

PART I
Chapter 3

Pensions Incentives to Retire

Individuals' decisions about work and retirement depend on the financial incentives embedded in retirement-income systems. This chapter presents measures of the pension incentive to retire, showing how the retirement income system can act as an implicit tax or subsidy on remaining in work. The analysis looks at the main retirement "window" in OECD countries, from age 60 to 65.

In addition to increases in pensionable ages (set out in Chapter 1), recent pension reforms in most countries have involved policies to reduce the incentive to retire early and increase the incentive to retire after the normal pension age.

However, the incentive to retire early remains strong in a minority of OECD countries. And there are ways in which most countries could further improve their pension system. The chapter concludes with nine policy conclusions that would reward people for working longer.

There is overwhelming evidence that the financial incentives embedded in pension systems affect retirement behaviour. This evidence base comprises both national and cross-country studies. Getting retirement incentives “right” is therefore a central concern of pension policy. Indeed, most pension-reform packages in OECD countries over the last two decades have included either increases in pension ages or other measures to encourage people to work longer.

Retirement incentives matter for reasons of both economic efficiency and equity. Of course, retirement incentives are not the be-all and end-all in explaining participation of older workers in the labour market. Health and the labour-market status of an individual’s spouse also have a significant impact. “Demand-side” factors – such as macroeconomic conditions and the state of the labour market, age discrimination and industrial organisation – also matter; these are discussed in Chapter 4 in Part I on “Helping older workers find and retain jobs”. Thus, appropriate incentives to keep working are rarely a sufficient solution to the problem of early retirement, but they are almost certainly a *necessary* part of the solution.

Retirement incentives also matter for reasons of equity. People who work more and contribute more *should* have higher pensions. Equally, those who are forced to drop out of employment early, perhaps through no fault of their own, need to have a reasonable standard of living. The aim should be to have a pension system which neither subsidises, nor excessively penalises, early retirement.

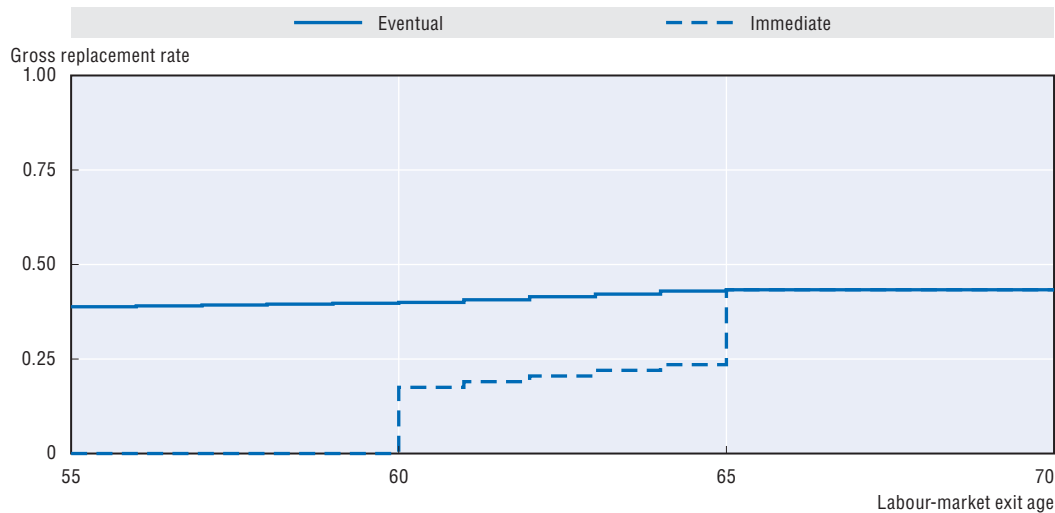
This special chapter uses an extension of the OECD pension models to look at pension entitlements of workers who retire at different ages. Section 3.1 discusses how the pension incentive to retire can be measured. It describes the impact a longer working life and a shorter retirement duration can have on entitlements in different kinds of pension scheme. Section 3.2 briefly reviews the research that shows that pension incentives have a significant effect on retirement behaviour. Sections 3.3 to 3.7 set out the empirical results of the paper. This begins with analysis of the change in pension wealth from working longer as a measure of incentives to retire, then looks at how this varies with individual earnings (Section 3.4). Sections 3.5 and 3.6 extend the analysis to bring in, first, the role of taxes and social security contributions and then the level of pension wealth as a second measure of incentives. Section 3.7 summarises these empirical results while Section 3.8 draws out some policy conclusions.

3.1. Measuring pension incentives to retire


Most studies of incentives to work use a simple indicator – the replacement rate – which measures the relationship between incomes in and out of work. This has been widely used to look at the effects of unemployment benefits and social assistance on people’s labour-market behaviour.¹

Figure 3.1 shows this measure for pensions using the example of Canada. (Illustrations for all 34 OECD countries are presented in D’Addio and Whitehouse, 2011.) Across the horizontal axis, the chart shows the age at which the individual exits the labour market,

Figure 3.1. **Gross pension replacement rates by age of labour-market exit: Canada**
Proportion of individual gross earnings



Source: OECD pension models.

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covering a broad range from age 55 to 70. On the vertical axis is the pension replacement rate. These results are for an average earner. The example individual is assumed to have worked and contributed in each year from age 20 until the age of labour-market exit indicated on the chart.

The dotted line shows the replacement rate from the public pension system that is immediately available when the individual leaves the labour market. It is not possible to claim any public pension until age 60, so the immediate replacement rate is zero before that point. At age 60, it is possible to claim the public, earnings-related pension. The replacement rate at this age is low: around 20%. This is because the benefit level is automatically reduced to compensate for the longer period over which the pension is paid (see the indicator of “Normal, early and late retirement” in Part II.1 below). Between age 60 and 65, the replacement rate increases because the benefit decrement is smaller for each extra year spent in work. At age 65, there is a big jump in the replacement rate because the individual then becomes eligible for the basic and means-tested retirement benefits.

However, the immediate replacement rate does not tell the whole story of how pension systems affect people’s work decisions. Although there is no immediate pension benefit available between age 55 and 60 in Canada, an extra year’s work adds to the final pension benefit. This is shown by the solid line in Figure 3.1. This line shows the total benefit that be claimed from age 65, conditional on withdrawal from the labour market at different ages.

