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OECD

2007

Online at <https://mpa.ub.uni-muenchen.de/10344/>
MPRA Paper No. 10344, posted 09 Sep 2008 00:52 UTC

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Monika Queisser, Edward Whitehouse and Peter Whiteford

ABSTRACT

This article provides a survey of selected aspects of the relationship between public and private pension provision in European countries in the Organisation for Economic Co-operation and Development and compares this with other regions of the OECD. Population ageing has led many OECD countries to undertake a wide range of pension reforms. The overall effect of these reforms has in many cases been to significantly reduce public pension promises. This, in turn, has increased the interest in the role of private pensions, which has expanded significantly in a number of OECD countries. The article discusses the extent to which a number of countries will need to further increase private provision in order to guarantee adequate future retirement incomes.

INTRODUCTION

Demographic changes pose major challenges to many OECD countries, particularly those in Europe. These developments have major implications for public policy, particularly for pension systems.¹ In order to meet these challenges, many OECD countries have already undertaken a wide range of pension reforms, including changes in benefit formulas, changing the indexation of pensions in payment, linking pensions to higher life expectancy, as well as reforms designed to increase incentives for later retirement (Whiteford and Whitehouse, 2006).

The overall effect of these reforms has, in many cases, been to significantly reduce public pension promises. This has led to increased interest in the role of private pensions. In some cases, reforms have been explicitly designed to increase private provision, while in other cases increased private pension coverage has been an indirect effect of reforms, as cuts in public pension promises have increased the need for supplementary private provision. Increasing the role of private pensions is seen by

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¹ OECD projections (taking account of pension reforms that are still being phased in) show that old-age pension spending could rise on average by 3 to 4 per cent of gross domestic product (GDP) in the period up to 2050, compared with a base of around 7.5 per cent of GDP in 2000. Population ageing could also add significantly to healthcare expenditure and increased spending on long-term care (OECD, 2005a).

some as an effective means of curtailing rising public expenditure and improving public finances, but it also raises concerns about the management of social risks as well as the future adequacy of retirement incomes. Part of the pension debate has also been concerned with the role of funding of pensions as a way of preparing for population ageing (see Barr, 2004, for a discussion).

This article provides a survey of selected aspects of the relationship between public and private pension provisions in OECD European countries and how it compares with other regions of the OECD. The section Pension Systems in OECD Countries outlines the design features of pension systems in OECD countries; the section Pension Schemes and Redistribution discusses the redistributive objectives of public pension systems; the section Comparing Public and Private- Spending on Pensions provides a range of aggregate data on the level of public and private pensions in order to identify the mix of public and private provision across Europe and other parts of the OECD; the section Pension Fund Assets provides details of the level of pension fund investments; the section Assessing the Impact of Pension Reforms looks at some of the consequences of reforms cutting pension promises and discusses the extent to which a number of countries will need to further increase private provision in order to guarantee adequate future retirement incomes. The article concludes with a summary of the main points made in the article.

PENSION SYSTEMS IN OECD COUNTRIES

Pension systems of OECD countries vary widely: in the way benefits are calculated, whether they are publicly or privately managed and the target level of benefits. In order to put private pension programmes in context, it is important to have a clear picture of the role of public pension programmes. Table 1 divides pension systems of OECD countries into two tiers, based on the role and objective of each part of the retirement-income regime.

The first tier includes redistributive components that are designed to ensure that pensioners achieve some absolute, minimum standard of living compared with the population as a whole. Second-tier programmes are defined as those with an insurance or savings role: these are designed to ensure a certain standard of living during retirement relative to the individual's earnings when in work. The table shows only the principal parts of the pension system; more detail is provided in OECD (2005b; 2007).

All OECD countries have safety nets to prevent old-age poverty, here called *first-tier* schemes. There are four generic types: social assistance; separate, targeted retirement-income programmes; basic pensions; and minimum pensions within earnings-related plans. All are mandatory and publicly provided.

The benefits of *basic* schemes are flat rate, with the same amount paid to each retiree, depending only on the number of years of work (but not on earnings). Entitlement does not vary with the level of other pension income. Ten OECD countries have a basic pension scheme that plays an important role in providing retirement incomes. *Targeted* plans, in contrast, pay a higher benefit to poorer pensioners and reduced or zero benefits to better-off retirees. There are three ways of targeting. First, benefits can be pension income-tested (where the value depends only on the level of pension income a retiree receives). Sweden's guarantee pension is an example. Second, benefits can be broader income-tested (reducing payments if, for example, a retiree has income from savings) or third, broader means-tested (reducing the pension to take account of both income and assets). Australia's old-age pension is an example of a

Table 1: Pension systems in OECD countries

	Pension scheme types	
	First tier	Second tier
Australia	Targeted	Private DC
Austria	Targeted	Public DB
Belgium	Minimum credit	Public DB
Canada	Basic + targeted	Public DB
Czech Republic	Basic	Public DB
Denmark	Basic + targeted	Public + private DC
Finland	Targeted	Public DB
France	Targeted + minimum	Public DB + points
Germany	Social assistance	Public points
Greece	Minimum	Public DB
Hungary	—	Public DB + private DC
Iceland	Targeted	Private DB
Ireland	Basic	—
Italy	Social assistance	Public notional accounts
Japan	Basic	Public DB
Korea	Basic	Public DB
Luxembourg	Basic + minimum	Public DB
Mexico	Targeted	Private DC
Netherlands	Basic	Private DB
New Zealand	Basic	—
Norway	Basic + targeted	Public points
Poland	Targeted	Public notional accounts + private DC
Portugal	Minimum	Public DB
Slovak Republic	Minimum	Public points
Spain	Minimum	Public DB
Sweden	Targeted	Public notional accounts + private DB + DC
Switzerland	Targeted	Public DB + private defined credits
Turkey	Minimum	Public DB
UK	Basic + targeted	Public DB
US	Targeted	Public DB

means-tested scheme. There are 13 OECD countries where targeted retirement-income programmes are significant.

Minimum pensions—like pension income-tested, targeted plans—aim to prevent pensions from falling below a minimum level. But the institutional set-up and eligibility conditions are different. Minimum pensions are defined here as those which form part of the rules of second-tier, earnings-related pension provision. Usually, retirees must have paid contributions for a minimum number of years in order to receive this benefit. Minimum credits in earnings-related schemes, such as those in Belgium and the UK, also belong to the first tier: benefit calculations for workers with low earnings assume the worker's earnings were higher. Finally, Germany and Italy

do not have specific, targeted programmes for older people, but general *social assistance* benefits protect poor older people.

Most countries rely on one primary instrument to prevent old-age poverty, but there are cases where there is a combination of several schemes. The average safety-net retirement benefit from all the relevant first-tier schemes is a little under 29 per cent of national average earnings (across all 30 OECD countries). The minimum pension in the Czech Republic is exceptionally low at just 12 per cent of average earnings. The basic pension in Japan, minimum pension in Mexico and the targeted scheme in the US are also on the low side (relative to national living standards), providing benefits worth one-fifth or less of average earnings. At the other end of the spectrum, Luxembourg and Portugal have minimum pensions worth well above 40 per cent of average earnings. Greece and Portugal's minimum pensions, Austria's targeted scheme and Belgium's minimum credits are also high compared with other OECD countries.

The *second tier* plays an insurance or savings role. It aims to ensure that retirees have an adequate replacement rate (retirement income relative to earnings before retirement), not just a poverty-preventing, absolute standard of living. Like the first tier, it is mandatory. However, there is a mix of public and private provision of these benefits. Among the 30 OECD countries, only Ireland and New Zealand do not have second-tier schemes, relying mainly and wholly on basic pensions for mandatory retirement-income provision.

Some 17 OECD countries have public, *defined-benefit* (DB) plans, making them the most widespread type of second-tier pension. In DB schemes, the amount a pensioner will receive depends on the number of years of contributions made throughout the working life and on some measure of individual earnings from work. *Defined-contribution* (DC) plans are the second most common kind of second tier pension. In these schemes, workers have individual accounts in which contributions are invested. The accumulated capital from contributions and investment returns is then usually converted into an income stream at retirement. These plans are typically managed privately, by financial services companies, employer-run or industry-wide pension funds. Australia and Mexico have only DC schemes in the second tier. In other countries with DC pensions—such as Hungary, Poland and Sweden—the DC schemes are a complement to public, earnings-related pension schemes.

Finally, some countries have earnings-related schemes that do not follow the 'traditional' DB model. First, there are *points* systems: French occupational plans and the German, Norwegian and Slovak public schemes. Workers earn pension points based on their individual earnings for each year of contributions. At retirement, accumulated pension points are multiplied by a pension-point value to convert them into a regular payment. Italy, Poland and Sweden have *notional-accounts* schemes, a third variant of an earnings-related plan. Contributions are recorded and they earn a notional interest rate, linked to a macroeconomic variable. At retirement, the accumulated notional capital in each account is converted to a stream of pension payments using a formula based on life expectancy at the time of retirement. Mandatory contributions to Swiss occupational plans look at first like a DC scheme because individuals and their employers must pay a contribution rate that varies with age. But the government sets the minimum rate of return that the scheme must pay and a mandatory annuity rate at which the accumulation is converted into a flow of pension payments. This makes the scheme closer to a DB plan than DC.

