

## 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 These can be means-tested, where both assets and income are taken into account, purely income-tested or withdrawn only against pension income.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](http://www.oecd.org/els/social/workincentives).

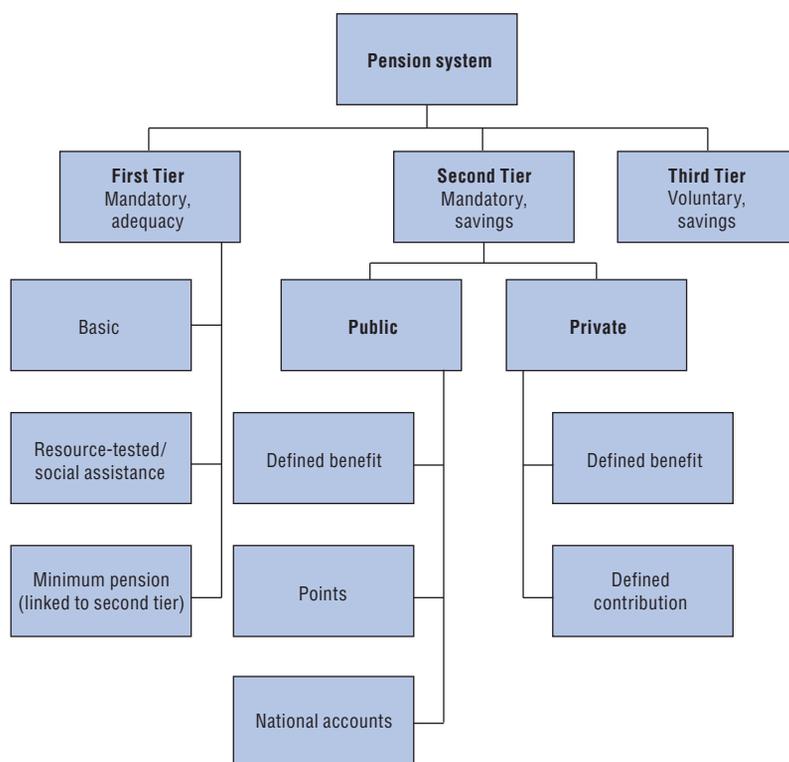
The modelling assumes that tax systems and social-security contributions remain unchanged in the future. This implicitly means that “value” parameters, such as tax allowances or contribution ceilings, are adjusted annually in line with average earnings, while “rate” parameters, such as the personal income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

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. No 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.

- 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).

## **References**

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