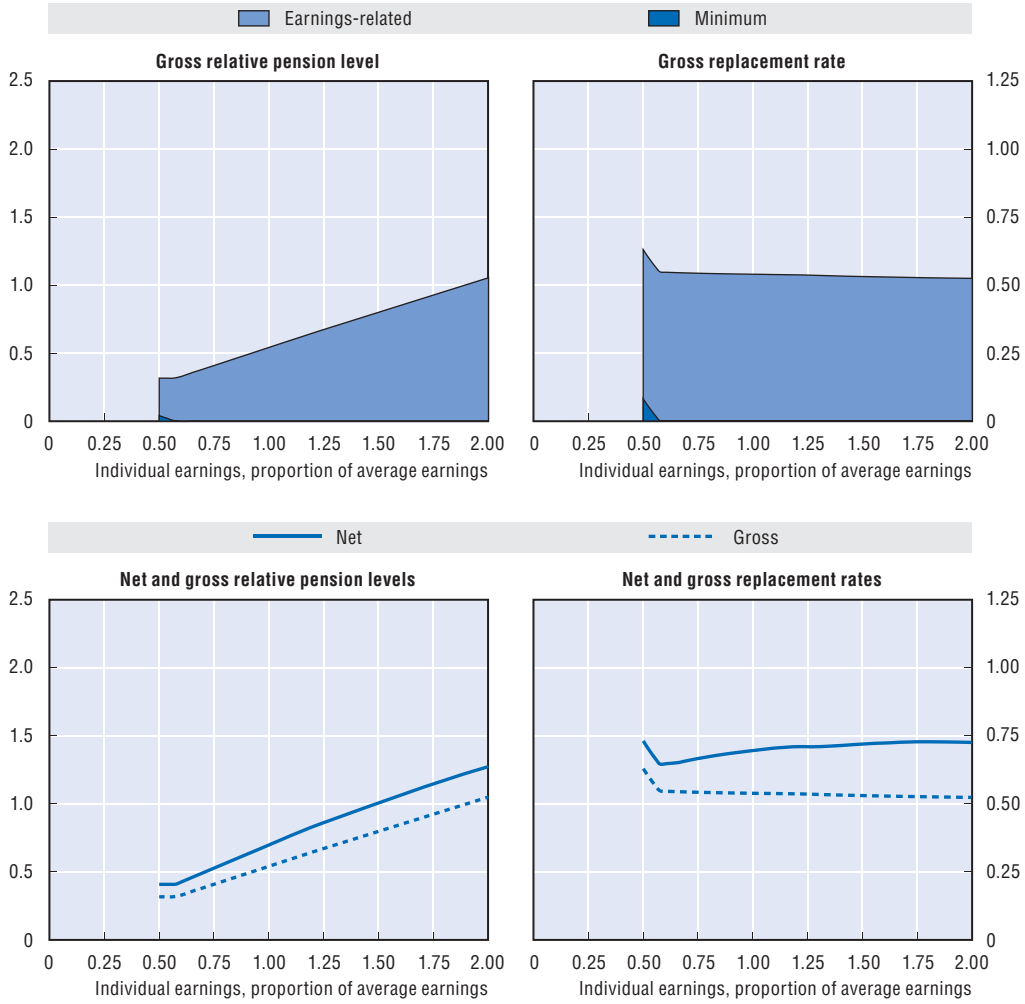
Periods on unemployment benefits count in calculating pension benefits. Pensionable earnings for these periods are based on pay in the six months before the second month of the start of the unemployment period. This applies both to unemployment and to social unemployment benefits.

There are special rules applying to people in long-term unemployment. People aged 55 or over who are long-term unemployed can retire at age 60 with full pension without decrement. It is required that the minimum contribution conditions are met and unemployment-benefit entitlement is exhausted.

Early retirement is also possible from age 55 with 20 years' contributions for individuals who become unemployed at age 50 or more. In these cases, the pension is reduced with a 4.5% annual decrement, with a maximum of five years' reduction applied.

Means-tested unemployment assistance subsidy is provided if registered contribution is more than 180 days in the 12 months prior to unemployment and monthly earnings before unemployment is less than 80% of the minimum wage. This allowance can be extended until beneficiaries meet the conditions for early retirement provided that they are 50 years of age.

Pension modelling results: Portugal



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	46.0	27.4	40.7	53.9	79.6	104.8
(% average gross earnings)						
Net relative pension level	59.4	35.4	52.6	69.6	100.5	127.2
(% net average earnings)						
Gross replacement rate	54.1	63.0	54.3	53.9	53.1	52.4
(% individual gross earnings)						
Net replacement rate	68.0	73.2	66.7	69.6	72.0	72.6
(% individual net earnings)						
Gross pension wealth	8.1	9.2	7.9	8.1	8.0	7.9
(multiple of individual gross earnings)	*9.5*	*10.7*	*9.2*	*9.5*	*9.3*	*9.2*
Net pension wealth	8.1	9.2	7.9	8.1	7.8	7.4
(multiple of individual gross earnings)	*9.5*	*10.7*	*9.2*	*9.5*	*9.1*	*8.7*

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Slovak Republic

Slovak Republic: Pension system in 2006

The earnings-related public scheme is similar to a points system, with benefits that depend on individual earnings relative to the average. There is no minimum pension, but low-income workers are protected by a minimum amount of earnings on which pension is calculated. All pensioners are eligible for social assistance benefits. Defined-contribution plans were introduced at the beginning of 2005. It is impossible to evaluate these defined-contribution plans at this time.

Key indicators

		Slovak Republic	OECD
Average earnings	SKK	231 200	1 061 500
	USD	7 800	35 800
Public pension spending	% of GDP	6.2	7.2
Life expectancy	At birth	74.3	78.9
	At age 65	80.2	83.4
Population over age 65	% of working-age population	18.4	23.8

Qualifying conditions

Ten years of pension insurance are needed to be eligible for a benefit. Pension ages are being increased gradually, to be equalised between the sexes at age 62. For men, pension age will reach 62 in 2006. For women, the increase in pension age will be spread over the period 2004-14.

Benefit calculation

Earnings-related

Contributors to the pension scheme earn annual pension points. These are calculated as the ratio of individual earnings to economy-wide average earnings. The pension entitlement is the sum of pension points over the career multiplied by the pension-point value.

This was SKK 214.68 for 2006. The pension-point value is indexed to average earnings. National average earnings in 2006 were SKK 19 268 per month. Dividing the point value by the earnings figure gives the equivalent to the accrual rate in a defined-benefit scheme, which is just under 1.2%.

There is a ceiling to earnings for contribution and benefit purposes, which is set at three times average earnings. The earnings data are lagged, so the ceiling for the first half of 2006 was three times average earnings in 2004 (SKK 15 825 per month). In the second half, the ceiling was based on 2005 data for average earnings (SKK 17 274 per month). (At the baseline assumptions for earnings growth and price inflation, the lagging means that the ceiling is slightly less than three times contemporaneous average earnings.)

Pensions in payment are indexed to the arithmetic average of earnings growth and price inflation.

For workers joining defined-contribution plans, the benefits under the public, earnings-related scheme are half of those of workers who remain only in the public plan. These workers are supposed to get the second half of their pension from life insurance or combined from life insurance and an old-age pension company.

Minimum

There is no minimum pension. However, there is a minimum assessment base for pension purposes that is equal to the minimum wage. The minimum wage was SKK 7 600 from the beginning of October 2006 and SKK 6 900 earlier in the year. The minimum wage is worth just under 40% of average earnings.

Defined contribution

The contribution rate for the defined-contribution scheme is 9% of earnings. Participation is mandatory for workers entering the labour market from January 2005; all others should have chosen by June 2006 to remain solely under the public scheme or join the mixed system. The defined-contribution pension can be taken as an annuity or as a combination of scheduled withdrawal and annuity. The modelling assumes withdrawal in the form of a price-indexed annuity using unisex annuity rates.

Variant careers

Early retirement

Early retirement is possible. Benefits are reduced by 0.5% per month since the pension is claimed early (equivalent to 6% per year). Early retirement also requires that the resulting pension is equal to at least 1.2 times the adult subsistence income level, which was SKK 4 980 per month in 2006. The subsistence minimum for the calendar year 2006 was worth 25.8% of average earnings, meaning that the minimum pension required for early retirement is SKK 5 976 per month which is 31% of average earnings. Average early retirement pension, in 2006, was SKK 8 970 per month which is 46.7% of average earnings.

There is currently no age limit on early retirement: it is theoretically possible at any age provided the ten-year contribution condition and the requirement for the level of the benefit are both met.

Late retirement

It is possible to defer claiming the pension after the normal pension age. The benefit is increased by 0.5% for each month of deferral (6% per year). For people who claim the pension and continue to work, the pension will be recalculated when the individual eventually retires adding one half of the points earned during that period.

Childcare

There are pension credits for people caring for children up to the age of 6, with the state paying the relevant contributions. The assessment base for pensions is 60% of earnings prior to the period spent caring for children. In the first half of each calendar year, it is based on average earnings two years before the absence started. In the second half, the calculation uses earnings in the calendar year immediately before the absence. There is more generous provision for carers of disabled children.

These rules also apply for the defined contribution scheme (old-age pension scheme).

Unemployment

Unemployed people receive no credits in the pension system. However, they can make use of provisions for voluntary pension insurance.