In addition to the differences in the way pension benefits are calculated and whether the schemes are managed publicly or privately, there are differences between OECD

countries in the target level of pension benefits that is set by the government either implicitly or explicitly. Table 2 shows the prospective replacement rate—total pension relative to individual earnings—for people entering the labour market in 2002. This indicator shows to what extent the regime preserves individual living standards as today's new workers eventually move from work into retirement.²

For each country, Table 2 shows replacement rates for people at different earnings levels: half, average and double-average earnings. The gross replacement rate at average earnings is perhaps the most familiar indicator in pension analysis. At this earnings level, the OECD average gross replacement rate is 57 per cent, with substantial variation between countries. Luxembourg is an outlier: the replacement rate for a full-career worker exceeds 100 per cent (meaning that the pension is higher than earnings before retirement were). Austria, Greece, Hungary, Italy, Spain and Turkey also promise sizeable pensions to full-career workers on average earnings: their replacement rates exceed 75 per cent. Towards the centre of the range, the replacement rate for average earners is around 50 per cent in France, Iceland, Japan, Norway and the Slovak Republic. Not surprisingly, Ireland—which has only basic and targeted pensions and no earnings-related scheme—has the lowest replacement rate. In the UK, the earnings-related public scheme does not result in a high pension: it has a low accrual rate and does not cover the first slice of earnings (up to around one-fifth of the average).

At low earnings, defined as half the average, the pension entitlements of full-career workers vary less than they do at average earnings. Again, Luxembourg has the highest pensions, offering a replacement rate above 115 per cent. But apart from Luxembourg and Turkey, a different set of countries can be categorised as having a relatively high pension promise to these low-income workers. Portugal pays a higher accrual rate to low-income workers in its public scheme and has a high safety-net income for pensioners. Sweden has a relatively high income-tested pension. Korea's redistributive public scheme—paying a pension based half on individual earnings and half on the economy-wide average—is also favourable for low-income workers.

The countries with the lowest replacement rates for low earners are those with the lowest first-tier pensions. German social assistance, Mexican and Polish minimum pensions, the minimum credit in the Slovak Republic and the means-tested scheme in the US all pay around one-fifth of average economy-wide earnings. Countries with redistributive retirement-income systems, such as Ireland and the UK, pay little to workers on average earnings but they move more towards the middle of the scale when it comes to benefits for low earners. Dutch pensions appear to be relatively low for low earners despite the fact that the basic pension, worth more than a third of average earnings, is at a relatively high level. This is because of the 'franchise', a calculation mechanism applied in the Netherlands, which cuts occupational pension entitlements by the value of the basic pension received. At half-average earnings, the occupational benefit is zero because of this rule.

Finally, at high earnings (double the average), Luxembourg is yet again an outlier, although the replacement rate at this earnings level is a little short of 100 per cent. It is followed by Greece and Italy because of the very high ceilings on pensionable

² The calculations are for a single person with a full career, working from age 20 to the normal pension age in the country, and they are based on 2002 values of parameters of the pension system assuming that all legislated changes in the rules of the system are fully in place. They use common macroeconomic and financial assumptions and include all mandatory pension benefits, as set out in Table 1.

Table 2: Gross replacement rates by earnings level, mandatory pension programmes
(% of individual pre-retirement earnings)

	Median earner	Individual earnings, multiple of mean				
		0.5	0.75	1	1.5	2
Men						
Australia	47.6	70.7	52.3	43.1	33.8	29.2
Austria	80.1	80.1	80.1	80.1	78.5	58.8
Belgium	40.6	57.3	40.9	40.4	31.3	23.5
Canada	48.6	75.4	54.4	43.9	29.6	22.2
Czech Republic	53.5	78.8	59.0	49.1	36.4	28.9
Denmark	82.4	119.6	90.4	75.8	61.3	57.1
Finland	63.4	71.3	63.4	63.4	63.4	63.4
France	51.2	63.8	51.2	51.2	46.9	44.7
Germany	39.9	39.9	39.9	39.9	39.9	30.0
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	79.1	109.9	85.8	77.5	74.4	72.9
Ireland	37.8	65.0	43.3	32.5	21.7	16.2
Italy	67.9	67.9	67.9	67.9	67.9	67.9
Japan	36.2	47.8	38.9	34.4	29.9	27.2
Korea	71.3	99.9	77.9	66.8	55.8	45.1
Luxembourg	90.0	99.8	92.1	88.3	84.5	82.5
Mexico	36.5	52.8	37.3	35.8	34.4	33.6
Netherlands	81.8	80.6	81.5	81.9	82.4	82.6
New Zealand	45.7	79.5	53.0	39.7	26.5	19.9
Norway	59.8	66.4	61.2	59.3	50.2	42.7
Poland	61.2	61.2	61.2	61.2	61.2	61.2
Portugal	54.3	70.4	54.5	54.1	53.4	52.7
Slovak Republic	56.7	56.7	56.7	56.7	56.7	56.7
Spain	81.2	81.2	81.2	81.2	81.2	67.1
Sweden	63.0	79.1	66.6	62.1	64.7	66.3
Switzerland	61.9	62.5	62.1	58.4	40.7	30.5
Turkey	72.5	72.5	72.5	72.5	72.5	72.5
UK	33.8	53.4	37.8	30.8	22.6	17.0
US	43.3	55.2	45.8	41.2	36.5	32.1
OECD	60.5	73.0	62.7	58.7	53.7	49.2
Women (where different)						
Italy	52.8	52.8	52.8	52.8	52.8	52.8
Mexico	30.4	52.8	35.2	29.7	28.5	27.9
Poland	44.5	46.2	44.5	44.5	44.5	44.5
Switzerland	62.5	62.8	62.6	59.1	41.2	30.9

Source: OECD (2007).

earnings in both countries. The other top slots are taken by the same countries that paid the highest pensions to average earners.

The countries with pure flat-rate systems—Ireland and New Zealand—are naturally the least generous to high earners, even with New Zealand's exceptionally high basic pension of nearly 40 per cent of average earnings. Canada and the UK—although they have earnings-related schemes—also provide benefits that are broadly flat-rate.

Private pensions play an important and growing role in providing for old age in OECD countries. In 11 of them—Australia, Denmark, Hungary, Iceland, Mexico, Norway, Poland, the Slovak Republic, Sweden, Switzerland and the UK—the private sector delivers part of the *mandatory* provision for income in old age. In addition, *voluntary* private pensions are important in a number of OECD countries.

Three kinds of policy have increased the role of private pensions. First, Hungary, Mexico, Poland, the Slovak Republic and Sweden have recently introduced mandatory private pensions as a substitute for part of the public pension provision. Second, Australia and Norway have added a mandate for a private pension on top of existing public plans. Finally, many countries have scaled back their public pensions, leaving a greater role for voluntary, private savings. These include—most notably—Germany and Japan.

How many people have private pensions? Unfortunately, data on coverage of private pensions can be extremely difficult to obtain and are often difficult to compare because of institutional differences in the markets for long-term savings. Table 3 draws on a number of sources, but the estimates should be regarded as preliminary.

Nearly one-half of OECD member countries (14 out of 30) have mandatory or quasi-mandatory funded pension systems. The quasi-mandatory systems of the Netherlands and Sweden are the results of, respectively, industry-wide and national collective bargaining that ensure high levels of labour market coverage (more than 90 per cent of the workforce). As for the other 16 OECD countries, where funded pension systems are voluntary, approximately one-half have medium levels of coverage (between 40 and 60 per cent of the workforce), while the other half have low levels of coverage (under 20 per cent of the workforce).

Voluntary occupational pension plans have long had broad coverage in English-speaking countries, such as Canada, Ireland, the UK and the US, where it currently reaches 40 per cent or more of employees. Belgium, Germany, Japan and Norway also achieve this degree of coverage. At the other end of the spectrum, 10 per cent or fewer workers are covered by voluntary, occupational, private pensions in Finland, France, Italy, Portugal and Spain.

Not surprisingly, mandatory personal or occupational schemes usually cover a much higher percentage of the workforce, particularly mandatory occupational schemes, where coverage exceeds 90 per cent in most countries using this approach (but 80 per cent in Denmark). Coverage of mandatory personal schemes also exceeds 90 per cent in Sweden and Denmark, but is lower in other countries (Hungary, Mexico, Poland and the Slovak Republic), possibly reflecting differences in the structure of their labour markets.

PENSION SCHEMES AND REDISTRIBUTION

The structure of and financing of pension systems have traditionally been characterised as either Bismarckian or Beveridgean. As is well known, Bismarckian social

Table 3: Coverage of private pension plans in selected OECD countries

	Coverage (%)
Mandatory personal	
Denmark	>90
Hungary	58
Mexico	31
Poland	49
Slovak Republic	45
Sweden	>90
Mandatory occupational	
Australia	>90
Denmark	>80
Iceland	>90
Norway	>90
Sweden	>90
Switzerland	>90
Voluntary occupational	
Austria	35
Belgium	40–50
Canada	39
Finland	7
France	10
Germany	57
Ireland	50
Italy	8
Japan	45
Luxembourg	20
New Zealand	20
Norway	545
Portugal	4
Spain	10
UK	43
US	47

Source: OECD, *Private Pension Statistics*; OECD, *Pensions at a Glance*.

policies are based on social insurance, with earnings-related benefits for employees and entitlement based on contribution records, and funded through employer and employee contributions. Beveridgean policies, in contrast, are characterised by universal provision with entitlement based on residence and in some cases on need, with benefits being flat-rate and financed through general taxation revenue (Bonoli, 1997).

