

**EARLY RETIREMENT IN OECD COUNTRIES:
THE ROLE OF SOCIAL SECURITY SYSTEMS**

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THE ISSUE AND KEY RESULTS

The early withdrawal of older workers from the labour market is one of the most striking socio-economic developments common to most OECD countries in recent decades. While working beyond the age of 65 was the rule for males in all OECD countries in the 1960s, this is now the exception and the average retirement age for males is well below 60 in some European countries. Thanks to the large baby-boom generation boosting the labour force, the trend towards earlier withdrawal from the labour force has not become a major burden for society so far. However, as the baby-boom generation starts moving into retirement in large numbers over the coming two decades, the share of the working-age population in the total will drop, and the low retirement age will amplify the problems associated with ageing populations. It is therefore important to understand the forces which have contributed to lower the retirement age over the past three decades, and this is the main purpose of this paper.

There are several possible explanations for the drop in retirement ages in OECD countries in recent decades. It has coincided with increased affluence, and higher incomes could have increased the demand for leisure at older ages. It has also taken place against the background of deteriorating labour market conditions in most OECD countries, which have arguably put older workers at a disadvantage in competition for jobs. Moreover, in some countries, the expansion of occupational pension schemes, voluntarily negotiated between employers and employees, may have made early departures from the labour market an attractive option for some workers. Finally, the increase in the financial incentives to early retirement embedded in public social security systems, including old-age pensions and other non-employment benefits, has also been identified as an important factor.

This paper focuses on the financial incentives to retire early in these public systems in the OECD countries over the past three decades.¹ The first part examines the incentives that exist in old-age pension systems. The second part reviews the incentive structures in disability, unemployment-related and special early-retirement programmes. The third part looks at how these incentives may have influenced actual retirement behaviour, and how actual and potential reforms could translate into changes in the labour-force participation of older male workers.

The key results of the analysis are as follows:

- Old-age pension systems discourage work at older ages in virtually all OECD countries. The disincentives are particularly strong after the earliest age at which pensions become available: continued work typically implies foregone pensions and continued payment of pension contributions, with little or no increase in ultimate pensions after retirement. Though to a much lesser extent than at post-pensionable ages, old-age pension systems also discourage work before the pensionable age in most OECD countries: the increase, if any, in pension entitlements due to an additional year's work is insufficient to cover the extra pension contributions.
- Financial incentives to retire early are amplified in countries where it is possible to get access to public income support prior to the pensionable age: the cost of an extra year of work is not only paid contributions but also foregone benefits, whereas ultimate pensions are often unaffected. Such *de facto* early retirement schemes operate within disability programmes, notably where a labour-market criterion is explicitly used to assess entitlement to benefits. They are also embedded in unemployment-related programmes, especially when benefit periods for older persons are extended to the pensionable age, the job-search requirement is removed for older workers, and/or where unemployment pensions have been established. Moreover, early-retirement programmes have been established in several countries, to assist older people to retire before the pensionable age.
- The disincentives have had significant effects on the retirement behaviour of older workers. The difference in the average age of retirement across countries is closely related to the extent of the disincentives. Estimation results from pooled cross-country time-series regressions show that removing these disincentives could lead to an increase in the participation rate of older males (55-64) of almost 10 percentage points in those countries where the financial penalties are particularly large.

OLD-AGE PENSION SYSTEMS: FINANCIAL INCENTIVES FOR EARLY RETIREMENT?

All OECD countries have established systems to support people in their old age. Typically people contribute to such schemes during their working life in exchange for income support after a certain age and/or benefits to surviving dependants. However, the level of pensions is generally not directly related to life-time contributions but instead is determined according to some fixed rules. In such

defined-benefit systems (as opposed to defined-contribution systems), the various rules can have strong effects on the retirement decision.

Assessing financial incentives for retirement in old-age pension systems: the framework

Work incentives embedded in old-age pension systems are often analysed with the help of standard labour-supply models.² These models distinguish between incentives before and after reaching the pension entitlement age. Prior to the entitlement age, work incentives are related to pension contributions which are treated as taxes in these analyses. Pension contributions give rise to negative substitution effects and positive income effects on work incentives. After reaching the pensionable age, the receipt of pensions increases the income of the recipient (if pensions can be combined with earned income) and/or reduces the opportunity cost of leisure (if pensions are subject to earnings tests). Both effects reduce labour supply and may even induce complete withdrawal from the labour market.

While this standard framework is useful for analysing the incentive effects of pension systems under certain restrictive assumptions, it is generally not well-suited in practice for analysing pension systems in most OECD countries. For example, pension contributions cannot be considered as taxes if they ultimately result in higher benefits after retirement. Moreover, retirement incentives can differ importantly within the periods before and after the pensionable age depending on pension rules. Before the pensionable age, pension contributions may turn into a tax once additional years of contributions do not result in higher benefits. Postponement of retirement after the earliest age of entitlement up to a certain age may also result in higher ultimate pensions, and thus dampen the income and substitution effects during this period.

New analytical frameworks have been developed to incorporate these real-world complexities of pension systems into retirement incentive calculations.³ These view pension entitlements at different retirement ages as a pension wealth, *i.e.* the present discounted value of pension income from the retirement age onwards, adjusted for the probability of survival, minus the present discounted value of pension contributions until the retirement age. At a given age (*x*), the expected old-age pension wealth (*W*) for a single worker at different retirement ages (*a*) is computed as

$$W_{(x,a)} = \sum_{i=a}^{\infty} [P(a)_i \cdot (1 + \tau)^{-(i-x)} \cdot \delta_i] - \sum_{i=x}^{a-1} [C_i \cdot (1 + \tau)^{-(i-x)} \cdot \delta_i] \quad [1]$$

where $P(a)_i$ is the level of pension available at age *i* when retiring at age *a* (taking a value of zero until the minimum entitlement age has been reached), *C* is the level of contributions, τ is the discount rate and δ_i is the probability of survival at age *i*.

¹⁰

Retirement incentives are then derived as changes in pension wealth which result from postponing retirement by one year:

$$WA(x, a) = W(x, a + 1) - W(x, a) \quad [2]$$

The wealth accrual (WA), in turn, can be interpreted as an implicit tax (or subsidy) to continued work at age a . A negative pension wealth accrual implies that gross earnings overstate the financial gain from continued work: the gain is not gross earnings but gross earnings minus the wealth accrual. In this case, the implicit tax will tend to discourage work and encourage retirement. On the other hand, if the pension wealth accrual is positive, gross earnings understate the financial gains from continued work and the implicit subsidy will tend to encourage continued work and the postponement of retirement.

The implicit tax rate expected at the age x for one more year of work at the age a , that is to say, $t(x, a)$, can be written as:

$$t(x, a) = -WA(x, a) / Y(x, a) \quad [3]$$

where $Y(x, a)$ is expected gross earnings from working at age a . The implicit tax rate in equation (3) can be conveniently written as (assuming that $Y(x, a)$ is constant for all a):

$$t(x, a) = [c_a + p(a)_a] \cdot (1 + \tau)^{-(a-x)} \cdot \delta_a - \sum_{i=a+1}^{\infty} [(p(a+1)_i - p(a)_i) \cdot (1 + \tau)^{-(i-x)} \cdot \delta_i] \quad [4]$$

This equation shows the implicit tax rate as the difference between the cost and benefits of continued work at age a relative to expected gross earnings. The cost at age a is equal to continued payment of pension contributions and foregone pensions, *i.e.* the sum of the pension contribution rate (c) and the pension replacement rate ($p(a)$); the benefits are the net present value of the increase in the pension replacement rate as a result of delaying retirement.

Basic determinants of old-age pension wealth accruals

As a first step to use this analytical framework for empirical analysis, this section reviews some of the basic determinant of pension wealth accruals in OECD countries and how they have evolved since the early 1960s. The determinants are discussed under four separate headings: the entitlement age; the pension replacement rate; the pension accrual rate and the actuarial adjustment to pensions; and pension contribution rates.

The age of entitlement

The standard age of entitlement to public pensions differs considerably across OECD countries (Table 1). At present, it is 65 for males in more than half of all the countries. However, it ranges from a low of 60 in a few countries [Japan (employee

Table 1. **Standard age of entitlement to public old-age pensions**

	Males			Females		
	1961	1975	1995	1961	1975	1995
Australia	65	65	65	60	60	60
Austria	65	65	65	60	60	60
Belgium	65	65	65	60	60	60
Canada	70	65	65	70	65	65
Denmark	67	67	67	67	67	67
Finland	65	65	65	65	65	65
France	65	65	60	65	65	60
Germany	65	65	65	65	65	65
Greece	65	62	62	60	57	57
Iceland	67	67	67	67	67	67
Ireland	70	68	66	70	68	66
Italy	60	60	62	55	55	57
Japan	60	60	60	55	55	58
Luxembourg	65	65	65	65	60	65
Netherlands	65	65	65	65	65	65
New Zealand	65	65	62	65	65	62
Norway	70	67	67	70	67	67
Portugal	65	65	65	65	62	62.5
Spain	65	65	65	65	65	65
Sweden	67	67	65	67	67	65
Switzerland	65	65	65	63	62	62
United Kingdom	65	65	65	60	60	60
United States	65	65	65	65	65	65

Source: US Department of Health and Human Services, *Social Security Programs Throughout the World*, various issues.

pension only), France, Italy, Belgium] to a high of 67 in some Nordic countries (Denmark, Iceland and Norway). The standard entitlement age is often lower for females. The majority of OECD countries have kept the standard age unchanged since the early 1960s: only 8 countries have lowered the age of entitlement. More recently, several countries have decided to increase the standard entitlement age in the future, and Italy had already implemented an increase in the mid-1990s.

Several countries have, however, made it possible to access old-age pensions prior to the standard age under certain conditions. Four European countries (Germany, Italy, Austria and Greece) have introduced seniority pensions since the early 1960s for those who have a long contribution history and who have reached a certain age: 54 in Italy,⁴ 58 in Greece, 60 in Austria and 63 in Germany. Seven countries also permit older citizens to obtain pensions before the standard age subject to a permanent reduction in pension streams. This was already possible in the United States and Sweden in the early 1960s, but was introduced later in Japan, Canada, Finland, Greece and Spain.

The entitlement age is of critical importance for retirement incentives because continued work beyond this age typically implies that pensions are foregone. Pensions are foregone in some countries because they are subject to means-testing on top of any income from work. Ten of the countries listed in Table A1 in the Annex had some form of means-testing of old-age pensions in 1995 after the standard entitlement age was passed. In most of them, the level of the earnings disregard, *i.e.* the amount of earnings allowed before pensions start being reduced, and benefit reduction rates, *i.e.* the amount by which pensions are reduced for each additional unit of wage income, implied that continued work at average earnings would entail the loss of most or all pensions. Earnings tests are often stricter for those who access pensions prior to the standard age. For example, in Austria and Germany the receipt of a seniority pension in 1995 was conditional on beneficiaries not earning more than 15 per cent of average earnings, and in the United States the earnings disregard was lower and benefit reduction rates steeper for those who are below the standard age than for those above it.

Pensions beyond the entitlement age can also be foregone because there is a direct restriction on combining receipt of pension and income from work. However, only a few countries (Portugal and Spain) make entitlements to old-age pensions beyond the standard age conditional on complete withdrawal from work.⁵ But even in countries where there are no direct restrictions on work or no means-testing of benefits, access to pensions is often (*e.g.* in France and Finland) conditional on leaving the current job⁶ and, given the difficulties for older workers to find a new job, this practice amounts to a *de facto* restriction on combining work with pension receipt.