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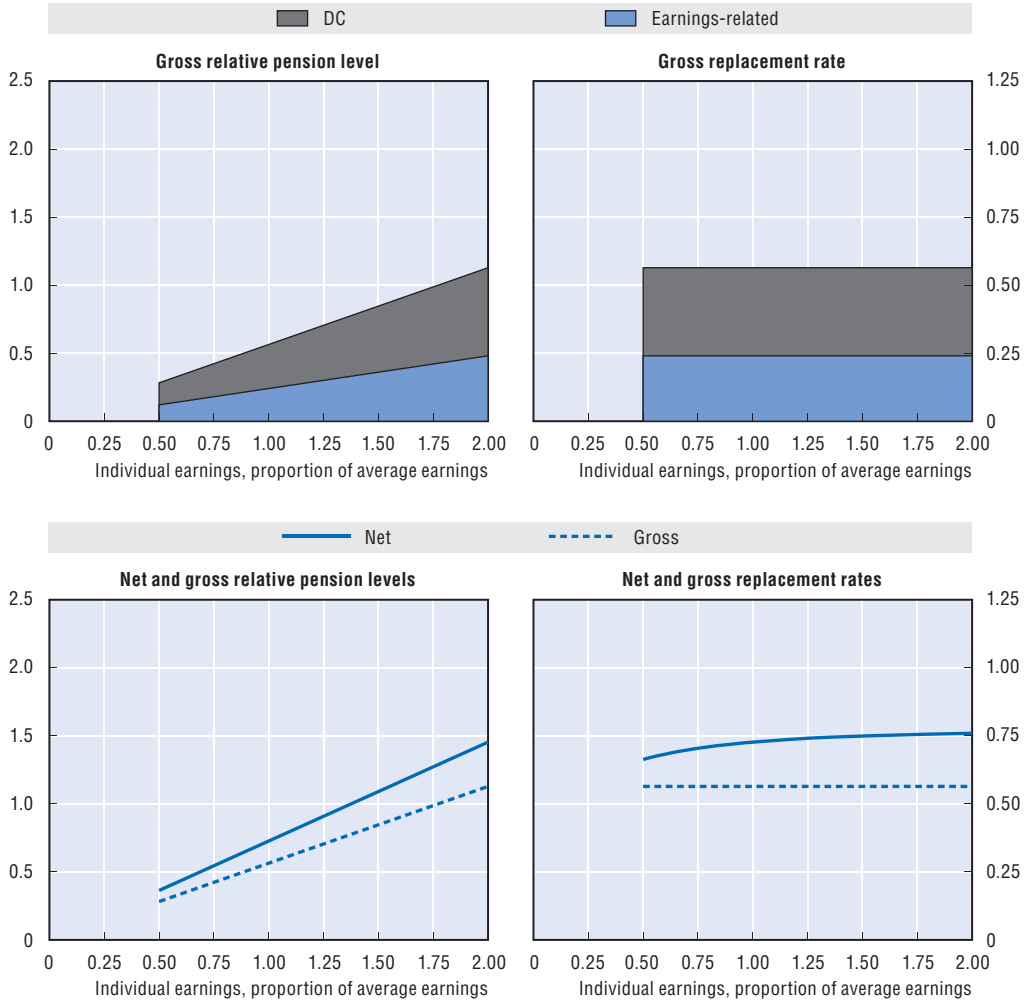
Pension modelling results: Slovak Republic



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	47.9	28.2	42.3	56.4	84.6	112.8
(% average gross earnings)						
Net relative pension level	61.8	36.3	54.5	72.7	109.0	145.4
(% net average earnings)						
Gross replacement rate	56.4	56.4	56.4	56.4	56.4	56.4
(% individual gross earnings)						
Net replacement rate	71.5	66.3	70.4	72.7	74.9	75.9
(% individual net earnings)						
Gross pension wealth	8.8	8.8	8.8	8.8	8.8	8.8
(multiple of individual gross earnings)	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*
Net pension wealth	8.8	8.8	8.8	8.8	8.8	8.8
(multiple of individual gross earnings)	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*	*10.6*

Spain

Spain: Pension system in 2006

The Spanish public pension system consists of a single, earnings-related benefit in the contribution level, with a means-tested minimum pension. There is also a non-contributory means-tested level, which replaces the previous special social assistance scheme.

Key indicators

		Spain	OECD
Average earnings	EUR	21 200	28 600
	USD	26 500	35 800
Public pension spending	% of GDP	8.1	7.2
Life expectancy	At birth	81.1	78.9
	At age 65	85.0	83.4
Population over age 65	% of working-age population	26.2	23.8

Qualifying conditions

The retirement age for a full benefit is 65 years for men and women. Fifteen years of contributions are necessary to qualify for a pension benefit.

Benefit calculation

Earnings-related

The benefit accrues according to a schedule. After 15 years' contributions, it is 50% of the earnings base. Over the next ten years, an extra 3% is accrued per year, followed by 2% per year thereafter. The maximum accrual is 100%, reached after 35 years' contributions.

The earnings base is pay over the last 15 years, up-rated in line with prices, apart from the last two years. This means that the replacement rate relative to final salary is less than 100%. On the standard assumptions for earnings growth and price inflation, this is calculated to be 88%.

There is a ceiling to earnings for contributions and benefit purposes of EUR 34 772.4 corresponding to 164% of average earnings.

Benefits are price-indexed.

Minimum and maximum

There is a minimum pension payable from age 65 amounting to EUR 469.73 per month, or 31.1% of average earnings, for pensioners without a dependent spouse, and 569.07 per month, or 37.7% of average earnings, for pensioners with a dependent spouse. There are 14 payments per year.

Due to specific policy from 2004, minimum pensions have increased above the price index in the last years.

The maximum pension is EUR 2 245.67 per month in 2006 (14 payments per year).

Variant careers

Early retirement

Early retirement is available from age 61 for people entering the system in 1967 or later who are unemployed, provided they have contributed for at least 30 years. The actuarial reduction depends on the number of years of contributions: 8% (30 years), 7.5% (31-34 years), 7% (35-37 years), 6.5% (38-39 years), and 6% for more than 40 years of contributions.

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For people who entered the system before 1967, early retirement is possible from age 60. If retirement is voluntary the reduction is 8% per year. If it is not voluntary reductions are the same as in the case of people aged 61 or more who entered the system in 1967 or later.

The minimum pension for early retirees is EUR 437.68 or 29% of average earnings for pensioners without a dependent spouse, and 531.84 per month, or 35% of average earnings for pensioners with a dependent spouse, and after 65 they moves to the higher level.

Between 60 and 64, it is possible to combine partial pension receipt and a part-time job, if working hours are reduced between 25% and 85%. Another employee must replace the remaining working hours left by the partial pensioner. Fifteen years of contributions are required.

With the new law 40/2007 rules about partial pensions have changed from 1-1-2008:

1. Working hours must be reduced between 25-75%.
2. Partial retired workers must have been six years or more with the last employer and contributed 30 years or more in total.
3. For people entering the system after 1967, the possibility for partial pensions starts from 61.

Late retirement

It is possible to defer the pension after normal retirement age. For people of age 65 and with 35 years of contributions, the amount of the pension may exceed 100% of the calculation base. The benefit increases by 2% per year of deferral.

From 65 there is also the possibility of combining partial pension and part-time job. In this case, there is no obligation to replace the remaining working hours.

With the new law 40/2007, workers who have contributed 15 years or more and continue working after 65 years old will increase their benefit by 2% of the base of calculation per additional year. The increase is 3% with 40 years of contributions. Pensioners entitled of a maximum pension entering retirement with 66 years or more will receive an annual lump sum (2% of the maximum pension per additional year after 65, 3% with 40 years of contributions).

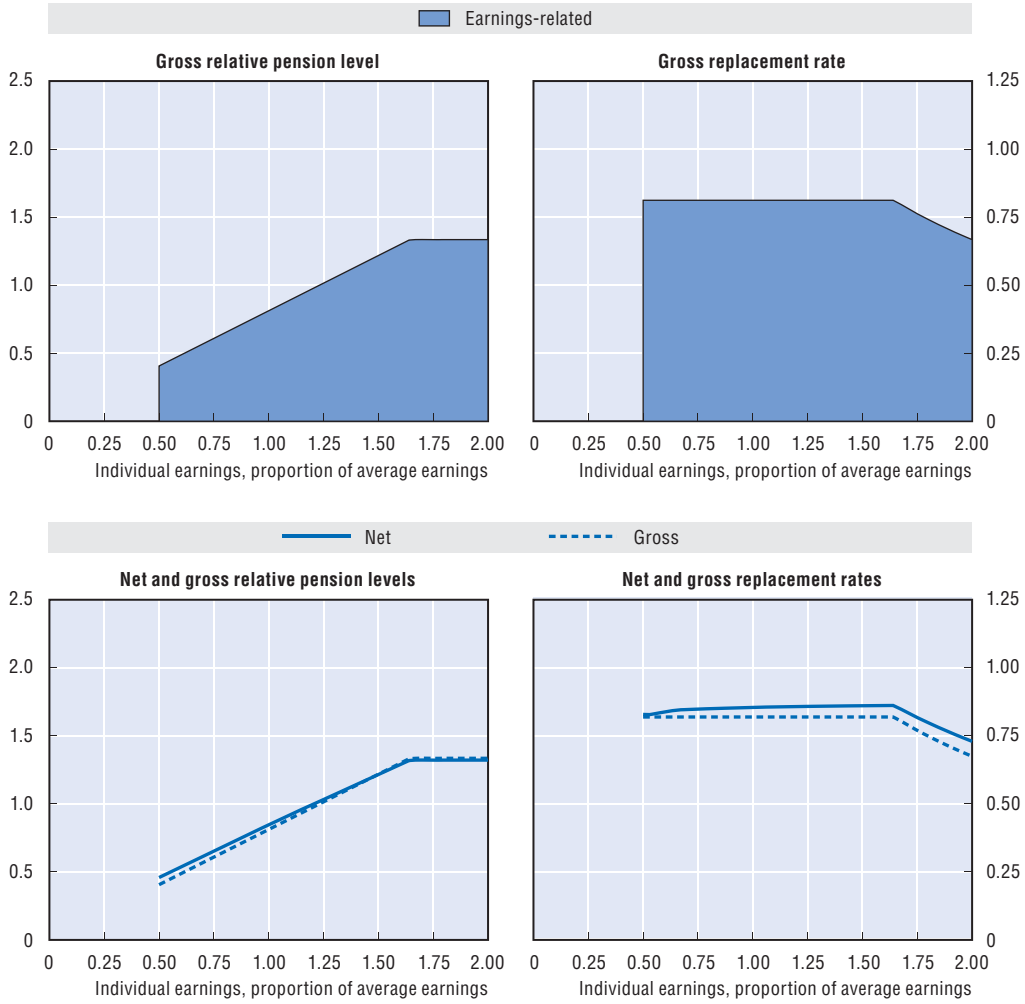
Childcare

There is coverage for the maternity period. Two years out of the labour market looking after children count towards the calculation of pension benefit.

