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W. Allard Bruinshoofd*
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Summary

The Netherlands is ageing. The proportion of Dutch citizens aged 65 or older, expressed as a percentage of all Dutch residents in the 20-65 age bracket – the so-termed grey burden – currently stands at about 22. Expectations are that this number will at least double in the next few decades. This study focuses on the issue of how to increase the labour supply of older Dutch workers as a means to absorb the growing grey burden. Of key importance is whether changes in the design of pension provisions will induce people to work longer. The main results are summarised as follows. In the first place, we demonstrate that for the Netherlands much is to be gained in terms of economic growth from the stimulation of labour market participation by ageing workers. Subsequently, in an international comparison of the institutional design of old-age pensions we show that financial incentives play an important role in labour market participation of older workers. This outcome is corroborated by a survey that we conducted among Dutch households: a large proportion of the Dutch population is sensitive to (financial) stimuli to work longer. In pension provisions, these stimuli may be effected through the level of the eventual (early) retirement pension benefits and the number of years over which a full pension can be accrued. In addition, the survey results demonstrate that the actual moment of retirement is highly dependent on whether or not the level of the pension benefit varies with it. Finally, a large share of the Dutch proves willing to participate in the labour process longer if they can do so on a part-time basis.

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1 Introduction and conclusion

The Netherlands is ageing. The number of Dutch citizens aged 65 and over, expressed as a percentage of all Dutch residents in the 20-65 age bracket – the so-termed grey burden – currently stands at about 22. In the four long-term scenarios recently published by the CPB, the Netherlands Bureau for Economic Policy Analysis, the grey burden will mount to over 40 in the most favourable scenario, and to as much as over 50 in the most unfavourable case (Huizinga and Smid, 2004). In other words, in the long term, the grey burden in the Netherlands will at least double.

The greying population issue concentrates on the costs attendant on the increasing grey burden by way of a rising demand for healthcare provisions and a rising number of claims on regular old-age pension benefits as well as on the related sustainability of public finance (e.g. Van Ewijk et al., 2000) and the pension system's shock resistance (e.g., Westerhout et al., 2004). Key to the greying population issue is how a declining population can continue to produce the pie (i.e. the gross domestic product or GDP) required to feed a growing number of mouths. Herein lie the principal fields of tension of, as well as the solutions to, the issue at hand. A first solution presents itself by way of a smaller piece of the pie for each and everyone. However, this has a discouraging effect on people's willingness to pull their weight in producing the pie, as their effort will be less well rewarded. An alternative would therefore be to give only the non-producing consumers a smaller piece of the pie, thus ensuring that the producing part of the population need not be the worse for it. This solution in turn conflicts with the solidarity principle. The only solution holding up is to strive for a greater pie, e.g. by increasing the productivity of the pie makers. In the recent past factor productivity in the Netherlands proved to be a phenomenon hard to grasp so there are no clear policy measures at hand to increase it (e.g. Van Leeuwen and Van der Wiel, 2003). This study will therefore explore the feasibility of an alternative way to increase the pie, viz. getting people more intensively involved in its production.

In Table 1.1., we have abandoned the analogy with the pie in order to look at the contribution of the factor labour to the production of the Dutch income, comparing this with it's contribution in the large euro countries (Germany, France, Italy), two Anglo-Saxon economies (the US and the UK) and Sweden (as an example of a 'functioning welfare state'). From this table it can be inferred that, in an international comparison, the Netherlands scores well as regards the proportion of the population participating in the labour process or available to do so. At 76%, in the Netherlands gross labour participation of the 15-64 age bracket is similar to the levels

recorded in the Anglo-Saxon countries, and only (slightly) surpassed by Sweden. Also if gross labour participation is considered separately for men and women, the Netherlands scores well. In terms of male labour participation, the Netherlands even takes the lead, together with the UK, at 84%. And where female labour participation is concerned, it is only amply exceeded by Sweden and, to a lesser degree, by the Anglo-Saxon countries. Besides, it is broadly expected that the total Dutch female labour supply will increase due to the so-termed cohort effect, since the labour participation rate of younger generations of women equals that of their male contemporaries. As the emancipated generation shifts through the population pyramid, taking the place of senior (housekeeping) women, the average participation of women in the 15-64 age bracket will automatically rise. This makes the female participation increase a highly autonomous process.

From the table it can also be read that, at 1354 hours, Dutch employees work the lowest number of hours per year of all the countries in the comparison. In Germany and France, the average number of hours worked per employee is 7% higher, in Sweden 16% higher, and in Italy 18%. The contrast is strongest with the Anglo-Saxon countries, for in the UK and the US the numbers of hours worked per year average out at 24% and 32%, respectively, more than in the Netherlands. The relatively low number of hours worked per year is largely explained by the high percentage of part-time jobs, i.e. about 33% in all. In no other country do so many people work on a part-time basis. Even so, this observation does not immediately imply that a wealth-enhancing solution to the ageing population issue is achieved by lowering the part-time factor. Euwals and Hogerbrugge (2004), for example, see indications that the high percentage of part-time jobs and the corresponding low number

Table 1.1 International comparison of the labour supply structure in 2003

	Number of hours worked per year	Percentage of part-time jobs[1]	Gross labour participation of the 15-64 age bracket			Ditto of 55-64 age bracker
			Total	Men	Woman	Total
Netherlands	1354	33.9	75.9	83.7	67.9	45.0
Germany	1446	18.8	71.3	78.0	64.5	43.1
France	1453	13.7	69.5	75.5	63.7	39.5
Italy	1591	11.9	61.6	74.8	48.3	31.5
Sweden	1564	13.8	78.9	80.8	76.9	72.5
United Kingdom	1673	23.0	76.6	83.9	69.2	57.5
United States	1792	13.1	75.8	82.2	69.7	62.4

1 Fewer than 30 hours per week.
Source: OECD (2004).

of hours worked is mainly the corollary of Dutch employees' preferences.[1] However, there are also indications that institutional obstacles play a role in the high percentage of part-time jobs (De Nederlandsche Bank, 2005).

From Table 1.1, finally, it can be read that labour participation in the Netherlands by citizens aged 55 and over is more than thirty percentage points below that of the total labour force. With this score, the Netherlands performs as poorly as the three large euro countries and well below the labour rates recorded for the age group in question in the Anglo-Saxon countries and Sweden. Duval (2003) demonstrates for the OECD countries a strong correlation between the level of the financial incentives to retire early and the labour participation rate of older workers. Thus viewed, the low figures for the countries presented in this context in Table 1.1 may be attributed to the financial incentives in the pension provisions rather than to preferences. This study will therefore focus on the issue of how to increase the labour supply of Dutch workers of 55 and over. Central to this issue is the question whether such changes to the design of pension provisions are conceivable as will induce people to opt for extending their participation in the labour process.

To serve this issue, the present study is built up as follows. Chapter 2 deals at length with the participation of senior citizens in an international comparative perspective. It also projects, on the basis of demographic trends and insightful model simulations, what the economic effects might be of a higher labour participation rate of the 55-plus bracket of the population. Chapter 3 addresses the institutional design of old-age pension provisions, again, in an international comparative perspective. Central to that chapter is the question whether there is a correlation between differences in this institutional design and differences in labour participation rates perceived between countries. In Chapter 4, the study turns its focus exclusively to the Netherlands, showing, on the basis of a survey among Dutch households, how strongly the labour participation rate responds to hypothetical changes in the design of the old-age pension system. Chapter 5, finally, contains a summary of the previous chapters and conclusions.

We arrive at the conclusion that the Netherlands does have an ageing population problem but, compared to its neighbouring countries, not to an excessive degree. In the three large euro countries, Germany, France and Italy, this problem is of a much larger magnitude as in those countries major demographic shifts, the low labour participation by the 55-plus and the pay-as-you-go pension system go hand in hand. On the other end of the spectrum are the United States, the United Kingdom and Sweden. While these countries, too, are faced with a greying population, they have been more successful in keeping the 55-plus component of their population in the labour force.

In an international comparison of pension systems, we find indications that the design of the pension system proper may be of influence on labour participation by the 55-plus. Bearing in mind that the analysis is merely tentative, we have been able to record that the nature and size of the financial incentives provided for by the system are related to the labour participation rate of citizens aged 55 and over.

This conclusion is corroborated by the survey results for the Netherlands. In this survey, three out of every five Dutch citizens stated they could be motivated into working longer. A policy stimulating continued labour participation by senior workers on a part-time basis appears to be the most effective way to keep the said category longer on the workforce. We demonstrate that, under such circumstances, employees are willing to continue working for another eighteen months on average. In addition, for most people it holds that, given the right financial stimuli, they can be induced to stay active for a longer time on the labour market. The survey results show that people are willing to work longer provided they are financially compensated in the short term. Besides, in the (early)retirement provisions, financial stimuli may also be reflected in the benefit level as well as in the degree of flexibility of the actual retirement decision and the benefit level linked to it. A retrenchment of the pension rights to the effect that labour participation must be extended by one more year in order for maximum pension benefits to be built up will induce employees to postpone their retirement by six months on average. If, in addition, the annual pension benefit rises by six per cent for each additional year worked, employees will be willing to put off their retirement by another period of just under six months on average. In other words, it would seem that by observance of this reward principle in pension schemes much is to be gained by way of higher labour participation of older workers, while these financial stimuli may also be offered cost-effectively in actuarial terms and even some room remains to safeguard a measure of solidarity among the generations.

The generosity of the benefits in many *early* retirement schemes largely depends on the tax-friendly accrual of the early pension capital. The results of this study indicate that the positive effects of cuts in early retirement provisions – e.g. achieved through abolition of this tax facility – on labour participation may be considerable.

2 A greying population: demographic trends, labour supply and fiscal sustainability in a comparative perspective

2.1 Introduction

The first national, compulsory insurance against loss of income was instituted in Germany, under the Bismarck regime. Bismarck was aware that, to build up one German nation, the industrial labour class had to be bound to the state. In the 1880s, this insight resulted in a statutory health care insurance, an accident insurance and a disability insurance. In the course of time, the structures of these insurances have served as examples to many a country (De Swaan, 1996).

Bismarck's disability insurance may be regarded as predecessor of the statutory old-age pension as well as the labour disability benefits. Bismarck's disability insurance provided a fully disabled labourer with a benefit amounting to two-thirds of his wages, at a minimum of five contribution years. In addition, the Act provided for entitlement to an old-age pension on reaching the age of 70 years (and after a minimum of thirty contribution years). This considered, old age was regarded as a form of disability. Indeed, in those days, it was highly likely that a septuagenarian labourer was unable to support himself owing to infirmities attendant on advanced age. Under the Act, a widow received 20% of her late husband's wages. By the turn of the century, male life expectancy in Germany (excl. infant mortality) had risen to slightly over 55 years. At the time, only 8% of the German population was older than 60 (Bundesinstitut für Bevölkerungsforschung, 2003). Obviously, this demographic structure held the costs entailed by the Act under control. However, life expectancy has increased considerably since those days. In 2003, life expectancy of German males and females was 74 and 80, respectively, while at 76 and 81, respectively, this rate is even higher for Dutch males and females. The Central Bureau of Statistics expects that by 2050 these figures will have risen further by another three years for males and another eighteen months for females.