The pension replacement rate

There is no such thing as a single pension replacement rate in any national retirement scheme. Even where old-age pensions are a set amount, the gross replacement rate will differ according to previous earnings and household composition or other household income. In earnings-related pension systems, the calculation of the pension level is much more complicated. It may differ depending on the length of contribution periods, the rate at which individuals earn pensions by contributing, the age at which pensions are accessed, and minimum and maximum levels of pensions. These determine the ratio of pension benefits to the earnings base used to calculate pensions. The earnings base depends on average earnings over the reference period which, in turn, is strongly influenced by the way past earnings are indexed for pension purposes, the general increase in real earnings over the period and the age profile of earnings.

Table 2 reports *gross* pension replacement rates (*i.e.* before taxes on earned income and benefits are taken into account)⁷ that a 55 year-old worker could expect to get at the standard retirement age if he or she were to continue working until

Table 2. **Expected old-age gross pension replacement rates: a summary indicator¹**

	Per cent		
	1961	1975	1995
Australia	19.1	32.8	40.9
Austria	79.5	79.5	79.5
Belgium	72.6	70.5	67.5
Canada	31.3	45.1	51.6
Czech Republic	n.a.	n.a.	53.2
Denmark	35.9	42.3	56.2
Finland	34.9	58.6	60.0
France	50.0	62.5	64.8
Germany	60.2	59.6	55.0
Greece	n.a.	n.a.	120.0
Hungary	n.a.	n.a.	54.6
Iceland	n.a.	n.a.	93.0
Ireland	38.6	28.9	39.7
Italy	60.0	62.0	80.0
Japan	24.6	54.1	52.1
Luxembourg	n.a.	n.a.	93.2
Netherlands	32.2	48.0	45.8
New Zealand	32.0	43.0	61.3
Norway	25.3	61.2	60.0
Poland	n.a.	n.a.	53.7
Portugal	85.0	77.0	82.6
Spain	n.a.	50.0	100.0
Sweden	53.8	77.1	74.4
Switzerland	28.4	51.7	49.3
United Kingdom	33.4	33.8	49.8
United States	39.1	49.1	56.0
Average of above countries ²	44.0	54.6	59.3

1. The figures refer to theoretical replacement rates and are based on assumptions listed in the text. Details of the calculations can be found in Blöndal and Scarpetta (1998).

2. The average for 1995 refers only to countries for which data are available for the whole period covered in the table.

Sources: Secretariat calculations based on pension legislation as described in US Department of Health and Human Services, *Social Security Programs Around the World*, (various issues); Commission of the European Communities, *Social Protection in the Member States of the Community*; national sources.

then. The summary replacement rates are simple averages of four cases: two earnings levels (*i.e.* economy-wide average and two-thirds of average) and two household compositions (*i.e.* a single worker and a worker with a dependent spouse). For all cases it is assumed that the employee starts work at the age of 20 and has uninterrupted full-time work until the standard age of entitlement to public pensions. For the derivation of the replacement rates, it is assumed that the earnings base is constant, *i.e.* real earnings are constant across time and across different ages, and that past nominal earnings are revalued in line with general earnings for pension purposes.⁸

According to Table 2, expected replacement ratios differ considerably across OECD countries.⁹ At one extreme are countries where pensions can be expected to be close to the pre-retirement earnings level (Italy, Luxembourg, Iceland, Portugal, Sweden and Austria), or even to match or exceed earnings from work (Spain and Greece). At the other extreme are countries (Australia, Ireland and the Netherlands) where only about 40 per cent of gross earnings can be expected to be replaced by public old-age pensions. However, for the majority of the countries the summary indicator for expected old-age gross replacement rates was in the range of 47 to 67 per cent in 1995.

There has been a clear tendency for expected pension replacement rates to rise over time. The un-weighted average for the countries for which data are available rose by 15 percentage points between 1961 and 1995, with most of the increase taking place in the 15 years to 1975. However, these broad trends mask considerable differences across countries. In some (Austria, Belgium, France, Ireland, Portugal and Germany), the replacement rate remained broadly stable or even fell,¹⁰ whereas in some others (Japan, Canada, Australia, New Zealand, Denmark, Finland, Norway, and Switzerland), it rose by 20 percentage points or more.

The pension accrual rate and actuarial adjustments to pensions

Pension accrual rates - *i.e.* the rate at which pensions payable at the standard retirement age increase with an additional year of employment and contributions - differ significantly across OECD countries. At one extreme are countries (*e.g.* Australia) where pensions are not related to employment/contribution records but on length of residence, in which case the accrual rate with respect to employment is zero. At the other extreme are countries (*e.g.* Germany and the Netherlands) where the level of pensions increases over the whole of the potential working life. In between are countries where full pensions are earned relatively quickly, implying zero pension accrual rates from additional years of work at older ages. In fact, in almost half of the countries for which data are available for 1995, a 55 year-old male worker could expect little or no increase in his pension by working for 10 additional years (Table 3). Even in countries which offered gains in pensions from continued work, the increase in the pension replacement rate was generally 15 percentage points or less.

The low accrual rates in the 1990s contrast sharply with those in the 1960s. For example, in 1967, ten additional working years from the age of 55 could increase the pension replacement rate by a third in Belgium, and by a fourth in France. The main reason for such high accrual rates for older workers in the 1960s was the introduction of contribution-related pensions and special transitory arrangements which allowed full pensions to be acquired in a few years. In the case of France, high

Table 3. **Expected increase in old-age pensions for a 55 year-old male by working for 10 more years¹**

	Percentage point increase in the summary replacement rate	
	1967	1995
Australia	0	0
Austria	13	12
Belgium	32	15
Canada	23	0
Czech Republic	n.a.	1
Denmark	2	1
Finland	10	4
France	25	17
Germany	13	11
Greece	n.a.	25
Hungary	n.a.	1
Iceland	n.a.	10
Ireland	0	0
Italy	24	10
Japan	5	3
Luxembourg	n.a.	19
Netherlands	0	0
New Zealand	0	0
Norway	17	9
Poland	n.a.	9
Portugal	15	10
Spain	0	0
Sweden	21	0
Switzerland	12	11
United Kingdom	0	10
United States	0	0

1. It is assumed that the individual started work at the age of 20 so that he has a potential contribution period of 35 years at the age of 55.

Source: Same as for Table 2.

accrual rates (until 1980) were due to a policy of having age-specific accrual rates for workers in their 60s, each additional year increasing the pension replacement rate by 5 percentage points (*i.e.* pension replacement rate at age 60 of 25 per cent compared with 75 per cent at age 70).

The incentives embedded in high pension accrual rates have also been weakened in some countries by crediting some form of inactivity over working-age years as equivalent to covered employment.¹¹ For example, special early retirement schemes (see below) typically involve continued contributions for old-age pensions; disability benefit recipients do not experience any drop in their old-age pensions due to their non-employment status; and in some countries (*e.g.* Germany) unemployment confers entitlement to pensions in the same way as employment.

As discussed earlier, some countries allow pensions to be accessed earlier than at the standard entitlement age subject to actuarial reduction, and reward deferred retirement with actuarial increases in pensions. The United States, Japan (National pension system), Canada, Sweden and Finland offer such flexibility on both sides of the standard retirement age, whereas Greece and Spain offer it only for early withdrawal, and the United Kingdom, the Czech Republic, Hungary and Germany¹² have it only for deferred withdrawal. The earliest age at which pensions can be accessed is typically 60 and the latest age at which pensions can be increased is typically 70. The most common adjustment to pensions is 0.5 per cent per month of early or deferred withdrawal. The adjustment factor is significantly higher in Japan, and in Finland and Sweden after the standard retirement age has been reached.

Pension contribution rates

Pension contributions are paid by both employees and employers in most OECD countries. Employees will certainly consider contributions paid by themselves as costs of continued work, as termination of work will allow them to stop such payments. Although not directly paid by themselves, employees may also indirectly pay employers' social security contributions as well since employers will seek to shift the cost of their contributions to their employees in the form of lower earnings. It is difficult to assess the extent to which such backward shifting of employer contributions occurs in practice. Moreover, in the short run, it may be difficult to transfer increases in employers' contributions into lower wages in the presence of strong trade unions or stipulated wage floors. Notwithstanding these caveats, the following analysis makes the assumption that there is no difference between employees and employers pension contributions in influencing retirement decisions.

Pension contribution rates in pay-as-you-go systems have increased in virtually all OECD countries since the 1960s. Only low rates were required in the 1960s to finance pension payments as the number of beneficiaries was small relative to the number of contributors and individual pensions were low relative to earnings. The overall contribution rate did not exceed 10 per cent in half of the countries listed in Table 4 which operated formal pay-as-you-go systems, while a few continental European countries already had rates around 15 per cent. The increase in pension generosity since the 1960s and an increase in the ratio of beneficiaries to contributors has required the doubling or tripling of the contribution rate in several countries. By the mid-1990s, contribution rates in excess of 20 per cent were applied in a number of countries (Italy, Spain, Austria and Norway) and only two countries (Switzerland and Canada) kept contribution rates below 10 per cent.¹³

Table 4. **Pension contribution rates**
Per cent of average earnings

	1967	1995
Austria	16.5	22.8
Belgium	12.5	16.4
Canada	5.9	5.4
Denmark	1.0	1.0
Finland	6.5	17.9
France	8.5	19.8
Germany	14.0	18.6
Ireland	5.2	15.7
Italy	15.8	29.6
Japan	5.5	16.5
Netherlands	10.2	14.5
Norway	12.8	22.0
Portugal	13.5	13.9
Spain	16.0	28.3
Sweden	6.4	19.8
Switzerland	4.0	8.4
United Kingdom	6.5	13.9
United States	7.1	12.4