As noted by Werding (2003), public pension schemes that follow a primarily Bismarckian tradition can be found in Austria, Belgium, Germany, Greece, Italy, Luxembourg, Portugal and Spain. Public pensions that are built on the Beveridgean

tradition exist in Ireland, the Netherlands, New Zealand and the UK. Public pensions, which, in one way or another, combine elements of both types of arrangements, are operated in Denmark, Finland, France, Sweden, Switzerland and the US.

It is also important to note the differing objectives of welfare states and the different types of redistribution that are possible. The primary objective of social security systems in most OECD countries is to provide income maintenance or insurance in the face of adverse contingencies (unemployment, disability and sickness) or to redistribute across the life cycle, either to periods when individuals have greater needs (e.g. when there are children), or would otherwise have lower incomes (such as in retirement). Barr (2001) describes this as the 'piggy-bank objective'. The second main objective of the welfare state can be described as being to take from the rich to give to the poor (what Barr calls the 'Robin Hood' motive). Targeting of benefits is usually justified as a means of achieving the 'Robin Hood' objective. The usual rationale for this approach is that it provides the most efficient means of reducing poverty, by concentrating available resources on the poor ('helping those most in need'), while minimising adverse incentive effects by limiting the overall level of spending and taxes.

In fact, all systems of social protection involve a mix of redistribution between rich and poor and life-cycle redistribution, with the mix of elements differing significantly between countries. The nature of the mix is difficult to measure because it cannot be observed in annual data on incomes or social spending. There are various ways of attempting to estimate the different forms of redistribution (Falkingham and Harding, 1995; Ståhlberg, 2007).

Table 4 provides a range of estimates of the progressivity of pension systems in OECD countries. The first three columns are derived from Disney (2004) and refer to the structure of pension systems in the mid-1990s. Column 1 shows the effective contribution rates to public pensions as a percentage of earnings. The effective contribution rate is the average rate of contributions required to finance current spending on public pensions without budgetary transfers or accumulation or decumulation of pension funds. In an actuarially fair or non-redistributive system individual pension entitlements would exactly match individual earnings. In contrast, in a redistributive system, there is little or no relationship between lifetime earnings and individual entitlements and rates of return to contributions differ significantly between generations.

It can be seen that Australia has the lowest effective contribution rate and the highest redistributive share—around 38 per cent of the effective contribution rate of roughly 15 per cent. In contrast, countries like Germany, Portugal, Luxembourg and Greece have much higher contribution rates but very limited redistribution. If the total level of contributions directed to redistribution is calculated in absolute terms, then the highest level of redistributive contributions are found in Denmark followed by New Zealand and Australia, with Ireland and the Netherlands also having relatively redistributive systems.

A number of points should be emphasised about these figures. First, as noted above, all systems contain a redistributive and an actuarial component—there are no 'pure' systems. Second, in the case of old-age pensions these figures show that redistribution across the life cycle is the dominant effect in all countries, ranging from 62 per cent to 96 per cent of contributions paid, so that on average only around 20 per cent of the effective contributions made for public pensions are used to redistribute from rich to poor. Third, there is apparently a high negative correlation between the

Table 4: Alternative measures of the redistributive profile of OECD pension systems

	1. Total effective contribution rate	2. Redistributive share	3. Actuarial share	4. Pensions as % of disposable incomes, older population, 2000	5. Concentration coefficient	6. Quintile ratio	7. Pension Gini
Australia	14.7	38	62	52.0	-14	2.55	7.3
Austria	..	..	..	63.1	17	0.43	18.9
Belgium	34.4	13	87	95.5	22	0.31	11.2
Canada	16.9	29	71	49.3	1	1.04	3.7
Czech Republic	..	..	..	81.6	5	0.80	8.7
Denmark	20.1	35	65	75.1	-9	1.60	11.1
Finland	22.5	13	87	21.7	-16	1.95	25.1
France	25.2	10	90	94.9	25	0.28	20.5
Germany	22.4	4	96	84.7	18	0.37	20.0
Greece	57.7	6	94	60.4	24	0.27	26.5
Hungary	..	..	..	78.7	11	0.56	26.9
Iceland	..	..	..	..	..	..	18.0
Ireland	15.2	36	64	51.3	-4	0.89	0.0
Italy	40.0	..	..	82.3	23	0.28	26.4
Japan	23.2	..	..	49.4	11	0.49	14.4
Korea	..	..	..	..	..	..	12.3
Luxembourg	42.1	5	95	76.8	16	0.45	22.2
							19.0
Netherlands	17.9	30	70	60.1	-1	1.03	26.9
New Zealand	20.8	31	69	69.5	-0.05	1.26	0.0
Norway	25.8	12	88	74.6	5	0.76	17.1
Poland	..	..	..	64.0	16	0.43	25.4
Portugal	35.4	5	95	69.4	30	0.23	22.1
Slovak Republic	..	..	..	..	..	..	26.5
Spain	45.0	..	..	65.6	16	0.41	22.1
Sweden	33.9	15	85	96.3	14	0.47	23.7
Switzerland	20.4	25	75	96.5	19	0.38	12.7
Turkey	..	..	..	4.8	-2	1.17	25.1
UK	23.7	20	80	52.4	2	0.89	5.1
USA	20.4	22	78	43.5	10	0.55	16.1
OECD	28.0	19	81	66.5	9	0.61	17.2

Source: Columns 1–3: Disney (2004); columns 4–6, calculated from OECD, *Income Distribution Study*; column 7 from OECD, *Pensions at a Glance*, 2007.

total level of contributions and the redistributive share (-0.72)—that is, more redistributive systems tend to be less expensive and the most costly pension systems are the least redistributive between rich and poor.

Columns 4 to 6 are estimated from income surveys for around 2000, and are based on the observed distribution of pensions to households with a head over 65 years of age. Column 4 shows the level of pensions as a percentage of household disposable income, while columns 5 and 6 show two measures of the distribution of pensions in payment. The concentration coefficient is calculated in the same way as the conventional Gini coefficient, but households are ranked according to their level of disposable income. Like the Gini coefficient, a level of 100 would imply that one person received all the pensions, while a level of zero would imply that all individuals received exactly the same level of payments. The concentration coefficient can be negative, however, implying that lower-income groups receive a higher share of pensions than richer households. The quintile ratio is a further measure of progressivity, showing the ratio of pension benefits received by the poorest 20 per cent of the older population compared to the pensions received by the richest 20 per cent.

In general terms, these columns are consistent with the estimates of Disney (2004). The countries with the most progressive systems at a point in time are the same as those with the highest redistributive share over the working life—Australia, Canada, Denmark, Finland, Ireland, the Netherlands, New Zealand, Turkey and the UK, while the countries with the least progressive systems include Austria, Belgium, France, Germany, Greece, Italy, Luxembourg and Portugal.³ Again, countries with more progressive pension systems tend to have lower levels of pensions as a percentage of disposable incomes than countries with more expensive public pension systems.

Applying a Gini coefficient, the final column shows a forward-looking measure of the progressivity of pension systems, as it is calculated on the basis of distribution of pensions to be received by persons joining the workforce in 2004. In broad terms, these results are also consistent with earlier rankings, although there are some changes for countries that have introduced significant pension reforms in recent decades.

The distribution of public pensions is important because—as will be shown later—there is a strong trade-off between the structure of public pensions and the existence and level of private pensions. In general terms, countries with Bismarckian and strongly earnings-related public pensions tend to have relatively low levels of private pension provisions, while, with some exceptions, countries with more Beveridgean and redistributive pension systems tend to have much more extensive private pension provision.⁴ Put another way, Beveridgean pension systems focus on redistribution between rich and poor, and achieve redistribution across the life-course through private pension arrangements. Bismarckian systems incorporate both forms of redistribution into the public pension system and have less space—and need—for private pension provisions. It follows that in assessing the effectiveness of pension systems in different countries, it is important to take full account of the costs and benefits of both public and private pensions.

³ The two anomalous cases are Finland and Turkey; in Finland it appears that this is because the definition of pensions in the household income surveys may not include the second pillar, while in the case of Turkey it is likely to reflect the fact that significant numbers of pensioners live with adult children and so are counted as part of households with a working-age head.

⁴ The exception is New Zealand, possibly because of the high level of generosity of the first-pillar public pension.

COMPARING PUBLIC AND PRIVATE SPENDING ON PENSIONS

Drawing a boundary between what constitutes public and private pensions raises a number of significant complexities. The distinction between public and private social protection in OECD Social Expenditure statistics (SOCX) is made on the basis of whoever controls the relevant financial flows; public institutions or private bodies. Public social expenditure is therefore defined as social spending with financial flows controlled by general government (different levels of government and social security funds), including social insurance and social assistance payments, for example.

