

Key results

Although private pension funds in OECD countries have, on average, now recovered all of the pre-crisis losses the markets are still volatile and negative growth is still not uncommon. However, it is important to bear in mind that private pensions are only a part of the overall retirement-income package: a major part of retirement income is generally not affected by investment risk. In some countries, means-tested pensions protect low-income workers from much investment risk and the tax system can also act as an “automatic stabiliser” of retirement incomes.

Measuring investment risk

The scale of investment risk has been analysed using historical data for eight OECD countries: Canada, France, Germany, Italy, Japan, Sweden, the United Kingdom and the United States. Detailed econometric results were then used to simulate a distribution of outcomes and probabilities for a 40-year investment horizon. The two main assets in pension-fund portfolios were analysed: equities and government bonds. The results for a portfolio split equally between these two assets are shown in the table below.

The degree of investment risk: Implications for pensions

Distribution of returns, percentile point	10%	25%	50%	75%	90%
Annual real return	2.5%	3.3%	4.3%	5.3%	6.0%
Replacement rate	26.9%	31.9%	39.9%	50.5%	60.0%

The table above shows that 50% of the time, investment returns will be higher or lower than 4.3% a year in real terms. This is higher than the baseline assumption of 3.5% of this report. Some 10% of the time, the real return is expected to be less than 2.5% or more than 6.0%. The table shows that these returns generate a large range of replacement rates, ranging from 27% in the worst cases to 60% in the best.

Investment risk in practice

The table shows gross and net replacement rates with low, middle and high returns: the 10th, 50th and 90th percentile of the distribution of returns respectively. On the left-hand side of the table there are ten countries where defined-contribution plans are mandatory. The nine countries on the right-hand side have broad coverage of voluntary private plans (see the indicator of “Coverage of private pensions” in Chapter 8).

The way investment risk affects retirement incomes depends crucially on the structure of the retirement-income package. First, many benefits – from

public earnings-related schemes or basic pensions – are unaffected by investment returns. In the Slovak Republic, for example, the defined-contribution pension in the best scenario is worth 2.6 times its value in the worst (also see figure). However, the overall benefit varies only by a factor of 1.6 times.

Secondly, means-tested benefits can offset some of the investment risk: a smaller defined-contribution pension results in higher benefits from targeted programmes. In Australia, for example, the defined-contribution pension is 2.4 times higher in the best rather than worst scenario for returns. Overall income, including means-tested benefit, varies by a factor of just 1.5. Means-tested benefits also play an important role on investment risk in Denmark.

The final stabiliser of retirement incomes in the face of investment risk is the tax system. Because marginal tax rates are generally higher than average rates (i.e. personal income taxes are progressive), a fall in income from defined-contribution pensions results in a more than proportionate reduction in tax liability. The effect is strongest in Denmark. Before taxes, the ratio of total pension in the best and worst cases is 1.7 compared with 1.6 after taxes are taken into account. The impact of taxes is also noticeable in Poland, but pensions in the Slovak Republic are not taxed and so there is no automatic stabiliser of retirement incomes.

Further reading


D’Addio, A.C., J. Seisdedos and E.R. Whitehouse (2009), “Investment Risk and Pensions: Measuring Uncertainty in Returns”, *OECD Social, Employment and Migration Working Papers*, No. 70, OECD Publishing, <http://dx.doi.org/10.1787/224016838064>.

Whitehouse, E.R., A.C. D’Addio and A.P. Reilly (2009), “Investment Risk and Pensions: Impact on Individual Retirement Incomes and Government Budgets”, *OECD Social, Employment and Migration Working Papers*, No. 87, OECD Publishing, <http://dx.doi.org/10.1787/224005547774>.

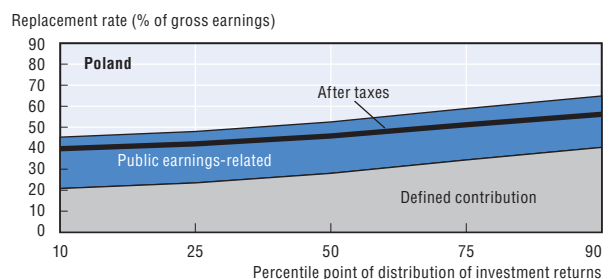
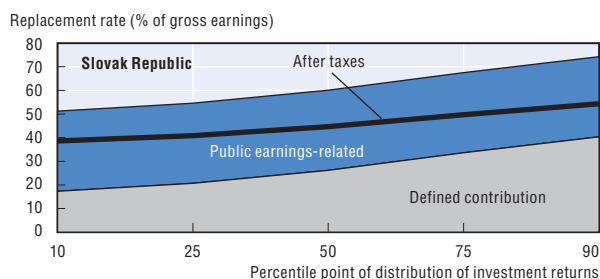
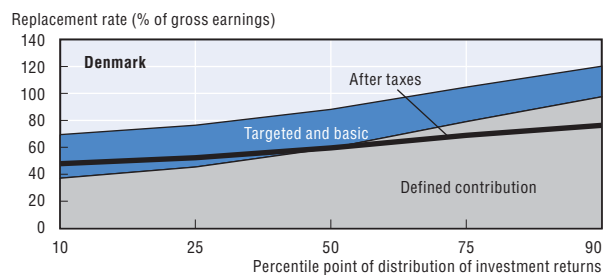
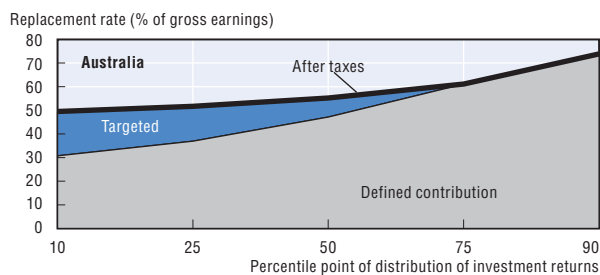
4.11. Gross and net pension replacement rates with different rates of investment return