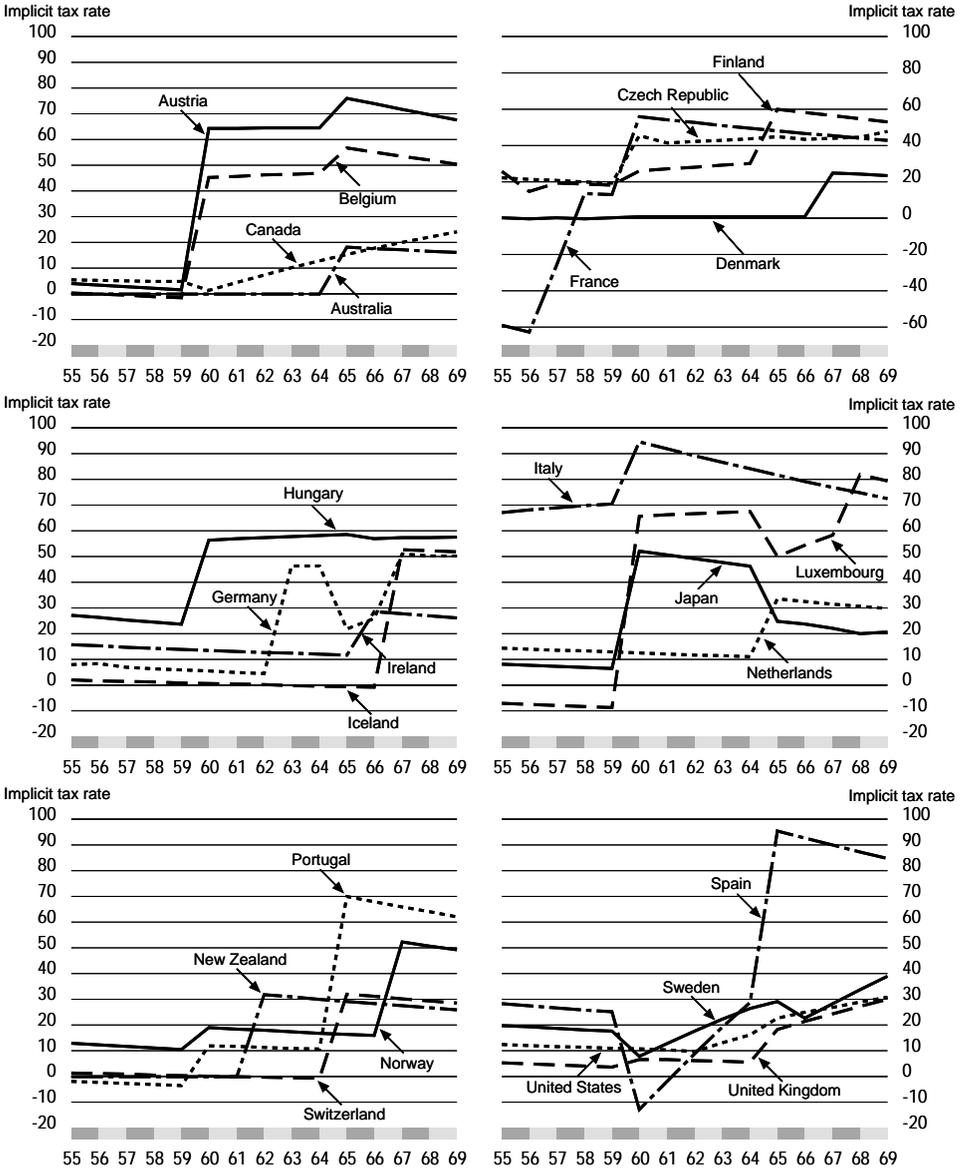
Source: US Department of Health and Human Resources, *Social Security Programs Throughout the World* (various issues).

Old-age pension wealth accruals

The information about the basic parameters discussed above can now be used to calculate implicit tax rates embedded in old-age pension systems, *i.e.* the *financial* losses from working longer due to the functioning of such systems. Figure 1 shows the estimated implicit tax on continuing to work for an additional year from 55 to 70 for 24 OECD countries. The tax rates refer to a single person aged 55 in 1995 and with average earnings. It is assumed that the individual has had 35 years of work at the age of 55, and has paid pension contributions as long as such arrangements have existed or been mandatory. It is also assumed that receipt of an old-age pension cannot be combined with continued full-time work for the reasons outlined above. The discount rate is set at 3 per cent for all countries and all periods, even if empirical estimates suggest that it may be much higher. For simplicity, survival rates are assumed to be 100 per cent up to the expected age of death of a 55 year old male, and zero thereafter.

Judging by these estimated implicit tax rates, old-age pension systems in all OECD countries in 1995 discouraged work at virtually all ages from 55 to 70.¹⁴ The implicit rate was particularly marked after the earliest age at which pensions could

Figure 1. **Old-age pension system:**
implicit tax rates on continuing work at different ages, 1995
Single workers, average earnings



Source: Authors' calculations.

be accessed: the delay in pension receipt for one year, and one year more of contributions, was not offset by the actuarial increase in pensions where that was possible. This implicit tax was very high in countries with high replacement rates, amounting to more than 60 to 70 per cent in Spain, Italy and Austria. In other words, the pre-tax gain from continuing to work full-time after the pensionable age in these countries amounted to only 30 to 40 per cent of gross earnings once the drop in pension wealth was accounted for.

Prior to the standard age of entitlement, almost all countries depicted in Figure 1 had lower pension wealth at the age of retirement than at the age of 55. In France, the pension wealth was higher at the standard entitlement age of 60 than at 55, as large implicit subsidies on continued work up to the age of 57½ more than offset subsequent implicit taxes, and in Australia and New Zealand there was no implicit tax on work prior to the entitlement age. Of the countries where the pension wealth fell, the drop was insignificant in the case of Denmark (where pensions are mostly financed by general tax revenues) and Switzerland, but amounted to more than one year of earnings in a number of countries (Finland, Ireland, Norway, Spain

Table 5. **Average implicit tax rate on continued work due to the old-age pension system, 1967 and 1995**

	Postponing retirement from 55 to 64		Postponing retirement from 55 to 69	
	1967	1995	1967	1995
Australia	0	0	5	6
Austria	31	34	43	47
Belgium	-2	23	15	33
Canada	-15	6	1	11
Denmark	0	0	4	5
Finland	0	22	9	33
France	2	14	8	42
Germany	4	14	19	23
Ireland	5	14	4	17
Italy	30	79	30	79
Japan	10	28	14	26
Netherlands	9	13	12	14
New Zealand	0	9	3	15
Norway	3	15	2	22
Portugal	5	4	25	25
Sweden	-9	18	0	22
Switzerland	-2	0	5	10
United Kingdom	6	5	9	10
United States	8	12	13	17

Source: Authors' calculations.

and Sweden). In countries where it was possible to get early access to benefits at a reduced rate, the actuarial reduction was not high enough to eliminate the discouragement to continued work.

As could be expected from the discussion in the preceding section, the drop in pension wealth from continued work after 55 has steepened significantly in recent decades (Table 5). Indeed, in 1967 pension systems in several countries were close to being neutral with respect to the retirement decision over ages 55 to 64, and a few countries encouraged work over this age span by increasing pension wealth with continued work. The broad trend towards stronger incentives in the old-age pension system to retire early masks considerable differences across countries. Increased incentives to retire early have been particularly strong in Italy, Sweden, Belgium, Finland and Canada, whereas the pension wealth accrual relative to earnings remained virtually unchanged in the United Kingdom, Australia, Denmark and Portugal.

NON-EMPLOYMENT BENEFIT SYSTEMS: INCENTIVES FOR EARLY RETIREMENT?

Older workers retiring before the minimum entitlement age for old-age pensions can often draw on other types of public income support until they have reached pensionable age. Special early-retirement schemes have been established in some countries with the explicit aim of providing such income support in the interval between the age of retirement and the pensionable age. The majority of OECD countries have also changed entitlement conditions for receipt of unemployment-related and disability benefits by older workers so as to turn such benefits into *de facto* early retirement benefits. As a result of these changes, more than a third of all males aged 55 to 64 receive non-employment benefits in a few countries and it is common in many countries that more than a fifth of the age group receives such benefits.

The availability of *de facto* early retirement benefits prior to the earliest age at which old-age pensions can be obtained has major implications for the implicit tax on continued work. One year of work after such benefits become available implies that one year's worth of benefits is foregone and that an extra year of contributions must be paid. The additional year of work may result in higher old-age pensions, depending on the accrual profile, but the common practice of crediting years of unemployment, special early retirement and disability in calculating old-age pensions means that the level of old-age pensions is not affected in most countries. Thus, there are no gains to offset the cost in terms of contributions and lost benefits.

Entitlement conditions and benefit levels

The critical parameters of non-employment benefit systems in determining the social-security wealth accruals are entitlement conditions and benefit levels. Entitlement conditions determine whether or not non-employment benefits programmes can be used for early retirement and at what age such use can commence. The benefit levels determine the opportunity cost of continuing to work after such benefits become available.

Entitlement conditions

Entitlement conditions have been relaxed for older workers in *unemployment-related* schemes in a number of countries (Table A2 in the Annex). At present, unemployment for a certain length (usually 12 or 18 months) prior to a certain age (50, 55 or 60) opens up the possibility of early access to old-age pensions in seven OECD countries, provided that minimum contribution requirements have been met. In the early 1960s, this option was only possible in Austria, the other countries introducing unemployment pensions in the course of the 1970s. Since the late 1970s, seven OECD countries have also relaxed entitlement conditions for older workers' receipt of ordinary unemployment insurance benefits, notably exempting unemployed workers above a certain age from having to search actively for a job. This is already the case at the age of 50 in Denmark; and in Australia, New Zealand and Belgium it applies at the age of 55 and after. There is also evidence that work tests are applied more leniently to the older unemployed in countries which do not formally exempt them from standard job-search criteria.¹⁵

Entitlement conditions for *special early-retirement* benefits vary considerably in the few countries which continue to operate such benefit schemes. In the 1970s and early 1980s, several countries introduced schemes which made entitlement explicitly conditional on the retiring person being replaced by an unemployed and/or young person. Such schemes were abolished in the late 1980s in most of the countries (e.g. Germany and the United Kingdom) and Denmark abolished its scheme in 1997, but they are still operating in Luxembourg (for those 57 and older), Belgium (for those 60 and older) and in Spain (though only for 64 year-olds being retired). Some other countries have tightened access to special early retirement benefits: France quickly closed the option of job leavers having access to such benefits after this became possible in 1983, and entitlement to such benefits in 1995 was restricted to workers made redundant¹⁶ after the age of 57 (56 in special circumstances). Entitlement conditions have also been eased in some countries in recent years: the introduction of special early-retirement schemes in Norway in 1988 restricted access to persons 65 and older (the standard retirement age is 67), but the age limit was reduced to 64 in 1993 and a further reduction to 62 became effective in 1998.

Given the importance of *disability benefits* as an income support for persons leaving the labour market before the pensionable age, entitlement conditions for this type of benefits are particularly relevant for the retirement decision. Disability benefits were originally intended as an income support for persons who were incapacitated, but several factors suggest that they have been used in some countries for other purposes:

- The sharp increase of disability beneficiaries in general, and elderly beneficiaries in particular, would seem to be inconsistent with indicators suggesting that health conditions are improving for all age groups (and the increased use of rehabilitation measures).¹⁷
- The large differences in invalidity rates among the elderly across OECD countries would seem to be inconsistent with objective indicators of comparative health conditions.
- Comparatively few in the 55-64 age group claim that they have gone into retirement because of health reasons, even in countries where the disability ratio is very high for the age group.

However, the sectoral pattern of early retirement reflects to some extent sectoral skill requirements: the incidence being significantly higher in some sectors making intensive use of motor skills (mining, construction and manufacturing).

In any case, there are strong indications that entitlement conditions have been *de facto* eased in disability benefit systems throughout OECD countries. This applies even to some of the countries where disability is supposed to be assessed against rigid medical criteria only (e.g. the United States, Japan, France, the United Kingdom, Canada and New Zealand). For example, though legislation has remained unchanged in the United States since 1965, there is general agreement that eligibility criteria have been applied more leniently by doctors (Haveman and Wolfe, 1984; Bound and Waidmann, 1992). There is also some evidence that invalidity benefits are used as *de facto* early retirement benefits in the United Kingdom (Holmes and Lynch, 1990), and that medical criteria play less of a role than before. In countries (mostly in continental Europe) where disability is assessed against the capacity to perform in a suitable job, depending on previous experience and/or training, increased labour-market problems may have *de facto* resulted in an easing of entitlement requirements.