In line with guidelines for the System of National Accounts (SNA93)⁵, however, SOCX records pensions paid to former civil servants through autonomous funds as a private spending item—for example, in Australia (partially), Canada, Denmark, Iceland, Finland, the Netherlands, Sweden and the UK.⁶ All social benefits not provided by general government are considered as ‘private’. Within the group of private social benefits, two broad categories can be further distinguished:

- **Mandatory private social expenditure:** social support stipulated by legislation but operated through the private sector, for example direct sickness payments by employers to their absent employees as legislated by public authorities, or benefits accruing from mandatory contributions to private insurance funds, including in a range of countries for private pensions.
- **Voluntary private social expenditure:** benefits accruing from privately operated programmes that involve the redistribution of resources across households and include benefits provided by NGOs, and benefits accruing from tax-advantaged individual plans and collective (often employment-related) support arrangements, such as, for example, pensions, childcare support and, in the US, employment-related health plans.

SOCX includes data on the magnitude of private social spending across the OECD, but these data should be considered as being less reliable than information on budgetary allocations for social support.

A further complication arises because governments can provide support for private social expenditure through a range of tax concessions, so that effectively the costs of provision are shared between the private and public sectors. Tax expenditures⁷ can

⁵ SNA (1993), paragraph 8.63, states: ‘. . . Social insurance schemes organized by government units for their own employees, as opposed to the working population at large, are classified as private funded schemes or unfunded schemes as appropriate and are not classified as social security schemes . . .’. In practical terms, for pension payments to former civil servants to be classified as private, these payments have to go through autonomous private funds (e.g. separate pension and/or insurance companies), for which the government does not make up the deficit on a regular basis (e.g. in practice benefit schemes which are defined contribution plans). Non-autonomous pension schemes (including pension benefits paid directly from the government budget) remain institutionally in the government sector.

⁶ Spending on civil service pensions is included in public spending, but cannot be separately identified in 14 countries (the Czech Republic, Finland, Hungary, Iceland, Italy, Luxembourg, Mexico, New Zealand, Norway, Portugal, Poland, the Slovak Republic, Switzerland and Turkey); it can be separately identified as part of public spending for 9 countries (Austria, Belgium, France, Germany, Greece, Ireland, Korea, Spain and the US); and it is counted as mandatory private spending for Australia only, and as voluntary private spending in 6 countries (Canada, Denmark, Japan, the Netherlands, Sweden and the UK).

⁷ Definitions of ‘tax expenditures’ vary across countries (OECD, 1996). In particular, there is no international agreement on what constitutes a ‘benchmark’ tax system—which can be used to identify tax expenditures. National benchmarks (the ‘normal’ structure of the tax system) against which tax expenditures are being measured vary considerably, which hampers the measurement of tax expenditures on a comparable basis across countries.

take different forms. Broadly speaking, there are two groups of such measures. One is reduced taxation on particular sources of income or types of household. For example, some cash transfers could be taxed at a zero or reduced rate. In other cases, there are special tax rebates or allowances for specific types of taxpayers, for example for persons over 65 years of age or for retirement pensioners, that can have the effect of reducing effective tax rates on public and private pensions.

The second group of tax measures with social effects concern Tax Breaks for Social Purposes (TBSPs) and are defined as: 'those reductions, exemptions, deductions or postponements of taxes, which: (i) perform the same policy function as transfer payments which, if they existed, would be classified as social expenditures; or (ii) are aimed at stimulating private provision of benefits'. TBSPs, which can be seen as replacing cash benefits, include tax credits towards dependent children. TBSPs that aim to stimulate the provision of private expenditures include favourable tax treatment of private pensions (and tax advantages towards private health insurance contributions, for example).

Information on the value of tax breaks with a social purpose can often be found in 'tax expenditure reports' as published by national authorities.⁸ Such reports generally present estimates of the revenue forgone through tax measures: that is the amount by which tax revenue is reduced because of the presence of fiscal measures. Such reports generally cover favourable tax treatment by central/federal governments, but do not include (and neither does this article) tax assistance by subnational levels of government, as for example, in Canada, Japan and the US.⁹

There are different ways of calculating the value of TBSPs (OECD, 1996). The 'revenue forgone' method is an *ex post* measure of the amount by which tax revenue is reduced because of a particular measure. Another approach is the 'outlay equivalent' method, which measures the cost of providing the same monetary benefit as the TBSP through direct spending. However, because of the relative ease of computation, most countries use the revenue forgone method and OECD results are based on that method. OECD (2007) shows that depending on the measurement technique the estimated value of the tax break can vary significantly, with the outlay equivalent method generally leading to larger estimates of the value of TBSPs than the revenue forgone method.¹⁰

Tax breaks for pensions include tax exemptions for contributions to private pensions, and tax relief for investment income of capitalised pension funds. On account

⁸ Tax expenditure reports in many countries aggregate different measures to give an overall picture of the importance of tax expenditures. Strictly speaking this can cause methodological problems, since tax expenditures (and TBSPs) are interdependent.

⁹ Comprehensive information across countries is not (yet) available, but the value of subnational TBSPs in Canada could be close to 0.6 per cent of GDP.

¹⁰ In addition, social expenditures and TBSPs can both be calculated on a cash or on an accruals basis. The former approach estimates the effect on government cash flows, the latter on the tax liabilities accruing to government in a particular period. Except for TBSPs for pensions, there is likely to be little difference between estimates calculated on these two bases. Favourable tax treatment of funded pension payments also has to account for the effect that tax treatment of current pension contributions may have on future tax payments. For example, a pension contribution in 2003 would cause a deferral of tax payments on wages in 2003 and on pension earnings on this contribution (e.g. interest, capital gains) in later years. However, in some future year, the 2003 pension contribution and accrued earnings will be paid out and taxes will be due: these receipts are included in the present-value estimate. As most countries currently publish information on tax expenditures on a cash basis, that convention has been followed here. However, in line with recent changes to reporting to the *Revenue Statistics* it is expected that estimates on the value of TBSPs on an accrual basis will become available on a cross-national basis.

Table 5: Public and private pension spending, OECD countries, 2003 (% of GDP)

	Public	Private	Total	Tax expenditures	Civil servant pensions
Australia	3.2	3.0	6.2	1.8	0.5*
Austria	12.4	0.6	13.0	0.1	3.3**
Belgium	7.0	2.3	9.3	0.1	2.5**
Canada	4.0	4.2	8.2	1.7	0.9*
Czech Republic	7.4	0.2	7.6	0.1	..
Denmark	5.3	2.2	7.5	..	1.2*
Finland	4.9	2.9	7.7	0.1	..
France	10.2	0.2	10.3	0.0	2.1**
Germany	11.1	0.7	11.8	0.8	1.5**
Greece	11.5	0.5	12.0	..	0.9**
Hungary	6.9	..	6.9	..	..
Iceland	2.4	2.4	4.7	1.0	..
Ireland	2.5	0.0	2.5	1.9	0.7**
Italy	11.3	1.3	12.6	0.0	..
Japan	7.0	3.1	10.1	0.6	1.0*
Korea	1.1	2.0	3.1	..	0.5**
Luxembourg	4.5	1.6	6.1	..	..
Mexico	1.0	..	1.0	0.1	..
Netherlands	4.7	3.2	7.9	..	0.7*
New Zealand	4.4	..	4.4	..	..
Norway	5.0	0.7	5.8	0.7	..
Poland	11.4	..	11.4	..	..
Portugal	8.6	0.1	8.7	0.1	..
Slovak Republic	6.2	0.3	6.5	0.0	..
Spain	7.6	..	7.6	0.2	0.7**
Sweden	7.4	2.0	9.4	0.0	0.6*
Switzerland	6.5	4.5	11.0	..	..
UK	5.3	4.7	10.0	1.0	2.1*
US	5.4	3.8	9.2	1.2	0.9**
OECD	6.4	1.6	8.0	0.6	

Source: Calculated from OECD Social Expenditure database, http://www.oecd.org/document/9/0,3343,en_2649_34635_38141385_1_1_1_1,00.html

*Included in private spending; **Included in public spending.

of the complexities of calculating the value of these tax reliefs that are given at various stages of what is a form of contractual savings, there is no comparable data set available on the value of tax breaks for pensions across countries. Therefore, a comprehensive analysis of Tax Breaks for Pensions is not yet possible, and estimates that are only available for a few countries should be considered as indicative rather than definitive.

Bearing in mind these caveats, Table 5 presents estimates of public and private pension spending in OECD countries in 2003. Public pension spending not only tends to be lowest outside Europe—in Korea, Mexico and Australia, in particular—but is

also low in Iceland and Ireland. Spending exceeds 10 per cent of GDP in Austria, France, Germany, Greece, Italy and Poland. Private pension spending is not only particularly high outside Europe (Australia, Canada, Japan and the US), but is also high in Finland, the Netherlands, Switzerland, and particularly the UK. As noted above, in some cases public and private pension spending appear to be substitutes—public spending is below average in the UK and the US, but when private pension spending is added in, total spending is above average in these countries.¹¹ Tax expenditures in support of pensions exceed 1 per cent of GDP in many non-European countries, including Australia, Canada and the US, but are also very high in Ireland and the UK. Finally, spending on civil service pensions—where it can be identified—is above average in Austria, Belgium, France, Germany and the UK, but is included as part of public spending in the continental European countries and as part of private social spending in the UK.