Mandatory or quasi-mandatory defined contribution plans						Voluntary or mainly voluntary defined contribution									
		Gross replacement rate (%)			Net replacement rate (%)					Gross replacement rate (%)			Net replacement rate (%)		
Percentile of rate of return		10	50	90	10	50	90	Percentile of rate of return		10	50	90	10	50	90
Annual real return (%)		2.5	4.3	6.0	2.5	4.3	6.0	Annual real return (%)		2.5	4.3	6.0	2.5	4.3	6.0
Australia	DC	30.7	47.1	73.9	39.8	61.0	95.6	Belgium	DC	11.9	18.6	29.7	15.1	22.4	34.3
	Other	18.8	8.1	0.0	24.3	10.4	0.0		Other	41.0	41.0	41.0	52.0	49.5	47.3
	Total	49.5	55.2	73.9	64.1	71.5	95.6		Total	52.9	59.6	70.8	67.1	71.9	81.6
Chile	DC	29.1	45.7	73.4	36.4	55.6	82.1	Canada	DC	26.3	42.1	69.0	34.0	54.4	89.2
	Other	7.1	2.3	0.0	8.9	2.8	0.0		Other	39.2	39.2	39.2	50.6	50.6	50.6
	Total	36.2	48.0	73.4	45.3	58.3	82.1		Total	65.5	81.3	108.2	84.6	105.0	139.8
Denmark	DC	37.2	59.5	97.5	37.1	58.1	89.4	Czech Republic	DC	30.1	49.2	82.7	35.5	56.6	92.6
	Other	32.3	28.7	22.6	32.2	28.1	20.8		Other	43.5	43.5	43.5	51.4	50.1	48.8
	Total	69.5	88.2	120.1	69.3	86.2	110.2		Total	73.6	92.7	126.2	87.0	106.7	141.4
Estonia	DC	19.5	30.5	48.7	23.7	35.8	55.4	Germany	DC	12.4	19.9	32.6	16.5	26.0	41.7
	Other	27.4	27.4	27.4	33.3	32.2	31.1		Other	42.0	42.0	42.0	55.6	54.9	53.7
	Total	46.9	57.9	76.1	57.0	68.1	86.4		Total	54.4	61.9	74.6	72.1	80.9	95.4
Israel	DC	39.7	63.4	104.0	46.0	70.7	109.4	Ireland	DC	33.2	53.6	89.0	35.4	53.5	81.5
	Other	22.2	22.2	22.2	25.8	24.8	23.4		Other	36.7	36.7	36.7	39.2	36.6	33.6
	Total	61.9	85.7	126.2	71.7	95.5	132.9		Total	69.9	90.3	125.7	74.6	90.0	115.1
Mexico	DC	19.4	30.4	48.6	21.5	33.6	53.7	New Zealand	DC	11.1	17.4	27.8	11.9	18.5	29.4
	Other	8.3	4.5	6.8	9.2	5.0	7.5		Other	40.6	40.6	40.6	43.7	43.4	43.0
	Total	27.7	34.9	55.4	30.7	38.5	61.2		Total	51.7	57.9	68.3	55.6	61.9	72.4
Poland	DC	20.8	28.0	40.4	25.5	34.1	48.7	Norway	DC	8.8	14.0	23.0	10.2	15.7	24.8
	Other	24.5	24.5	24.5	30.0	29.8	29.5		Other	50.9	54.1	59.5	58.9	60.6	64.1
	Total	45.3	52.5	64.9	55.5	63.9	78.3		Total	59.7	68.1	82.5	69.1	76.4	88.8
Slovak Republic	DC	22.0	35.2	57.7	28.5	45.6	74.7	United Kingdom	DC	26.6	43.0	71.4	31.5	49.3	80.2
	Other	37.6	37.6	37.6	48.7	48.7	48.7		Other	32.6	32.6	32.6	38.6	37.3	36.6
	Total	59.6	72.8	95.3	77.2	94.3	123.4		Total	59.2	75.6	104.0	70.2	86.6	116.9
Sweden	DC	17.3	26.2	40.4	17.3	25.9	39.3	United States	DC	29.4	46.9	76.9	34.5	54.5	86.3
	Other	33.9	33.9	33.9	34.0	33.5	33.0		Other	38.3	38.3	38.3	45.1	44.5	43.0
	Total	51.2	60.1	74.3	51.3	59.4	72.3		Total	67.7	85.3	115.3	79.6	98.9	129.3


Source: OECD pension models; see also Whitehouse et al. (2009).

StatLink  <http://dx.doi.org/10.1787/888932907414>

4.12. Gross pension replacement rate and taxes and contributions paid on pensions with different rates of investment return



Source: OECD pension models; see also Whitehouse et al. (2009).

StatLink  <http://dx.doi.org/10.1787/888932907433>



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