It should be clear that a simple analysis of replacement rates at different ages fails to capture the full impact of the pension system on incentives to retire or to remain in work. The comparison between incomes in and out of work presented above is a static one. But work decisions made at one point affect future pension entitlements: the analysis needs to be “dynamic”. Unlike an analysis of unemployment and social-assistance benefits on incentives to work, account has to be taken of the impact of work decisions on pension entitlements in

the future. More formally, the retirement-income system affects the individual's "inter-temporal budget constraint". Furthermore, the period over which pensions are paid also clearly changes as people withdraw from the labour market at different ages.

More complete measures of retirement incentives are therefore based around the concept of "pension wealth": the present value of the lifetime flow of pension benefits. A more detailed discussion of this concept, along with calculations of pension wealth at the normal pension age, is presented in the two indicators "Gross pension wealth" and "Net pension wealth" in Part II.2.

The **change** in pension entitlement from working an additional year (as well as the level of pension wealth) is important for work incentives. Table 3.1 shows the main factors that might affect the pension incentive to leave the labour market, looking at the effect of working an extra year on pension entitlements. In each case, it is assumed that workers delay claiming the pension. (If they are able to combine work and pension receipt, then there is no pension effect on incentives to retire.) The effects on pension incentives to retire are grouped into three kinds of change.

Table 3.1. **Pension incentives to retire in different kinds of pension plan**

	Defined benefit	Points	Notional accounts	Defined contribution
Longer working period	Extra year's entitlement.	Extra year's entitlement.	Extra year's entitlement.	Extra year's contributions.
	Extra year towards qualifying conditions.	Extra year towards qualifying conditions.	Extra year towards qualifying conditions.	–
	Valorisation of earlier years' earnings.	Uprating of pension-point value.	Notional interest on accumulated notional capital.	Investment returns on accumulated balance.
	Higher earnings replace earlier, perhaps lower, earnings in benefit formula.	Higher earnings replace earlier, perhaps lower, earnings in benefit formula.	–	–
Shorter retirement duration	Forgo a year's benefits. "Actuarial" adjustment.	Forgo a year's benefits. "Actuarial" adjustment.	Forgo a year's benefits. Lower annuity factor.	Forgo a year's benefits. Lower annuity factor.
	Delay in claiming	Probability of dying. Discounting.	Probability of dying. Discounting.	Probability of dying. Discounting.

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The impact is shown for the four most common types of pension plan designed to provide income replacement rate in retirement, the second tier of the taxonomy used in *Pensions at a Glance*: see the indicator of "Architecture of national pension systems" in Part II.1. Briefly, pension entitlements in a defined-benefit (DB) scheme depend on the number of years of contributions and some measure of individual earnings. In points schemes, pension contributions "buy" a certain number of pension points. At the time of retirement, the accumulated number of points is multiplied by a pension-point value to determine the entitlement. Notional accounts – "notional" in the sense that there is no money in them – receive contributions each year and the balance earns a notional interest rate, typically linked to a macroeconomic variable such as GDP or wage growth. The accumulated notional capital at the time of retirement is then converted into a pension entitlement using an annuity calculation. In defined-contribution (DC) schemes, the process is similar to notional accounts, except that there is real money in the accounts and the interest rate depends on the financial performance of the underlying assets.²

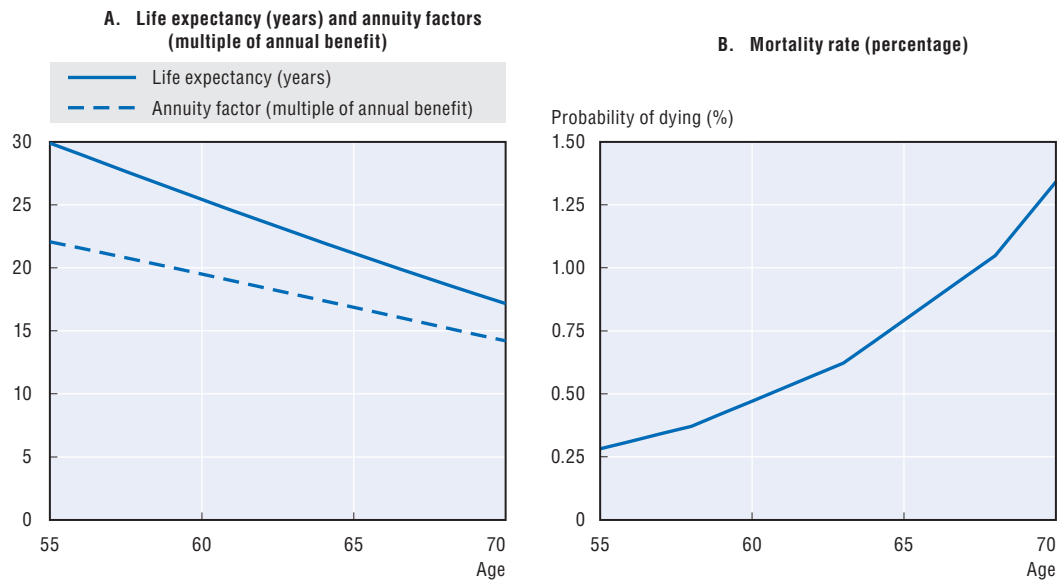
The first pair of effects in Table 3.1 arises from the **longer working period**. This changes pension rights in many different ways. In all kinds of pension schemes, the extra year's contribution usually brings some extra pension entitlement. In most DB and points schemes (and occasionally with notional accounts), the right to retire depends on the number of years of contributions. So the extra year's contributions may help the individual meet these qualifying conditions. These first two factors – shown in the first two rows of Table 3.1 – relate to the additional pension entitlement earned during the year.

In contrast, the next two factors, although again affected by a longer working period, result from changes to the value of pension entitlements already accrued. In DB plans, earlier years' earnings are typically "valorised" to allow for changes in costs and standards of living from the time that entitlements were earned to the time that pensions are claimed.³ The parallel effect in a DC scheme is that the balance in the individual account that had built up at the beginning of the year earns investment returns during the year. In notional accounts, the same thing happens but using the notional interest rate. In point schemes, the corollary is the uprating of the value of the pension point, which increases previously accrued entitlements. These factors are shown in the third row of Table 3.1.

Finally, some DB and points schemes calculate the entitlement on a subset of years of earnings ("best" or "final" pay, for example⁴). In these cases, individual earnings might (even after valorisation or uprating of the point cost) be higher than in an earlier year. Similarly, some countries have a maximum number of years of accrual. So an extra year of work might not bring any extra entitlement, but an earlier year with lower earnings might drop out of the pension formula. These effects are shown in the fourth row of Table 3.1.