PENSION FUND ASSETS

Table 6 shows trends in the size of investments of pension funds in OECD countries between 2001 and 2005.¹² This measure covers the vast majority of occupational and personal pension arrangements for both the public and private sectors that rely on funding. Total pension funds are particularly large relative to GDP in Iceland, the Netherlands, Switzerland and the US, approaching or exceeding 100 per cent of GDP. Pension funds also exceed 50 per cent of GDP in Australia, Canada, Finland and Ireland, and 70 per cent of GDP in the UK. In contrast, pension fund investments amount to less than 10 per cent of GDP in a significant number of countries—Austria, Belgium, the Czech Republic, France, Germany, Hungary, Korea, Luxembourg, Mexico, Norway, Poland, Spain and Turkey.

In dollar terms, total investment of pension funds increased by more than 10 per cent on average in the OECD area between 2001 and 2005. Norwegian pension funds showed the strongest expansion at 66 per cent in dollar terms followed by Australia (57 per cent), Hungary (54 per cent), Poland (48 per cent), Czech Republic (36 per cent) and Iceland (31 per cent). In dollar terms, pension funds in these countries had an average growth rate ranging from 31 to 54 per cent over the period 2001–04. On the other hand, countries with more mature pension systems, like the US, UK, Japan, the Netherlands and Canada, have seen a less rapid, but still positive evolution, with growth rates ranging from 4 to 10 per cent. In between are countries like Austria,

¹¹ A further factor to bear in mind in comparisons of public spending is that in different countries pensioners and benefit recipients can be liable for very different levels of direct and indirect taxation. For example, direct taxation (including social security contributions) paid on cash transfers are close to or exceed 2 percentage points of GDP in Austria, Belgium, the Netherlands and Norway, and are nearly 3.6 per cent of GDP in Sweden and over 4 per cent in Denmark, but are less than 0.25 per cent of GDP in Australia, the Czech Republic, Japan, Korea, Mexico and the Slovak Republic. Indirect taxation levied on goods and services bought by benefit recipients is estimated to be much higher in European countries (over 3 per cent of GDP in Denmark and over 2 per cent of GDP in Austria, Belgium, Germany, Finland, France, Italy, Norway and Sweden) than in non-European OECD countries (0.3 per cent of GDP in the US, 0.6 per cent in Japan, 0.9 per cent in Canada and 1 per cent in Australia) (Adema and Ladaïque, 2005). Taking account of taxes paid on social spending also produces convergence in net effort relative to gross social spending.

¹² The main types of privately managed pension plans excluded from this measure are book reserve arrangements, which are still popular in some OECD countries such as Germany. The total size of households' benefit claims in occupational and personal pension systems in countries such as Germany is therefore substantially larger than the value of assets in funded arrangements.

Table 6: Evolution of the size of pension funds relative to GDP, 2001–05

	Total investments of pension funds (in % of GDP)				
	2001	2002	2003	2004	2005
Australia	57.7	58.1	54.4	51.4	58.0
Austria	3.9	3.9	4.2	4.5	4.7
Belgium	5.5	4.9	3.9	4.1	4.2
Canada	53.3	47.8	52.1	48.9	50.4
Czech Republic	2.3	2.8	3.1	3.6	4.1
Denmark	27.2	25.5	27.4	29.8	33.6
Finland (i)	8.2	8.0	8.3	45.3	66.1
France	3.9	6.6	7.0	6.0	5.8
Germany	3.4	3.5	3.6	3.8	3.9
Greece	—	—	—	—	—
Hungary	4.0	4.5	5.3	6.9	8.5
Iceland	84.7	85.7	99.9	108.0	123.2
Ireland (ii)	44.3	35.1	39.4	42.0	52.8
Italy	2.3	2.3	2.4	2.6	2.8
Japan (iii)	13.9	14.1	15.3	15.2	18.8
Korea	..	1.5	1.6	1.7	1.9
Luxembourg	..	..	..	0.3	0.4
Mexico	4.3	5.2	5.8	6.3	7.2
Netherlands	102.6	85.5	101.3	108.7	124.9
New Zealand	14.7	13.0	11.3	11.3	11.3
Norway	4.0	4.0	4.6	6.6	6.8
Poland	2.5	4.0	5.5	7.0	8.7
Portugal	11.5	11.5	11.8	10.6	12.9
Slovak Republic (iv)	0.0	0.0	0.0	0.0	0.6
Spain (v)	5.8	5.7	6.2	9.0	9.1
Sweden (vi)	8.2	7.6	7.7	12.4	14.5
Switzerland	104.4	96.7	103.6	108.5	117.4
Turkey	..	..	..	0.1	0.3
UK (vii)	72.5	68.9	65.1	68.8	70.1
US	96.2	84.1	96.2	99.6	98.9
OECD	86.7	75.5	84.8	87.3	87.6

Notes: (i) Data for 2004 and 2005 include the statutory pension funds. (ii) Source: Irish Association of Pension Funds. (iii) Data do not include Mutual Aid Trusts; 2004; 2005 data are estimates. (iv) 2004 pension assets data is 2003. (v) Data for 2004 and 2005 include Mutual Funds. (vi) Includes assets from the premium pension system for 2004 and 2005; 2005 data are estimates. (vii) 2005 pension assets data is staff estimates; 2002 pension assets data is 2001.

Source: OECD, *Global Pension Statistics*.

Denmark, Ireland, Germany, Korea, Mexico, New Zealand and Portugal that have exhibited an average growth rate between 13 and 19 per cent.

A number of countries also have funds for part of their public social security systems. Social security reserve funds experienced substantial growth in the few

OECD countries for which information is currently available, raising the volume of assets managed by all retirement-linked institutional investors.

The emergence of funding gaps and changes in the regulatory and accounting frameworks are driving pension funds to find better ways to manage risks. The result has been increasing asset diversity within portfolios, with growing allocations into bonds in those countries with high equity investments and a general shift towards alternative investments. This diversification occurs especially in those countries where pension funds exhibit high ratios of total pension fund investments to GDP like Switzerland, Iceland, the Netherlands, the US and the UK. Questions remain, however, as to the extent of home bias in investment strategies. Investment limits and currency matching requirements also account for the relatively low investment abroad in some countries, though, in a few cases, these rules are being relaxed.

The allocation by investment vehicles varies widely across both OECD countries (see Table 7). In the majority of countries, bills and bonds rank first in asset allocation ranging from 50 to 60 per cent in Denmark, Finland, Norway, Poland and Spain, and from 72 to 97 per cent in Austria, Czech Republic, Hungary, Korea, Mexico and Turkey. In three countries, equities ranked first with more than one-third of all investments: the Netherlands, the UK and the US. In Belgium and Canada, mutual fund shares are predominant in the asset structure, accounting respectively for 75.2 and 36.7 per cent of all investments.

In most OECD countries, cash and deposits, loans and real estate (lands and buildings) only account for relatively small amounts of assets, although some exceptions exist. Real estate, for example, is a significant component of pension fund portfolios in Finland, Italy, Portugal and Switzerland (about 10 per cent of total assets).

The impact of adverse stock market performance on pension fund assets has been felt strongly in countries like the UK and Ireland, where occupational pension plans are heavily exposed to equities. On average, pension funds in these countries targeted over 60 percent of plan assets in equities, an even greater exposure than US pension funds. This exposure, however, may be partial in the UK with the introduction of the Pension Protection Fund (PPF)—an agency with responsibilities similar to those of the Pension Benefit Guarantee Corporation (PBGC) in the US—to help guard against insolvency of pension schemes there. The PPF will charge a risk-based levy, which, among other factors, may take into account the asset allocation of the pension fund. However, the details of the risk-based levy have not been announced yet.

It is nonetheless expected that pension funds will seek to reduce their equity exposures in European countries that started implementing the International Accounting Standard 'IAS19' in 2005. Like the UK's 'FRS17' accounting standard, IAS19 requires pension fund liabilities to be measured with discount rates based on corporate bond yields. In order to minimise the volatility on their sponsors' balance sheets, pension funds are increasing their exposure to bonds and using interest swaps and other derivative instruments to better match the valuations of their assets and liabilities.