In other words: the Dutch population is growing older and older. This process places the affordability of the pension benefits under pressure. But the Netherlands is not the only country facing the issue of an ageing population. To gain insight in the gravity of this problem, we place the developments in the Netherlands in a comparative perspective. In the following paragraphs of this chapter we shall first look at the demographic developments projected for the coming fifty years and their implications for public finance. Subsequently, we shall dwell on the trend to advance the age of retirement and the implied extension of the pension benefit period. And, subsequently, since the number of active labour participants eventual-

ly forms the basis for the affordability of the increasing pension burden, we shall deal with the development of the labour participation rate in the recent past, in particular that of older workers. In the final section, this chapter provides an indication based on model simulations of the economic advantage that may be realised if a policy change succeeded in inducing a greater part of the 55-plus bracket of the population to work longer, and winds up with a summary and conclusions.

2.2 Demographic developments and their consequences for public finance

The ageing population issue arises from the increasing number of elderly citizens, with, moreover, an increasing life expectancy. In addition, in many countries the birth rate is declining. As a result, the rising burden of the greying population will need to be shouldered by a stagnant, if not shrinking, active labour population. At present, the grey burden in the Netherlands is 22 to 100, which, compared to other countries, is not exceptionally high. For example, at 24 old-age pensioners to 100 economically active citizens, the OECD average exceeds the Dutch average (see Table 2.1). Of the countries considered by us in our comparison, the Netherlands even turns out to have the least aged population, together with the United States. In Italy and Sweden, already about 29 senior citizens must be supported by 100 active workers.

The second column of Table 2.1 shows the increases in the ratio of the 65-plus population to the labour force for the coming 50 years as projected by the OECD. As is clear from these figures, the expected rise of the grey burden is anything but an exclusively Dutch problem. For the Netherlands, the OECD assumes that the grey pressure will double to 45 senior citizens per 100 workers. This projection, too, is well below the average for the OECD countries, i.e. almost 50 senior citizens to 100 economically active citizens. The projected increase in the percentage of the 65-plus population may be called moderate in comparison with, e.g., Italy, where in fifty years' time the ratio will have risen to as many as 67 senior citizens to 100 economically active citizens. Column 3 shows that in 2050, also the average age of the labour force will be higher than it is now. By then, in the Netherlands the share of the 55-plus age group in the total labour force will be 5.2% higher; an increase that is close to the average for all OECD countries together.

The public finance component absorbed by old-age pensions in 2000 is reflected by column 4, and the corresponding costs increase projected by the OECD for the coming 50 years in columns 5 and 6. Here, a distinction is made between the additional costs arising from (exogenous) demographic developments (column 5) and the assumed cost savings as a result of policy measures (column 6). For the correct interpretation of the figures, we emphasize that the costs and projections reflected here only relate to the old-age pension. The figures presented therefore do not provide a complete survey of the consequences of the greying population for the public budget. First, the possible effects of early retirement arrangements on the public bud-

Table 2.1 The projected grey burden and the related consequences for public finance

	Ratio of 65-plus to labour force (65-plus/20-64 year-old; in %)		Share of 55-64 year old in labour force[1] (in %)	Public expenditure on old-age pensions (in % GDP)			Pension fund assets (in % GDP)
	In 2000	Increase in 2000-2050	Increase in 2000-2050	In 2000	Increase in 2000-2050[2]		In 2000
					Demo-graphy	Policy	
Netherlands	21.9	23.0	5.2	5.2	3.8	1.5	119.7
Germany	26.6	26.6	2.7	11.8	6.4	-0.6	<15
France	27.2	23.6	4.1	12.1	7.6	-3.0	<15
Italy	28.8	38.0	7.9	14.2	10.1	-7.0	<15
Sweden	29.4	16.9	2.6	9.2	3.9	-1.8	68.6
United Kingdom	26.6	18.7	4.3	4.3	1.7	-2.4	100.0
United States	21.7	16.2	4.5	4.4	2.4	-0.5	106.1
OECD-average[3]	23.8	26.1	5.4	7.4	3.4	-0.9	n.a.

1 Labour force of 55-64 age bracket vis-à-vis 15-64 age bracket.
2 France 2000-2040.
3 Unweighted.
Source: Burniaux et al. (2004), Casey et al. (2003), Antolin et al. (2004).

get have been left out of account. In addition, senior citizens' comparatively high needs of healthcare provision is not covered by the figures, whereas this factor will present a major extra cost item for public finance, especially given the projection that in 50 years' time there will not just be more senior citizens, but people will also reach a higher age. The OECD expects that 50 years from now 35% of the 65-plus will be upwards of eighty years, against 23% now. Senior citizens make about three to five times more use of healthcare provisions. The largest cost item is entailed by care for the elderly in nursing homes and hospitals. The OECD estimates that in fifty years' time the additional healthcare and nursing costs attendant on the greying population will absorb an extra 4.8% of GDP in the Netherlands, 3.2% of GDP in Sweden, 1.7% of GDP in the United Kingdom, and 4.4% of GDP in the United States.[2]

Strikingly, in column 4 of Table 2.1, the burden of the old-age pension costs on public finance in Germany, France and Italy is already two to three times higher than in the Anglo-Saxon countries and the Netherlands. The high costs in the first three countries are attributable, among others, to the way old-age pensions are funded. In Germany, France and Italy, pensioners' benefits are collected through social security contributions from the current generation of active workers, i.e. the pay-as-you-go system. This is why these countries have barely built up reserves for pension pro-

visions (see column 7). The projected negative effect of the demographic shift on the government budget in these countries is also the most pronounced (see column 5). This is attributable, on the one hand, to the population ageing rates in these countries being higher than anywhere else and, on the other hand, to the funding system. In an ageing society, a pay-as-you-go system comes under increasing pressure as a rising number of citizens must be supported by a stagnant, if not shrinking labour force. For lack of reserves, extra benefits can only be provided if the contributions levied are raised correspondingly. Unlike these countries, the Anglo-Saxon countries and the Netherlands have built up vast pension reserves through saving. In these countries, the basic (minimum) pension benefit is the only pension component raised via a pay-as-you-go system of contributions levied by the state. The supplementary pension is capital-funded. This considerably reduces the effects of the ageing population on the public budget[3]. Sweden takes a middle position[4].

The figure in column 6 reflects the combined (policy) effect of the change in the number of pensioners and the change in the level of the benefit. This column also incorporates the effect of the increase in the number of individual pension rights as a result of the rise in female labour participation. Several countries have seen a number of far-reaching pension reforms affecting both the future number of pensioners and the level of the future benefits. Cases in point are Sweden and Italy, which have adopted the Notional Defined Contribution system (see Chapter 3). In Italy, in particular, this will make for substantial savings as it will compensate for about 70% of the cost increase arising from the demographic development.

2.3 The effective age of retirement since the 1970s

Although in most countries the statutory age of retirement is 65[5], the effective age of retirement proves much lower. As a consequence of this phenomenon – besides the autonomous rise in life expectancy – (early) pensioners draw benefits over an increasingly longer period of time. In a comparative survey, Table 2.2 shows where the Netherlands stands in the development of the effective age of retirement and life expectancy at retirement.

At 61.6 years, the average effective age of retirement in the Netherlands is one to two years above that in Germany, France and Italy, but two to three years below that in Sweden and the United States. The average effective retirement age is about as high as it was thirty years ago (compare columns 1 and 2). However, these figures hide the marked swing in the effective retirement age that the Netherlands has seen in the past thirty years. Starting in the early 1970s, the age of retirement steadily declined to an absolute low of 58.7 years between 1980 and 1985, and has gradually risen since, so that today we are back to where we were thirty years ago.

How to account for this fluctuation? In the past, early retirement was often realised through the 'VUT' (early retirement) arrangement based on a pay-as-you-go funding mechanism. After a somewhat hesitant start, in the early 1980s the VUT

Table 2.2 Development of the effective retirement age and the remaining life expectancy

	Average effective retirement age[1] (in years, men)		Life expectancy at effective retirement age (in years, men)		Share of active years in entire life[2] (in %, men)	
	1999	1970	1999	1970	2000	% change vis-à-vis. 1970[2]
Netherlands	61.6	61.5	17.3	14.5	57.3	-2.1
Germany	60.5	62.8	18.6	13.4	55.9	-6.5
France	59.3	63.5	20.7	14.0	49.4	-6.8
Italy	59.3	62.3	20.3	15.1	50.3	n.a.
Sweden	63.3	64.7	17.7	14.4	56.6	-3.8
United Kingdom	62.0	n.a.	n.a.	n.a.	58.7	-3.9
United States	65.1	64.2	15.9	13.6	62.2	-4.3

1 Averages for the periods 1994/1999 and 1970/1975.
2 US: 1965, Germany and the Netherlands 1975, UK: 1990
Source: OECD (2002), Burniaux et al. (2004).

became a tremendous success. In the economically lean years following the two oil crises, the arrangement came to be increasingly regarded as an effective remedy against youth unemployment. In the course of time the public's perception of the VUT as a solidarity contribution by which, through early retirement of senior workers, their own jobs were secured, gradually made way for that of the VUT as a right to early retirement towards which much contribution had been paid. In the mid-1990s, the pay-as-you-go basis of the VUT met with increasing resistance, when it dawned on younger generations that their chances of ever benefiting from the regulation were very slim. The pension funds attempted to resolve this situation by gradually replacing the VUT by a capital-funded pre-pension system. According to a survey by Central Planning Bureau, the transition from the VUT to the pre-pension system took away strong incentives to retire early and, hence, provided an important contribution to the rise in the effective age of retirement (Euwals et al. 2004). The Dutch cabinet's announcement that the fiscal support of both VUT and the pre-pension schemes would be abolished with effect from 2006 encountered much social resistance. In the 'Autumn Agreement' of 2004, the cabinet agreed with its social partners to devise a life-course savings scheme aimed, among others, at raising the effective age of retirement further.[6] While this development signifies a trend breach in the development of the effective age of retirement in the Netherlands, no such development is in evidence in our neighbouring countries. Since the 1970s, the effective ages of retirement in Germany, Italy and France have dropped between two to four years. In the United States, the opposite development has taken place: the effective age of retirement rose by almost one year. Self-evidently,

lowering the effective age of retirement immediately amounts to extending the period of entitlement to pension benefits (see Table 2.2, columns 3 and 4). In France, the average period of pension entitlement has increased approximately 50 per cent over the past thirty years; in Italy and Germany between 30 and 40 per cent. The increases in the periods of pension benefit entitlement in the Netherlands and the United States by less than 20 per cent seem moderate by comparison. Indeed, the increases recorded in these two countries mainly reflect the autonomous rises in life expectancy. In the last two columns of Table 2.2, we see the development outlined above reflected in a different form. In France and Italy men participate only half their lives in the labour force. American males, by contrast spend 62% of their lives working. The other countries, the Netherlands included, take positions between these extremes.