The easing of eligibility requirements has been most notable in countries which have introduced an explicit labour-market criterion in granting disability pensions. Such a criterion was written into law in several European countries in the 1970s (Table A3 in the Annex), while court rulings introduced such a criterion as early as 1969 in Germany. In some countries, notably Austria, Spain (prior to 1985) and Norway, a labour-market criterion appears to be applied, though not with any explicit basis in law.¹⁸ In Sweden, Spain (from 1985) and Finland (as from 1986), there is clear evidence that the labour market criterion was largely

used to assess eligibility of older workers to benefits. The strong increase in the number of disability beneficiaries in some of these countries prompted remedial action: the Netherlands abolished the criterion in 1987, and Sweden followed suit in 1991. The experience of both countries suggests that it may take considerable time before changes in legislation affect the actual practice of medical assessors.

It would thus seem that most OECD countries have schemes which allow people to retire prior to the pensionable age set down in legislation. However, entitlement conditions are not always transparent. Medical assessors may use a *de facto* labour market criterion in the granting of disability benefits to older workers, even if this is not permitted by the legislation. Also, benefit officers may exempt older unemployed workers from a work test in countries where such an exemption is not written into law. Nonetheless, entry into these non-employment schemes for early-retirement purposes is likely to be more difficult if such an option is not explicit in law. The few OECD countries with no formal relaxation of work tests for older workers, no statutory special early retirement schemes and a relatively rigid medical assessment of disability include the United States (notwithstanding the *de facto* easing of entitlement criteria discussed above), Japan, Canada, Iceland and Switzerland.

Replacement rates

Gross replacement rates in non-employment benefit systems typically vary by previous earnings levels and household compositions. In the case of disability benefits and unemployment pensions, they may also be related to the length of contribution history to old-age pensions. Table 6 provides a summary measure of gross replacement rates in unemployment-related, disability and special early-retirement schemes. The indicators are averages of six cases: two earnings levels (*i.e.* economy-wide average and two-thirds of average) and three household compositions (*i.e.* single, dependent spouse and a working spouse). For each case, gross replacement rates are calculated for each year in the 55-64 year age range, and the annual average derived. In the absence of formal rules as to when disability benefits can be used as early-retirement benefits, it is assumed that they can be obtained from the age of 55 onwards. For special early retirement schemes, the age limit is set in legislation; and for unemployment-related benefits, it is assumed that they become available at the age of entitlement to an unemployment pension or at the age at which the active job-search requirement is relaxed.

The main patterns of benefit generosity in the various schemes reported in Table 6 can be summarised as follows:

- Disability schemes would offer the most generous compensation in most countries¹⁹ if it is an option to retire into such schemes as early as age 55. In

Table 6. Non-employment benefit schemes: Summary replacement rates¹ for aged workers, 1995

Yearly average from age 55 to the standard entitlement age for old-age pension

	Disability schemes ²	Unemployment schemes ³	Special ER schemes ⁴
Australia	27.3	27.6	..
Austria	68.1	34.0	..
Belgium	58.3	40.0	52.9
Canada	..	..	..
Czech Republic	44.7	5.6	..
Denmark	38.8	71.5	20.0
Finland	60.0	30.0	..
France	50.0	34.4	52.0
Germany	44.1	29.1	..
Hungary	55.8	18.6	..
Iceland	..	..	..
Ireland	32.2	24.0	..
Italy	60.0	50.0	70.0
Japan	..	..	..
Luxembourg	52.9	77.6	64.8
Netherlands	70.0	52.5	..
Norway	57.0	..	14.7
New Zealand	31.5	30.0	..
Poland	46.9	16.2	..
Portugal	71.7	35.9	..
Spain	71.5	37.1	..
Sweden	69.6	..	..
Switzerland	..	..	..
United Kingdom	..	8.2	..
United States	..	..	..

1. For derivation of the summary replacement rates, see main text

2. “..” denotes that disability benefits are granted, in principle, on medical criteria only.

3. “..” denotes that unemployment pensions are not available, or that job-search requirements are not relaxed for older workers.

4. “..” denotes that there are no special early retirement systems.

Source: Authors' calculations.

most cases, the benefit levels would be close to those available in old-age pension systems at the standard age of entitlement, reflecting the common practice of crediting years of disability until the standard retirement age for pension purposes.

- Unemployment-related schemes differ widely across OECD countries in terms of benefit generosity. Such benefits cannot be used for early-retirement purposes in countries where older unemployed workers are required to search actively for jobs like their younger counterparts. In the countries where entitlement conditions have been relaxed for older

workers, unemployment-related benefits are available from the age at which the conditions are eased to the standard entitlement age for old-age pensions.

- Special early retirement schemes offer comparatively generous benefits in the few countries where such schemes exist. In France, the scheme is more generous than either the disability or unemployment benefits; and in Austria and Italy, it is on a par with either of the main schemes. As mentioned earlier, the early retirement scheme in Denmark was abolished in 1997.

As is the case with old-age pensions in most OECD countries, the generosity in non-employment benefit schemes is higher for low-earning workers than for high-earning workers, and spouse supplements imply higher generosity for couples than for singles.

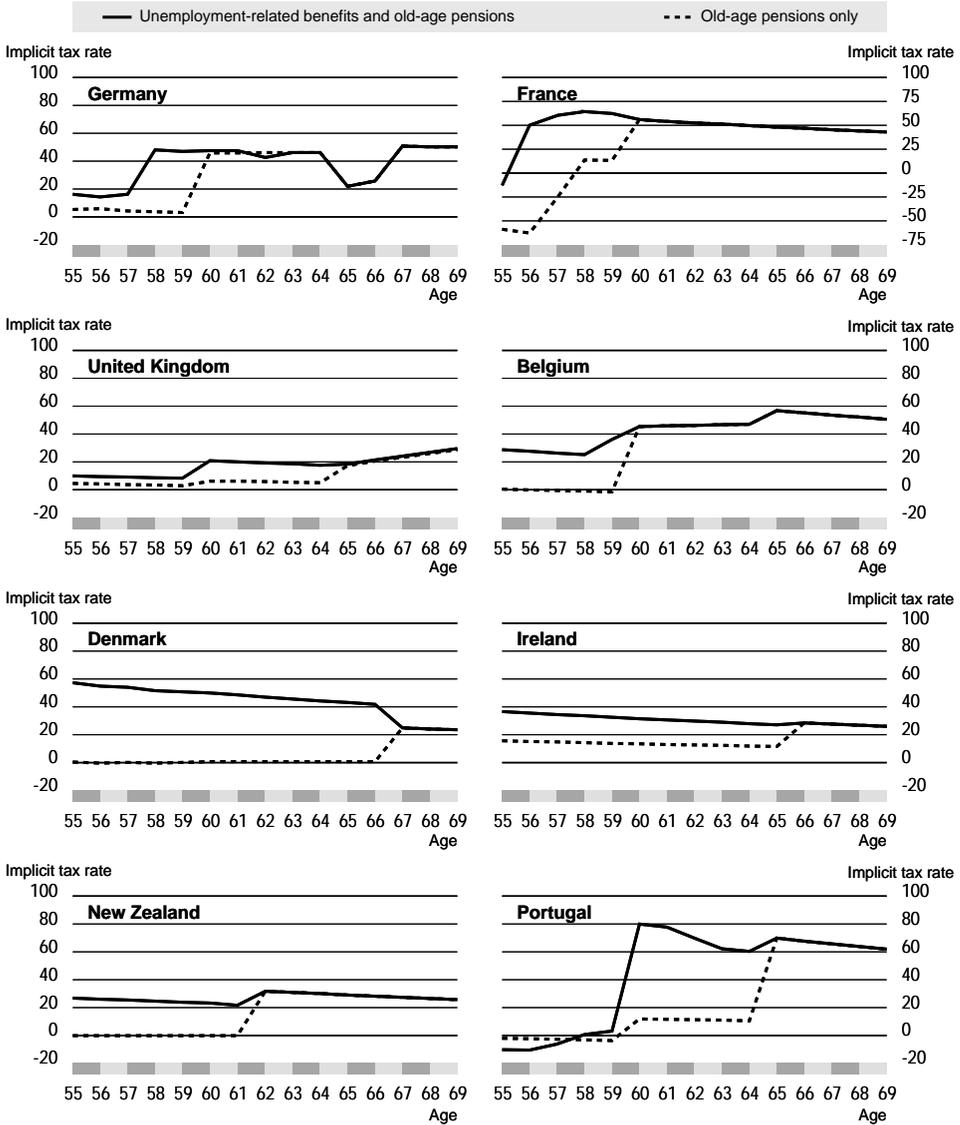
The generosity in most non-employment benefit systems has increased over time. As discussed in Blöndal and Scarpetta (1998), the increase in the generosity of disability benefits was concentrated in the 15 years to 1975 during which the un-weighted average of the summary indicator rose by 10 percentage points, whereas the stability of the average since 1975 masks considerable movements in both directions for individual countries. The generosity in unemployment-related schemes for the elderly has risen over both the two sub-periods 1961-75 and 1975-95, due to a more generous unemployment benefit system in general and, in particular, to extended benefit periods for the elderly. The only benefits that have not shown a strong increase in generosity are the special early retirement schemes.

Implicit tax rates with non-employment benefits

The impact of unemployment-related benefits on implicit tax rates on continued work in 1995 is depicted in Figure 2 for selected countries and the average implicit tax rates for the 55-70 age span are reported in Table 7. Compared with the old-age pension system alone, the accruals change substantially prior to the pensionable age for several of the countries examined. Denmark, which had only modest disincentives to work in its old-age pension system prior to the standard retirement age of 67, now registers substantial implicit taxes on continued work after 55, due to the relaxation of the work test as early as 50 and generous replacement rates. The disincentives also increase substantially in Ireland due to unemployment pensions being available at 55. In France, the availability of unemployment benefits without active job search also implies a sizeable drop in social-security wealth after the age of 56, whereas the old-age pension system provides strong incentives to remain in work until the required contribution history has been completed.

When the disability system offers generous compensation, there is an incentive to enter into the system as early as possible. As can be seen from Table 7, continued work after 55, if it is an option to access disability benefits at that age, would

Figure 2. **Old-age pensions and unemployment-related benefits:**
Implicit tax rates on continuing work, 1995
Single workers, average earnings
 Relative to annual earnings



Source: Authors' calculations.

Table 7. **Implicit tax rates on continued work embedded in benefits for the elderly, 1995**

	Old-age pensions ¹	Old age pensions plus:		
		Unemployment related benefits ²	Disability benefits ²	Special early-retirement ³
Australia	0	20	21	..
Austria	34	34	64	..
Belgium	23	37	44	56
Canada	6	..	..	..
Denmark	0	51	37	22
Finland	22	42	71	..
France	14	49	..	57
Germany	14	37	46	..
Ireland	14	32	32	..
Italy	79	.. ⁴	.. ⁴	.. ⁴
Japan	28	..	..	..
Luxembourg	29	65	63	51
Netherlands	8	57	41	.. ⁵
New Zealand	9	27	..	..
Norway	15	..	65	17
Portugal	4	33	66	..
Spain	18	33	53	..
Sweden	18	..	76	..
Switzerland	0	..	..	..
United Kingdom	5	15	.. ⁵	..
United States	12	..	..	..

1. Same figures as in Table 5.

2. ".." denotes that early retirement into the non-employment benefit system is not option because of entitlement conditions.