For example, the increased funding required for US plans over the next several years may have a noticeable impact on asset allocation. A recent PBGC report estimated that, as of September 2005, pension underfunding in US pension plans was more than US\$450 billion. Pension funds may be taking on new risks on their investment portfolios in order to minimise the financial cost to sponsors of closing this funding gap. The recent move to increase allocations to alternative investments,

Table 7: Structure of assets of autonomous pension funds in selected OECD countries, 2005 (in % of total assets)

	Cash and deposits	Bills and bonds	Of which: bills and bonds issued by public administration	Of which: bonds issued by the private sector	Loans	Shares	Land and buildings	Mutual funds (CIS)	Unallocated insurance contracts	Private investment funds	Other investments
Australia	2.3	—	..	..	7.0	21.7	1.2	65.9	—	—	1.9
Austria	3.6	54.5	74.7	25.3	0.8	36.5	1.3	..	..	..	3.2
Belgium	2.5	6.7	60.2	39.8	0.3	9.8	1.1	74.9	1.2	..	3.5
Canada	4.3	22.5	78.9	21.1	0.6	25.8	3.3	39.8	—	..	3.7
Czech Republic	—	82.4	73.2	26.8	—	—	0.6	—	..	..	17.0
Denmark (i)	0.7	50.3	52.9	46.9	—	25.9	1.7	11.2	—	..	10.2
Finland	—	45.7	100.0	—	5.2	41.3	7.7	..	..	..	0.1
France	1.6	63.4	..	..	1.2	5.3	3.1	25.8	..	..	0.3
Germany (ii)	3.3	30.7	4.3	95.7	27.3	34.5	3.4	—	—	0.6	0.2
Hungary (iii)	1.4	75.5	98.2	1.8	—	7.8	0.2	9.0	—	—	6.1
Iceland	1.7	49.9	53.9	46.1	8.7	34.5	0.1	1.8	—	..	3.3
Italy (iv)	4.7	36.5	79.2	20.8	—	9.9	7.8	11.3	23.9	—	5.9
Korea	8.0	78.9	35.5	64.5	10.9	0.7	—	0.1	—	—	1.3
Luxembourg	6.8	33.2	—	—	—	10.6	—	—	—	45.8	3.6
Mexico	—	94.8	88.4	11.6	—	1.3	—	—	—	—	2.2
Netherlands	2.5	38.3	8.5	91.5	3.4	49.8	3.7	—	—	—	2.3
Norway	4.9	55.4	40.7	59.3	1.9	28.9	4.6	..	..	..	4.3
Poland	4.1	63.4	98.2	1.8	—	32.0	—	—	—	—	0.4
Portugal (v)	10.0	40.5	61.9	38.1	—	21.1	8.1	22.1	—	—	-1.9
Spain	7.3	60.2	30.3	69.7	1.0	15.2	3.2	9.0	—	—	2.4
Switzerland (vi)	7.9	25.6	..	..	6.3	16.9	9.6	30.2	—	3.0	0.6
Turkey (vii)	—	80.5	100.0	—	—	11.6	—	—	—	—	7.6
UK (viii)	2.2	20.2	63.8	36.2	0.5	40.1	3.8	18.0	8.5	..	6.6
US (ix)	4.8	14.7	59.7	40.3	0.7	41.3	0.7	23.5	5.2	..	9.1

Notes: Totals may not add up due to rounding or to negligible value. (i) Other investments include value of buildings (not for investment purpose); accounts receivable, provisions for liabilities covered by reinsurance, as well as accrued income and deferred expenses. (ii) Private investment funds: of which 82.3 hedge funds and 17.7 private equity funds. (iii) Other investments include mortgage bonds. (iv) Other investments include assets of affiliated companies (with a 100 per cent holding) holding land and buildings. (v) Other investments include short-term payable and receivable accounts. (vi) Data are estimates; private investment funds: of which 80.3 hedge funds and 19.7 private equity funds. (vii) Other investments include 'reverse repo' investments. (viii) 2004 data. (ix) Other investments include security repurchase agreements, commercial paper, payments receivable and other miscellaneous investments. Source: OECD, *Global Pension Statistics*.

including hedge funds and private equity funds, is partly driven by this need to generate exceptional returns to investments.

In the pension fund industry, revenue is primarily composed of contributions, profits on the sale of investments, and dividends and interest. Pension fund expenditures consist primarily of pension payments and losses on the sale of investments. The more mature a pension fund system is, the more likely it will incur negative cash flows. Periods of adverse market performance such as those experienced during 2001–02 also led to large negative cash flows. Cash flow varies considerably from year to year, partially because of accounting practices, but primarily because of profits or losses from the buying and selling of stocks.

Most pension funds' positive cash flow came from contributions and other forms of investment income, such as interest and dividends.

Cash flows should increase at a more rapid rate over the next few years when members of the baby-boom generation start to retire in large numbers. However, growth rates vary significantly across countries, ranging from 18 per cent to 130 per cent over 2001–04. Pension contributions are expected to rise further across all types of schemes, most particularly DB ones, as increases in contributions are required to help reduce plan deficits. Substantial growth in contributions should also come from the establishment of new DC plans.

There are also wide differences across OECD countries in the split between employer and employee contributions. Countries in which employees make the largest part of contributions include Hungary (83 per cent of total), Spain (76 per cent of total) and Italy (62 per cent of total). This contrasts with countries like Portugal and Norway where, respectively, only 5 and 9 per cent of contributions are paid by employees. There is also a trend towards a smaller share of employee contributions in recent years, driven in part by employers' efforts to reduce funding gaps in DB plans.

In terms of the global public–private mix, it is worth noting that private pension funds could be expected to become even more significant in a number of world regions. For example, in Eastern Europe, many non-OECD countries have introduced pension funds during the last five years, including Bulgaria, Croatia, Estonia, Latvia, Lithuania, Macedonia, Russia, Slovenia and Ukraine. The funded pension system is mandatory for new entrants to the labour force in all these countries except Lithuania. While assets under management in non-OECD Eastern European countries represented less than 3 per cent of the region's GDP in 2004, it is expected that they will grow rapidly over the coming years as a result of the mandate to save. Similarly, Asian countries face the most significant demographic changes in the world. The average old-age dependency ratio is expected to triple in Asia from 10 per cent today to 24 per cent by 2050, with some countries facing dependency ratios of nearly 70 per cent. With a view to addressing the impending problem that will occur from population ageing, most countries in the region have started to implement measures to increase pension coverage and to provide adequate replacement rates. In particular, both China and India will experience rapid growth in DC pension arrangements now that the legislation for these plans has been put in place.¹³

¹³ As a first laboratory in structural pension reform, Latin America has accumulated a large pool of pension fund savings. Total assets under management by Latin American pension funds amounted to US\$146.5 billion in 2004, only 0.9 per cent of the OECD total, but 32.1 per cent of the region's GDP.

ASSESSING THE IMPACT OF PENSION REFORMS

As noted in the introduction, most OECD countries have substantially changed their retirement-income systems in the last 25 years. In some cases, there has been a single, ‘big-bang’ pension reform, but in others, changes have been regular and incremental. The main, although not sole, motivation for reform has been to preserve the financial sustainability of public pension systems. Cuts in future public pension benefits are one of the main ways that governments have improved affordability of pension systems. For obvious political reasons, these changes have often exploited the complexity of pensions to reduce future benefits in less-than-transparent ways. However, governments have often recognised that across-the-board benefit cuts might increase the risk of inadequate income in retirement and a resurgence of old-age poverty. As a result, reforms have often aimed to target public pension spending on low-income older people and to encourage middle and high earners to take out voluntary, private pensions.

To what extent do the reforms described above risk compromising the insurance goal to provide an adequate pension relative to the pre-retirement earnings of each individual? This can best be assessed by looking at the net replacement rate because this measure indicates how much disposable income individuals have after paying taxes and any social security contribution on their pensions. Looking across the OECD, on average, a worker on average earnings can expect a net replacement rate of just under 70 per cent—in other words, his or her pension income after tax will be around 30 per cent less than *individual* net annual earnings over their lifetime. High-income workers (earning twice the average) will receive less than 60 per cent. Even the least generous of the countries with DB, earnings-related systems (Korea, the UK and the US) pay a net replacement rate of around 50 per cent at average earnings. If, as seems likely, this level of payment represents the lower bound of acceptable replacement rates through mandatory systems, the scope for further cuts in pension entitlements seems limited, particularly for low-income workers. Unless countries become willing to abandon earnings-related pensions altogether and move to a flat-rate benefit for the elderly—as in Ireland and New Zealand—these levels probably represent the lower limits of benefit reductions in countries with earnings-related pension systems. Even though the average OECD low-income worker (on half-average earnings) will receive a net replacement rate of about 85 per cent, pensions for low-income workers are very low in some countries when expressed relative to *economy-wide* earnings. In Mexico, the Slovak Republic and the US, for example, pension benefits can be worth 20 per cent or less of average economy-wide earnings. In Germany and Poland, pensions for low-income, full-career workers are worth less than a quarter of average economy-wide earnings. Such low levels of old-age pensions relative to the general living standard of each country warn of the risks of higher old-age poverty in the future. While some countries still need to cut back on pension entitlements, they also need to maintain safety nets for poor pensioners; in other countries, where pensions are now tightly linked to previous earnings, safety-net elements appear inadequate.

Cuts in public pension entitlements require individuals to step up their own efforts to provide for their retirement income. This increases the role of the private sector in financing old-age pensions, in the form of both employer-based occupational pensions and personal pension savings. However, it also shifts risks from governments and firms towards individuals, who have less capacity to hedge against these risks, and whose degree of aversion to risk increases with age.