2.4 Developments of labour participation in a comparative perspective

In view of the imminent ageing of the population it is therefore desirable that the labour force is kept as large as possible. To be able to support the grey burden, industrialised countries simply cannot afford to send large numbers of older but productive and healthy citizens on retirement, the more so since in the years ahead an increasing proportion of the labour force will be made up of the 55-plus.[7]

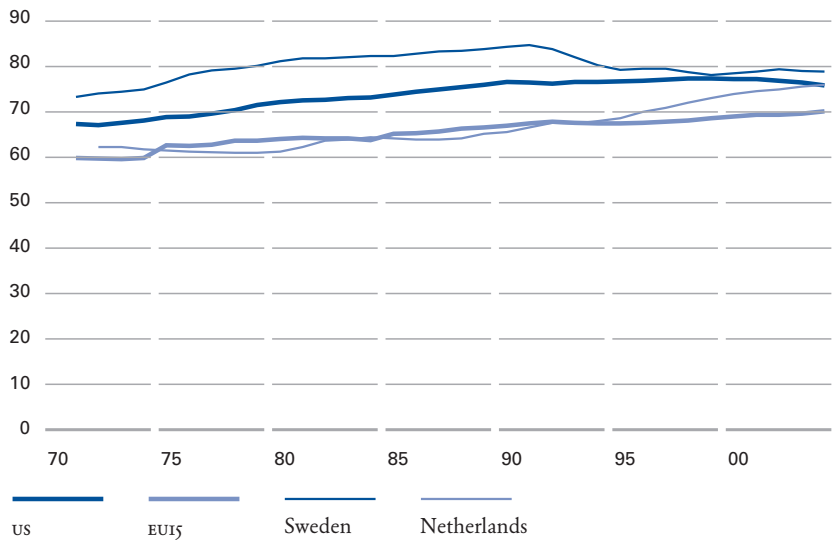
Chart 2.1 reflects the development of gross labour participation in the Netherlands in a comparative perspective with the United States, the European Union and Sweden. The upper part shows the development of labour participation of all citizens in the 15-64 age bracket; the lower part shows the development of the participation of the 55-plus.[7]

Until the early 1990s, labour participation of Dutch residents in the 15-64 age bracket fluctuated around the EU average. From then onwards, the participation rate rose rapidly, reaching the level recorded in the United States (76%). Strikingly, in the United States and Sweden it was, and still is, far more common practice not to retire early than in the European Union or the Netherlands. Across the period, the participation rates of older workers in the United States and Sweden are substantially higher. The second noticeable development is that of labour participation of the 55-plus, which from the late 1970s onwards falls (far) below the EU average. The low point is reached around the 1990s, when labour participation was a mere 30%. Since then, it went up again, returning to the EU average of 45% in 2003.

While not differing all that much, the 2003 and 1970 figures for the participation rates of the 55-plus in the European Union and the Netherlands are indicative of different developments for men and women. In Table 2.3, these differences are worked out further with the aid of separate participation rates for men and women for three sample years.

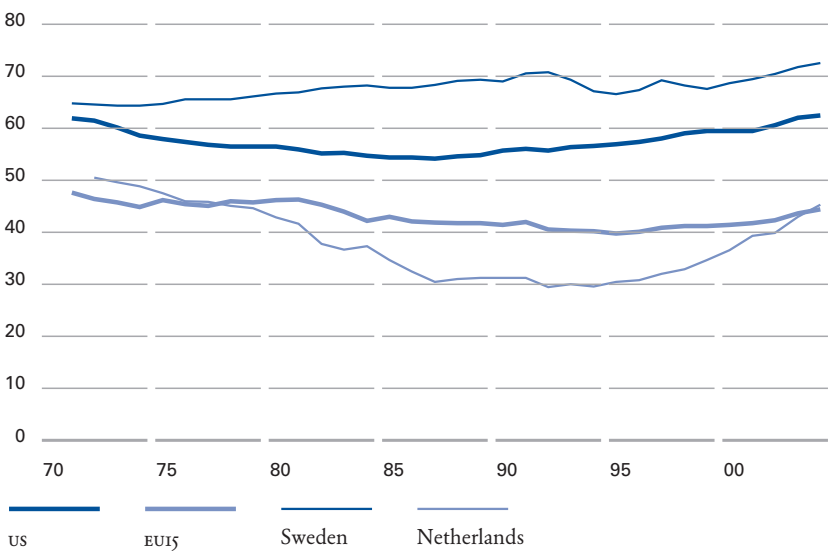
Chart 2.1 Development of the gross participation rate from 1970 to 2003

Chart 2.1a 15-64 year-old



Source: OECD (2004) and in-house calculations.

Chart 2.1b 55-64 year-old



Source: OECD (2004) and in-house calculations.

From the table it appears that total gross labour participation in the Netherlands has increased by 13.5 percentage points since 1971. Most of this increase was not realised until after 1990. The rise in paid labour participation is mostly accounted for by women. Indeed, while being still 16 percentage points below its male counterpart, over the past thirty years female participation almost doubled. Bear in mind however, that full-time and part-time jobs are assigned the same weight in Table 2.3, whereas in the Netherlands part-time jobs are primarily held by women (60% women, against 15% men). While, on the one hand, female participation shows a sharp rise across the period, the level of male participation in 1990, on the other hand, was 9 percentage points below that in 1971. The male participation rate, although higher again in 2003, is still below the 1971 level.

From Table 2.3 it also appears that the male participation rate movements for all age brackets are largely accounted for by changes in the participation rate of men in the 55-64 age bracket. While, in 1971, the participation rate of males aged 55 and over is barely lower than that of males in all age groups combined, 1990 presents an altogether different picture. In that year, the participation rate of this group declined to almost 46%. Since 1990, labour participation of males in the 55-plus category has recovered. It is still below the 1971 level, though, by almost one third. Unlike that of older males, participation of older females was low in 1971. Back then, only one in five women held a paid job. It appears that, in 1990, participation of women fell, just as that of men but not to the same extent. From 1990 upwards, participation of women aged 55 and over gained momentum. In 2003, almost one in every three women in this age category held a paid job. This phenomenon can be partially accounted for by the so-termed cohort effect: the autonomous increase in labour supply as emancipated working women advance in age and take the place of housewives in the statistics.

Table 2.3 Breakdown of labour participation by gender for the Netherlands and the EU-15

Percentages

	Total			Male			Female		
	2003	1990	1971	2003	1990	1971	2003	1970	1971
Netherlands									
- Total (15-64 year-old)	75.9	66.7	62.4	83.7	80.0	89.0	67.9	53.1	35.3
- 55-64 year-old	45.0	30.8	50.3	57.9	45.7	84.6	31.9	16.7	19.4
European Union									
- Total (15-64 year-old)	70.2	67.5	59.8	78.6	80.1	80.8	61.6	54.8	39.6
- 55-64 year-old	44.1	41.6	46.1	54.6	57.3	69.2	33.9	27.0	26.9

Source: OECD (2004) and in-house calculations.

While, since 1990, total labour participation of the 55-plus in the Netherlands has grown by 14 percentage points, it is still below the 1971 level. A recovery of the participation rate of men aged 55 and over to the 1971 level may present a significant improvement. It is expected that the cohort effect will yet lead to a further increase in senior female labour participation for some time to come.

At the European level, total labour participation increased by 10.4 percentage points between 1971 and 2003. Here, too, the rise in female participation is a considerable contributing factor, be it that compared to the Netherlands, the increase is less pronounced. Where female labour participation is concerned, the Netherlands has partially made up the arrears. In 1971, the female participation rate average for Europe was above that for the Netherlands, whereas in 2003, this situation reversed. The male participation rate in the European Union shows a slight decline between 1971 and 2003. Unlike the situation in the Netherlands, however, the male participation rate in the European Union as a whole shows no improvement since the 1990s.

Also at the European level, changes in the participation rate of the 55-plus to a large extent account for the movements in the participation rates of the entire labour force. Just as in the Netherlands, senior female participation in the European Union as a whole started to rise in 1990, but at a much lower rate than in the Netherlands. The level of participation in the European Union in 1990 was higher, though, than in the Netherlands. The most relevant conclusion within the present scope, however, is that the figures for the European Union contain no indication of a trend breach in the low participation level of senior males: the participation of older workers in the European Union in 2003 is 2.7 percentage points below the 1990 level. We establish that the Netherlands is already on course to realise further participation gains, while in the European Union as a whole efforts still need to be directed at reversing the declining trend.

2.5 The economic benefit of increased participation of older workers

Suppose that Dutch economic policy succeeds in keeping older workers longer and more often involved in the production process. What benefits would this bring economically? Example: in the Netherlands labour participation of the 55 to 65 year-olds stands at 59% of the total labour force. In Sweden, the corresponding percentage is 92 (also see Table 1.1.). Total labour supply in the Netherlands would be 5.4% higher if Dutch citizens aged 55 and over were to participate to an equal extent as their Swedish counterparts.

To give an indication of the scope of the possible effects, we simulated a 1% rise in the labour supply using the macroeconomic structure model NiGEM, the NIESR[8] Global Econometric Model. As its name suggests, NiGEM is a global model, covering the 36 most important economies, including all EU countries. The rest of the world is reflected by several geographic blocks.

We performed the simulation twice. On both occasions, labour supply at the start of year 1 rises permanently by 1%. The first simulation assumes that the Netherlands is the only country pursuing a policy that stimulates the 55 years and over bracket of the labour force to work more and longer. In the foregoing, we saw, however, that the low participation rate of the 55–plus in the euro area is even more serious an issue as it is in the Netherlands. In the second simulation, we therefore assume a 1% increase in labour supply in all euro countries. Table 2.4 shows the effects of the 1% increase in labour supply, both for the Netherlands and the euro area.[9]

A 1% rise in labour supply in the Netherlands will first lead to an increase in the unemployment rate by 0.8%. Through rising unemployment, however, the extra labour supply will depress wages, as a result of which more jobs will be created. After five years, more than half of the new labour supply will be absorbed. In addition, as the lower wage costs will translate into a lower price level, the real wage decrease will be much lower than the nominal wage decrease. Eventually, after ten years, the extra supply of workers added to the production process will account for a 0.5% rise of real GDP, mainly by way of extra consumption and investment. The weight assigned to the Netherlands in the total labour supply of the euro area is a mere 5%, i.e. too little to make a perceivable difference at the aggregate euro area level.

Conversely, the developments in the euro area are of much importance to the Netherlands indeed. As said, the low participation rate of the 55-plus is a problem throughout the euro area. That is why we performed a second simulation. At the European level, we see the same mechanism operating as in the Netherlands (see Table 2.4.b). The extra labour supply leads to lower wages, which in turn are conducive to a higher GDP through the creation of more jobs and a lower price level. As, this time, the lower European price level will actually result in lower interest rates, the effects will be more favourable for the Netherlands than in the first simulation. The unemployment rate will drop faster and the GDP gains will be larger. Besides lower interest rates, the extra import demand from the other euro countries also plays a positive role in this context. While under the current European policy the pressure of the unemployment rate on wages and prices is lower, the lower interest rate is exerting additional pressure on prices. As a consequence, the eventual effects on the price level of consumption in the Netherlands in both simulations will hardly differ from each other. This exercise demonstrates that a joint European approach makes for better results for the Netherlands.