3. ".." denotes that there are no public schemes or that such schemes are not much used.

4. Existing schemes are not relevant for a worker with a long contribution history as he benefits from the old-age pension system.

5. Special early retirement schemes in the Netherlands are not mandatory.

Source: Authors' calculations.

in most countries result in a sharper drop in social-security wealth than in the case of retiring into unemployment-related schemes. Indeed, the implicit tax would be very high in several countries. In the countries which still retain a labour-market criterion in granting disability pensions, continued work from the age of 55 to 70 would reduce social security wealth by the equivalent of 6½ years of economy-wide average earnings in Germany up to 10 years of earnings in Finland. In Norway and Austria, where a labour-market criterion is tolerated in practice, the drop in social security wealth is equivalent to 9 to 10 years of earnings. Other countries with very high implicit taxes on continued work include Sweden (which abolished the labour market criterion in 1991) and Portugal.

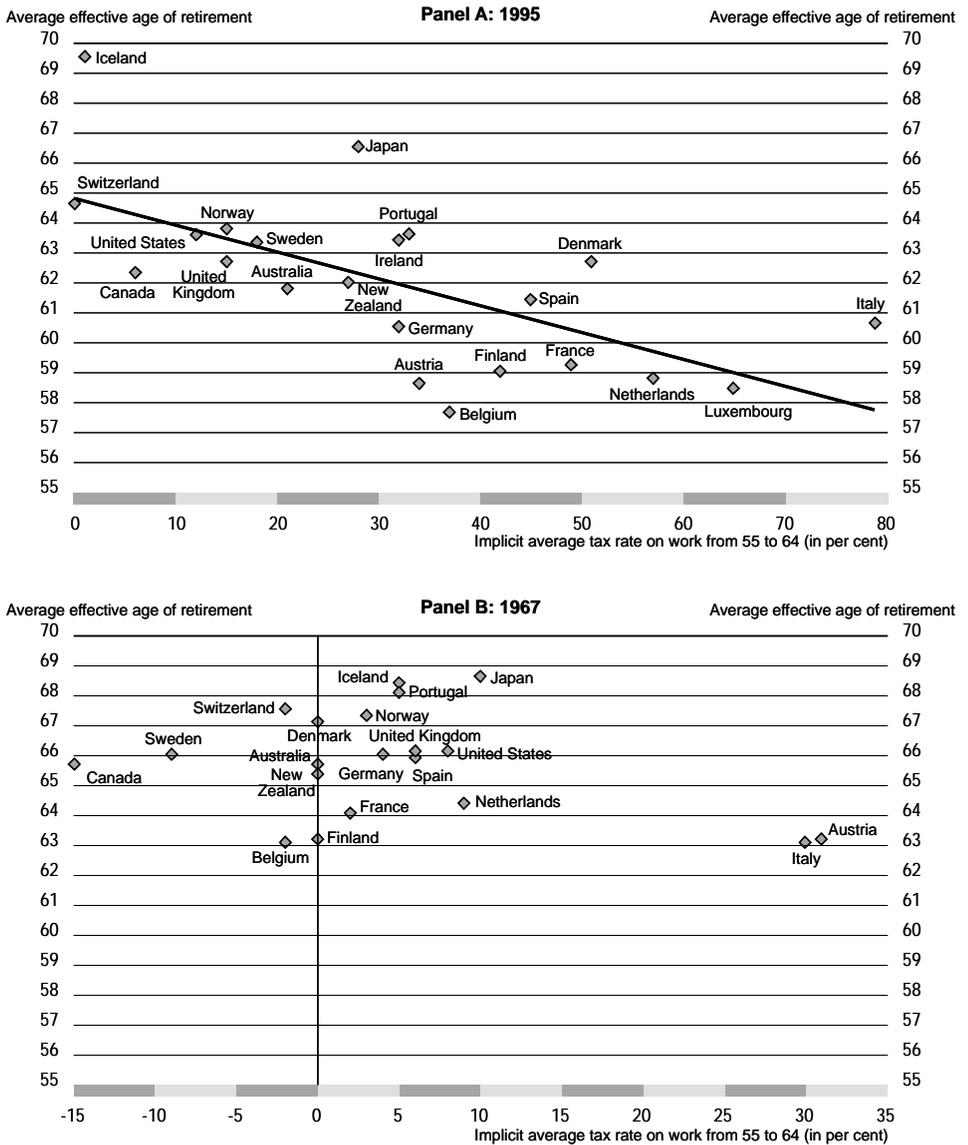
The disincentives to work are also strong in special early-retirement schemes in some of the countries still operating such systems. For example, the opportunity to enter into the French scheme (AFSNE) at the age of 56 (which is only possible in exceptional circumstances, the standard entry age being 57) implies higher implicit taxes on work up to the standard age of retirement and even higher taxes than if the unemployment or disability route is taken. In Luxembourg and in Denmark (before the abolition of the scheme), the special early retirement schemes strongly discouraged work at older ages. The disincentives are less pronounced in Spain and Norway as such schemes are only open to persons close to the pension age.

SOCIAL SECURITY WEALTH ACCRUAL AND PARTICIPATION RATES OF OLDER WORKERS: AN EMPIRICAL ANALYSIS

Panel A of Figure 3 suggests a close correlation between the average effective retirement age²⁰ and the implicit tax rate on continued work across OECD countries in 1995. The countries with low implicit tax rates tended to have higher average retirement ages, and *vice versa*. Thus, this simple correlation points to a potentially high impact on the average retirement age of measures which create strong incentives to early retirement. However, labour force participation of older workers is more complex than this correlation suggests. This becomes clear by looking at Panel B in Figure 3 which shows no significant relationship between average effective retirement ages and the implicit taxes on labour in 1967.

This section examines how changes in pension (or social security) wealth accrual have influenced labour force participation of older male workers in the past, and by how much reforms of social security benefit systems could raise activity rates in the future. It is based on pooled cross-country and time-series data which incorporate, in addition to social security wealth accruals, other potential determinants of the labour supply decision.²¹ This international approach is preferable to country-specific time-series analyses because most of the institutional and policy factors affecting labour supply decisions among older workers show only moderate time variations at the national level, but marked disparities from an international perspective. Thus, a cross-country analysis may provide a better basis for the identification of the potential effects of reforms of social security systems.²² The major drawback of this international approach is that the number of policy and institutional factors that can be included in the analysis is limited given the lack of comparable data across a large number of OECD countries. Moreover, the empirical analysis focuses on older male participation rates because of the marked differences in their historical evolution with respect to female participation rates.²³

Figure 3. *Implicit tax rates on continued work and average effective age of retirement, males, 1967-1995*



Note: The implicit tax rates take into account incentives in both old-age pension and unemployment-related benefit systems.

Source: Authors' calculations.

Model specification and econometric results

The labour supply decision of older males is modelled using a reduced-form equation that mimics an intertemporal utility comparison:

$$MPR_{it} = \mu_0 + \mu_i + \beta_1 WA(or\ SSWA)_{it} + \beta_2 EAGE_{it} + \beta_3 UR_{it} + \beta_4 RPOP_{it} + \beta_5 UDENS_{it} + \varepsilon_{it} \quad [5]$$

where i indexes countries, t the years, μ_0 is the constant and μ_i is the country-specific effect not accounted for by the available explanatory variables, and ε is the usual error term. The dependent variable (MPR) is the number of older males in the labour force divided by the total male population aged 55-64. The choice of the participation rate as the dependent variable instead of hours worked is mainly due to the lack of data on hours by age groups in most countries.²⁴ Since the retirement decision is a discrete labour market outcome in most countries, and only a limited number of individuals combine retirement benefits with part-time work, the use of participation rates should not represent a major problem in the empirical analysis.²⁵ The explanatory variables include: the expected change in pension wealth (WA), or social security wealth (SSWA), for a 55-year old single male from working for ten more years;²⁶ the standard age of entitlement to old-age pensions (EAGE); the male unemployment rate (UR); the share of the prime-age population in the total working-age population (RPOP); and the proportion of workers who are members of trade unions. Results from an extended model that also considers the specific role of the different components of the pension system (accrual rate, replacement rates for old-age, invalidity and special early retirement) are reported in Blöndal and Scarpetta (1998). The health status of older workers has not been included in the empirical analysis because of the lack of cross-country comparable data. In particular, data referring to the subjective assessment of the health status of older people are not readily available and objective measures, albeit available for some countries, are not generally significant in explaining aggregate labour supply changes among older workers (see, amongst others, Johnson, 1988).

The labour market and demographic variables, UR ²⁷ and $RPOP$, are included to account for the possibility that activity rates of older people may be affected by growing labour-market imbalances and changes in the composition of the working-age population.²⁸ Thus, the increase in the unemployment rate may have prompted, or forced, older workers to withdraw from the labour market, especially if they were considered as less productive than their younger counterparts. Likewise, the increase in the proportion of younger workers in the working-age population may have put additional pressure on older workers to retire early, younger workers effectively crowding out job opportunities for their elders. These labour market variables would not play a significant role in the retirement decision if real wages adjusted to balance supply and demand for different categories of workers, but there is strong empirical evidence that this is not the case in most OECD countries.

And even where these labour market variables seem to be important, it may reflect the working of social security systems not captured by the summary measure of the wealth accrual: few older workers could afford to retire in response to adverse labour-market conditions if they were not entitled to public income support.

Furthermore, participation rates of older workers are likely to be influenced by institutional factors which affect wage settings and contribute to shaping employment protection regulations. Given limited data availability, the sole proxy for cross-country differences in labour market institutions which is included in this study is the union density rate (UDENS) - the proportion of workers who are members of trade unions. The relationship between the labour supply of older workers and union density is difficult to assess on *a priori* grounds. On the one hand, unions may promote early retirement as a socially acceptable way to accommodate downsizing and economic restructuring of firms. On the other hand, in highly unionised countries the interest of older workers may be reflected in more restrictive firing costs (*e.g.*, tenure-related severance payments) that protect them from dismissals. Moreover, countries with low unionisation and decentralised wage bargaining have generally a higher relative wage flexibility, creating greater possibilities for older workers to adjust hours supplied and often to combine earnings from work and social security benefits.

Feasible Generalised Least Squares (FGLS) were used to estimate equation (5). This estimation procedure allows controlling for group-wise heteroscedasticity and for country-specific fixed effects. Since participation rates of older workers tend to react only slowly to changes in social security systems and labour market structural factors, we tested for country-specific serial correlation of residuals and used the following three-stage approach to control for it.²⁹ Each model was firstly estimated with ordinary least squares to obtain consistent estimates of the autocorrelation terms. Subsequently, data were transformed by taking each time series separately and using the Prais-Winsten transformation of the original data. This transformation removed the country-specific autocorrelation, and the transformed data became suitable for the estimation of group-wise disturbance variances which, in the third step, allowed calculating the heteroscedastic regression (see Greene, 1993 for more details).

Statistical tests were also performed to identify outliers in the sample set. Estimates based on a relatively small panel of cross-section and time-series data may be significantly affected by a few observations which increase the standard error of the regression and/or affect disproportionately the estimated coefficients. In this study, outliers have been identified with the help of the so-called leverage-residual plot, which is based on the *studentised residuals* and the *leverage points*.³⁰ Moreover, two regression diagnostics were used to identify outliers in the leverage-residual plot.