Unemployment

During periods of unemployment-benefit receipt, the government pays all of the employers' contribution and 35% of the employee's contribution to the pension insurance scheme. The remaining 65% of the employee's contribution is paid by the worker. The base salary for contributions is the average salary in the six months prior to unemployment. The duration depends on the number of contribution days during the prior six years, varying between four months and two years. The unemployment assistance which is paid thereafter does not create any pension credits, except for people 52 or more. For these people, contributions for old age pension are paid by the government up to retirement age. These contributions are levied on the minimum base of EUR 631.20 per month.

Pension modelling results: Spain



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	64.9	40.6	60.9	81.2	121.8	133.5
(% average gross earnings)						
Net relative pension level	69.1	45.9	65.3	84.7	121.6	132.1
(% net average earnings)						
Gross replacement rate	81.2	81.2	81.2	81.2	81.2	66.7
(% individual gross earnings)						
Net replacement rate	84.2	82.1	84.1	84.7	85.3	72.2
(% individual net earnings)						
Gross pension wealth	12.2	12.2	12.2	12.2	12.2	10.0
(multiple of individual gross earnings)	*14.3*	*14.3*	*14.3*	*14.3*	*14.3*	*11.7*
Net pension wealth	10.3	10.9	10.4	10.1	9.7	7.9
(multiple of individual gross earnings)	*12.1*	*12.8*	*12.2*	*11.8*	*11.3*	*9.2*

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Sweden

Sweden: Pension system in 2006

The new pension system, introduced in 1999, applies to people born in 1954 and after. The old and the new systems will cover older workers proportionally: people born 1938-53 will receive pensions under a mix of the old and new rules. The earnings-related part is based on notional accounts and there is a small mandatory contribution to individual, defined-contribution funded pensions. There is also a pension-income-tested top-up. Occupational pension plans – with defined-benefit and defined-contribution elements – have broad coverage.

For the occupational plan, in 2006 the new ITP scheme was passed. The scheme has long transitional rules but came into effect fully for those born in 1979 and after.

Key indicators

		Sweden	OECD
Average earnings	SEK	324 600	263 800
	USD	44 000	35 800
Public pension spending	% of GDP	7.7	7.2
Life expectancy	At birth	80.8	78.9
	At age 65	84.2	83.4
Population over age 65	% of working-age population	29.4	23.8

Qualifying conditions

The pension from the income and premium pension can be received from the age of 61.

Eligibility for the guarantee pension will be earned with three years' residency. It is possible to get a guarantee pension from age 65.

Maximum guarantee pension is earned with 40 years' residency and is reduced proportionally for shorter periods. The pension can be claimed from age 65.

Benefit calculation

Contributions of 18.5% of pensionable pay are credited and then up-rated in line with a three-year moving average of economy-wide average earnings. Pensionable pay is defined as earnings less the employee contribution to the pension system (*i.e.* to both the notional accounts system and the premium pension system) of 7% of gross earnings, giving an effective contribution rate on gross earnings of 17.21%, 14.88% to the notional-accounts system and 2.33% to the defined-contribution funded pensions. Contributions are only levied when annual earnings exceed a small floor of SEK 16 800 in 2006, just over 5.2% of average earnings, although they are due on the whole of earnings for all people earning above the floor. There is a ceiling to benefits calculated in terms of pensionable earnings of SEK 333 750 in 2006. However, this again relates to pensionable earnings, giving an effective ceiling relative to gross earnings of SEK 359 100 in 2006 (around 111% of average earnings). Employer contributions are also paid only to the ceiling, but there is an additional tax on earnings above the ceiling. This tax has the same percentage as the pension contribution but goes directly to the central government budget. It does not accrue any pension rights.

Earnings-related

The new earnings-related scheme uses notional accounts. The notional accounts are increased every year by the distribution of the pension balances of deceased persons of the same age as the survivors (inheritance gains). The inheritance gains from people who die before the earliest possible retirement age (61 years) are relevant. After this age the inheritance gains factor is estimated on the basis of the mortality observed for an earlier period (computed from five year unisex mortality tables).

At retirement, the accumulated notional capital will be converted into an annuity. This calculation will use a coefficient depending on individual retirement age and contemporaneous life expectancy (based on the previous five year unisex mortality tables). A real discount rate of 1.6% a year will be assumed in this calculation. Illustrative values for the annuity coefficient at age 65 are 15.4 for 2000 rising to 16.8 by 2020 and 17.4 by 2040. The annuity coefficient is currently 18.0 for retirement at 61 and 12.8 at age 70 for people born in 1940.

After retirement, pensions are uprated with the increase in nominal average earnings less the imputed interest rate in the annuity divisor of 1.6%.

There is also a "balance mechanism": if assets (the buffer fund plus the estimated value of assets in the form of contribution revenues) fall below liabilities (accrued notional pension capital and capital value of outgoing pensions), then indexation of pensions in payment and returns credited to notional accounts are reduced by the ratio of assets to liabilities. The balancing ratio reached a low point of 1.0014 in 2004 and remained just over one until 2007 (1.0097 in 2003, 1.0014 in 2004, 1.0044 in 2005 and 1.0149 in 2006). In 2008, however, this has fallen to 0.9672. The balancing ratio for year *t* is used to calculate the balance number or the need for activating the balancing mechanism in year *t* + 2. An activated balancing mechanism would mean lower replacement rates from the national system but could also produce higher results when the pension system recovers and the balance figure increases (the balance index can exceed the income index during the recovery period).

For modelling purposes, the annuity coefficients are calculated using the above rules and the relevant mortality data from the UN/World Bank population database. It is assumed that the balance mechanism does not affect the uprating of benefits.

Minimum

The "guarantee pension" is an income-tested top-up for people with low levels of benefit from notional accounts. For a single person, the full guaranteed benefit in 2006 was SEK 84 561 for a single pensioner born after 1938 or 26% of gross average earnings.

The guarantee pension is withdrawn at 100% against the first SEK 50 022 (2006) of income, for a single person, from the earnings-related pension, thereafter at 48%. This threshold is equivalent to 15% of average earnings. Only when earnings-related pension exceeds SEK 121 879 – nearly 38% of average earnings – is entitlement to the guarantee exhausted.

The guarantee level is price indexed under current legislation. However, the baseline assumption in the modelling for all countries is that the value of safety-net retirement benefits will tend, over time, to track average earnings rather than decline relative to general living standards.

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There is also a housing benefit that covers 93% of housing costs up to a maximum of SEK 5 000 per month for a single pensioner. The benefit is an important part of the minimum living standard for Swedish pensioners. This means-tested benefit is not included in the modelled calculations.

Defined contribution

A further 2.5% of pensionable income (giving an effective contribution rate against gross earnings of 2.325%) will be paid into personal pension accounts: the premium pension. People have a broad choice of where these funds are invested.

At retirement, people have a choice over the way benefits are withdrawn. First, people can convert the pension into an annuity to avoid investment risk. Alternatively, people will be able to choose a variable annuity, where their funds continue to be invested by their chosen fund manager. These annuities do not have a guaranteed value. The principle of the pension calculation in this case is that the value of the account is divided by an annuity divisor (based on estimated average life expectancy) and the pension benefit is credited with an estimated future interest rate of 3% minus administrative costs. If returns exceed 3%, then either an additional payment is made or the balance of the account is higher and so, therefore, is the base for calculating the annual pension.

Quasi-mandatory occupational

The occupational schemes together are estimated to cover almost 90% of employees. There are only four major occupational schemes. The modelling has used the ITP scheme for white-collar workers, which mixes defined-benefit and defined-contribution elements. This plan has now been renegotiated. The old plan is current for those born 1978 or earlier with some minor changes and the new plan covers those born 1979 or later.

ITP1

From 1 January 2007, salaried employees born in or after 1979 begin to accrue a retirement pension under the new ITP1 plan from the age of 25. The plan is a complete defined-contribution plan. The contribution is 4.5% of salary portions up to 7.5 income base amounts (SEK 333 750 for 2006). For salary portions in excess of 7.5 income base amounts (divided by 12 for one month) the contribution is 30%. The pensionable salary becomes the gross salary paid out in cash, excluding reimbursement of expenses. Premiums are paid from the first SEK of salary.

The employee can choose the form of the savings and the fund manager. However, at least half the contribution is invested in traditional pension insurance. The employee can also choose repayment cover and family cover of one, two, three or four price base amounts per year over five, ten, 15 or 20 years. The contributions of those who do not specify a choice are invested in traditional pension insurance with no repayment cover or family cover. This default choice is the one that is modelled.