The second type of change to pensions from working a year longer stems from the **shorter duration of retirement**. In every kind of pension scheme, individuals must, of course, forgo a year's benefits if they retire a year later. However, there are often adjustments to the value of benefits to reflect this. In DB and points schemes, this comes through "actuarial" adjustments for early or late retirement. In DC schemes and notional accounts, the route is through the annuity calculation whereby the accumulated balance is converted into a retirement-income stream.⁵ This calculation reflects the expected duration of retirement. Some illustrated numbers are provided in Figure 3.2, Panel A. Based on projections for mortality rates at different ages in 2050, the chart shows additional life expectancy at age 55 will average nearly 30 years, falling to about 17 extra years at age 70. The way that is reflected in benefit calculation is shown by the "annuity factor": the present value of a pension of one unit payable each year until death. In a defined-contribution pension, for example, the value of an annuity will be the accumulated balance in the plan divided by the annuity factor.

The final elements of the pension incentive to retire reflect further costs to the worker of **delaying the pension claim**. The worker might die during the year, and so receive nothing from the pension system. This is not taken into account in DC and most notional-accounts schemes, because annuity calculations are made at retirement and so implicitly assume the worker is still alive to claim the pension. Mortality rates increase with age, as shown in the projections for 2050 mortality rates for OECD countries in Figure 3.2, Panel B. At age 55, the probability of dying in the next year is less than 0.3%, compared with over 1.3% at age 70.

Figure 3.2. **Life expectancy, annuity factors and mortality rates by age**

Note: Annuity factor calculated using a real discount rate of 2% and assuming a price-indexed benefit.

Source: OECD pension models based on data from United Nations, *World Population Prospects – The 2008 Revision*.

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Pension entitlements must also be discounted; money in the future is worth less than money now because of the opportunity cost of forgoing consumption. The impact of discounting can be seen from the difference between life expectancy and the annuity factor in Figure 3.2, Panel A.

Taking into account all the multiple factors affecting pension entitlements outlined in Table 3.1, the change in pension wealth is then normalised to individual gross earnings. This is used to illustrate pension incentives to retire. The change in pension wealth from working an additional year can be interpreted as an implicit tax or subsidy on continuing in work. This measure compares directly two flows of income: one from retiring immediately, the other from working an additional year and then claiming the pension. The difference between the two income flows is earnings during the year plus the implicit tax or subsidy in the pension system, since this is measured relative to individual earnings.⁶

3.2. Incentives matter

A group of national experts from 11 OECD countries, co-ordinated by Gruber and Wise (1998, 1999), compared labour-force withdrawal rates between age 60 and 64 with the “implicit tax” from remaining in work exerted by the pension system. They also looked at alternative pathways out of work, such as unemployment and disability benefits. They found an elasticity of labour-force withdrawal with the implicit tax of 0.41. Japan had both the lowest withdrawal rate – with 75% of 60-64 year-olds in work – and the lowest implicit tax on continuing in work. In contrast, Belgium, Italy and the Netherlands had the highest withdrawal rates – with only around 20% of 60-64 year-olds in work – and among the highest implicit taxes on continuing to work at those ages. These general findings were confirmed by later OECD studies (Blöndal and Scarpetta, 1999; and Duval, 2003).^{7, 8}

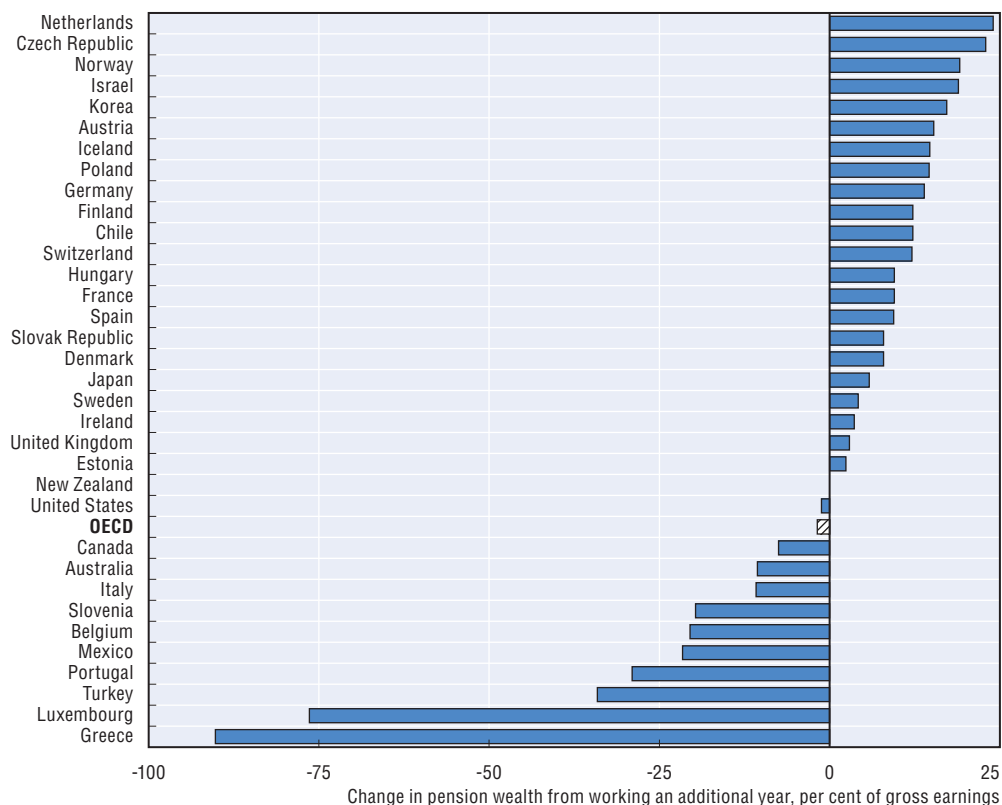
3.3. Changes in pension wealth from working longer

Changes in pension wealth from working an additional year have been calculated using the OECD pension models, as described elsewhere in *Pensions at a Glance*.