The DFITS statistic measures the influence of an individual observation on the predicted dependent variable, or fitted values. The COVRATIO statistic measures the effect of an individual observation on the efficiency of the coefficients' estimation (see also Fiebig, 1987 and Belsley *et al.*, 1980 for more details).³¹

Table 8 presents the results of estimating different specifications of equation (5). Since there is evidence of a serial correlation of residuals (Model 1), we used the three-stage approach discussed above in Models 2 to 5. While Model 2 focuses on the pension wealth accrual and includes unemployment-related benefits as a separate explanatory variable, Models 3 to 5 consider the "social-security wealth" which incorporates unemployment-related benefits prior to the entitlement to old-age pensions.

As stressed above, the availability of generous non-employment benefits is likely to be a prerequisite for labour-market factors to influence activity rates of older workers, and this kind of interaction is explored in Model 4 by allowing the parameter of RPOP to vary according to the expected change in social security wealth.³² Likewise, Model 5 presents some evidence on the interactions between the level of centralisation/co-ordination of wage negotiation and the demographic variable. Insofar as different bargaining systems lead to different degrees of aggregate and relative wage flexibility, they may also affect the impact of demographic changes on the labour supply of older workers.

The empirical results suggest that labour market conditions and incentives embedded in the pension systems play a significant role in explaining cross-country and time-series variations in the participation rates of older men in the OECD countries.³³ As an illustration, an increase of one year in the age of entitlement, while leaving in place the different early retirement schemes, could raise participation rates of older male workers by 1 to 2 percentage points. Along these lines, the effects on participation rates of the observed decline in the standard age of entitlement over the 1971-1995 period can be quantified as 7.5 percentage points in France, 6 percentage points in Ireland and 3 percentage points in Sweden. The results also point to a strong impact of the pension wealth accrual and of unemployment-related benefits on the retirement decision (Model 2). Not surprisingly, the coefficient for social security wealth accrual is strongly significant too. In particular, the parameter of the social-security wealth suggests that a 10 percentage points reduction in the implicit tax on continued work from 55 to 65 years of age would lead to an increase in participation rates among older males of almost 2 percentage points. This implies that the significant drops in the pension wealth accrual observed over the past two decades could have led to a fall in participation rates of about 5.5 percentage points in Italy, while the drops in the broadly-defined social-security wealth accrual could have led to a fall of about 8-9 percentage points in Finland, the Netherlands and Portugal.

Table 8. **Old-age male participation rate and pension and social-security wealth accrual, 1971-1995**

FGLS, population 55-64

	With controls for serial correlation of residuals and heteroskedasticity															
	Model 1				Model 2				Model 3				Model 4		Model 5	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.		
UR	-1.460	0.102***	-1.355	0.090***	-0.747	0.078***	-0.605	0.071***	-0.915	0.078***	-0.765	0.071***	-0.764	0.072***	-0.754	0.071***
RPOP			-0.903	0.097***			-0.805	0.091***			-1.024	0.091***				
UDENS	0.317	0.045***	0.264	0.040***	0.107	0.040***	0.129	0.039***	0.094	0.044**	0.139	0.043***	0.131	0.046***	0.141	0.043***
U repl	-0.328	0.034***	-0.285	0.030***	-0.188	0.030***	-0.149	0.029***								
Off. age.ret.	0.028	0.004***	0.029	0.003***	0.018	0.003***	0.015	0.003***	0.011	0.003***	0.015	0.002***	0.012	0.002***	0.014	0.002***
Pens. wealth accr.	0.010	0.007	-0.002	0.006	0.026	0.004***	0.018	0.004***								
Soc. s. wealth accr.									0.017	0.002***	0.015	0.002***	0.014	0.002***	0.015	0.002***
RPOP (decentralised)													-0.782	0.119***		
RPOP (sectoral)													-1.656	0.294***		
RPOP (centralised)													-1.023	0.133***		
RPOP (small)																
RPOP (intermediate)															-0.906	0.092***
RPOP (large)															-0.722	0.437*
															-1.367	0.217***
Log Likelihood		809.0		848.0		1 187.5		1 209.9		1 184.0		1 206.9		1 215.6		1 215.2
χ^2_1		2 536.3		3 220.4		1 501.6		1 517.2		1 616.2		1 926.6		1 929.6		2 105.3
Test of country dummies (χ^2_{13})		868.8		731.8		409.9		143.5		544.8		180.4		122.3		135.3
Adj Durbin-Watson test		0.2		0.3												
Wald tests (χ^2_1):																
RPOP (decentr.) =																
RPOP(sect.)														7.8***		
RPOP (sect.) =																
RPOP(centr.)														3.7*		
RPOP (small) =																
RPOP (intermediate)																0.2
RPOP (small) =																
RPOP(large)																4.0**

Table 8. **Old-age male participation rate and pension and social-security wealth accrual, 1971-1995** (cont.)

FGLS, population 55-64

Notes: No. of observations: 366; No. of countries: 15; No. of time periods: 25. Nine observations have been excluded from the sample because they are outliers. Each specification includes country dummies which are not reported.

Dependant variable = male labour force (55-64) divided by male population (55-64).

UR = Unemployment rate of prime-aged male workers (25-54).

RPOP = Share of prime-aged male population in total male population.

U repl = Replacement rate for unemployment rate (see main text).

Off. age of ret. = official age of retirement (see main text).

Pens. wealth accr. = Old-age pension wealth accrual (relative to annual earnings) for 55 year-old as a result of working for 10 more years.

Soc. s. wealth accr. = Social security wealth accrual (relative to annual earnings) for 55 year-old as a result of working for 10 more years.

RPOP (small) = coefficient for RPOP for countries with small variations in pension (or social-security) wealth.

RPOP (intermediate) = coefficient for RPOP for countries with intermediate variations in pension (or social-security) wealth.

RPOP (large) = coefficient for RPOP for countries with large variations in pension (or social-security) wealth.

* Statistically significant at 10 % level; ** at 5 % level; *** 1% level.

1. Chi-squared of the significance of the regression equations.

Source: Authors' calculations.

Labour market conditions have also had a strong impact on the labour supply of older workers. The empirical results suggest that a one percentage point increase in the prime-age unemployment rate may produce a drop in older workers' participation rates of about 0.6-0.9 percentage points in the longer run. As an example, the dramatic increase in unemployment in Spain in the 1980s might have led to a decline in the older male participation rate of 8-9 percentage points. In most of the other European countries, the marked increases in prime-age unemployment could have accounted for a decline in the participation rate of the order of 3-5 percentage points. Along the same lines, changes in the size and composition of the labour force due to the entry into the working-age population of the baby-boom generation seem to have produced significant crowding out of job opportunities, creating a strong pressure for early withdrawal among older male workers. The empirical results also give some support to the idea that high levels of unionisation have favoured early withdrawals of older workers by promoting early retirement schemes at the firm and/or sectoral levels and by, *de facto*, reducing the degree of relative wage flexibility, with adverse effects for the employment prospect of older (low-skilled) workers.

As stressed above, the effects of demographic changes on participation rates are likely to involve rather complex transmission mechanisms which also depend upon labour market institutions. Models 4 and 5 offer an attempt to evaluate some of these interactions by allowing the parameter of the demographic variable to vary according to the degree of centralisation/co-ordination of wage bargaining and to the level of incentives to early retirement summarised by the changes in the social security wealth.³⁴ The results point to a stronger effect of changes in the labour supply on participation rates in countries with intermediate levels of centralisation (i.e. sectoral wage bargaining with no co-ordination).³⁵ This is probably due to the difficulty that intermediate systems have in internalising in the bargaining process the negative externalities on vulnerable groups, including (low-skilled) older workers.³⁶ Moreover, changes in the composition of the working-age population have a stronger impact on older male participation rates in countries with strong incentives to early retirement than in those with moderate incentives, which confirms the importance of income support schemes in translating labour market pressures into early withdrawals from the labour market.

Accounting for the decline in labour supply of older males

Using the empirical results presented in Table 8, Table 9 offers a breakdown of the cross-country differences in the participation rates of older workers over the entire sample period (Panel A) and over the past decade (Panel B). The average of the 15 OECD countries of the sample is used as a reference. The second column in both panels reports the estimated differences between the OECD average and the value observed in each country, while the other columns display how these differences can be explained by differences in the policy variables. As stressed above,

³⁶

Table 9. **The role of pension and social security systems in explaining cross-country difference in participation rates, 1971-95**

Male workers aged 55-64

	Explaining the difference ¹									
	A: 1971-95					B: 1985-95				
	Part. rate _i	Part. rate _i - Part. rate OECD ²	U repl	Pension wealth accrual	Standard ret. age	Part. rate _i	Part. rate _i - Part. rate OECD ²	U repl	Pension wealth accrual	Standard ret. age
Australia	67.93	-0.92	0.72	2.80	0.62	60.93	-1.08	0.65	2.80	0.87
Canada	71.57	2.72	1.73	1.92	0.62	64.39	2.38	2.03	1.92	0.87
Finland	54.51	-14.33	-2.94	0.63	0.62	46.51	-15.50	-3.55	0.63	0.87
France	57.35	-11.50	-0.88	0.17	-2.47	45.74	-16.27	0.83	0.17	-4.65
West Germany	64.37	-4.47	-1.82	0.44	0.62	58.58	-3.43	-1.41	0.44	0.87
Ireland	75.82	6.98	1.39	-0.02	2.69	67.70	5.69	1.37	-0.02	1.97
Italy	54.80	-14.04	-0.82	-10.66	-4.81	50.70	-11.31	-1.31	-10.66	-4.45
Japan	84.78	15.94	3.85	-2.10	-4.89	83.73	21.72	4.29	-2.10	-4.65
Netherlands	57.21	-11.64	-1.90	2.02	0.62	44.50	-17.52	-3.10	2.02	0.87
Norway	78.45	9.60	2.51	0.42	2.83	74.27	12.26	2.18	0.42	3.08
Portugal	71.02	2.18	-1.74	1.29	0.62	64.35	2.34	-4.01	1.29	0.87
Spain	70.79	1.95	-2.52	0.45	0.62	61.52	-0.49	-3.05	0.45	0.87
Sweden	77.30	8.45	-2.30	-0.42	1.06	73.68	11.67	-0.84	-0.42	0.87
United Kingdom	75.75	6.91	1.47	2.19	0.62	66.59	4.57	2.19	2.19	0.87
United States	71.02	2.18	3.25	0.85	0.62	66.98	4.97	3.72	0.85	0.87
OECD-15 ³	68.85					62.01				

Notes: Variables are described in Table 8.

1. Estimates based on model 2 in Table 8.

2. Difference between the participation rate of country *i* and the OECD-15 average.

3. Simple average of the 15 countries.

Source: Authors' calculations.

labour market and institutional factors (not presented in the table) also explain a great deal of the cross-country and time-series differences in participation rates. However, even controlling for these factors leaves a large fraction of the cross-country differences unexplained. This is not surprising taking into account that a number of unmeasured (or un-measurable) factors are omitted from the empirical analysis, including a wide variety of institutional, cultural and historical factors. Therefore, in reading the empirical results in Table 9 it should be kept in mind that other factors play an important role in the observed behaviour of labour supply of older workers, with different intensities across countries. In this study, such unexplained differences and country-specific measurement errors are identified through country-specific fixed effects.