Employees whose yearly salary exceeds ten income base amounts (SEK 445 000 in 2006) may choose to be covered under the new plan upon agreement with their employer. This applies regardless of whether the employee has a traditional ITP2 plan or has taken out an alternative ITP.

Variant careers

Early retirement

Retirement is possible from age 61 in the public pension scheme (both the income pension and the premium pension). There is no fixed retirement age. The notional-accounts and annuity calculations provide an automatic actuarial reduction depending on the age of retirement.

The income-tested guarantee pension cannot be claimed before 65. If the notional-accounts pension is withdrawn before or after age 65, the guarantee pension is still calculated as if the pension had been withdrawn at age 65.

In the new ITP1 plan, pensions are normally paid from the age of 65, but may be taken out from the age of 55. Pensions are life-long but can be paid in full or in part for a limited period of at least five years. The annuity is modelled as one that gives lifelong payments. The size of the pension is determined by the amount of premiums paid, the return, fees and taxes, and for how long the pension is to be disbursed.

Late retirement

It is possible to defer the notional accounts and premium pension with no upper age limit, again with automatic actuarial adjustments. It is also possible to combine work and pension receipt. Finally, pensions can be withdrawn partially (at 25, 50 or 75% of the full pension). The guarantee pension is adjusted against other pensions from the Swedish old-age pension system and from comparable foreign national pensions, but is not reduced by wage income, capital income, occupational pension or private pension insurance. Thus, it is also possible to combine work with receipt of the guarantee pension.

It is possible to defer the ITP1 occupational pension after age 65. No additional pension rights can be accrued after age 65.

Childcare

Years are credited under the public pension scheme for any period spent caring for children aged four or under. In a household with two parents the credits go to the parent with the lowest income if an active choice is not made. Individuals receive the best of three different ways of calculating the credit. First, if income is zero or lower than previous earnings, then the credits are based on the earnings the year before the child was born. Secondly, for low-income workers or people who were not working before childcare responsibilities started, the credits are based on 75% of economy-wide average earnings. Thirdly, if income actually rises or does not decrease to a great extent as childcare responsibilities begin, then the credit is set at one income base amount. In all three cases, the government makes the total contributions to the pension system (covering both the income pension and the premium pension). This is, however, up to the earnings ceiling in the pension system. Furthermore, parental benefits paid to people on parental leave from work are also considered pensionable income. The beneficiary pays the employee pension contribution of 7% on benefit income. The government makes all the "employer contributions" of 10.21% for incomes from social security including parental benefits.

The parental benefit is payable for a period of 480 days as follows:

- 390 days at 80 % of the parent's annual income up to a ceiling of ten price base amounts (SEK 39 000 in 2006).
- 90 days at a universally applicable flat rate of SEK 180/day.

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The parental benefit is computed daily. Parents on low income or no income at all receive a minimum guaranteed benefit of SEK 180/day. The 480 cash benefit days are divided equally between the parents (*i.e.* 240 days to each parent). A parent may also transfer up to 180 of her or his days to the other parent.

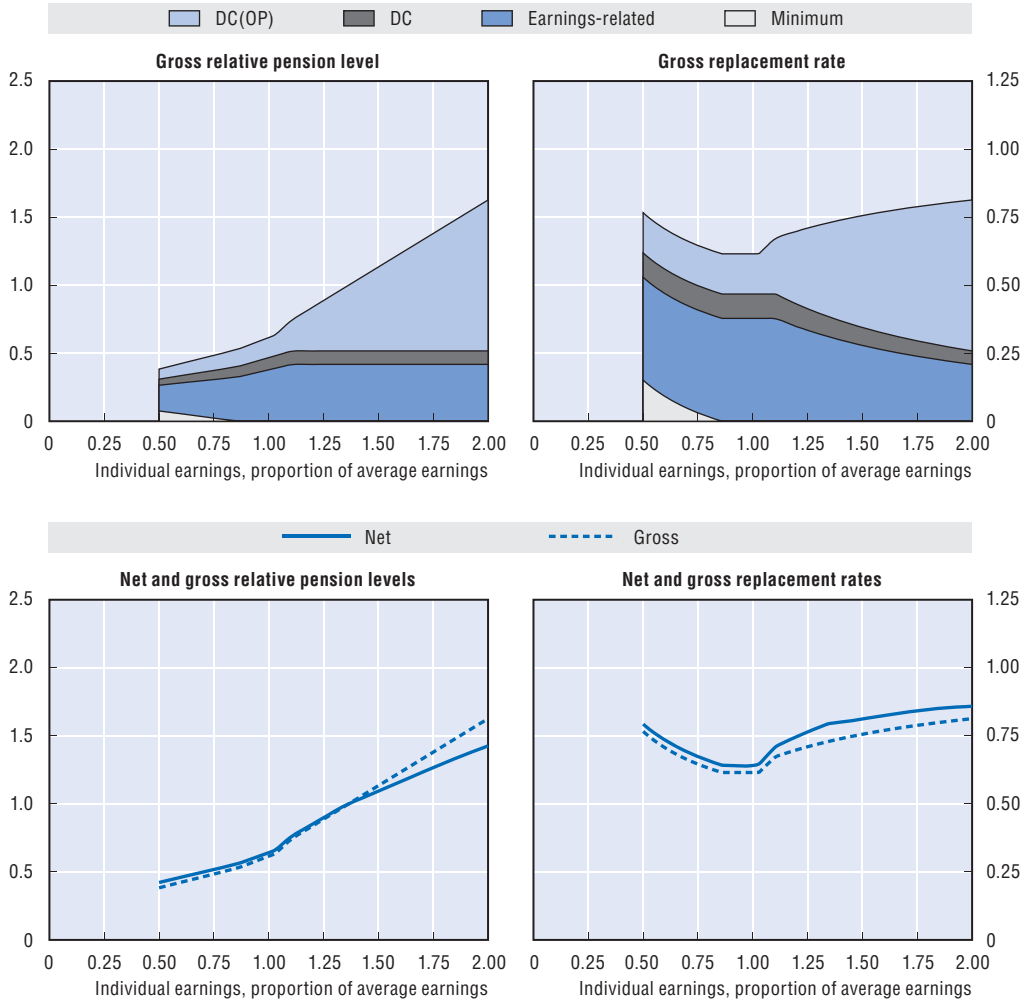
Under the ITP occupational plan, there is a recommendation that the employer contributes to an employee's pension during periods of up to 11 months for parental leave (and most do so).

Unemployment

Unemployment benefits and training allowances paid to unemployed people taking up labour market programmes are pensionable income, with the government making the "employer" contribution. Income-related unemployment benefits are 80% of previous earnings for the first 200 days. From day 201 up to day 300 the benefit is 70% of previous earnings. Thereafter the benefit is 65% of previous earnings unless one is the parent of a child below the age of 18 for whom the benefit remains at a level of 70% of previous earnings. The unemployment benefits are disbursed up to a ceiling of SEK 680 per day and subject to a minimum payment of SEK 320 per day. Unemployment benefits can be paid for up to 600 days subject to certain conditions.

After the receipt of unemployment benefits for a prolonged maximum period of 600 days, the beneficiary is entitled to an activity guarantee that implied the receipt of a training allowance where the compensation is at the same level as the unemployment benefit and accrues pension rights. The activity guarantee and the subsequent training benefit are obtainable for an unlimited period until the age of 65. An individual who is unemployed would seldom opt to take out their old age pension instead of receiving a training allowance, as this would mean a lower pension.

Pension modelling results: Sweden



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	54.1	38.3	48.4	61.5	113.3	162.6
(% average gross earnings)						
Net relative pension level	57.2	42.2	51.8	64.1	109.4	142.6
(% net average earnings)						
Gross replacement rate	61.5	76.6	64.6	61.5	75.6	81.3
(% individual gross earnings)						
Net replacement rate	64.1	79.3	67.4	64.1	81.2	85.9
(% individual net earnings)						
Gross pension wealth	9.9	12.2	10.3	9.9	12.0	12.9
(multiple of individual gross earnings)	*11.3*	*14.0*	*11.8*	*11.3*	*13.7*	*14.7*
Net pension wealth	7.2	9.3	7.6	7.1	8.0	7.8
(multiple of individual gross earnings)	*8.2*	*10.6*	*8.7*	*8.1*	*9.1*	*8.9*

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Switzerland

Switzerland: Pension system in 2006

The Swiss pension system has three main parts. The public scheme is earnings-related, but has a progressive formula. The other components are a system of mandatory occupational pensions and an income-tested supplementary benefit.

Key indicators

		Switzerland	OECD
Average	CHF	72 400	44 800
earnings	USD	57 800	35 800
Public pension spending	% of GDP	6.8	7.2
Life expectancy	At birth	81.7	78.9
	At age 65	85.3	83.4
Population over age 65	% of working-age population	25.9	23.8

Qualifying conditions

Pensionable age under the public scheme and mandatory occupational pensions is currently 65 for men and 64 for women. A full pension requires contributions for 44 years for men and 43 for women.

Benefit calculation

Earnings-related

The public pension is based on average lifetime earnings. If this figure is less than CHF 38 700, then the entitlement is CHF 9 546 plus 26% of average lifetime earnings. For lifetime earnings above the threshold, the entitlement is a flat CHF 13 416 plus 16% of average lifetime earnings.

There is a minimum pension of CHF 12 900 and a maximum pension of twice that level. These are equivalent to 18 and 36% of average earnings, respectively. The maximum benefit is reached when average lifetime earnings are CHF 77 400, equivalent to 107% of economy-wide average earnings.