The analysis here differs from the previous studies cited above (Gruber and Wise, 1998, 1999; Blöndal and Scarpetta, 1999; and Duval, 2003) – in that it is *prospective*. It does not look at incentives faced by older workers today, which depend on past as well as current pension policies. Rather, it aims to evaluate the current pension-policy stance as it affects workers retiring in the future. As in the indicators of pension entitlements in Part II.2, benefits are calculated for workers who enter work at age 20 and contribute to the pension system each year until the varying age of exit from the labour market. Changes in rules that have already been legislated, but are being phased-in gradually – increases in pension age, for example – are therefore taken into account. Parameter values are those for 2008.⁹

Figure 3.3 shows the first set of results. These look at the age range of 60 to 65 (as in previous studies) because this is the main retirement “window” in OECD countries. Between the ages of 55 and 59, around 77% of people participate in the labour market, compared with 23% of people age 65-69. In the age range 60-64, labour-force participation rates are around 50%. (See Chapter 2 in Part I on “Trends in retirement and in working at older ages”.) The aggregate change over the age range of 60-65 is calculated and then annualised.

Figure 3.3. **Changes in gross pension wealth for working age 60-65, men with average earnings**
Percentage of annual gross earnings



Source: OECD pension models.

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The results presented in this special chapter are for men for reasons of space. Because the measures are based on pension wealth, retirement incentives for women – with lower mortality rates and higher life expectancy are different. Calculations for women will be published in D’Addio and Whitehouse (2011).

The change in pension wealth is positive in 22 countries, negative in 11 and zero in New Zealand. The very large negative values in Greece and Luxembourg dominate the picture. This arises because of the ability to retire before age 65 without actuarial reduction in benefits. Similar effects are at work in Belgium, while in Slovenia and Portugal the actuarial adjustments for retirement at different ages can be relatively small.

Other cases of negative changes in pension wealth arise because of limits on the number of years that accrue a pension entitlement: this is 35 years in the United States and 40 years in Canada. In this example of a full-career working from age 20, the full benefit is already reached at or before age 60, which limits the return to continuing in work relative to other countries.

The rules for valorisation of earnings in calculating benefits also have an effect. (Valorisation is the procedure under which earlier years’ earnings are adjusted to the time of retirement to reflect changes in costs or standards of living.) Most OECD countries valorise in line with average-earnings growth. But a few do not. In the United States, for example, valorisation is with average earnings until age 60, with no adjustment from age 60 to 62, and with prices thereafter. Since the calculations are based on an assumption that earnings grow faster than prices, accrued pension rights grow more slowly than earnings after age 62 in the United States than in countries with earnings valorisation. This effect is also at work in Belgium – with price valorisation – and Portugal, where valorisation is 75% with price inflation and 25% with average-earnings growth.

In Canada and Australia, there are significant resource-tested benefits. These limit the returns to working longer because a larger pension under the earnings-related or defined-contribution schemes (respectively) is partly offset by a smaller resource-tested benefit.

Where there is a small increment to pension wealth from working longer, the small size is often explained by the fact that mandatory pension benefits are relatively low. Ireland, Japan, the United Kingdom, for example, have among the four lowest gross pension replacement rates for full-career workers. In Estonia and France, too, replacement rates are significantly below the OECD average.

The Netherlands is at the top of the scale, with an increase in pension wealth worth 24% of earnings for an additional year’s work. This is because of the abolition of the early-retirement programmes that provided benefits from age 60 to 65 coupled with the fact that the full-career replacement rate is one of the highest in the OECD. The Czech Republic scores highly here because of the relatively large actuarial adjustments for early retirement. Both factors are at work in Iceland. In other cases, such as Denmark and Poland, the relatively large increment in pension wealth is partly driven by the fact that it is not possible to claim benefits before 65.


3.4. Individual earnings and changes in pension wealth

So far, the results have looked at the case of an average earner. However, most OECD countries’ pension systems result in different incentives to work for workers across the earnings range. The evidence is set out in Table 3.2, which shows the change in pension

Table 3.2. **Changes in gross pension wealth for working age 60-65, men at different earnings levels**

	Individual earnings (% of average)				Individual earnings (% of average)		
	Low (50%)	Average (100%)	High (150%)		Low (50%)	Average (100%)	High (150%)
Better incentives for lower or middle earners to stay in work				Retirement incentives strictly constant with earnings			
Czech Republic	30.3	22.9	18.3	Australia	-10.6	-10.6	-10.6
France	8.3	9.5	-0.1	Greece	-90.2	-90.2	-90.2
Korea	26.2	17.2	13.1	Hungary	9.5	9.5	9.5
Iceland	47.7	14.7	12.2	Italy	-10.8	-10.8	-10.8
Ireland	7.3	3.6	2.4	New Zealand	0	0	0
Israel	23.1	18.9	12.6	Poland	14.6	14.6	14.6
Slovak Republic	24.1	7.9	7.9	Spain	9.4	9.4	9.4
Switzerland	13.4	12.1	8.5				
Worse incentives for lower or middle earners to stay in work				Retirement incentives broadly constant with earnings			
Belgium	-25.2	-20.5	-16.5	Austria	14.9	15.3	14.2
Chile	12.2	12.2	17.3	Canada	-7	-7.5	-6.4
Finland	0.8	12.2	12.2	Denmark	8.7	7.9	7.6
Germany	-16.3	13.9	13.9	Estonia	2.3	2.4	2.4
Luxembourg	-88.1	-76.4	-72.5	Japan	5.2	5.8	6
Mexico	-56.5	-21.6	0.4	United Kingdom	3.5	2.9	1.9
Netherlands	14.1	24	27.3	United States	-1.2	-1.2	0.4
Norway	-26.9	19.1	14.5				
Portugal	-61.8	-29	-28.6				
Slovenia	-59.4	-19.7	-19.7				
Sweden	-10.5	4.2	4.3				
Turkey	-78.9	-34.1	-34.1				

Source: OECD pension models.

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wealth from working an additional year for people with 50%, 100% and 150% of economy-wide average earnings.

At the left-hand side of the table are 20 OECD countries where there is significant variation in retirement incentives with individual earnings. In the 14 countries on the right-hand side, retirement incentives are exactly the same for different workers in half of them, and broadly the same in the other half.

In the strictly-constant group, Greece, Hungary, Italy, Poland and Spain have pension systems with a strong link between individual earnings and pension benefits.¹⁰ In New Zealand, the universal basic pension scheme means that the change in pension wealth is zero for everyone.

The seven countries in the broadly-constant group (at the bottom right-hand side of Table 3.2) mainly have progressive pension systems, in contrast to retirement-income provision in most of the strictly-constant group. The incentive to remain in work is a little better, the lower are individual earnings, in Austria, Denmark and the United Kingdom. The reverse – work incentives are slightly stronger for higher earners – in Canada, Estonia, Japan and the United States.