Another factor coming into play is the phenomenon that since the launch of the monetary union the effects of one country's policy tend to extend more often to other countries. This means that, if the ageing population issue should threaten to undermine the sustainability of public finance in Germany, France or Italy, the Netherlands will be affected as well via higher interest rates, increased inflation and a weaker currency. So the Netherlands has become more susceptible to the policy conducted in other European countries. This effect is not reflected in the simulation results, however, as the simulation assumes that all countries conduct a fiscally sustainable policy.

Table 2.4 Effects of a permanent rise of labour supply by 1% as measured by NiGEM

(per cent deviations vis-à-vis the base line)

a. In the Netherlands

	Netherlands				euro area			
	year 1	year 2	year 5	year 10	year 1	year 2	year 5	year 10
Labour supply	1.0	1.0	1.0	1.0	0.05	0.05	0.05	0.05
Real GDP	0.1	0.1	0.3	0.5	0.0	0.0	0.0	0.0
Consumer prices	-0.1	-0.3	-0.6	-0.7	0.0	0.0	0.0	0.0
Unemployment rate[1]	0.8	0.7	0.4	0.1	0.0	0.0	0.0	0.0

1 Absolute deviation .

b. In the euro area

	Netherlands				euro area			
	year 1	year 2	year 5	year 10	year 1	year 2	year 5	year 10
Labour supply	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Real GDP	0.1	0.2	0.4	0.6	0.2	0.3	0.5	0.6
Consumer prices	0.0	-0.2	-0.6	-0.7	-0.1	-0.2	-0.5	-0.6
Unemployment rate[1]	0.8	0.6	0.2	0.1	0.6	0.4	0.1	0.1

1 Absolute deviation.

2.6 Summary and conclusion

Since the introduction of the first social security Acts, the population's life expectancy has risen. In addition, the population is ageing: the proportion of senior citizens is increasing, whereas the birth rate per woman is dropping. The grey pressure will rise sharply in the future as a result. This is not a topical issue in the Netherlands alone, but in industrialised countries in general. Also, in an international perspective, the situation in the Netherlands is not extraordinarily unfavourable.

In the economically lean times after the two oil crises, the continental European welfare states in particular sought remedy against the high unemployment in early

retirement arrangements. As a result, participation of the 55-plus dropped sharply and the average effective age of retirement is now significantly lower than the official age of retirement. Considering the number of senior and elderly citizens that will require care in the future, it is inopportune to continue sending productive citizens on retirement now and it will be impossible to do so in the future. In the Netherlands, a trend breach is already perceivable, however, for the participation rate of the 55-plus has been on the increase since 1990. It is still below the 1971 level, though, despite the fact that the participation of older females has risen sharply since then. This is accounted for by older males' participation still being amply below the 1971 level, which signifies that a lot is to be gained yet in this category. For the European Union as a whole, however, no such trend breach is in evidence.

The OECD expects the largest demographic shifts to evolve in Italy, Germany and France. In these countries, which combine the lowest effective retirement age with the lowest participation rate of workers aged 55 and over as well as observing the pay-as-you-go system for pensions, the burden on public finance as a result of the greying population is by far the heaviest. To alleviate this pressure, Italy has meanwhile proceeded to restructure its pension system radically.

The potential economic gain to be achieved from a rise in participation of older workers may be considerable. A labour supply increase by 1 per cent may eventually cause GDP to increase 0.5%. Given that the greying population and low participation of the 55-plus is a common European problem, coordination at European level is desirable. In any case, the outcome of model simulations is that in this context a policy pursued at the European level will lead to higher labour participation across the Union as well as more favourable effects for the Netherlands than if the Netherlands were to pursue this policy on its own.[10]

Since the introduction of the Monetary Union, mutual dependence of the participating countries of each other's policy has increased. Hence, any negative external effects cannot be excluded. We demonstrate that, in the long term, the greying population may exert considerable pressure on public finance in Germany, France and Italy. This perspective underscores the relevance and necessity of the agreements concluded regarding the maximum allowable budget deficits as laid down in the Stability and Growth Pact.

The conclusion seems justified that the Netherlands does have an ageing issue, but, compared to the countries around it, not to an excessive degree. This is not to say that no action is required. The magnitude of the problem is still such that measures are called for to prevent the bounds of the social welfare state coming in sight. In Italy, France and Germany, however, the problem is of a larger scale. These three large euro countries have to cope with major demographic shifts and low participation in the 55 years and over bracket of the labour force, while relying on a pay-as-you-go pension system, i.e. a system more vulnerable to the ongoing ageing of the population than a capital-funded system.

On the other end of the spectrum we find the two Anglo-Saxon countries and Sweden. While these countries, too, are faced with greying populations, they are far

more successful at keeping citizens aged 55 and over in the labour force than the Netherlands and the other continental European countries. The wide divergence between the labour participation rates of the countries compared in this study is perhaps partly attributable to the differences in design of the pension provisions involved. In the next chapter, we shall therefore compare the structure of the Dutch pension system with those of the three large euro countries, Germany, France and Italy, the two Anglo-Saxon countries, the United States, the United Kingdom, and Sweden.

3 Institutional differences between old-age pension systems and their implications

3.1 Introduction

The previous chapter identified large differences in effective retirement ages and labour participation of workers aged 55 and over. Whereas in Sweden, participation of the 55–64 age bracket is 92% of the overall rate for people of working age, this figure for Italy comes to only 51%. With rates just below 60%, Germany, France and the Netherlands score slightly better on senior participation. In the United States and the United Kingdom senior participation rates, at 82% and 75% of overall rates, respectively, are above those of continental European countries but below the Swedish rate.

Where do these differences come from? One possible explanation is that the various participation rates of older workers are primarily an expression of national differences in cultural preferences. In that case, lower rates simply reflect a greater preference for leisure in Italian, French, German and Dutch older citizens compared to their American, English or Swedish counterparts. On the other hand a person's individual decision to retire from work is also determined by the design of the pension system. In that case, (early) retirement systems prevailing in continental European countries must be regarded as 'an offer one cannot refuse', whereas this is much less true of schemes prevalent in the US, the UK and Sweden. In this chapter, we try to clarify this issue by means of an institutional comparison between pension legislations. First, by way of theoretical background, we provide the conceptual framework underlying our analysis. We continue with a brief description of the different national legal arrangements that determine the old-age pension system of each country, taking account wherever possible of recent reforms which although officially adopted have not had time to take (full) effect. Next, we compare the strength of the incentives for (early) retirement which these systems generate. A summary and conclusions complete this chapter.

3.2 Theoretical background

The issue of population ageing has both a temporary and a structural component. On the one hand, the post-WW2 generation now about to reach retirement age is large in numerical terms, and on the other, as people live to increasingly advanced ages, they remain entitled to pension benefits for longer periods. The often-cited image

of the 'baby boom generation' as a lump moving upward through the population pyramid illustrates the temporary nature of the numbers problem: at some point in time, the post-war generation will have passed away, and the worst of the population ageing problem will be over. The OECD expects the adverse effect to peak between 2025 and 2035. Increased life expectancy, however, poses a structural problem.[11]

Diamond (2001) states that in the hypothetical case without any social security an individual can choose from three possible coping strategies, given increased life expectancy: (1) he may consume less and save more during his working age span; (2) he can consume less during retirement; or (3) he can continue working for longer. In a situation where there is a collective pension scheme, strategy (1) translates into higher contributions by the economically active; strategy (2) translates into reduced retirement benefits; while strategy (3) translates into an increase of the effective retirement age. According to Diamond, a mix of all three strategies makes the most sense.[12]

We have already seen how in many countries the effective retirement age has come down since the 1970s. According to Diamond's paradigm, a reverse development in terms of the 'continued work' strategy must, all else being equal, be offset by opposite movements in terms of the other two strategies: 'higher contributions' and/or 'reduced benefits'.

The trend towards early retirement may have several different causes, both direct and indirect. The most-cited direct causes are: improved standard of living, increased demand for leisure, and also government policy. In the lean years of the 1970s and '80s, early retirement was not only encouraged by government policies, but in some cases even regarded as a solution for (youth) unemployment. Other social legislation, for instance unemployment or disability Acts, may also provide a disincentive on the participation of older workers. The more indirect causes of reduced participation in the 55+ age bracket lie in the area of employers' decreased demand for this age group. Often-mentioned examples of this phenomenon are: declining relative productivity of low-education workers as a result of rapid technological developments; insufficient training levels among older workers leading to low wage-earning capacity; and temporary negative demand shocks resulting in the irreversible retirement of older employees.

If the early retirement trend does indeed reflect an increased preference for leisure and increased welfare, then policies to encourage senior participation will, in principle, reduce welfare. For in this case every extra hour of work is counterbalanced by an hour of leisure less, which is valued more than the remuneration for the hour of work. Duval (2003), however, conducting a panel analysis across all OECD countries, found a strong correlation between the size of financial incentives to retire (early) and the participation rate of seniors. In other words, there are empirical indications that the reduced participation of older workers is a consequence of the institutional design of the retirement systems themselves. In addition, Duval's study found a statistically significant 'discouraged worker effect', i.e. indications that as opportunities on the labour market develop unfavourably, more and more people tend to turn their backs on that market for good. This is in line with findings for the Netherlands

by the Bureau for Economic Policy Analyses (CPB) on the characteristics of early retirees: for someone with low education – typically less likely to find a job – the likelihood of early retirement is above average, whereas it is significantly lower for university-educated employees (Roodenburg and Rijn, 2002). Moreover, the higher-educated exhibit a demonstrably stronger preference to continue working. A possible explanation for this could be that they find their work more rewarding and that the work they do is often less strenuous physically (De Nederlandsche Bank, 2004).

3.3 The institutional design of regular old-age pension systems in seven countries

3.3.1 Definitions

This section discusses the institutional design of regular pension systems. We will find large differences between countries. This may come as no surprise, since the current design of such systems is the end result of a long history, in which national preferences, local value patterns and the existence and design of other institutions have played important roles. Let us give a few examples: while in some countries, the provision of old-age benefits is predominantly a public responsibility, in others pension entitlements are largely individually funded. Also, current arrangements in many countries have come under pressure from the oncoming wave of demographic ageing. Some countries have recently decided on reforms, while in others reform has been the subject of (sometimes heated) debate. Examples of countries that have recently implemented far-reaching reforms are Sweden and Italy.

For a better understanding of different types of schemes, we will first discuss two basic principles underlying the architecture of pension systems, which are (1) funding methods and (2) the degree of certainty about the level of future pension benefits.