Pensions in payment are indexed 50% to prices and 50% to nominal earnings.

Mandatory occupational

The system of mandatory occupational pensions was introduced in 1985. It is built around "defined credits" to an individual's pension account. These credits vary by sex and age:

Men and women of age (from 2005)	25-34	35-44	45-54	55-64/63
Women of age (1987-2004)	25-31	32-41	42-51	52-62/63
Credit (% of co-ordinated earnings)	7	10	15	18

The value of accumulated credits at retirement naturally depends on the required interest rate applied to earlier years' contributions. This was, for a long period until the end of 2002, 4%, but was cut to 3.25% in 2003 and to 2.25% in 2004. The interest rate was raised to 2.5% in 2005. If the interest rate is broadly equivalent to the growth rate of earnings, then a full career in the system will give a man at age 65 accumulated credits of 500% of

earnings. However, higher (or lower) outcomes are possible if the interest rate exceeds (is less than) growth in earnings. The modelling assumes that the interest rate applied to the credits will be equivalent to earnings over the long term.

The system has a minimum annuity rate of 7.10% for men (65) and 7.2% for women (64) that is applied to this notional capital sum. For men, this gives a full career replacement rate of 500 × 7.1 = 35.5% (subject to the interest rate being equal to earnings growth). From 2005, the minimum annuity rate falls gradually from 7.10% eventually reaching 6.8% over a ten-year period.

The defined credits (and hence the replacement rate) apply only to "co-ordinated" earnings. This is pay between three-quarters of the maximum pension of the public scheme (CHF 19 350 for 2006) and three times the maximum pension of the public scheme (CHF 77 400 for 2006). These thresholds are equivalent to 27% and 107% of average earnings. The coordination deduction is ? of the maximum pension of public scheme (CHF 22 575 for 2006). Note that the ceiling for pensionable pay is the same in the public scheme and in the mandatory occupational pension sector. There is a minimum for co-ordinated earnings of one eighth of the maximum value. Credits accrue at this minimum level for people with co-ordinated earnings below this level.

Targeted

The amount of the annual benefit is the share of expenditure recognized that exceeds the income determinants. The expenditure on basic needs are provided by law and amounts to CHF 17 640 for single people, equivalent to 24% of average. The supplementary benefit is indexed in the same way as the public old age pensions, *i.e.* to a mixed index of 50% prices and 50% wages. There are discretionary cantonal additions for low-income pensioners; these are disregarded in the model.

Variant careers

Early retirement

Early retirement in the public scheme is possible two years before the standard retirement age, *i.e.* from age 63 for men and 62 for women as of 2005. In case of early retirement, the full value is reduced by 6.8% for each year of early claiming. This is equivalent to an actuarial adjustment, as operated in other countries, of 4.5% (since 1/44 = 2.3% of the adjustment reflects the additional year that the member has contributed).

For women born in 1947 or before, the reduction in pension benefits from their full value is 3.4% per year of early retirement.

Early retirement is permitted in occupational schemes. In practice, schemes may allow retirement up to five years before the normal age, although schemes can decide on their own policy. Generally, the statutory annuity rate is reduced from the 7.1% at age 65 (from the 7.2% at age 64 for women), by 0.2 percentage points per year of early retirement. (Note that this conversion rate will fall gradually to 6.8% over the ten years starting in 2005.) The 0.2 point reduction is equivalent to an actuarial adjustment, as conventionally measured, of 2.8-3.1% per year of early retirement (increasing with the extent of early retirement). Including also the loss of contributions and credits as a result of early retirement, the theoretical benefit is 8%-9.4% lower per year of early retirement. The loss increases the earlier the retirement is taken. (The range given is from age 61 to age 65.)

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Late retirement

Both public and occupational pensions can be deferred after normal pension age. Pensions are adjusted in the same way as for early retirement. The pension can be deferred for up to five years after the normal pension age. The pension is increased according to the following schedule:

Deferral	1 year	2 years	3 years	4 years	5 years
Adjustment	5.2%	10.8%	17.1%	24.0%	31.5%

It is also possible to claim the public pension at 65 and continue working.

Contributions are not levied on people working after age 65 if earnings are below CHF 16 800 per year. For earnings above that level, contributions are levied when people defer the pension or claim the pension while continuing their work but no additional pension entitlement can be earned.

In the occupational plans, the annuity rate is increased by 0.2 percentage points for each year that retirement is deferred according a recommendation of the Federal Social Insurance Office (pension funds decide freely on the percentage points). The authorities, in practice, allow deferral for up to five years.

In principle, it is possible to combine receipt of the occupational pension with continuing to work. In practice, these are mainly cases of people with incomplete careers or people who have retired early rather than late. Therefore, the modelling assumes that people defer their occupational pension if they continue to work after the normal pension age. People do not continue to contribute after 65 under the public pension scheme.

Childcare

Years of childcare (for children under age 16) are credited in the public scheme as if earnings had amounted to three times the minimum pension of the year in which the caring parent retires. For 2006, this was CHF 38 700, corresponding to 53% of economy-wide average earnings. If the caring parent is married during the caring period, the credits are split equally between the spouses.

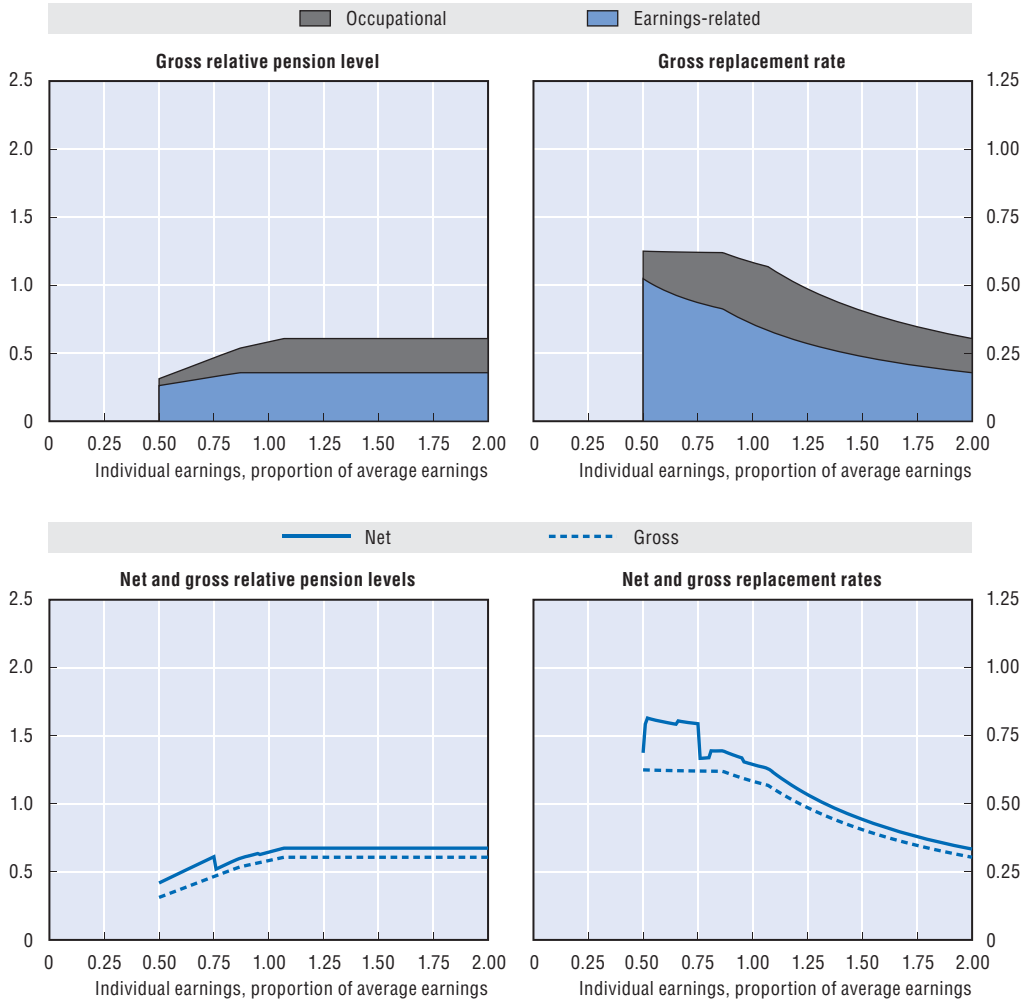
Credits for childcare are not required in occupational schemes.

Unemployment

Unemployment benefits are subject to social security contributions and so count towards the public pension just as if they were earnings. Unemployment insurance pays 80% of previous earnings. Persons with no child maintenance, who receive a full daily allowance of more than CHF 140 or who are not disabled receive 70% of the insured salary. The duration of unemployment insurance varies between 260 and 520 days. Once unemployment insurance is exhausted and a former worker is on social assistance, no contributions are payable. If income is very low, then municipal authorities often pay the minimum contribution.

There are no credits for unemployment periods in occupational schemes.