The countries where the link between individual earnings and retirement incentives are strongest (left-hand side of Table 3.2) also divide into two groups. Progressivity of pension benefits is the main reason why the eight countries in the upper part of the table have stronger work incentives for lower or middle earners. The progressivity results from

quite different features of the national scheme: the basic pension in Iceland and Ireland, minimum credits for low earners in the Slovak Republic and progressive benefit formulae for earnings-related pensions in the Czech Republic and Korea.

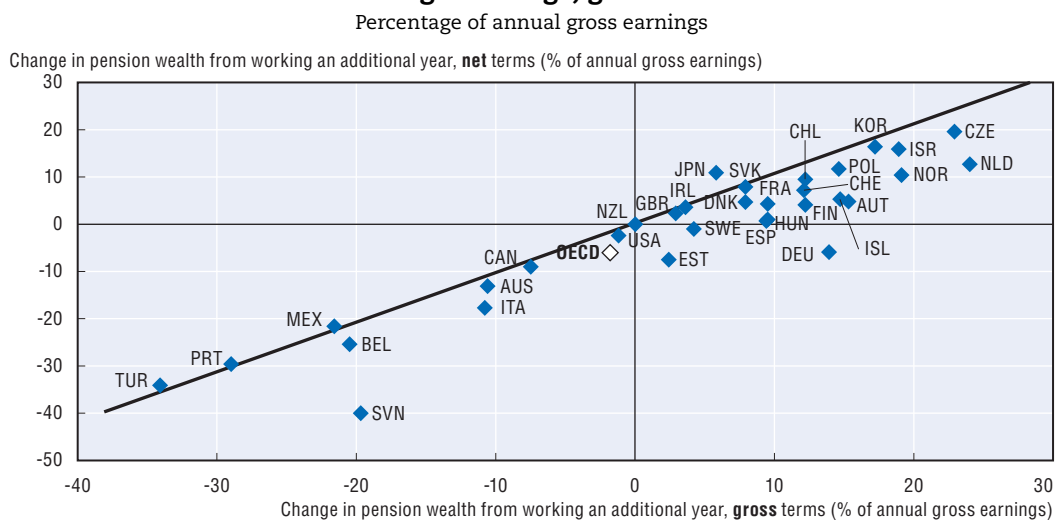
Incentives to retire are stronger for low earners than middle or high earners in the 12 OECD countries in the lower-left part of Table 3.2. In nearly all cases, this is driven by safety-net provisions in the retirement-income system. In Belgium, Luxembourg and Portugal, for example, progressivity accentuates the negative rather than the positive (compared with the countries in the upper left-hand side of Table 3.2). In Finland, Germany, Norway and Sweden, low-income workers who will be entitled to minimum pensions or resource-tested benefits have incentives to retire early that are not shared by average and high earners. In Mexico, the minimum pension means that incentives to retire early are especially strong for low earners.

3.5. The role of taxes: Changes in net pension wealth from working longer

Pensions in payment are taxable in virtually all OECD countries' personal income tax systems. In 15 OECD countries, pensions are subject to social security contributions (usually for health or long-term care), albeit at a lower rate than levied on earnings. Taking account of these taxes and contributions – set out in the indicator of the “Tax treatment of pensions and pensioners” in Part II.2 – gives the net change in pension wealth from working longer.

To illustrate the impact of taxes and contributions on pensions in payment, Figure 3.4 plots changes in gross pension wealth on the horizontal axis and the net measure on the vertical. To make the chart easier to read, the outliers of Greece and Luxembourg are not shown. A 45°-line has been added to the chart to show cases where changes in gross and net pension wealth are equal. This occurs in two countries that do not tax pensions in payment – the Slovak Republic and Turkey – and in a number where pensions form part of

Figure 3.4. **Changes in gross pension wealth for working age 60-65, men with average earnings, gross and net terms**



Note: Two outliers – Greece and Luxembourg – not shown for reasons of clarity.

Source: OECD pension models.

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taxable income but an average earner's pension entitlement would be below the level at which income tax starts to be paid. This latter group comprises Australia, Hungary, Ireland, Mexico and Portugal.

Taxes and contributions on pensions in payment make a significant difference in other cases. For example, the Netherlands has the highest change in gross pension wealth from working longer in gross terms, but falls behind the Czech Republic, Israel and Korea in net terms. Positive changes in gross pension wealth in Estonia, Germany, Japan, Spain and Sweden turn negative when measured in net terms. On average for all OECD countries, the change in net pension wealth for working from age 60 to 65 is -7.9% , compared with -1.8% in gross terms.