Generous unemployment-related benefits compared with the OECD average are estimated to have contributed to lower the participation rates relative to the OECD average by about 4 percentage points in Portugal, 3.6 percentage points in Finland, and about 3 percentage points in the Netherlands and Spain in the 1985-1995 period. On the contrary, lower-than-average replacement rates are estimated to have significantly contributed to maintain higher-than-average participation rates in Japan (+4.3 percentage points), the United States (+3.7), Norway, the United Kingdom and Canada (around 2 percentage points).

Cross-country differences in the pension wealth accrual also seem to have played an important role in the observed differences in labour supply of older male workers. In the 1985-1995 period, the sharp fall in the pension wealth of postponing retirement from 55 to 64 years of age in Italy could have contributed to reduce participation rates by about 10 percentage points, while the relatively stable level of the pension wealth across retirement ages in Australia and the United Kingdom could have kept participation rates above the OECD average, other things being equal, by more than two percentage points. The estimated model also suggests that the lower standard retirement age in France, Japan and Italy may have contributed to reduced participation rates amongst older workers by about 4.6 percentage points, while some 3 percentage points of the higher participation rate in Norway can be attributed to the higher (67) standard retirement age.

Moving to an actuarially neutral system

The summary measure of the pension (or social-security) wealth accrual also allows a policy simulation in which the OECD social security systems are reformed so as to be actuarially neutral (Table 10). A neutral system implies that the pension (or social-security) wealth is independent of the retirement age and therefore does not distort the retirement decision. In the case of the social-security wealth, moving to a neutral system would also imply that unemployment-related benefits prior to old-age pension benefits should be replaced by appropriately adjusted early pension benefits.

Table 10. **The simulated impact on older male participation rates of moving to an actuarially neutral pension system, 1995**

In per cent of the population

	Expected change in older male	Older male participation rates		
	Participation rate ¹	Current	Expected	
Australia	0.0	60.9	60.9	60.9
Canada	1.5	58.9	60.3	60.3
Finland	6.1-9.2	46.0	52.0	55.2
France	3.6-8.3	41.5	45.1	49.9
Germany	3.4-6.8	57.8	61.2	64.6
Ireland	3.5-5.3	63.9	67.4	69.2
Italy	20.1	44.1	64.2	64.2
Japan	3.9	84.8	88.8	88.8
Netherlands	1.3-8.2	42.3	43.5	50.4
Norway	3.3	72.3	75.6	75.6
Portugal	1.0-9.0	60.7	61.7	69.8
Spain	3.1-5.1	54.9	58.1	60.1
Sweden	4.2-4.6	70.4	74.5	75.0
United Kingdom	1.2-3.0	62.4	63.6	65.4
United States	2.9	66.0	68.9	68.9
<i>Coefficient of variation</i>		0.21	0.18	0.16

1. Estimates based on the empirical results presented in Table 8. Changes in older male participation rates are based on the assumption of a reform aimed at keeping constant the age profile of the pension wealth over the different retirement ages from 55 to 64. For the countries where two values are reported, the first refers to a reform of the pension system alone, and the second to a reform of both the pension system and the unemployment-related benefit system. See main text for more details.

Source: Authors' calculations.

Moving to an actuarially neutral system could significantly increase the labour supply of older workers in the OECD countries. The cross-country variability of the participation rates of males aged 55-64 would also be markedly reduced, with most countries reaching a participation rate of at least 60 per cent (France, Finland and the Netherlands being notable exceptions). The largest increase would be in Italy, where the move towards a neutral system could bring the participation rate back to its levels of the 1950s and 1960s. France, Finland, the Netherlands and Portugal would also experience marked increases in their participation rates, especially if unemployment-related benefit systems were to be included in the reform package. However, the simulation suggests that their participation rates would remain at the lower end of the OECD range, even after such a reform (with the exception of Portugal). In the other European countries, the labour supply of older male workers would increase to around 65 per cent of the older male population, while in the United States and Japan it could approach 70 and 89 per cent of the older male population, respectively. Lack of data made it impossible to estimate participation-rate

equations for the 65-70 year-olds. Yet, the generally very high tax rates on continued work after 64 suggest that a move to a neutral system could have sizeable effects for this age group too.

The results of the simulation reported in Table 10 should be considered as a lower bound estimate of the potential effects of social security reforms. Firstly, they do not take into account the interactions between the social security systems and labour market conditions: as stressed above, changes in the incentives to early retirement may affect the way in which demographic and/or labour market pressures are transmitted into the labour supply decision of older workers. Furthermore, the simulation exercise only focused on moving to an age-neutral system but did not look at changes in the overall generosity of the social security systems and at whether the current replacement rates are sustainable in the light of the projected ageing of the OECD populations. Results in Blöndal and Scarpetta (1998) suggest that a reduction in old-age pension and unemployment-related benefits may lead to a significant increase in participation rates, over and above that produced by a reform towards a neutral system.³⁷

A few OECD countries have taken measures that will make their pension systems broadly neutral in the future by strengthening the link between life-time contributions and pension benefits. Mexico has transformed its previous pay-as-you-go system into a fully funded capitalisation system in which mandatory contributions finance individual pension accounts managed by private fund administrators. Italy will retain its pay-as-you-go system, but pension benefits will be determined by the stock of contributions (capitalised at the rate of real GDP growth) and made available from the age of 57 onwards, with adjustments reflecting life expectancy and expected GDP growth rates. Some other countries (Hungary, Poland and Sweden) are in the process of adopting, or will introduce, two-tier pension systems: a pay-as-you-go tier linking pension benefits to accumulated contributions and a fully-funded compulsory tier.

Most pension reforms in OECD countries have, however, stopped short of eliminating incentives to retire early. For example, in the United States the average implicit tax rate on work from 55 to 69 will have fallen only moderately once the 1983 reforms are fully implemented; in Japan the average tax rate will be unchanged after the completion of the 1994 reforms as the reduction for ages 60-64 is offset by higher taxes on work from ages 55 to 59; in Germany the tax rate after the 1992 reform will drop by 10 percentage points when there is a possibility of accessing pensions at the age of 60; in France it is practically unchanged after the 1993 reform when it is taken into account that early retirement can still take place via unemployment benefit and special early retirement systems; and in the United Kingdom the 1986 reforms will lower the average implicit tax rate only modestly. Thus, removing

the tax on continued work requires much more drastic changes to pay-as-you-go systems than have been decided so far.

CONCLUDING REMARKS

The evidence presented in this paper suggests that economic incentives embedded in the old-age pension system create strong incentives for the early retirement of older workers in most OECD countries. The financial incentives to early retirement are particularly strong after the earliest pensionable age: the increase, if any, in pension entitlements due to an additional year's work is often insufficient to cover the extra pension contributions and foregone pension payments. A number of factors have contributed to the observed increases in the implicit tax on work after the age of 55 over recent decades, including the lowering of standard retirement ages, higher pension replacement rates, flatter pension accruals at older ages, and higher pension contribution rates. Incentives to retire early are amplified in countries where other income-support schemes - which were originally designed to deal with other contingencies such as unemployment or disability - have been used to finance early retirement.

Removing financial incentives to early retirement is a demanding task. In most countries it would involve changing both the old-age pension system and the various income-support programmes. In fact, tackling the latter is likely to be an essential ingredient of a successful pension reform, as the effectiveness of a neutral old-age pension system in itself will be undermined if other systems continue to offer large incentives to early retirement. Reforms could be carried out in various ways. Given that incentives are typically less distorting prior to the earliest age at which old-age pensions become available, a direct way to encourage people to work longer would be to raise the pensionable age. Provided that the various *de facto* early retirement programmes are reformed at the same time, this measure could be effective in raising the average retirement age. However, increasing the minimum pensionable age and closing down the option to access pensions prior to that age might involve an excessive degree of compulsion, denying the elderly with very strong preferences for leisure or poor health or facing difficulties in the labour market the possibility to retire early.

To combine neutrality with flexibility, the most appropriate reform would be to allow people to retire at the age of their own choice and to adjust the pension level so that the pension system is neutral on average. Under such a system, the increase in pensions due to an additional year of work would make up for an additional year of pension contributions and for delaying the receipt of pensions by one year, removing the incentives to retire early embedded in current arrangements. With such a neutral system, people could be given the opportunity to retire at the age of

their own choice: those choosing to retire in their fifties could do so but at the cost of a permanently lower annual pension than if they worked longer, whereas those choosing to work until their late sixties or longer would be correspondingly rewarded.

Judging from the empirical results presented in the paper, removing the incentives to early retirement (an age-neutral retirement system) could raise the labour supply of older male workers significantly. Participation rates of older male workers could increase by 8-9 percentage points or more in countries with particularly large distortions in their current systems; in most of the other European countries the rise would be in the order of 4 to 6 percentage points, and in North America and Japan it would be below 4 percentage points.

These reforms, if implemented, could pose considerable challenges to OECD labour markets. The removal of disincentives to work would significantly increase the supply of older workers in the labour market, and it might be difficult to absorb this increase in countries with high structural unemployment. The adjustment would be eased if reforms of pensions and other income-support systems for the elderly were to be accompanied by measures to increase job opportunities in general, including elimination of measures and practices that discriminate against the hiring and training of older workers.³⁸ The reforms discussed above could themselves contribute to increasing job opportunities for older workers by inducing *inter alia* changes in their wage determination, participation in training, mobility, and working-hour schedules. However, more broad-based reforms of labour and product markets along the lines advocated in the OECD Jobs Strategy would make the transition to increased participation of older workers in the labour market both easier and quicker.

NOTES

1. For a more detailed discussion of the incentive structures embedded in social security systems, see Blöndal and Scarpetta (1998). See also Quinn *et al.* (1998) for a study on the United States; Antolin and Scarpetta (1998) for a study on Germany; Miniaci (1998) for a study on Italy; Miniaci and Stancanelli (1998) for a study on the United Kingdom; and Lindeboom (1998) for a study of the Netherlands.
2. See *e.g.* Chapter 2 in Quinn *et al.* (1990).
3. Burkhauser (1980) introduced this new analytical framework. It has been used extensively to analyse retirement incentives in public and private pension arrangements in the United States. It has also been used in the NBER project on Social Security and Retirement Around the World, see Gruber and Wise (1997).
4. Recent pension reforms in Italy include the gradual raising of the earliest age of entitlement to seniority pensions, and the abolition of this type of pension in the year 2013.
5. This practice was more common earlier. For example, full retirement was necessary in Belgium in the 1960s.
6. See *e.g.* Blanchet and Pelé (1997).
7. Net (*i.e.* after-tax) pension replacement rates are more meaningful for behavioural decisions about retirement than gross replacement rates. However, lack of information about the tax treatment of pensioners prevented the calculation of net pension replacement rates for the countries listed in Table 2. However, Eurostat (1995) shows that the net replacement rate in 1989 was on average 16 percentage points higher than the gross rate in the 12 EU countries studied. The difference was due to the operation of progressive income tax systems, and special tax privileges for older people (*e.g.* pensions based on economy-wide average earnings over the whole working life being practically exempt from taxation and special high tax credits or tax allowances for older people). Moreover, social security contributions are lower for pension recipients than for employees, and in some countries pensioners are even exempted from contributions to the health insurance system. Outside the European countries, tax privileges for pension recipients are common. For example, pensioners who have earnings during their working life equal to the economy-wide average pay very small, if any, taxes in the United States (Diamond and Gruber (1997)) and in Japan (Takayama (1996)).
8. Exceptions were made for the United States prior to 1977 and Japan prior to 1975. In the United States prior to 1977, the basic parameters of the pension system were changed to partially offset the impact of the reduction in the real value of the earnings on which basis pensions were calculated. In this case, applying the pension parameters to an assumed constant real earnings over the whole working life would significantly overstate pension generosity, and the assumption of constant real earnings has been replaced with an assumption that nominal

earnings evolve in line with average nominal earnings in the economy as a whole. The same assumption has been employed for Japan for the same reason.