Pension modelling results: Switzerland



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	52.7	31.2	46.6	58.3	60.8	60.8
(% average gross earnings)	*53.2*	*31.4*	*47.0*	*59.0*	*61.5*	*61.5*
Net relative pension level	58.8	41.8	61.1	64.5	67.5	67.5
(% net average earnings)	*59.4*	*42.0*	*51.8*	*65.3*	*68.3*	*68.3*
Gross replacement rate	62.0	62.5	62.1	58.3	40.5	30.4
(% individual gross earnings)	*62.6*	*62.8*	*62.6*	*59.0*	*41.0*	*30.7*
Net replacement rate	69.5	68.8	79.4	64.5	44.3	33.4
(% individual net earnings)	*70.2*	*69.1*	*67.3*	*65.3*	*44.9*	*33.8*
Gross pension wealth	10.5	10.7	10.5	9.8	6.8	5.1
(multiple of individual gross earnings)	*12.8*	*13.1*	*12.9*	*12.0*	*8.3*	*6.2*
Net pension wealth	8.5	10.4	10.0	7.9	5.5	4.1
(multiple of individual gross earnings)	*10.4*	*12.7*	*10.3*	*9.6*	*6.7*	*5.0*

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Turkey

Turkey: Pension system in 2006

An earnings-related public scheme with an income-tested safety net and a flat-rate supplementary pension.

Key indicators

		Turkey	OECD
Average earnings	TRY	15 600	51 200
	USD	10 900	35 800
Public pension spending	% of GDP	7.8	7.2
Life expectancy	At birth	71.6	78.9
	At age 65	79.1	83.4
Population over age 65	% of working-age population	10.4	23.8

Qualifying conditions

Entrants into the system since September 1999 can draw a pension from age 60 (men) or 58 (women) with 7 000 days of contributions. This is equivalent to around 28 years of contributions for continuous employment. An alternative eligibility condition is 25 years of insurance coverage with 4 500 days of contributions.

The means-tested pension is payable only to those with no other social security rights who are disabled or those aged 65 or over.

Benefit calculation

Earnings-related

The pension under the new scheme is based on average lifetime earnings revalued in line with nominal GDP growth. The pension has a non-linear formula with years of coverage. The first ten years earn a pension of 35% of pay, with 2% per year extra for the next 15 years and 1.5 % per year thereafter.

There is a floor above which contributions are required. This had only one value during calendar 2006, TRY 531.

There is a ceiling to pensionable earnings; its value was TRY 3 451.50.

According to the law acted in 1999 pensions are monthly indexed by consumer price index. But since 2003 indexation of pensions in payment is determined once or twice a year, either by budget laws, other laws or by Board of Cabinet. For 2006 pensions are increased by 3% in January and 4.33% in July.

Minimum

There is a minimum pension, which in 2006 varied between TRY 463.1 and TRY 483.1.

Targeted

The means-tested pension is paid quarterly. For the first half of 2006 the pension was TRY 68 per month, for the second, pension was TRY 71 per month.

Variant careers

Early retirement

Workers in specific industries (*e.g.* mining) and people with disability can retire earlier but other workers cannot claim pensions before the eligibility ages.

Late retirement

It is possible to defer the pension beyond the normal pension age, but until 2006 the amount of pension benefit is not adjusted to the longer period of contributions. However from 2006, the extended contribution will be reflected.

Childcare

There is no credit for periods spent out of paid work caring for children.

Unemployment

There is no credit for periods of unemployment.

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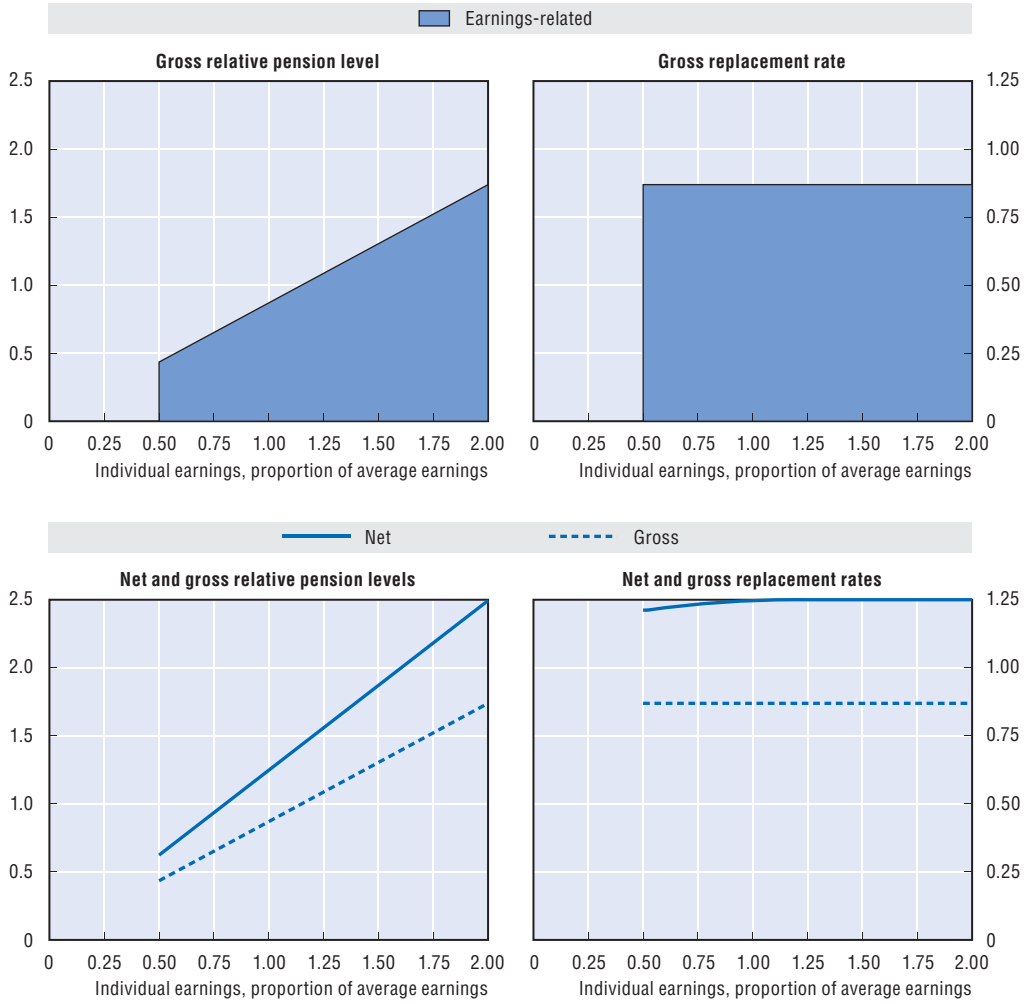
Pension modelling results: Turkey



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	73.9	43.5	65.2	86.9	130.4	173.9
(% average gross earnings)						
Net relative pension level	106.0	62.3	93.5	124.7	187.0	249.4
(% net average earnings)						
Gross replacement rate	86.9	86.9	86.9	86.9	86.9	86.9
(% individual gross earnings)						
Net replacement rate	124.0	121.2	123.4	124.7	127.1	130.4
(% individual net earnings)						
Gross pension wealth	11.0	11.0	11.0	11.0	11.0	11.0
(multiple of individual gross earnings)	*12.9*	*12.9*	*12.9*	*12.9*	*12.9*	*12.9*
Net pension wealth	11.0	11.0	11.0	11.0	11.0	11.0
(multiple of individual gross earnings)	*12.9*	*12.9*	*12.9*	*12.9*	*12.9*	*12.9*

United Kingdom

United Kingdom: Pension system in 2006

The United Kingdom has a complex pension system, which mixes public and private provisions. The public scheme has two tiers, (a flat-rate basic pension and an earnings-related additional pension), which are complemented by a large voluntary private pension sector. Most employee contributors "contract out" of the state second tier into private pensions of different sorts. An income-related benefit (pension credit) targets extra spending on the poorest pensioners.

Key indicators

		United Kingdom	OECD
Average earnings	GBP	31 500	19 300
	USD	58 000	35 800
Public pension spending	% of GDP	5.7	7.2
Life expectancy	At birth	79.1	78.9
	At age 65	83.3	83.4
Population over age 65	% of working-age population	26.8	23.8

Qualifying conditions

State pension age, currently 60 for women born on or before 5 April 1950 and 65 for men, will gradually be equalised from 2010 reaching 65 in 2020. As a result of the Pensions Act 2007, state pension age will increase to 66 between 2024 and 2028; to 67 between 2034 and 2036 and 68 between 2044 and 2046. The eligibility age for the guarantee credit element of the pension credit is 60, and will increase in line with the women's state pension age. The new savings credit element of pension credit is only available from 65 for both men and women.

To qualify for the basic state pension, people need: *i)* to pay; or *ii)* have been treated as having paid social security contributions; or *iii)* have credits for around nine-tenths of their potential working lives (39 years for women with a state pension age of 60; 44 years for men and women with a state pension age of 65). A proportionally reduced state pension is available for people who do not meet the full condition, but only to a minimum of 25% (*i.e.*, 10 years for women with a state pension age of 60; 11 years for men and women with a state pension age of 65). As a result of the Pension Act 2007, the number of years of contributions or credits required for entitlement to a full basic state pension will be reduced to 30 with proportionally reduced state pensions available where a person has a minimum of one year's contribution or credits for people reaching state pension age on or after 6 April 2010.

Benefit calculation

Basic

The full basic state pension for a single person is GBP 84.25 per week in 2006/07, equivalent to nearly 14% of average earnings.

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Earnings-related

For earnings between the lower earnings limit (GBP 4 368 per year in 2006/07) and the low earnings threshold (GBP 12 500), the replacement rate is 40% of the difference. The lower earnings limit is worth nearly 14% of average earnings while the low earnings threshold is 40%. This also applies to people covered by credits. This is equivalent to treating people earning below the low earnings threshold as if they had earned at this level. Over the next range, the replacement rate is 10%, ending at GBP 28 800 in 2006/07. Between this threshold and the ceiling, the replacement rate is 20%. The ceiling is GBP 33 540 in 2006/07. The upper threshold is worth around 91% of average earnings and the ceiling is 106% of average earnings.