3.6. Adding a dimension to the analysis: Levels of pension wealth

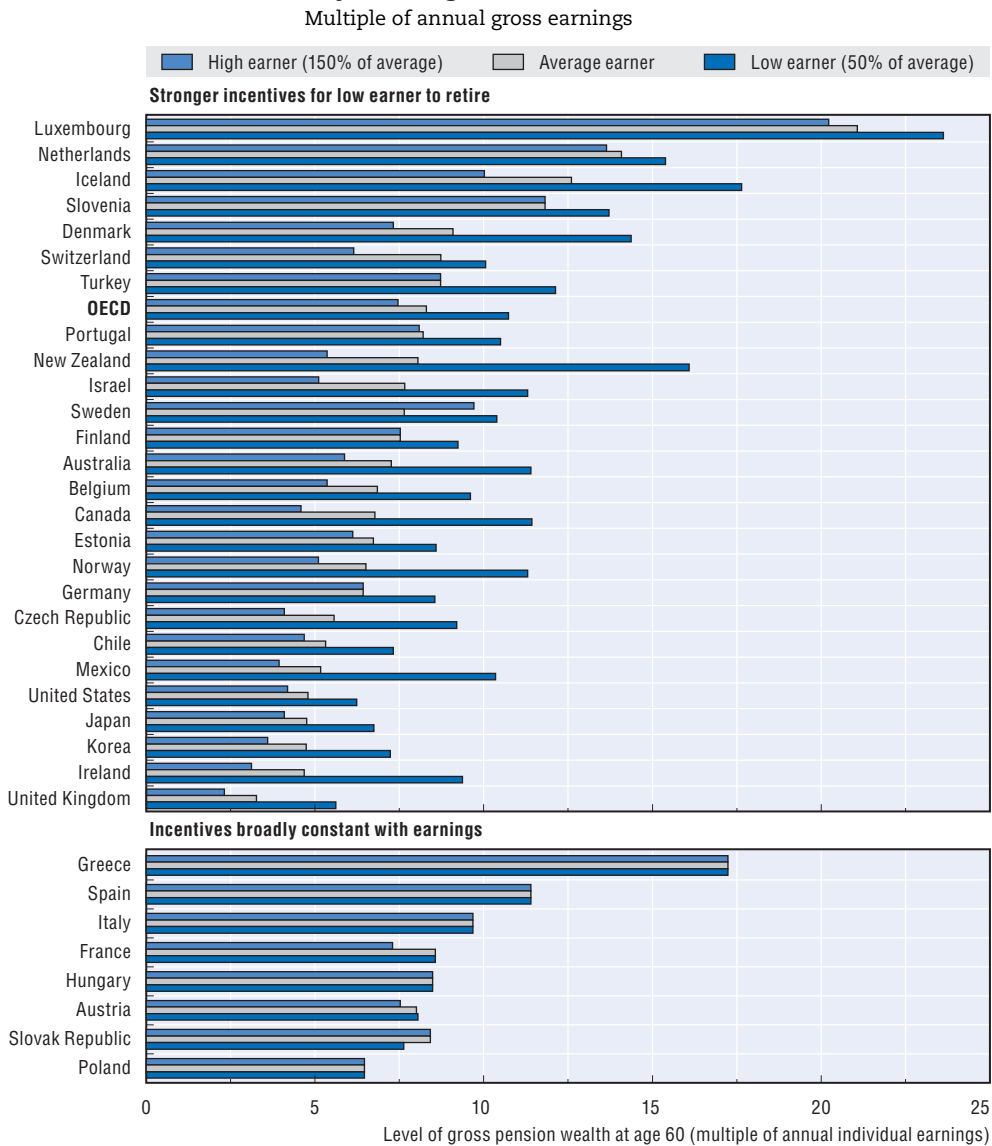
The previous studies of retirement incentives (Gruber and Wise, 1998, 1999; Blöndal and Scarpetta, 1999; and Duval, 2003) – have all emphasised the *change* in pension wealth as the key measure of retirement incentives. But this misses the rather obvious point that the *level* of pension wealth also matters. The change in pension wealth can be thought of as a “substitution effect”: leisure becomes more attractive as the implicit subsidy to continuing on work declines or turns into an implicit tax. The level of pension wealth is akin to an “income effect”. If people have a high level of pension wealth already at age 60, they may not wish to add to this by working an additional year, even if this results in a large increment in their pension entitlements. Put another way, if two individuals in different countries have the same *change* in pension wealth from working longer, but one has a higher *level* of pension wealth already earned than the other, then the pension incentive to retire will be greater in the country with the higher pension.

This section looks at levels of pension wealth, using again the baseline retirement window of age 60-65. Pension wealth is calculated at age 60. Normal pension ages for men are above age 60 in all OECD countries, and so pension wealth shown here is lower than in the indicator of “Gross pension wealth” in Part II.2 for full-career workers. This is due to the pension system. People might not have a full contribution history by age 60: pension wealth depends on the replacement rate, pension eligibility age and indexation rules. There are also actuarial effects: pension wealth depends on national life expectancy. Furthermore, people are unable to claim the pension at age 60 in most countries. The computations in these cases allow for the probability that people die between age 60 and the age at which the pension can first be drawn.

Figure 3.5 shows the level of pension wealth to which a man is entitled for working from age 20 until age 60 at different earning levels. The OECD average for a person with average earnings is just over eight times annual pay. Pension wealth is larger for low earners (with 50% of average pay) in the 26 countries in the top panel of Figure 3.5. Because pension wealth is normalised to annual individual gross earnings, then retirement-income systems that are redistributive deliver a higher replacement rate to lower earners and so higher pension wealth. Pension wealth is broadly constant with earnings in the eight countries in the lower panel.

The levels of pension wealth already earned at age 60 shown are highest in Luxembourg and Greece, irrespective of the earnings level. In both cases, replacement rates are relatively high and a full-career worker contributing from age 20 will already have a full pension entitlement by age 60. Pension wealth also exceeds ten times annual earnings for average earners in Iceland, the Netherlands, Slovenia and Spain.

Figure 3.5. Level of gross pension wealth already accrued at age 60 by earnings level, men



Source: OECD pension models.

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On average, pension wealth for low earners is 10.4 times annual earnings, significantly higher than the 8.1 figure for average earners. The differences between the results at low and average earnings are especially large in the countries with the most redistributive pensions: the basic schemes in Ireland and New Zealand, for example.

Pension wealth is generally lower for high earners (with 150% of average pay), again because of redistributive elements but also in some cases as a result of ceilings on pensionable earnings. The OECD average pension wealth for high earners is 7.3 times their annual earnings.

3.7. Summary of the results for age 60-64

Pension incentives to retire, based on levels of and changes in pension wealth discussed above, are summarised in Tables 3.3 and 3.4. Both of them consider the main retirement window, between age 60 and 65. On each measure, the 34 OECD countries are divided into three groups: low, middle and high. Both changes and levels are presented in net terms, after allowing for taxes and contributions levied on pension income. The three columns of the tables show the change in pension wealth from continuing on work between 60 and 65. The three rows present the levels of pension wealth already achieved at 65. There are substantial differences between the groups. The level of pension wealth is more than twice as large in the “high” countries as in the group with the lowest results. Similarly, the change in pension wealth averages about –32% in the low group, +1% in the middle and +11% in the high group.

Table 3.3. **Levels of and changes in net pension wealth at ages 60-65, men with average earnings**

		<i>Change</i> in pension wealth from working age 60-65		
		Lowest third	Middle third	Highest third
<i>Level</i> of pension wealth at age 60	Lowest third	Mexico	Germany, Ireland, Sweden, United Kingdom, United States	Chile, Czech Republic, Japan, Korea, Poland
	Middle third	Australia, Belgium, Canada, Estonia	Denmark, Finland, New Zealand	Austria, Israel, Norway, Switzerland
	Highest third	Greece, Italy, Luxembourg, Portugal, Slovenia, Turkey	France, Hungary, Spain	Iceland, Netherlands, Slovak Republic

Note: Countries grouped into thirds of the distribution of both change and level of pension wealth. Mean level of pension wealth is 4.9 times individual annual earnings for the low group, 6.6 for the middle and 10.2 for the high. Mean change in pension wealth for working from age 60-64 is –31.7% of annual earnings for the low group, +1.0% for the middle group and +11.0% for the high group.

Source: OECD pension models: see D’Addio and Whitehouse (2011) for complete results.