(1) *Pay-as-you-go vs. funding* Under a pay-as-you-go (PAYG) system, contributions paid by the current generation of wage-earners are redistributed by a public authority to the current generation of old-age pensioners as pension benefits. There is no actual 'piggy-bank', as opposed to what happens under a funded system. Under a funded system, personal savings are managed (i.e. invested) by (independent) pension funds. The total capital thus saved should, in principle, be sufficient to pay all entitlements.[13]

(2) *Defined Benefit (DB) vs. Defined Contribution (DC)* Under a DB system, the size of future pension entitlements is guaranteed to some degree, usually in terms of a fixed percentage of average or last-earned wages. Capital shortages and surpluses, should they occur, are compensated for through adjustment of the required contribution payments. Contrasting with this is the DC system, under which the level of contributions is fixed but there is no certainty as to the level of the eventual benefits, which depend on the capital build-up resulting from invested contributions. A DB system

has the benefit of allowing a degree of risk-sharing, also across generations. In theory, this could have a beneficial effect on welfare. Conversely, however, such a system may reinforce the effects of a negative capital shock on the economy, through the contribution increase required to absorb that shock. Recent examples are the contribution increases that were needed to enhance Dutch pension funds' solvency rates due to poor stock market performance. In addition to the direct effect of reduced asset prices on consumption, increased pension contributions also worked to reduce Dutch households' purchasing power.[14] Under a DC system, by contrast, every individual has to bear their individual loss, which is why such a system is, by definition, neutral in terms of the macroeconomic implications of asset shocks (Westerhout *et al.*, 2004).[15]

Both pairs of principles, regarding funding method and benefit assurance, respectively, may occur in any of the possible four combinations. A system guaranteeing defined benefits may be funded either by accrued capital (Netherlands) or by a PAYG method (Germany). Defined contribution systems are found mostly in Anglo-Saxon countries, usually supplementing a basic guaranteed benefit scheme. Such supplementary pension arrangements are of the funded type and involve fixed periodic transfers of funds into individual accounts. Thus such a scheme has a fairly close resemblance to a (frozen) individual investment account.

A relatively novel development is the advent of Notional Defined Contribution (NDC) schemes, which should be seen as a hybrid between a DC and a PAYG system. NDC systems are introduced in an attempt to translate the labour supply stimuli inherent in a defined contribution system to a PAYG system, in cases where the transition to a capital funding system is ruled out for financial reasons (see footnote 13). Under an NDC system, individual accounts are kept, but the actual contributions, instead of being invested, are used to pay current benefits. Individual capital build-up is therefore 'notional', or virtual. At retirement time, the built-up virtual capital is converted into a retirement benefit by means of a formula that is very similar to the one used to calculate a life annuity, in that it takes into account the remaining life expectancy of the respective birth cohort. When life expectancy increases, the same capital amount has to be spread out across more years, resulting in lower benefits. Many NDC systems allow for early retirement in exchange for more or less proportionally lower retirement benefits. Thus such a system provides strong financial incentives to 'sing for one's supper'. Under an NDC system, future benefits are surrounded by less uncertainty than they are under a pure DC system.[16]

By applying the annuity formula, an NDC system lays the burden of longevity on the shoulders of the long-lived generation itself, just as a DC system does. However, it fails to relieve the temporary problem of the numerically large baby-boom generation, which requires today's workers to provide pensions to a strongly growing population of seniors under the PAYG principle.

The remainder of this section describes the chief characteristics of the different national pension systems, based on studies by Yoo and de Serres (2004) and Whitehouse (2003). We discuss each system in terms of the three pillars on which it

is built. The first pillar is a mandatory scheme independent from a person's past employment record. The benefits under such a scheme constitute a social safety net for senior citizens and are, by and large, guaranteed. In most countries, the first pillar is funded through contributions, although one also finds benefits paid from general public funds. Participation in the second pillar is also mandatory, but related to wages and employment duration. Second pillar pension systems differ widely between countries. One finds pure PAYG systems, fully funded systems and combinations of both. In most countries, second-pillar benefits are guaranteed, although in some countries, a shift towards DC schemes can be discerned. Participation in the third pension pillar, finally, is voluntary. Usually, one finds individual tax exemptions for certain well-defined types of contractual pension savings. These may be either of a defined benefit type, such as annuities, or of a defined contribution type, such as frozen investment accounts.

In order to compare national systems, the OECD has created, for each country, a virtual person called the Average Production Worker (APW), whose remuneration is used here to scale the various schemes.[17] On a final note, we should add that our study has no pretensions at exhaustiveness but merely attempts to offer an overview of the most salient characteristics.

3.3.2 Germany

The public pension system in Germany is a PAYG system in which the first two pillars are combined into one. Income-related retirement pension is based on a grading system, with grades being assigned on the basis of the number of contribution years and the average income during those years. The pensionable base is limited to 200% of APW. Up to this maximum, a full pension entitles the retiree to 70% of former wages, gradually declining to 64% in 2010. The pensionable age is 65 years.[18] However, after 35 contribution years retirement at 63 is allowed. German government employees have a separate scheme that guarantees 75% of the last-earned salary for someone with fully accrued entitlement.

German seniors with a shortfall in accrued entitlement may use a social safety net called *Sozialhilfe*, amounting to 13% of APW for a single person and to 23% of APW for couples. The third pillar consist mostly of individually bought life insurance or private pension schemes in combination with tax benefits. Circa 25% of employees take part in company pension schemes offered mainly by big companies. Relatively weakly developed, such schemes provide only 5% of total pensioner income in Germany.

3.3.3 France

In France, too, the first and second pillars of the pension system coincide.

Participation is mandatory and schemes include both an income-related component and a redistribution component. The statutory pensionable age is 60 years. Employees in private companies are required to participate in two job-related pension schemes called the 'General regime' and the 'Supplementary regime'. The General regime is a public PAYG system with employers and employees sharing the contribution burden. A full pension entitles the retiree to 50% of the average wage during the highest-earning 25 employment years. Different supplementary regimes apply to blue-collar and white-collar workers, but both systems are publicly guaranteed NDC systems. Government employees are covered by a separated public PAYG system entitling them to 75% of last-earned salary after fewer contribution years than apply to private-sector workers. The third pillar consists of tax benefits on individual annuities or other pension schemes either offered by employers or taken out individually.

3.3.4. Italy

The Italian system underwent two engulfing waves of reform during the 1990s, while further adjustments are being debated. The second, income-related pillar was transformed to a public NDC system. The regular pensionable age under the new system is now 65 years, but retirement is possible from 57 years in return for a discount on pension benefits. The remaining life expectation of a pensioner's age bracket is factored into the calculation of pension benefits. However, the government retains the power to depart from the calculated rates to allow pensioners to benefit from favourable economic developments. A fully accrued pension comes to 70% of last-earned pay. This income replacement rate is expected to fall significantly over time, however, because retirees have been given additional entitlements during the transition period. Contributions are paid jointly by employers and employees. On the introduction of the new first-pillar system, minimum state pensions were discontinued and replaced by the *Assegno Sociale* for the elderly. This scheme guarantees a minimum income of 17% of APW for singles and twice that amount for couples. A fledgling third pillar in Italy is still in its earliest stages of development, which is explained by the generosity and scope of the old regime.

3.3.5 The Netherlands

The first pillar consists of the mandatory basic public pension scheme, with full entitlement accrued on the fact of residency in the Netherlands between ages 15 and 65. The benefit is an amount fixed at 55% of APW for singles and 70% of APW for couples. Contributions are paid entirely by employees as a percentage of income up to 90% of APW. This so-called AOW scheme is a PAYG system supplemented, in recent years, from public funds in case of shortfalls. The second pillar, for both private-

sector and government employees, is a system of funded company pension funds. Although employers are not required to offer pension schemes, almost every employer does so. If a company pension is offered, participation is mandatory for employees. As a result, the scope of company pensions is large, extending to 90% of employees. Some 95% of pensions are of the defined benefit type. A fully accrued pension income, including the fixed AOW state pension, usually comes to 70% of the average or last-earned salary.[19] The pensionable age is 65. Persons whose pension accrual is less than 70% of the last-earned salary may supplement their pension up to that level via the third pillar, through the purchase of tax-supported annuities.

3.3.6 United Kingdom

The UK has a complex pension system consisting of a mix of DB and DC schemes, with savings accrued on either a collective or an individual basis, or both. The public system is PAYG-funded and combines both the first and the second pillars: the first pillar entitles a fully pensionable person to a fixed amount of 20% of APW (30% APW if there is a dependant partner). The second pillar is income-related, with benefit levels determined on the basis of an incremental bracket system. Because this system includes only three brackets that set low limits on pensionable salaries, the second pillar in the public system has a strongly redistributive character. Contributions are paid jointly by employees and employers. Benefits are paid from age 65 for men and age 60 for women. Employees are free to opt out of the second public pension pillar on condition that they participate in an alternative supplementary pension scheme. These further conditions apply to the level of guaranteed benefits, under a DB scheme, or to the level of contributions in the case of a DC scheme. If an employee opts out the public system, both he and his employer pay lower contributions. 65% of employees have opted out, with almost 40% of employees participating in a company scheme instead. At retirement time, a standard (full) company pension scheme will disburse a lump sum of twice the last-earned yearly salary, of which 75% is usually paid out at once while the rest is used to buy an annuity. Another 25% of employees use the contributions saved by opting out to buy into individual DC-type schemes marketed by banks and insurers. Under the third pillar, employees may save for a higher pension by making voluntary extra contributions to the schemes mentioned above. Finally, a social safety net provides for an income-dependent supplement, guaranteeing a minimum income of 25% of APW minimum to single seniors, and of 40% of APW to retired couples.

3.3.7 United States

The income-dependent public system under the second pillar has strong redistributive features, with mandatory contributions taken out of (pensionable) salaries up to

225% of APW. The official retirement age used to be 65 until recently, but is now being very gradually raised to 67 by 2022. The system is part PAYG (with contributions paid by both employees and employers) and part funded. This collective pension scheme provides some 44% of senior citizens' incomes. In the absence of (sufficient) accrued entitlement or private wealth, a first-pillar safety net called *Supplemental Security Income* provides a minimum income of 21% of APW to singles and of 32% of APW to couples. Some states also offer a supplementary benefit scheme. At 20% of total pensioners' incomes, additional savings under the third pillar are an important factor as well. The two main tax-supported schemes are the so-called '401(k)' schemes offered by employers and the 'Individual Retirement Accounts' or IRAs. Some 45% of employees participate in company pension schemes, about half of which are of the DB type. About 7% of employees participate in individual IRA supplementary schemes.

3.3.8 Sweden

In Sweden, reforms in 1999 included the introduction of an NDC system. Everyone who was under the age of 45 at the time is fully covered by the new system, while proportional arrangements apply to older persons. Since 2001, the second pillar has consisted of two parts: a main part, which is an NDC-based PAYG scheme and an additional part, which is a DC-type funded scheme. Contributions to the main part are mandatory and paid as a percentage of income up to 120% of APW. Contributions to the additional part are invested, with participants being offered a wide range of investments to choose from. Entitlements may be granted on social grounds in circumstances such as illness or pregnancy and during e.g. training courses or care leave. Employees may opt to retire between ages 61 and 70, with deferred retirement translating into higher benefits. The remaining life expectancy of the retiree's age bracket is factored into the benefit amount. Since 2003, a first pillar has come into force in the shape of a social safety net guaranteeing a minimum retirement income of 33% of APW to singles and 60% of APW to couples. The third pillar in Sweden is, again, divided into two parts, namely company pension funds and individual schemes. Like their Dutch counterparts, Swedish company pension schemes are quasi-mandatory, resulting in 90% participation. While most of these funds are (largely) funded, pension funds for government employees are only partly so. In recent years company funds have begun to shift away from DB-type schemes towards DC-type schemes. The resulting increased income uncertainty is regarded as acceptable because such schemes largely serve as income supplements and target the higher income brackets. Company pension funds provide some 10% of total pensioner incomes. In addition, almost 50% of employees participate in individual pension plans.