The benefit value is calculated on average lifetime salary, with earlier years' pay uprated in line with average economy-wide earnings. The benefit is then price-indexed after retirement.

As a result of the Pensions Act 2007, from 2010 the income bands will reduce to two. Between the lower earnings limit and the low earnings threshold, the replacement rate will be 40% of the difference. Between the lower earnings threshold and the ceiling, the replacement rate will be 10%. From a date to be set, Band 1 income will provide a flat-rate entitlement of GBP 1.60 a week for each qualifying year (in 2008/09 earnings terms). Furthermore, from April 2009 the cap on accruals will be frozen through the introduction of an upper accrual point at GBP 770 a week.

Targeted

The Pension Credit, introduced in 2003, is a tax free weekly benefit for people aged 60 or over who are living on low incomes and guarantees all pensioners an income above a certain level. The Pension Credit is an income-related benefit and is not based on National Insurance contributions. There are two elements to the Pension Credit, the guarantee credit and the savings credit. The guarantee credit ensures a minimum level of income by providing financial help for people aged 60 and over whose income is below the standard minimum guarantee amount. In 2006/07 this was GBP 114.05 for individuals and GBP 174.05 for couples (these amounts may be higher for people with severe disabilities, caring responsibilities or certain housing costs).

The savings credit is an extra amount for people aged 65 or over who have made modest provision for their retirement. It is designed to reduce the effective withdrawal rate of benefits from 100% under its predecessors to 40%. People, whose income (excluding any guarantee credit) is below their guarantee credit minimum guarantee and above the savings credit threshold, GBP 84.25 for individuals and GBP 134.75 for couples respectively in 2006/07, receive 60% of the difference between their income and the threshold up to a maximum of GBP 17.88 for individuals and GBP 23.58 for couples, respectively. For people with incomes above their guarantee credit minimum guarantee (that is they are not entitled to the guarantee credit), the maximum savings credit is reduced by 40% of their income over their guarantee level.

Voluntary private pensions

Some 47% of employees are members of an occupational pension scheme and around 19% have personal plans. Because some people have both plan types, overall coverage of voluntary private pensions is 59%. The defined-benefit plan modelled pays a

pension of 1/80th of final salary for each year of service, equivalent to an accrual rate of 1.25%. When people change jobs, the value of the deferred occupational pension is indexed to price inflation.

However, most private-sector occupational plans have changed to defined-contribution provision, some for new members only and some for existing members. The government will also introduce a new national pension savings scheme. Using the same principles as New Zealand's KiwiSaver, this will have a default contribution rate of 8%, which is a little below the 9% average contribution rate to existing defined-contribution occupational schemes. The modelling assumes a contribution of 8% of earnings.

Variant careers

Early retirement

A state pension will not be paid before state pension age.

Late retirement

Until April 2005, deferral of the state pension was possible for up to five years after state pension age. This earned an increment of about 7.4% for each year. From April 2005, the time limit for deferral was removed and the increment increased to about 10.4% for each full year of deferral. Also, it is possible instead to take a taxable lump sum provided the deferral has been for a minimum of 12 consecutive months. The lump sum is made up of the state pension foregone during the deferral period, plus interest which is guaranteed to be at least 2 percentage points above the repo rate (the Bank of England base rate). The choice has to be made when the state pension is eventually claimed.

Childcare

Both tiers of the public pension scheme (basic state pension and state second pension) provide protection for periods of child care. This covers both people not in paid work and those working but earning below the lower earnings limit who therefore do not contribute to the system. For the basic state pension, this is called Home Responsibilities Protection (HRP), and covers years spent caring for at least one child under 16. HRP reduces the number of years required for a full pension so that, with sufficient HRP, only 20 years' work (including periods when national insurance contributions may be credited) is required to receive the full basic state pension. For the state second pension, years caring for a child under age six are credited; caring parents are deemed to have earnings at the low earnings threshold: GBP 12 500 per year in 2006/07.

As a result of the Pensions Act 2007, people attaining SPA (State Pension Age) after 2010 will able to build up entitlement to S2P (State Second Pension) if they are caring for children up to the age of 12.

Unemployment

Periods of unemployment on insurance or assistance benefits are credited for the basic state pension. There are no credits for periods on these benefits for the state second pension.

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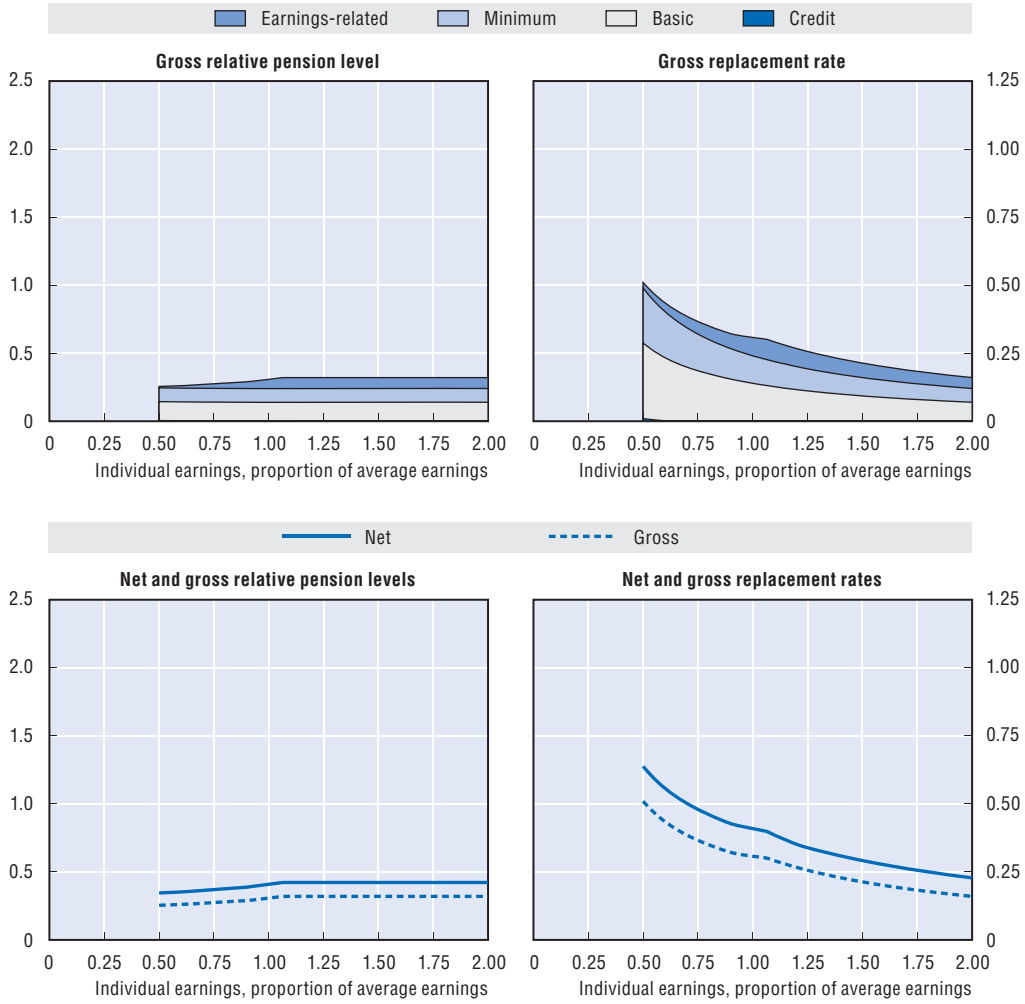
Pension modelling results: United Kingdom



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	28.4	25.5	27.5	30.8	32.0	32.0
(% average gross earnings)						
Net relative pension level	38.2	34.5	37.0	40.9	42.2	42.2
(% net average earnings)						
Gross replacement rate	33.5	51.0	36.6	30.8	21.3	16.0
(% individual gross earnings)						
Net replacement rate	44.3	63.8	48.0	40.9	29.2	22.8
(% individual net earnings)						
Gross pension wealth	4.5	6.8	4.9	4.1	2.9	2.1
(multiple of individual gross earnings)	*5.2*	*7.8*	*5.6*	*4.7*	*3.3*	*2.5*
Net pension wealth	4.4	6.8	4.8	4.0	2.8	2.1
(multiple of individual gross earnings)	*5.1*	*7.8*	*5.5*	*4.6*	*3.2*	*2.4*

United States

United States: Pension system in 2006

The publicly provided pension benefit, known as social security, has a progressive benefit formula. There is also a means-tested top-up payment available for low-income pensioners.

Key indicators

		United States	OECD
Average earnings	USD	39 400	35 800
	USD	39 400	35 800
Public pension spending	% of GDP	6.0	7.2
Life expectancy	At birth	77.8	78.9
	At age 65	83.6	83.4
Population over age 65	% of working-age population	20.8	23.8

Qualifying conditions

The pension age (called normal retirement age, or NRA) is 66 in 2006, and will later be increasing to 67 in steps. Eligibility for retirement benefits depends on the number of years in which contributions are made with a minimum requirement of ten years' contributions. Early retirement is possible from 62 with reduced benefits.

Benefit calculation

Earnings-related

The benefit formula is progressive. The first USD 656 a month of relevant earnings attracts a 90% replacement rate. The band of earnings between USD 656 and USD 3 955 a month is replaced at 32%. These thresholds are 20 and 121% of average earnings, respectively. A replacement rate of 15% applies between the latter threshold and the earnings ceiling. A 50% dependants' addition is available to married couples where secondary earners have built up a smaller entitlement and for a qualifying dependent child.