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Table 3.4. **Levels of and changes in net pension wealth at ages 60-65, men with low earnings (50% of mean)**

		<i>Change</i> in pension wealth from working age 60-65		
		Lowest third	Middle third	Highest third
<i>Level</i> of pension wealth at age 60	Lowest third	Germany	France, Sweden, United Kingdom, United States	Austria, Chile, Japan, Korea, Poland, Slovak Republic
	Middle third	Belgium, Italy, Mexico, Portugal	Denmark, Estonia, Finland, Hungary	Czech Republic, Ireland, Switzerland
	Highest third	Australia, Greece, Luxembourg, Norway, Slovenia, Turkey	Canada, New Zealand, Spain	Iceland, Israel, Netherlands

Note: Countries grouped into thirds of the distribution of both change and level of gross pension wealth. Mean level of pension wealth is 7 times earnings for the low group, 9 for the middle and 13 for the high. Mean change in pension wealth for working from age 60-64 is –49.8% for the low group, –0.9% for the middle group and +16.5% for the high group.

Source: OECD pension models: see D’Addio and Whitehouse (2011) for complete results.

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The pension incentive to retire is therefore strongest at the bottom left, where levels of pension wealth are already high at age 60 and the change in pension wealth from continuing in work to age 65 is low or negative. In contrast, at the top right, levels of pension wealth are low but the increment to pension wealth from working to age 65 is high.

Starting with the case of average earners, in Table 3.3, Chile, the Czech Republic, Japan Korea and Poland have the combination of low level of and high change in pension wealth likely to keep people working. However, incentives are also pretty good in Germany, Ireland, Sweden, the United Kingdom and the United States. Although the increment to pension wealth is not as high, the low levels of pension wealth make early retirement unattractive from a financial viewpoint. In Austria, Israel, Norway and Switzerland, the level of pension wealth at 60 is towards the middle of the range in OECD countries. But large increments to pension wealth might encourage people to keep working until 65.

In Greece, Italy, Luxembourg, Portugal, Slovenia and Turkey, both the “income effect” from a high level of pension wealth and the “substitution effect” from reductions in pension wealth from working until age 65 are likely to drive people to leave the labour market well before age 65.

The picture is less clear-cut in the 16 countries not already discussed. In Iceland, the Netherlands and the Slovak Republic, for example, both levels of and changes in pension wealth are high. The impact of pension systems on retirement will therefore depend on the relative forces exerted by the income and substitution effects. In Mexico, the level of pension wealth is low but the change in pension wealth is negative. Again, it is ambiguous which effect will win out.

Table 3.4 shows the same analysis for low earners, with pay of half the average. The level of pension wealth is generally higher for low earners. The average in the group with “high” pension wealth is nearly double that in the “low” group. Changes in pension wealth average around -50% in the low group, zero in the middle and +17% in the high.

Greece, Luxembourg, Portugal, Slovenia and Turkey again have among the highest levels of pension wealth at age 60 and negative changes in pension wealth for working between 60 and 65. However, low earners in Norway are also in this group, whereas average earners had strong incentives to work on both measures. This is because of the guarantee pension in the reformed retirement-income system. Italy moves up one cell looking at low rather than average earners. This is because levels of pension wealth for a low earner are in the middle of the range in OECD countries: other pension systems have redistributive elements that push pension wealth higher for low earners, while Italy’s has a strong link between pension and earnings.

Chile, Japan, Korea and Poland feature at the top right of both tables. For low earners, the level of pension wealth is also relatively low and the change in pension wealth relatively high in Austria and the Slovak Republic.

3.8. Policy implications

If older workers can retire early on high incomes relative to their earnings then they can hardly be blamed for doing so. Thus, improving incentives to work longer has been a motif of most OECD countries’ pension reforms over the last two decades.

The most obvious element of pension reforms has been increases in normal pensionable ages, already underway or planned for the future, as set out in Part II.1 of this volume.¹¹ Since average pension ages reached a low point in the early 1990s, 14 OECD countries have already increased or plan to increase in the future pension ages for men and 18 for women.

In addition, around half of OECD countries have taken other measures to encourage people to work longer.¹² Firstly, a range of countries – Austria, Belgium, Denmark, France, Greece, Hungary, Italy and Poland (for some types of worker) – have tightened the qualifying conditions for early retirement. These conditions cover the number of years of contributions required, or the eligibility age for early retirement, or both. The Netherlands has removed tax incentives for private, occupational early-retirement schemes. Austria, Germany, Italy and Portugal either introduced or raised the level of reductions in benefits for early retirees. Increments to benefits for late retirement were introduced or enhanced in Belgium, Spain and the United Kingdom. Five countries – Canada, the Czech Republic, Finland, France and the United States – adjusted incentives for both early and late retirement. Australia has made it easier to combine work and pension receipt.

It is also important to note that many pension reforms will mean that benefits for workers entering the labour market today will be significantly lower than for workers with the same career history retiring today. Earlier analysis showed that 14 out of 20 major pension reforms in OECD countries will cut benefits for average earners, by an average of around 20%.¹³ This chapter has stressed that both the *level* of and *change* in pension wealth affect incentives. Therefore, these more general cuts in benefits provide an incentive for people to remain in work longer and make retirement less financially attractive.

This chapter has assessed incentives to retire in pension systems *after* these reforms are fully in place. It is clear that most OECD countries have fixed any major problems of incentives to retire early. The retirement-income regime is relatively neutral over age of retirement. Nevertheless, pension systems sometimes still provide a powerful incentive to leave work at the earliest possible opportunity. This is most obvious in Greece and Luxembourg, although Italy, Portugal, Slovenia and Turkey also provide fairly strong incentives to retire early. Even some countries with a relatively small change in pension wealth from remaining in work could do better.

The OECD pension models allow the measures of pension wealth to be decomposed into the different parts of the retirement-income system.¹⁴ This makes it possible to identify the particular features of pension systems which reduce work incentives.

- In Belgium, France, Greece and Luxembourg, it is possible to retire at age 60 (or earlier in some cases) without reduction in benefits to reflect the longer duration of payment. The average reduction in benefits in earnings-related schemes for each year of early retirement is around 4.5%. This is well below the actuarially neutral level of around 6-8%.¹⁵ These actuarial reductions are low in Austria, Hungary, Italy, Norway and Slovenia. However, they are close to the actuarially neutral level in Canada, the Czech and Slovak Republics, Finland, Iceland, Japan, Korea and Spain.
- During the early-retirement window, valorisation of accrued pension rights with price inflation or a mix of price and earnings growth reduces incentives to remain in work. This applies to Belgium, Finland, France, Portugal and the United States. However, in Finland and France, other elements of the treatment of early retirees compensate for this effect.
- Estonia, the Slovak Republic and Slovenia are the only OECD countries that are not increasing normal pension age for men to at least 65. Indeed, eight countries are going beyond 65 to either 67 or 68. Earlier pension ages for women than men in Chile, Italy, Poland (all age 60) and Switzerland (age 64) look anachronistic.