The shift towards greater individual responsibility in the financing of retirement income has occurred through either explicit provisions embodied in reforms of public pension systems, or as individuals adapt to these reforms with the aim of making up for cuts in public pensions. Such a shift can be expected to be especially strong among those in middle and higher-income groups. OECD calculations of prospective pension entitlements show that, under existing rules, middle- and higher-income workers should anticipate substantial falls in their standard of living unless they make additional savings to supplement their retirement income. These reforms have changed the risk confronting individuals in various ways. Pre-reform systems generally provided a high degree of old-age insurance: full benefits were provided under generous conditions and were not tightly linked to earnings over an individual's career. As a consequence, in most OECD countries, even individuals with short or interrupted contribution records and low earnings could expect pension benefits that largely exceeded poverty thresholds. This is no longer the case. Pension benefits are more closely aligned to lifetime earnings, shifting the risks of interrupted contributions towards individual workers. This transfer has been complete in countries that have moved towards notional DC systems, where the individual bears all the risks of higher longevity and of shorter contribution periods. Risks have also been transferred towards individual contributors by parametric changes in public pension systems that blur the distinction between DB and DC schemes; this has shifted the insurance goals of such schemes towards safety-net programmes.

In the following, we investigate the challenge of funding adequate pension provision, focusing in particular on a group of 11 OECD countries that face a relatively large pensions gap. The case of Mexico is excluded here because the Mexican pension system is already based on private retirement savings accounts; the large informal sector and, consequently, low pension coverage, as well as the guarantee that benefits from the new system will not fall below the level of those provided by the old DB system make Mexico a special case. In countries with relatively small public pensions, individuals will need to make extra, voluntary, private savings to ensure that their living standards do not decline sharply as they move into retirement. Figure 1 shows the replacement rate—pension in retirement relative to gross earnings when working—for average earners in OECD countries. The projected gross replacement rate for the average earner with a full career ranges from 31 per cent of individual earnings in the UK to 96 per cent in Greece. The 11 countries at the bottom of the chart (except Mexico), which have below-average mandatory replacement rates, are highlighted in dark grey. What level of voluntary, private pension savings would be needed to deliver an overall gross replacement rate in these countries that equalled the OECD average? This is obviously an arbitrary target but it is useful to set a benchmark relative to all OECD countries, including those with mainly mandatory retirement provision.

The difference between the national mandatory replacement rate and the OECD average is here called the 'pensions gap'. Along with all six of the mainly English-speaking members of the OECD—Australia, Canada, Ireland, New Zealand, the UK and the US—mandatory gross replacement rates are below the OECD average in four continental European countries—Belgium, the Czech Republic, France and Germany—and in Japan. In the UK, private pension savings would need to deliver an increase in the gross replacement rate of 28 percentage points to bring the overall pension up to the level of the OECD average. France has the smallest retirement-savings gap of the 11 countries analysed: 7.5 per cent.

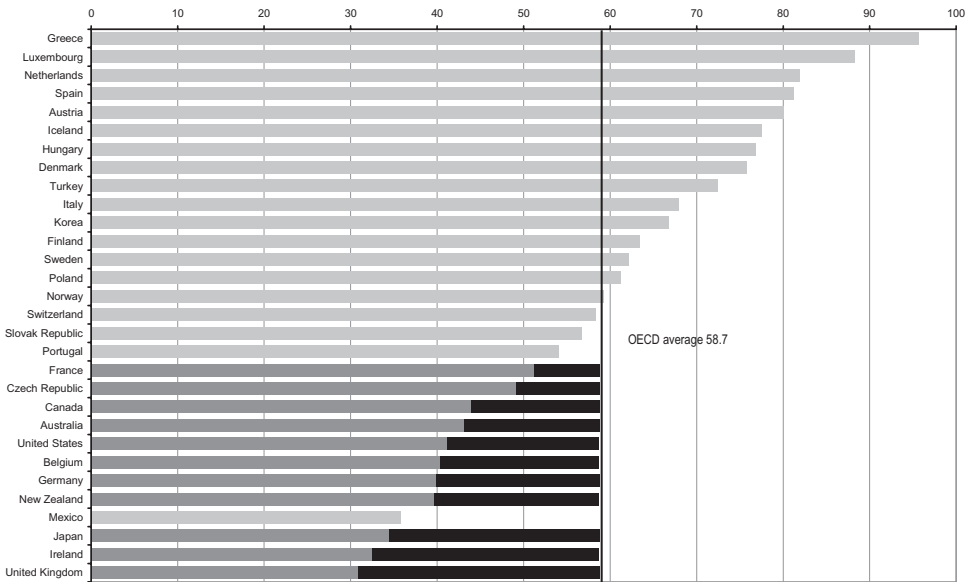


Figure 1: The pensions gap (gross replacement rate for an average earner from mandatory pension schemes and difference from OECD average replacement rate)

Source: OECD, *Pensions at a Glance*.

The savings effort required to fill the pensions gap obviously varies with the size of the gap: contributions would need to be larger in the UK than in France, for example. But it also depends on how long the pension is likely to be paid as well as the value of the pension. Life expectancy in France and Japan is much higher than it is in the Czech Republic. The length of time over which the pension is paid also depends on the age of retirement. The normal pension age is 65 in eight of the countries, but is 60 in France, 62 in Hungary and 67 in the US. The normal pension age also affects the duration over which contributions are made. On the baseline assumption of labour-market entry at age 20, individuals who contribute for a full career will pay into their pension funds for between 40 and 47 years, although in most cases, this will be for 45 years. Taking account of all these factors—differences in pension age, life expectancy and the pension gap—it is possible to calculate the percentage of earnings that individuals would need to contribute to achieve an overall—mandatory plus voluntary—replacement rate equal to the OECD average. The results are shown in Figure 2.

The UK has the largest replacement-rate gap and the highest required contribution rate. Japan's replacement-rate gap is four percentage points lower than in the UK but life expectancy is longer. The required contribution rate in Japan is 6.7 per cent compared with 6.9 per cent in the UK. France has the smallest replacement-rate gap, but normal retirement age of 60 and life expectancy above the OECD average together increase the required contribution rate compared with countries with normal retirement at 65 or more. The required contribution rate is 2.6 per cent in France and the Czech Republic.

But what are the factors that shape savings behaviour and, consequently, the required contribution rates in different countries? First, there is some evidence that

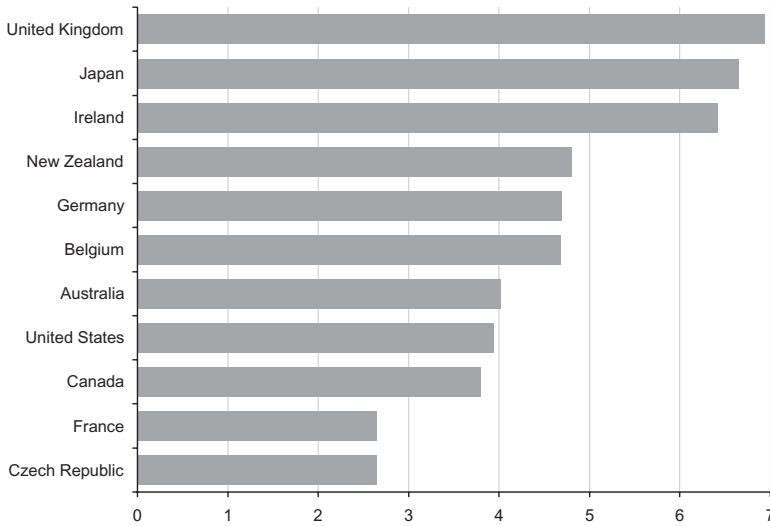


Figure 2: Filling the pensions gap (contribution rate required for full-career average earner to reach OECD average pension)

Note: Assumes a real rate of return on investments of 3.5 per cent per year.

Source: OECD, *Pensions at a Glance*.

individuals respond to lower replacement rates from mandatory pensions by making voluntary, private provision for retirement. Figure 3 compares coverage of voluntary private pensions with the size of the mandatory (public and private) replacement rate. There are two clear clusters of countries. One cluster includes mainly not only Southern European countries—Greece, Italy, Portugal, Spain and Turkey—but also Finland and Poland. These countries combine very low voluntary private pension coverage (less than 10 per cent) with relatively high mandatory replacement rates for average earners (measured on a prospective basis). A second cluster consists of eight countries that combine much lower mandatory gross replacement rates with relatively high voluntary private pension coverage. Unsurprisingly, half of this group are from the mainly English-speaking countries—Canada, Ireland, the UK and the US. However, Belgium, the Czech Republic, Germany and Japan show a similar relationship between private pension coverage and the scale of the mandatory pension system.