Earlier years' earnings are revalued up to the year in which the recipient reaches age 60 in line with growth in economy-wide average earnings. There is no adjustment of earnings for years after age 60. The basic benefit is computed for payment at age 62. Thereafter, the basic benefit is adjusted in line with prices. The benefit is based on the career average earnings for the 35 highest years of earnings (after revaluing) including years with zero earnings if needed to total 35 years.

The earnings ceiling for both contributions and benefits is USD 94 200 a year, corresponding to 239% of average earnings uprated annually in line with growth in economy-wide earnings.

Pensions in payment are adjusted in line with price increases.

Minimum

There is a minimum pension under social security. People earning less than a special minimum primary insurance amount are given a minimum pension that depends on their lifetime total years of coverage, varying between USD 33 for 11 years' coverage and USD 683 for 30 years. The threshold for this minimum pension was USD 10 485 in 2006, or 27% of average earnings. (The threshold is defined formally as 15% of the "old law" contribution and benefit base.) The minimum pension does not affect the modelling results because the earnings range affected is below that presented.

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Targeted

The United States provide a means-tested benefit for the elderly, known as supplemental security income.[1] Individuals without an eligible spouse over the age of 65 can be eligible for up to USD 7 236 a year depending on assets and other income. The benefit rate for cases where both members of a couple are eligible is USD 10 848 (33% higher than the rate for singles). These benefit rates are equivalent to around 18% and 28% of the national average wage, respectively. The benefit is indexed to price increases.

The asset tests are strict: individuals without an eligible spouse are limited to USD 2 000 worth of assets and eligible couples to USD 3 000, excluding personal belongings, a home, a car, funeral insurance and life insurance (the last two up to USD 1 500 in value). There is a small (USD 20 a month) "disregard" in calculating the entitlement. The benefit is then withdrawn at a 100% rate against income above this level.

The analysis is complicated by the fact that states can supplement the federally determined minimum. While 8 states pay only the federal minimum, 29 administer their own system, nine offer supplements that are operated solely by the federal Social Security Administration (SSA), and six offer supplements administered by both the state and SSA. The average supplemental payment in the 15 states with SSA administration is 29% of the maximum federal benefit for single pensioners and 50% for couples.[2] Note that the modelling does not include these additional payments.

Voluntary private pensions

Some 46% of employees are members of an occupational pension scheme and around 35% have personal plans. Because some people have both plan types, overall coverage of voluntary private pensions is 58%. Defined-contribution arrangements have become much more common. Evidence suggests that average contribution rates (employee plus employer) are around 9% of earnings.

A minority of workers continue to have defined-benefit occupational plans. Based on evidence from a national survey of such schemes, the modelling assumes an accrual rate of 1% of earnings for each year of service.

Variant careers

Early retirement

Early retirement is possible from 62, subject to an actuarial reduction. For each year of retirement before the normal age, the benefit is reduced by $6^2/_3$%. However, after three years, the reduction falls to 5%. This applies to retirees with a normal retirement age (NRA) of over 65. For retirees becoming eligible at age 62 in 2006, the normal retirement age is 66 years. This will increase gradually to reach 67 for people becoming eligible for retirement in 2022.

Late retirement

Initial receipt of the pension may be deferred until after NRA, and credit is given for deferment up to age 70. The actuarial increment for 2006 is 7.5% for each year deferred. It will increase to 8% in 2008.

It is also possible to combine work and pension receipt subject to an earnings test. For beneficiaries of age under their NRA, the pension is reduced by 50% of earnings in excess of USD 12 480. For workers who have reached their NRA, there is no benefit reduction based on earnings.

Childcare

There are no provisions for credits during periods of childcare (except for workers who become disabled at younger ages, who may drop years of child care from their benefit computation).

Unemployment

There are no provisions for credits during periods of unemployment. However, periods of unemployment may be omitted from the calculation of earnings for benefit purposes in many cases as only the highest 35 years of earnings are considered. Periods of disability are omitted from the 35 years of earnings considered.

Notes

1. Supplemental Security Income benefits are also payable to eligible blind or disabled individuals.
2. Excludes those classified as blind or disabled.

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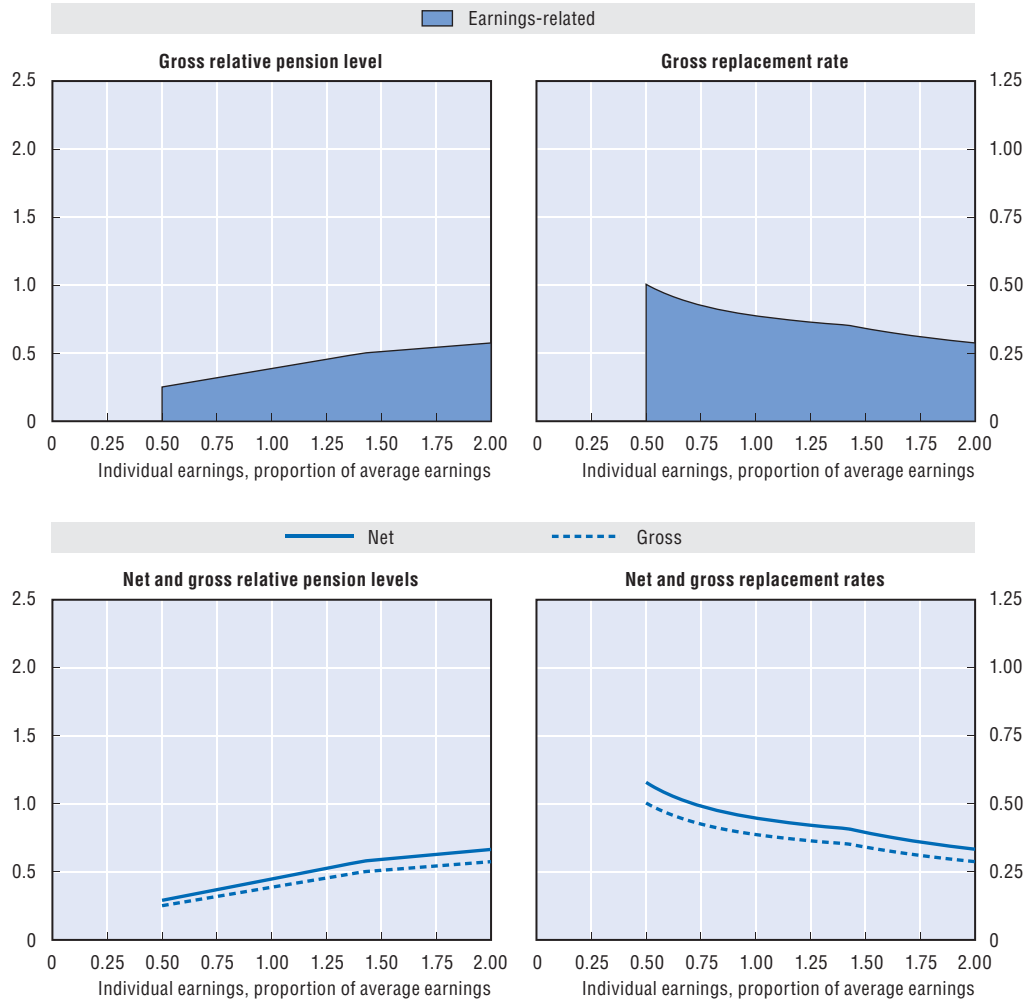
Pension modelling results: United States



Men *Women* (where different)	Median earner	Individual earnings, multiple of average				
		0.5	0.75	1	1.5	2
Gross relative pension level	34.7	25.2	31.9	38.7	51.2	57.5
(% average gross earnings)						
Net relative pension level	40.1	29.1	36.9	44.8	59.2	66.5
(% net average earnings)						
Gross replacement rate	40.8	50.3	42.6	38.7	34.1	28.8
(% individual gross earnings)						
Net replacement rate	47.1	57.9	49.2	44.8	39.5	33.3
(% individual net earnings)						
Gross pension wealth	5.8	7.2	6.1	5.5	4.9	4.1
(multiple of individual gross earnings)	*6.8*	*8.3*	*7.1*	*6.4*	*5.7*	*4.8*
Net pension wealth	5.8	7.2	6.1	5.5	4.9	4.1
(multiple of individual gross earnings)	*6.8*	*8.3*	*7.1*	*6.4*	*5.7*	*4.8*

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Pensions at a Glance 2009

RETIREMENT-INCOME SYSTEMS IN OECD COUNTRIES

Pension and retirement policies have changed dramatically in recent years, as governments have tried to balance the goals of adequate retirement incomes and the long-term financial sustainability of pension systems in the face of population ageing. *Pensions at a Glance 2009* provides a consistent framework for comparing pension policies between countries along with reliable data.

This third edition updates information on key features of pension provision in OECD countries and provides projections of retirement income for today's workers. It offers an expanded range of indicators, including measures of assets, investment performance, coverage of private pensions, public pension spending, and the demographic context and outlook.

Four special chapters provide an in-depth look at important issues in pension policy today. The first examines the implications of the present financial and economic crisis on pension systems. Which countries and which individuals are most affected? What can governments do to help and which policies should they avoid? The second looks at incomes and poverty of older people, looking at trends over the past two decades. In many countries, the position of pensioners has improved relative to the population as a whole, but there remain pockets of old-age poverty. The third updates the analysis of pension reforms in the second edition of *Pensions at a Glance*. How have pension systems changed in the period 2004-08? The final special chapter considers coverage of voluntary private pensions, extending the analysis to look at how this varies with age and earnings. It also evaluates five different policies to expand coverage.

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– Olivia Mitchell, Director of the Boettner Centre for Pensions and Retirement Research, Wharton School, University of Pennsylvania

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