- Increments in pension benefits for people who defer claiming the pension after normal pension age are close to 5% on average, still below actuarial neutrality. There are no increases payable in Belgium and Italy and the increments are small in Austria, Poland, Spain and the Swiss occupational pensions. However, a range of countries – such as Canada, the Czech Republic, Japan, the United Kingdom and the United States – offer attractive terms for deferring pensions.
- In many cases, the absence of an increment for late retirement does not particularly matter because people can combine work and pension receipt. Some countries, however, still operate earnings tests that mean that this is not possible: Belgium, Ireland and Greece, for example.
- Resource-tested schemes can have negative effects on work incentives for low earners. However, such schemes target benefits on those most in need and so reduce the need for higher taxes and contributions throughout the economy. Still, some countries have managed to combine redistributive pension systems with incentives to stay in work – Chile, the Czech Republic, Iceland, Ireland, New Zealand and Switzerland, for example – while others – such as Portugal and Slovenia – have not.
- Spain’s public, earnings-related scheme has higher accrual rates at younger ages: 3.33% for the first years of contributions compared with 2% later on. A uniform accrual structure would improve incentives for older workers.
- Many OECD countries used to calculate pension benefits based on a limited subset of “best” or “final” earnings. This encourages people to retire once earnings have peaked: indeed, in some cases, continuing to work but in a lower-paid job could reduce benefits. Most countries – Austria, Finland, Italy, the Netherlands, Poland, the Slovak Republic, Sweden and the United Kingdom – have fixed this problem and will base benefits on earnings across the career. However, Greece still bases benefits on the final five years’ pay and Spain on the final 15 years.
- A small number of OECD countries have limits on the number of years that can accrue pension benefits in earnings-related schemes. In Greece, for example, the maximum pension replacement rate is achieved after 35 years’ contribution: only working after age 65 accrues any additional benefit. The pension entitlement in Greece may increase with additional work, but only if higher earnings replace lower earnings in the benefit formula. Similarly, the public pension scheme in the United States pays a full benefit with 35 years of contributions. There is a penalty if the pension is claimed early, but, as in Greece, extra years’ contributions increase benefits solely through the mechanism of lower earnings dropping out of the benefit formula. The maximum accrual is also reached after 35 years in Spain. These policies discourage work once the maximum number of years has been achieved: they are economically inefficient. Also, they are in a sense “unfair”: contributions are levied but no additional benefit is earned. Two OECD countries – Belgium and Sweden – have fixed this type of problem in pension reforms.

These nine policy conclusions are undoubtedly technical. But they are unashamedly so: the details really do matter. In the big picture, they determine whether the pension system fairly treats individuals who retire at different ages and how much or how little individual decisions over work and retirement are distorted by the pension system.

This special chapter has focused on the retirement-income system. As shown in Chapter 2 in Part I on “Trends in retirement and in working at older ages”, however, many workers take alternative routes into early retirement, such as disability or unemployment benefits. Disability and unemployment are not just about financial incentives, and so are difficult to assess using the framework adopted here. Particularly important is the way benefits are policed through analysis of health status and job-search requirements. These policies are addressed in the OECD’s disability reviews (see OECD, 2010) and “Ageing and employment policies” reports (OECD, 2006).

Notes

1. See the OECD’s (2007), *Benefits and Wages* report for an example.
2. A more detailed analysis of these different types of scheme can be found in Whitehouse (2010).
3. The issue of valorisation is discussed in detail in the indicator of “Income-replacement pensions” in Part II.1.
4. See the indicator of “Income-replacement pensions” in Part II.1. Whitehouse (2010) and Whitehouse *et al.* (2009) provide a more detailed discussion.
5. See the indicator of “Normal, early and late retirement” in Part II.1 for information on these adjustments and an analysis of their importance. Queisser and Whitehouse (2006) provide a more detailed discussion.
6. This measure is closely linked to the concept of “actuarial neutrality”, which requires that the present value of accrued pension benefits for working an additional year is the same as in the year before. See Queisser and Whitehouse (2006), for a rigorous discussion of the concept and its application to different types of pension scheme). This means that benefits increase only by the additional entitlement earned in that year. Conversely, retiring a year earlier should reduce the pension benefit both by the entitlement that would have been earned during the year and by an amount to reflect the longer duration for which the pension must be paid. For present purposes, an “actuarially neutral” pension system does not mean that the change in pension wealth (or implicit tax/subsidy) should be zero.
7. Blöndal and Scarpetta (1999) found a smaller elasticity than Gruber and Wise (1998, 1999) of 0.28 in their study of 20 countries. (The calculations of elasticities to enable a direct comparison between these two studies was carried out by Burtless, 2004.) The different size of the effect does not reflect differences in the countries included in the two studies. Rather, the cause is that estimates of the “implicit tax on remaining in work” vary between the two studies, in part because they look at different years. Nevertheless, there was still a strong and statistically significant relationship between retirement incentives and retirement behaviour.
8. Regular updates of this work have been published in the OECD’s *Economic Policy Reforms: Going for Growth* report (2005-10).
9. Earlier results, using 2006 parameters and rules, were published in D’Addio, Keese and Whitehouse (2010).
10. See the indicators of “Progressivity of pension-benefit formulae” and the “Pension-earnings link” in Part II.2.
11. See also Chomik and Whitehouse (2010) for more details.
12. Whitehouse *et al.* (2010) provide a description of these changes: see also the chapters on pension reforms in OECD (2007, 2009).
13. See OECD (2009), Chapter I.2, especially Table 2.3 and the surrounding discussion, and Whitehouse *et al.* (2010), particularly Figure 3 and the discussion thereof.
14. These detailed calculations will be published in D’Addio and Whitehouse (2011).
15. The indicator of “Normal, early and late retirement” in Part II.1 and Whitehouse (2010) present and discuss these adjustments. Queisser and Whitehouse (2006) discuss the concept of actuarial neutrality and present calculations for OECD countries of neutral adjustments.

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