3.4 Early retirement incentives compared

According to Duval (2003) an employee's decision to retire is determined by three factors: the pension system's statutory retirement age, the income replacement rate and the system's degree of actuarial neutrality. After a brief discussion of each of these concepts, we will have a set of tools to compare the incentives provided by the various systems in the second part of this section.

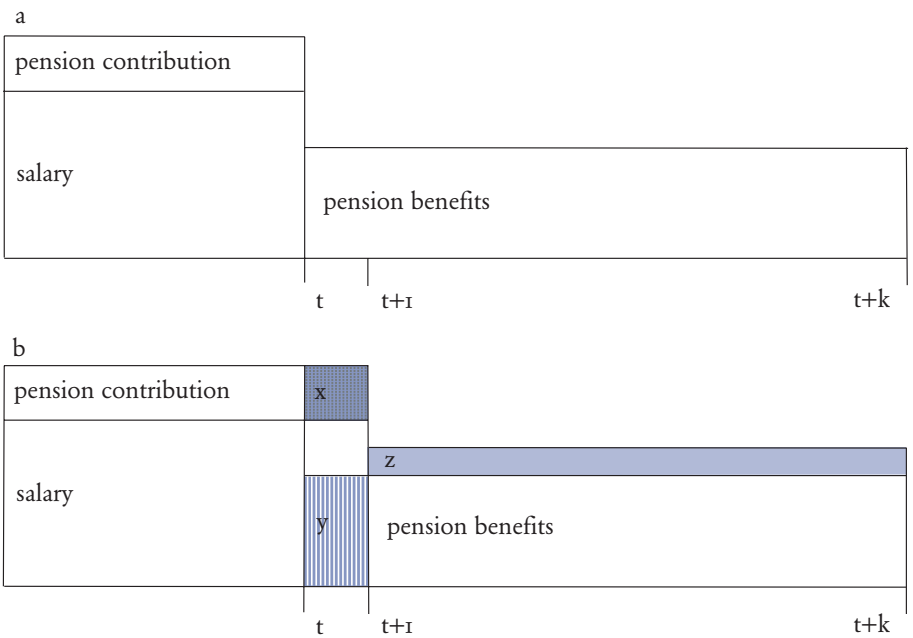
(1) The *statutory retirement age* shapes retirement customs and determines what is generally felt to be the 'normal' retirement age. In many countries, it also works as an effective upper limit, because employees who reach the statutory retirement age are automatically discharged regardless of whether they would have been willing to continue working.

(2) The (expected) *income replacement rate* is defined as the (expected) pension income as a share of previous income from work, and is a measure of the generosity of the system. Representing the income effect of retirement, this ratio is calculated by the OECD for all participating countries and for both gross and net incomes (i.e. before and after tax). The larger the income replacement rate, the more easily an employee can afford to retire. A high rate would allow one, for instance, to quit working without the backing of substantial savings.

(3) The *change in pension capital resulting from one extra year of work*. Pension capital, here, is defined as the cash value of the future flow of pension benefits the beneficiary is to receive for the rest of his life. If an extra year of work reduces that capital (i.e. the increase in benefit does not compensate for the extra contribution paid plus the pension benefit waived that year), this may be regarded as an implicit tax on continued working. Conversely, an increase in pension capital represents an implicit subsidy on continued working. A schematic illustration of the concept is provided in figure 3.1. For simplicity's sake, we have not visualised the decline in the pension benefits' discounted value.

Let us assume an employee has reached retirement age at time *t*. Until that moment, the employee has received a salary out of which he has paid pension contributions. From time t, the now retired employee receives regular pension benefits until time *t+k*, with *k* representing the remaining life expectancy in years at the time of retirement (see situation a). Now assume the employee decides not to retire, but to continue working for one year. This decision entails costs (see situation b) in terms of the payment of an extra year's worth of pension contributions (the rectangle marked x) plus that year's worth of unpaid pension benefits (the rectangle marked *y*). Offsetting these costs is the fact that the pension benefits from time t+1 will be higher than in situation a. If the increase of total pension payments (the rectangle marked z) is exactly equal to x+y, the costs will be matched precisely by the benefits. The change in pension capital will be nil, and the pension scheme will be what is called 'actuarially neutral'. An actuarially neutral system does not generate any positive or negative incentives affecting the employee's labour supply decision.

Figure 3.1 Graphical representation of the concept of actuarial neutrality



The traditional early retirement scheme (known as VUT in the Netherlands) used to have a strongly discouraging effect on participation of older workers. In the most extreme cases, one year of extra work brought only costs with it in terms of continued contribution payments x and unpaid pension benefits y, with no extra benefits z to compensate for them (i.e. $z = 0$). The implicit tax rate, in this case, is 100%. A pension system involving high implicit taxation of continued work provides a strong incentive to substitute leisure for income. Duval (2003), for instance, on the basis of his empirical survey, estimated that a decline by 10% in this implicit tax rate will lead to a 1.5% increase in labour supply of older workers.

Table 3.1 provides an overview of the calculations made by Casey *et al.* (2003) in the context of an OECD study into the strength of the three retirement incentives mentioned above. Before discussing the table in greater detail, we should make certain provisos. In the first place, the figures only present the results of all mandatory pension schemes including, for Sweden and the Netherlands, the quasi-mandatory company schemes. This means that the table disregards third-pillar individual savings, which especially in the US and the UK are very important pension income factors enjoying wide demographic distribution. Secondly, the calculations relate to a 100% APW income, assuming fully accrued entitlement. However, income replacement rates may vary substantially between income brackets, since in some countries pension schemes are strongly redistributive. We will return to this latter point further down.

The table presents the size of the incentives both at the 'normal' retirement age, which usually coincides with the statutory retirement age, and at the earliest possible retirement age. The ages corresponding to each situation is given in the table: In all countries, the pensionable age is 65, except in France, where it is 60. In the UK, early retirement is not possible. The NDC systems in Sweden and Italy allow for early retirement with compensation taken out of retirement benefits. In Germany and the US, early retirement is possible after completing the full number of contribution years. For the Netherlands, the table includes the calculations for the 'classical' VUT early retirement scheme. The average implicit tax rate was highest under the Dutch VUT scheme, at 82%, followed by the French system, at 66%.[20] The net (after-tax) income replacement rate was also most generous in the Netherlands and France. In the meantime, many VUT schemes have been replaced by 'pre-pension' schemes that come closer to actuarial neutrality. The figures in the table clearly show that discontinuation of the VUT scheme was desirable with a view to encourage the labour participation of older workers. In France, the regular scheme is also characterised by high implicit taxation, because the 'normal' and the earliest possible retirement date are both at the relatively low age of 60.

The table also shows that in Sweden and Italy the new systems have been designed to include less than full actuarial neutrality. In the US, there actually is a small implicit subsidy on continued work during the early retirement period.
The picture is different at the regular retirement age. The Dutch AOW scheme, for instance, is actuarially neutral – the sole criterion for eligibility being the comple-

Table 3.1 Retirement incentives inherent in pension schemes at 100% APW incomes

	At 'regular' retirement age				At earliest possible retirement age			
	Age	Gross income replacement rate	Net income replacement rate	Change in pension capital[1]	Age	Gross income replacement rate	Net income replacement rate	Change in pension capital[1]
Netherlands	65	70	92	0	60	80	83	-82
Germany	65	48	77	-6	63	43	68	0
France	60	63	77	-66	60	63	77	-66
Italy	65	88	97	-97	57	55	65	-21
Sweden	65	74	82	-24	61	51	63	-41
United Kingdom	65	34	40	18	65	34	40	n/a
United States	65	37	47	15	62	31	40	5

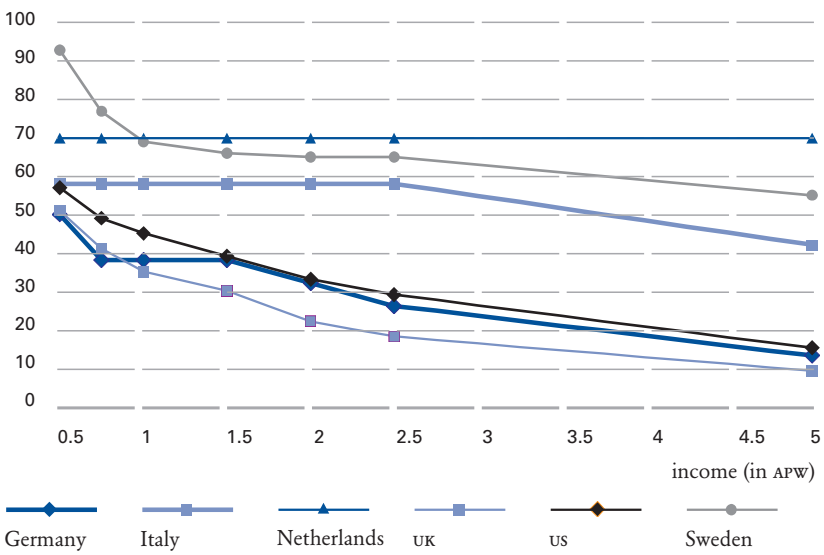
1 Resulting from one year of extra work as a percentage of pay.
Source: Casey *et al.* (2003).

tion of one's 65th year. No income or wealth assessment is performed. In Italy, by contrast, the implicit tax rate for employees approaching the retirement age rises to almost 100%. The pension systems of the US and the UK grant implicit subsidies on continued work of 15% and 18%, respectively. In all countries, net income replacement rates are higher than gross replacement rates. This reflects the considerable tax benefits enjoyed by the over-65 in many countries. In addition, they are in many cases exempted from paying various social contributions. In the Netherlands and Italy, the net replacement rate for retirees over 65 is almost 100%, which means that available income after retirement is hardly less than before. Compared to this, income replacement rates of the US and UK pension systems may be called low. Hence individual savings provide an important compensation for regular pensions in the latter two countries.

As we have seen, the pension systems of the various countries are based on different philosophies. Two broad streams may be distinguished here: one which intends pension schemes to provide the elderly with a basic income, and one which aims to provide a broad range of salaried workers with a fixed share of their erstwhile salary income. Chart 3.2 illustrates the differences by showing gross income replacement rates for different income levels at the 'normal' retirement age. The dots in the chart represent available figures, while the connecting lines are shown for visual effect. Because data for France were unavailable, this country is not represented in the chart.In the UK, the US and Germany, gross income replacement rates decline

Chart. 3.2 Gross income replacement rate for different income brackets

In % APW



Source: Whitehouse (2003)

sharply as income increase as a result of the relatively low ceilings in either pensionable salaries or pension benefits, or both. The systems of these countries are strongly redistributive in character. In Italy and Sweden, by contrast, the ceilings are put at 250% of APW, while in the Netherlands, no ceiling applies at all. Here gross pension benefits will replace 70% of even a 500% of APW salary.