9. Eurostat (1995) provides cross-country comparable data on gross and net replacement rates in 1989 for some of the EU countries. The gross replacement rates reported in that publication are generally close to those in Table 2.
10. However, in the case of Germany, the fall in the gross replacement rate was accompanied by a rise in the net replacement rate, see Börsch-Supan and Schnabel (1997).
11. See Ministerie van Sociale Zaken (1997).
12. The retirement reform in Germany in 1992 introduced flexible retirement options from 60 to 70 years of age with accrual adjustments.
13. Australia and New Zealand continued to finance pension outlays from general government revenues, and contribution-related benefits remain insignificant in Denmark.
14. These results are broadly in line with findings for 11 countries included in the NBER international project on retirement (see Gruber and Wise, 1997). The country monographs from this project include: the United States (Diamond and Gruber, 1997), Japan (Oshio and Yashiro, 1997), Germany (Börsch-Supan and Schnabel, 1997), France (Blanchet and Pelé, 1997), Italy (Brugiavini, 1997), United Kingdom (Blundell and Johnson, 1997), Canada (Gruber, 1997), Belgium (Pestieau and Stijns, 1997), Netherlands (Kapteyn and de Vos, 1997), Spain (Boldrin, Jimenez and Peracchi, 1997), and Sweden (Palme and Svenson, 1997).
15. See *e.g.* OECD (1997).
16. The experience of France with these schemes is described in Blanchet, Brousse and Okba (1996).
17. In the case of the United States, Bound and Waidmann (1992) have argued that, even if health conditions have been improving, early detection of health problems could account for the rise in disability beneficiaries.
18. For Austria, see Ministry of Labour and Social Affairs (1995); for Norway, see *e.g.* Norges Offentlige Utredninger (1990).
19. As the replacement rates in Table 6 refer to full disability benefits, they differ from those reported in Blöndal and Pearson (1995) where the summary replacement rate is an average of partial and full benefits.
20. The average retirement age measures the average age at which people withdraw completely from the labour force. It is derived from age-specific labour force participation rates, for details see Blöndal and Scarpetta (1998).
21. The sample includes data for 15 countries (Australia, Canada, Finland, France, Western Germany, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom and the United States) over the 1971-1995 period.
22. Elhorst (1996) used a pooled time-series cross-section dataset to analyse regional labour force participation rates across the Member states of the European Union.
23. For married women there are generally more alternative uses of time than for men, given their predominant role in household work. Heckman and Killingsworth (1986) also suggest that much of the variation in female labour supply is explained by changes in family status rather than by wages and income.
24. Mincer (1962), Ashenfelter and Heckman (1974) and Bowen and Finegan (1969) have used a similar approach, amongst others.

25. Pencavel (1986) discusses how the labour supply function of a single individual can be aggregated across individuals in order to make the formulation suitable for an empirical analysis at the aggregate level. Following his formulation, the participation rate reflects the share of the population who want to work at the current wage, controlled for a range of microeconomic-oriented factors – including alternative non-employment benefits – which are aggregated across individuals.
26. As discussed above, the old-age pension wealth, or the social security wealth, are the sum of the discounted value of expected old-age pension benefits (or unemployment benefits plus old-age pension benefits) minus the discounted cost of obtaining such benefits.
27. To minimise endogeneity problems, the unemployment rate of prime-aged workers was used instead of the old-age unemployment rate or the overall unemployment rate.
28. From a theoretical stand-point, the utility maximisation process which governs the labour supply decision of older workers incorporates the probability of redundancy and the probability of finding a new job in addition to non-employment benefit schemes. These two probabilities depend on a variety of micro- and macroeconomic factors, including the overall and group-specific unemployment rates.
29. Within-group serial correlation of residuals was tested with the adjusted Durbin-Watson statistics (Adj D-W, see Bhargava, Franzini and Narendranathan, 1982).
30. For each observation, the studentised residual is the t-statistic of a dummy which has a value equal to 1 for the observation and zero everywhere else. The leverage point is the corresponding diagonal element in the least-squared projection matrix. It proxies the distance between the individual observation and the centre of the data.
31. This approach identified nine observations as significant outliers over the sample of 375 observations: the 1971 observation for Finland; the 1979 observation for France; the 1991 and 1992 observations for Germany; the 1971 and 1985 observations for Ireland; and the three observations 1971-1973 for Portugal.
32. The 15 OECD countries have been grouped according to the expected change in the level of the social security wealth accrual presented in Table 7. The groups are as follows: group 1 (low variation in the wealth) = Australia, Canada, Japan, Norway, Sweden, United Kingdom and United States; group 2 (intermediate variation in the wealth) = Germany, Ireland and Portugal; and group 3 (large variation in the wealth) = Finland, France, Italy, Netherlands, and Spain.
33. Parameter estimates are robust to the exclusion of the UDENS variable from the regression.
34. The countries in the sample have been grouped according to available information on the degree of centralisation and the degree of co-ordination among social partners over the period 1970-1995 – see OECD (1997). The groups are as follows: group 1 (decentralised countries) = Canada, Italy, Japan, United States; group 2 (sectoral bargaining with lack of co-ordination): Australia, France, Ireland, New Zealand, Portugal, Spain and the United Kingdom; group 3 (centralised bargaining or sectoral bargaining with high co-ordination): Finland, Germany, Norway and Sweden. See Elmeskov, Martin and Scarpetta (1999) for a description of the country groups according to the degree of centralisation/co-ordination of the wage bargaining process.
35. The Wald tests suggest that the coefficient for the demographic variable for the intermediate countries (sectoral wage bargaining with lacking co-ordination) is significantly higher than those for decentralised and highly centralised countries.
36. This result is also consistent with evidence of a U-shaped relationship between labour market performance and the centralisation of wage bargaining, whereby both highly centralised and

fully decentralised countries offer better labour market outcomes than intermediate systems (see Calmfors and Driffill, 1988; Scarpetta, 1996).

37. In particular, a 10 percentage points reduction in the replacement rate for unemployment-related benefits is estimated to raise the participation rate of older male workers by as much as 2 percentage points.
38. The difficulties older workers face in the labour market at present are discussed in OECD (1998).

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STATISTICAL ANNEX

Table A1. **Old-age pensions system: Earnings disregards and benefit reduction rates after the standard entitlement age, 1995**

Single workers		
	Earnings disregard (% of average earnings ²)	Benefit reduction rate (BRR)
Australia	7.5	50
Austria	29.8	Does not apply if years of contributions exceed 35.
Belgium	28.7 ¹ 33.0	susp. ³ Over the 28.7-33% earnings range, one per cent increase in earnings results in one per cent reduction in benefits.
Canada	160 ²	15 Applies only to the Old Age Security (OAS) system.
Denmark	50 ¹	60 Only up to age 70. For means tested pension supplements, the disregard is 17.7%, and the BRR is 30%.
Finland	-	-
France	-	-
Germany	-	-
Greece	116.1	susp.
Iceland	58.9	25 For supplementary pensions, the disregard is 15.6% and the BRR is 45%.
Ireland	-	-
Italy	22.5	100 The earnings disregard is increased to 51.3% if earnings come from self-employment.
Japan	17.0 90.0	(20) Up to 90% of average earnings: 20 % reduction in level of pensions. Only up to 64.
Netherlands	-	-
New Zealand	-	-
Norway	18.0	50 Only up to age 70.
Portugal	-	-
Spain	-	-
Sweden	-	-
Switzerland	-	-
United Kingdom	-	-
United States	38.4	33 Only up to age 70.

1. 1993.

2. Canada survey.

3. "susp." denotes that pensions are suspended if earnings are above the earnings disregard.

Source: US Department of Health and Human Services, *Social Security Programs Throughout the World, 1995 issue*; Commission of the European Communities, *MISSOC - Social Protection in the Member States of the Community*. Situation on July 1st 1993 and evolution: OECD (1996), *Economic Surveys - Canada*.

Table A2. **Unemployment-related benefits for older workers: Entitlement conditions**

	Unemployment benefits	Unemployment pensions
Australia	1990: 55+, exemption from requirements to seek a full-time job, if engaged in or seeking substantial part-time work.	1994: 60+, "mature age allowance".
Austria		Prior to 1961: 60+ (males) and 55+ (females), 1 year of unemployment.
Belgium	1985: 55+, exemption from job-seeking requirements	
Denmark	50+, exemptions from job-seeking requirements and participation in ALMPs, but a job offer must be accepted.	1979: 60+, available to both the unemployed (benefits stop at 59) and the employed. 1992-1996: 50+, available to members of unemployment insurance funds aged between 50 and 59, and unemployed for more than a year.
Finland		1972: 60+, unemployed at least 500 days during last 60 weeks and covered for at least 5 of the last 15 years.
France	56+, no requirements to seek a job or to participate in ALMPs	
Germany	1986: 58+, active job-search not required.	1972: 60+, unemployed 1 year in last 18 months, and 15 years of contributions.
Ireland		1995: 55+, unemployed for 15 or more months.
Italy		1979: 57+ (males) and 52+ (females) 1983: 55+ (males) and 50+ (females), if unemployment due to severe economic conditions or industrial organisation.
New Zealand	1992: 55+, relaxed work test.	
Portugal		1973: 60+, exhaustion of unemployment benefits.
United Kingdom	1983: 60+ (males) and 55 (females), exemption from job-seeking requirements.	

Source: OECD 1995a, US Department of Health and Human Services, *Social Security Programs Throughout the World*, various issues, national sources.

Table A3. **Labour-market criteria in disability systems**

Australia	May 81 July 87 Oct. 91	Factors such as changes in the labour market to be taken into account. Greater emphasis on labour market conditions. New Disability Support Pension: only a limited range of non-medical factors are taken into account.
Austria	1980/81	One of the groups becoming eligible: long-term unemployed aged 56 and over.
Finland	1973 1986 (1989 in in public sector)	Labour market conditions introduced as one of elements when deciding on award. Early disability pension for those aged 55+. Criterion: whether the claimants' last work can still be held to be suitable to him/her, rather than whether any other work would be suitable.
Germany	1969	Criterion: whether there is any work available that the disabled person could do.
Italy	1970	Local socio-economic situation must be assessed in determining the award of invalidity pensions.
Netherlands	1972 to 1987	Granting of awards took account of labour market conditions. Thus, a person who was partially disabled could be classified as totally disabled if it was considered that he/she would be unable to find suitable work in the local labour market.
Sweden	1970 Mid-1972 to 1991	For those aged 62 and over, labour market chances were taken into account. For older workers, labour market conditions could be the sole reason for awarding invalidity benefit. Those aged 62+ (60+ from July 1976) could claim could claim benefit if they had exhausted their entitlements to unemployment benefit (after 450 days).

Source: OECD (1995a and b).