Second, the number of years over which people contribute to voluntary private pensions affects the contribution rate required to fill the pensions gap—that is, to deliver an overall—mandatory plus voluntary—replacement rate that equals the OECD average mandatory replacement rate. The left-hand side of Figure 4 shows the required contribution rate with a full contribution history—from age 20 to national normal pension age. The next entry on the chart shows the situation with five years missing from the contribution history, that is assuming people delay in starting their private pension until age 25. With 10 missing years—at the centre of the chart—the required contribution rate in the UK increases to nearly 10 per cent, compared with 7 per cent with a full career. With 20 missing years, contributions need to be nearly 15 per cent to plug the retirement-savings gap. In Ireland and Japan, the necessary contribution rates are a little below the rates for the UK. In Belgium, Germany and

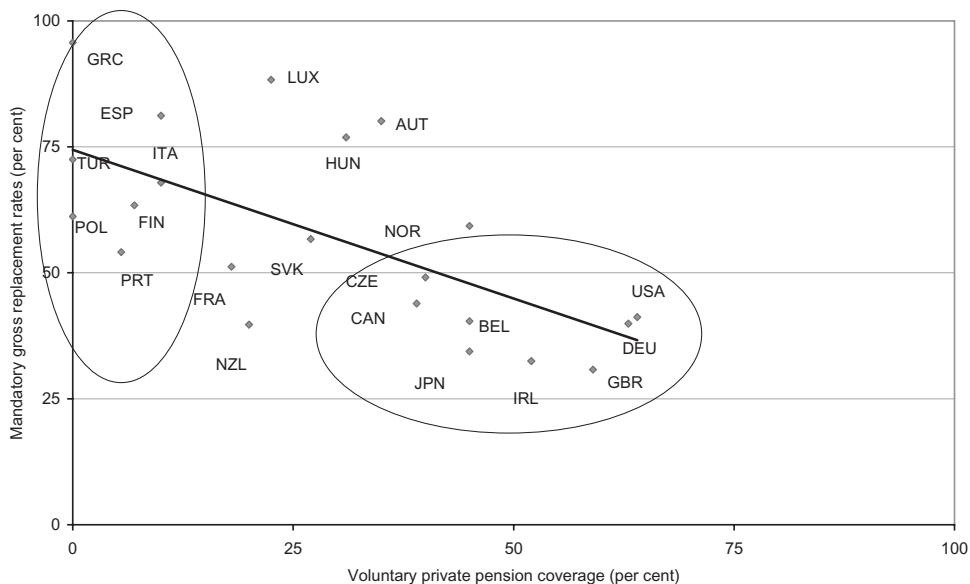


Figure 3: Projected mandatory pension and coverage of voluntary private pensions
Source: OECD, *Pensions at a Glance*.

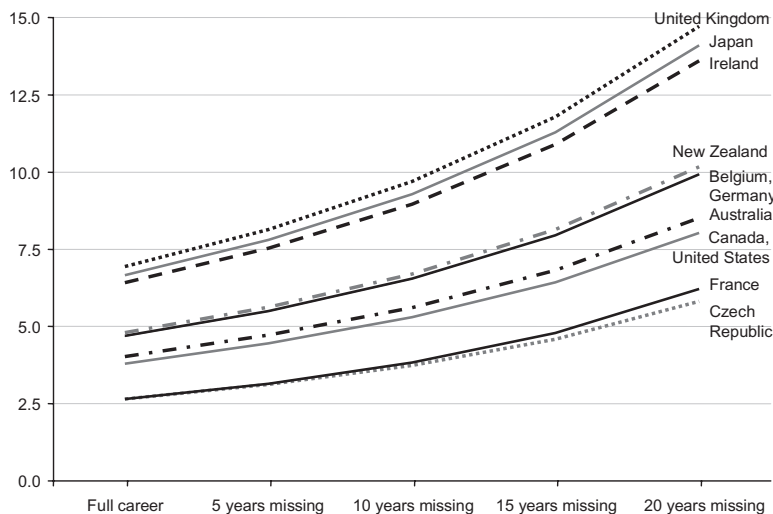


Figure 4: Years of contributions and the pensions gap (contribution rate needed to reach OECD average replacement rate by years of contributions)
Source: OECD, *Pensions at a Glance*.

New Zealand, the required contribution rate is around 4.6 per cent for a full career, 6.7 per cent with 10 missing years and 10 per cent with 20 missing years.

Third, the value of DC pensions during retirement depends crucially on the rate of return on investments as well as on the amount contributed. The baseline assumption

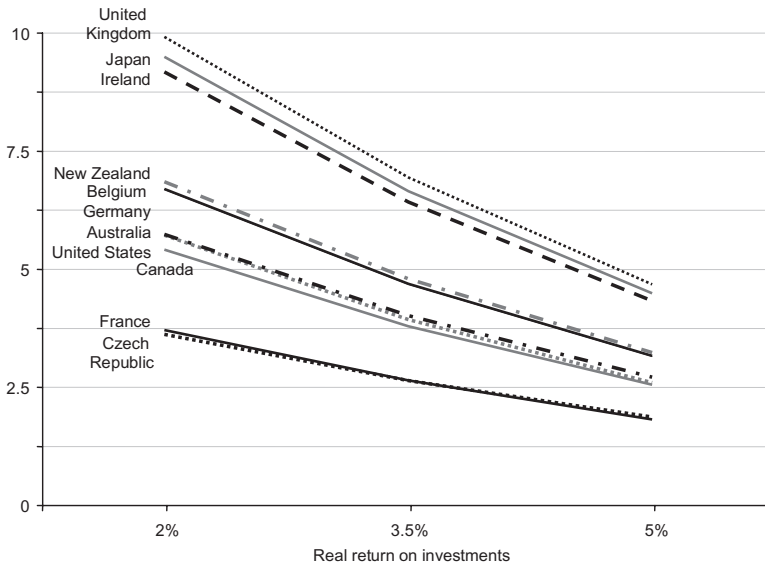


Figure 5: Rate of return on investments and the pensions gap (contribution rate needed to reach OECD average replacement rate by return on investments)

Source: OECD Pensions at a Glance.

in the preceding analysis is a 3.5 per cent real annual return. What happens when rates of return differ from this assumption?

Figure 5 shows how varying the real rate of return affects the contribution rate required to fill the pension savings gap. Ireland, Japan and the UK have the largest retirement-savings gaps, averaging 6.7 per cent on the baseline assumptions. However, a lower rate of return would naturally mean that individuals would need to contribute more. To fill the retirement-savings gap in these three countries would need a 9.5 per cent contribution rate if real returns were only 2 per cent. In contrast, higher returns would offset some of the requirement to contribute to the private pension plan, lowering the necessary contribution rate to only 4.5 per cent. At the other end of the scale, the contribution rates required in the Czech Republic and France would be 3.7 per cent with low returns, 2.6 per cent at the baseline and 1.8 per cent with high returns.

CONCLUSIONS

This article has provided a broad overview of the relative roles of public and private pension provisions in OECD countries. A number of conclusions can be highlighted.

There are extremely wide variations across OECD countries in the role of public and private pensions. In many OECD European countries, public pensions are based on Bismarckian principles, with high levels of public spending associated with pension formulae that concentrate on high levels of income replacement. In contrast, in systems adopting the Beveridge approach, public spending tends to be much lower, and the benefit formulae are much more progressive. However, in countries with Beveridgean pension systems, private provision tends to be much more significant, with much higher levels of private pension coverage, and pension investments being

much more significant as a percentage of GDP. As noted above, this implies that countries with Beveridgean systems tend to provide for poverty alleviation through their public pension systems and redistribution across the life course through private systems. Countries with Bismarckian systems tend to combine both these objectives within their public pension systems. It is therefore crucial to consider the combined impact of public and private pensions.

Having made these points, it should be emphasised that it is not straightforward to identify the boundaries between public and private provision. To varying degrees, OECD countries provide public support for private pensions through the tax system, and the cost of this support is greatest in countries with high levels of private pension provisions. On the other hand, many countries with apparently high levels of public pension spending also ‘claw-back’ a lot of this support through direct and indirect taxes on benefits. A further complicating factor is that in some countries, civil service pensions are included as part of public spending and in others as part of private spending, depending on the administrative arrangements for these pensions. In other countries, civil service pensions cannot be separately identified in available data.

The evidence also suggests that the role of private pensions has expanded significantly in a number of OECD countries, and it looks likely to expand further in coming years. As part of a range of pension reforms, many countries have put the financing of their public pension systems on a sounder basis in recent years, but there are concerns in some countries about the future adequacy of retirement pensions. In around a dozen OECD countries the target replacement rate from the mandatory (usually public) pension system is relatively low, leaving a large ‘space’ for voluntary, private pension provision. In most of these countries, coverage of private pensions is broad. Around one-half of employees contribute to private pensions (on the best available evidence).

Data on average contribution rates are even more difficult to obtain than information on coverage. Preliminary evidence shows average (mean) contribution rates for those covered of 8.5 per cent in Canada, around 9 per cent in the UK and the US and 10 per cent in Ireland. These contribution rates would be sufficient to fill the pensions gap, but only if people contribute for most of their working lives at these rates.

A related concern for policy makers arises because private pension coverage data are a ‘snapshot’ whereas lifetime coverage and contributions determine individuals’ retirement incomes. It is often not possible, for example, to know whether snapshot coverage of 50 per cent implies that half the workforce contributes for every year of their working lives or the whole workforce contributes for half of their working lives. The implications for pension policy are very different if the target is to get more people to contribute or to get the same people to contribute for more of their careers.

The ‘traditional’ way of encouraging voluntary savings for retirement has been through tax incentives. However, these can be expensive and there is strong evidence that they are inefficient, in that much of the saving would have happened anyway without the incentive; tax incentives tend to be worth more to higher earners, for example. Moreover, voluntary private pension coverage does not reach much over 50 per cent of the workforce in any OECD country. From the international experience, mandating private pensions appears to be the only way to have private pensions that cover significantly more than half the working-age population. But mandatory coverage also has its problems. People may resent being ‘forced’ to save for retirement and may have good reasons not to: for example, because they are poor, their jobs are insecure or they have other reasons to save.

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