Can the different incentives provided by the pension schemes in Table 3.1 help explain the national differences in senior participation rates? Chart 3.3 shows gross participation rates in 2003 by gender, for the total 15–64 years age bracket as well as for the 55–59 and the 60–64 age brackets.

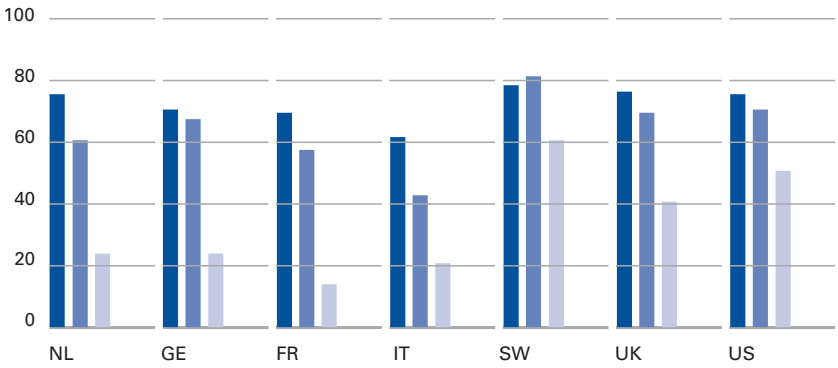
In contrasting these data, we should keep the following provisos in mind. First, if older workers' decision to retire is determined (in part) by financial incentives, these incentives are unlikely to be generated by the pension system only. For a full discussion, therefore, the attractiveness of alternative retirement opportunities provided by, e.g., unemployment or disability legislation should also be analysed. Second, current senior participation rates are unlikely to reflect only the current regime, but should instead be regarded as an indication of the system's financial attractiveness over time. A clear example of this is given by Italy, which has recently made far-reaching changes to its pension system. Italy's new NDC system provides substantially weaker financial disincentives on deferred retirement than the old system. However, current participation rates result largely from decisions taken in the past under the old pension regime. Although these provisos show that our analysis can only be tentative, some conclusions do suggest themselves.

1) The relatively high participation rates for the 55–64 age bracket in the UK, the US and Sweden which we have found in preceding chapters are mostly accounted for by considerably higher participation rates for 60–64-year-olds. In the Netherlands, Germany, France and Italy, participation among this age bracket is considerably lower. Can the incentives shown in Table 3.1 suggest an explanation for this difference? The country with the lowest 60+ participation rate is France, at a mere 14%. An obvious explanation is that France is unique in having a state retirement age of 60. According to the table, the financial reward for one year of continued work is lowest in France (and in the Netherlands under the old VUT regime), whereas early retirement is most affordable there because of the high net income replacement rate. In Germany, low participation of 60+ seniors is explained in part by the fact that until recently the official retirement age for German women was 60. Currently it is being gradually raised to that of men (65). Little can be said about Italy or Sweden, because both countries have recently implemented far-reaching system changes. A likely assumption would be that the low Italian participation rates are a relic from the generosity and scope of the old system. The traditionally low participation of Italian women also contributes. In the case of Sweden, the lack of easily available alternative retirement routes may play a role, while the traditionally high participation rate of Swedish women also helps to push up the figure.

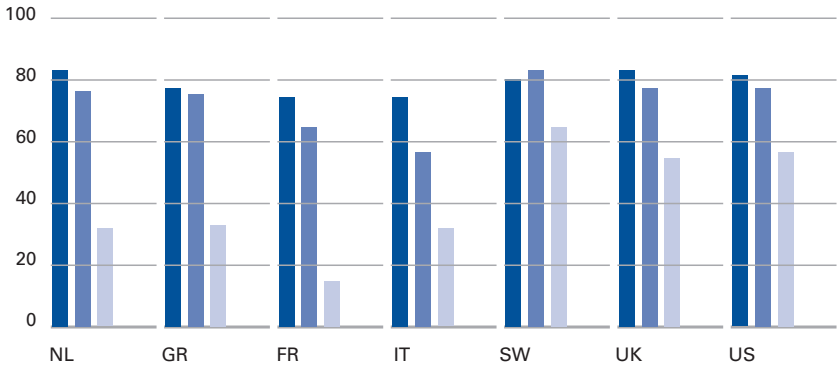
The low income replacement rates and the actuarially neutral character of the US and UK pension systems are consistent with the high participation of 60–64-year-olds

Chart 3.3 Gross Participation rates of different age groups in 2003, by gender

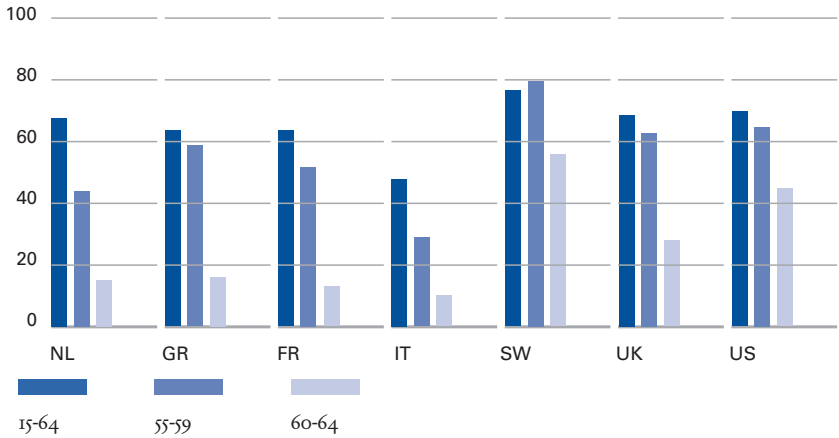
Men and woman



Men



Woman



Source: OECD (2004)

in those countries. In the UK it is not possible to retire on a pension before the age of 65. The fact that the UK's state retirement age for women is 60 explains the low participation rate of British women.

2) Also notable is the fact that in most countries, the participation rates of the 55–59 age bracket are not much below those for the entire working-age population, except in the case of the Netherlands, France and Italy. In the Netherlands, this is mostly accounted for by the low participation of older women. However, it is expected that these rates will rise in the future as a result of the cohort effect discussed before. In the case of Italy, too, low participation of women offers part of the explanation. Also standing out is the relatively low participation of men of this age bracket in Italy, but also in France. This is an indication of the relatively easy availability of alternative retirement routes, as through unemployment or disability schemes. In Sweden, the participation of 55–59 year-olds, both men and women, is in fact above that of the general working-age population.

3.5 Summary and conclusions

If the system of collective pension schemes is to be maintained on a financially sound basis in the face of increasing life expectancy, a mix of three adjustment strategies must be pursued: pension contributions must be increased; benefits must be reduced; and labour force participation of older workers must be increased. These three strategies operate like communicating vessels: Because since the 1970s, the effective retirement age has come down in most countries, either this trend will have to be reversed or additional efforts will be required with respect to the other two strategies. One often-expressed view is that the ongoing tendency to retire from the labour process at ever younger ages primarily reflects changing preferences. Yet econometric studies have identified a strong correlation between early retirement and financial incentives. One way such incentives might be given is through the design of pension schemes.

The actual design of pension schemes varies widely across countries. Pension systems might differ in the way they are funded (pay-as-you-go versus capital funding) and in their inherent degree of uncertainty about future benefit levels (DB versus DC). All four possible combinations of both pairs of principles are observed in one or more of the seven countries under consideration. There are clear differences in underlying philosophies: in continental Europe, old-age pensions for a wide range of income brackets are largely the responsibility of collective entities including the public sector. In Anglo-Saxon countries the emphasis is on individual schemes, with collective entities providing for a low basic benefit and a social safety net, while the higher income brackets are assumed to be able to provide for higher pensions on an individual basis. Therefore, the collective part of the pension system is strongly redistributive in character.

We briefly discussed the national pension systems, applying a breakdown across

three pillars, with participation in the first two being mandatory. The first pillar provides for a basic scheme or social safety net and its benefits are independent of a person's employment record. Benefits under the second pillar, however, are dependent on income and the number of contribution years. The third pillar, finally, is optional and usually takes the form of individual tax benefits on particular savings schemes.

The strength of the incentives to retire early inherent in the various pension systems has been expressed in terms of three concepts: the statutory retirement age, the income replacement rate and the change in pension capital as a result of continuing working by one more year. Using these tools, we looked at whether the design of a pension system can contribute to an explanation for participation differences in the 55+ age group. Despite the tentative nature of our analysis, we were able to establish that the nature and the strength of the incentives inherent in each national system correspond to the relative participation rate among the over-55. Sweden and Italy were left out of the analysis because of recent, far-reaching changes in their pension systems.

In the next chapter, we will narrow our focus from international comparison down to the Netherlands, considering questions such as: Where do our countrymen's preferences lie? Are we, in principle, prepared to continue working beyond the statutory retirement age? And if so, how should this be compensated for?

4 Dutch retirement decisions: the role of financial considerations

4.1 Introduction

Obviously, the participation rate of older employees will have to be raised if demographic ageing is to remain affordable in the Netherlands. This chapter addresses the ham question: how? Dutch employees set great store by leisure. Normally, the question is not *whether* one will be retiring early, but *how early*. This picture seems to be confirmed by public resistance to the measures taken by the current Government with regard to early retirement and pre-pensions, which suggests that delayed retirement is an unpopular theme. The figures in Chapter 2 show clearly, however, that the participation rate of older Dutch employees went up in the 1990s, while Chapter 3 shows that this trend coincided with the widespread abolition of financially attractive early retirement schemes. These findings run counter to the image of Dutch workers who will do just about anything in order to be able to stop working as soon as they can. In this Chapter, we will show, with the aid of the DNB Household Survey (DHS), that retirement decisions are largely underlain by financial considerations. This means, on the one hand, that people can be stimulated to stay in work if more of the consequent gains fall to individuals via the level of their eventual pension benefit.[21] On the other hand, people feel compelled to continue working if the price of (early) retirement goes up, for instance, because implicit and/or explicit subsidies are removed. These findings support the correlation between the higher participation rate of older workers and pension cuts entailing that individuals themselves bear the costs of early retirement and reap the benefits of retiring later. Obviously, the answers given in the survey, and hence its results, are based on current (early) retirement schemes and institutional frameworks. The results for the Netherlands are, however, consistent with research in other countries and offer several concrete handles for further policy measures aimed at encouraging older employees to stay in work; when explicitly confronted with the true costs and gains of early retirement, the Dutch opt for a longer working life.

The analysis in this Chapter addresses only the supply side of the labour market, i.e. the preparedness to take part in the labour process. Increased preparedness on the part of older employees to remain economically active does not mean their participation rate will immediately go up. The model simulations in Chapter 2 show that an increased supply of labour will initially fuel a (temporary) rise in unemployment.

This Chapter is organised as follows. Section 4.2 goes into the importance of

financial considerations for retirement decisions observed in the economic literature. Section 4.3 then sets out how the results in this Chapter were obtained. The ideas and expectations of DHS respondents are charted in section 4.4, while sections 4.5 and 4.6 discuss how they are influenced by financial considerations. In section 4.5, the emphasis is on ranking the motives underlying longer working and the efficacy of income tax incentives, while section 4.6 focuses on the financial stimuli contained in retirement schemes. Section 4.7 presents a summary and conclusions.

4.2 Background

The economic literature generally acknowledges that individual retirement decisions are determined by financial considerations (e.g. Gruber and Wise, 1997). Berkel and Börsch-Supan (2003) show the sensitivity of German retirement decisions to financial motives. Simulations based on their results demonstrate that the effective retirement age goes up when the implicit tax on continuing to work is reduced. Duval (2003) arrives at a similar conclusion in his analysis of all OECD countries. Mastrogiacomo et al. (2004) show that the Dutch, too, are motivated by financial considerations. They find notably that incentives and pension options are major determinants of retirement decisions. Research also shows that, all other things being equal, higher-income earners in the Netherlands are, on average, keener to retire early (De Nederlandsche Bank, 2004). This would indicate the role played in retirement decisions by financial feasibility. Moreover, higher educated, male and single employees tend to work longer. The actual moment of retirement is determined largely by factors such as health and employer pressure (reorganisations).

The financial feasibility of retiring (early) also plays an important role in the link between wealth and retirement. Blake (2004) shows that higher pension or home assets stimulate early retirement in the UK.[22] Van Els et al. (2004) find indications that for Dutch households, too, home assets may be considered a substitute for pension assets. Such results correspond with the long-term trend of cashing an increase in prosperity in the form of a shorter and less intensive working life.[23]

Changes in the set-up of pension schemes seem to have considerable effects on the behaviour of employees. Disney et al. (1994) analysed the retirement behaviour of employees in the UK with collective versus individual pension arrangements. Employees subject to collective arrangements have fewer options of retiring very early. On the other hand, the chances of retiring rise very rapidly for these employees once they reach the pensionable age. This means that the terms of the pension arrangement strongly determine the retirement age. In a more general sense, Meghir and Whitehouse (1997) show that employees in the UK base their retirement decisions largely on economic considerations; higher wages make people delay their retirement decisions, while the existence and the level of social security reduce the value added of working.[24] Diamond (2001) agrees. He points out that when a pension system is reformed – and people are confronted more explicitly with the actu-

al costs of (early) retirement – alternative ways of withdrawing from the labour force (such as disability or unemployment schemes) should be blocked to abuse. For the Netherlands, Mastrogiacomo et al. (2004) show that, when the level of the state old age pension depends on the labour market status of the partner, younger partners may be more inclined to retire early, rather than that older partners opt to work longer.

Research also shows that Dutch employees are not very knowledgeable about their own pension provisions, even though the majority say that they are sufficiently to well informed (e.g. De Nederlandsche Bank, 2004).[25] Van Els et al. (2004) find a positive correlation between knowledge of one's own pension entitlements and age, education and income. On the basis of U.S. data, Chan and Stevens (2003) show that this phenomenon is not specifically Dutch; U.S. workers, too, are far from adequately informed about their pension arrangements. Though most employees know little about their own pension provisions, they do react to what they think they know. This has two major consequences for policy-making. To begin with, even if the existing provisions contain sufficient stimuli to delay retirement, major labour supply effects can be achieved through an information campaign. It must be kept in mind that the observed average behaviour reaction to financial pension considerations is generated by a minority of well-informed people. Information should therefore be explicitly acknowledged as a link between stimulus and behaviour. Secondly, pension reforms may have a disappointingly insignificant effect on behaviour if they are not accompanied by a well-considered communication plan. Chan and Stevens (2003) make several interesting remarks on supplying information. For instance, some individuals can do without financial information because they do not use it when taking their retirement decisions (for example, partners who work part-time and are not the main breadwinner in the household). They also show that persons who stand to gain the most from a sound retirement decision are, on average, better informed. This means that knowledge of pension arrangements is not an exogenous variable in retirement decisions. This is supported by the finding that, on average, people become better informed as they get older; this goes for Dutch employees, too.[26]

The literature clearly shows that financial considerations play a major role in the retirement decisions taken in most countries. Also, retirement and various forms of inactivity seem communicating vessels when it comes to retiring early. This means that economically desirable retirement behaviour can be stimulated by passing more of the actual costs of early retirement and the actual gains of retiring later on to individuals, while limiting the opportunities for a free lunch in the form of an alternative way of early retirement. Below, the financial sensitivity of the pension behaviour of Dutch employees is analysed empirically.

4.3 **Empirical analysis**

For the purpose of this study, Dutch households were asked to state their expecta-

tions and preferences for retirement and continuing to work at an older age. To this end, the panel members of the DNB Household Survey (DHS) were presented with a questionnaire in January 2005, which contained direct and indirect questions as to preferences and expectations with regard to retiring later and the role played by financial considerations. The bulk of the information presented here comes from the answers to these questions, given by a total of 1,614 panel members.

In the presentation of the survey results, all observations have been weighted, in order to correct for overrepresentation of higher incomes and home ownership. Furthermore, the answers to some questions were related to a list with background characteristics of the respondent (or his/her household) with the aid of a logit model. Information about many of these background characteristics was obtained through the regular consultation of the panel in 2004. These characteristics are the respondent's age, gender and education and the household's annual income. The DHS's regular questionnaires also deal with many aspects of the financial behaviour of Dutch households, see, for example, Alessie et al. (2002) and Van Els et al. (2004). We summarised this financial behaviour in terms of home ownership and stock market investments. Finally, we construct indicators of the respondents' knowledge of their own pension provisions, as well as their impatience and risk tolerance when it comes to taking decisions (see Appendix 4.1 for the technical details). Impatience gives an indication of the time horizon of the respondent's decision. A high degree of impatience means that the respondent tends to value short-term proceeds relatively more than proceeds which will take longer to realise. The risk-averse, however, may similarly prefer short-term to longer-term proceeds because the latter are more uncertain. In the following analyses, we therefore checked for both impatience and risk tolerance, so as not to confuse the two when interpreting the results. The background characteristics of the respondent were defined as follows.

– *Gender*: 1 = male; 0 = female.
– *Age*: in years.
– *Education*: 1 = primary education; 2 = lower vocational education; 3 = general secondary education/pre-university education; 4 = upper vocational education; 5 = professional education; 6 = university education.
– *Job*: 1 = paid work; 0 = otherwise.
– *Pension*: 1 = retired (early) with a pension benefit; 0 = otherwise.
– *Partner*: 1 = married or cohabiting; 0 = otherwise.
– *Income*: 1 = net annual income of household below EUR 13,000; 2 = income between EUR 13,000 and EUR 20,000; 3 = income between EUR 20,000 and EUR 26,000; 4 = income above EUR 26,000.[27]
– *Home ownership*: 1 = home owner; 0 = not a home owner.
– *Share holdings*: 1 = invests in shares or investment funds; 0 = does not invest in shares or investment funds.
– *Pension knowledge*: degree of knowledge about own pension provisions, a higher value indicating more knowledge (see Appendix 4.1).

– *Impatience*: emphasis on the present in decision-making and action-taking, a higher value indicating a high degree of impatience (see Appendix 4.1).
– *Risk tolerance*: degree to which the respondent is prepared to accept risk in exchange for a higher return (see Appendix 4.1).
– *Physical*: the physical burden of the respondent's job, on a scale of 1 (very light) to 5 (very strenuous).
– *Mental*: the mental burden of the respondent's job, on a scale of 1 (very light) to 5 (very demanding).

4.4 **Retirement decisions**

To begin with, we are curious about respondents' expectations as to the age at which they expect to retire, and the intensity of their thoughts about retirement. The expected or desired retirement age is the logical measure with which hypothetical changes in policy, put before the respondents later, may be compared, because it reflects the current (early) retirement schemes and institutional frameworks. The intensity with which respondents think about retirement gives an indication of the accuracy of the signals emanating from the answers.

4.4.1 The importance of the retirement decision

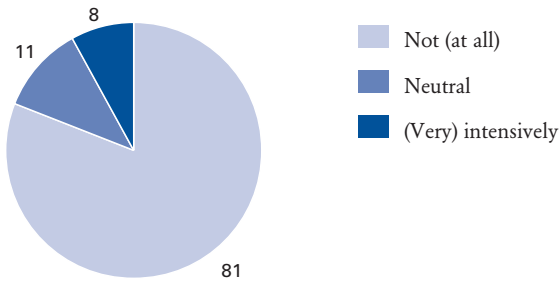
The panel members were asked to indicate, on a scale of 1 to 5, the intensity of their retirement thoughts, with 1 standing for 'not at all' and 5 for 'very intensively'. Four out of five respondents do not think about retirement (at all), while only one in twelve thinks about retirement (very) intensively, see Chart 4.1. This is in line with the outcome of an earlier survey, where nearly half of the respondents agreed with the statement 'I don't worry about my pension, I will think about it when the time comes' (De Nederlandsche Bank, 2003, p. 49).

Confrontation of this intensity with individual background characteristics by means of logit analysis furthermore shows that older respondents think about retirement more intensively. This is in line with the results of Chan and Stevens (2003) who pose that age determines when information is collected. Also, male respondents think more intensively about retirement, as do home owners and more patient respondents (who have a longer decision horizon). Finally, respondents with a physically strenuous job think relatively intensively about retirement.[28]

Chart 4.2 shows that the widely publicised debate between employers and trade unions about the reforms of early retirement and pre-pension schemes have had little effect on this intensity: five out of six respondents say they do not think about retirement more intensively; one in ten now thinks about retirement more intensively, and one in fourteen now does so less intensively.

Chart 4.1 The intensity of thinking about retirement

Percentage of respondents



Source: DNB Household Survey, January 2005.

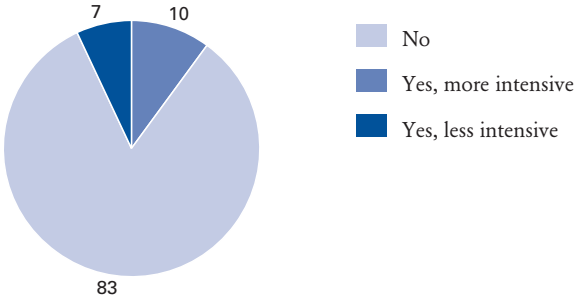
4.4.2 Expected retirement age

One finding which may result from the debate is the fact that last year one in six respondents indicated not knowing when to retire, against one in ten, i.e. far fewer, in January 2005. On average, respondents expect to retire at 62.1 years; if allowance is made for sample uncertainty, this corresponds with what the panel expected a year ago.

We then confronted the age at which people expect to retire with the background characteristics.[29] The expected retirement age shows a negative correlation with the intensity with which people think about retirement. Respondents who indicated that

Chart 4.2 Has the intensity been changed by the pension debate?

Percentage of respondents



Source: DNB Household Survey, January 2005

they do not worry about retirement (at all), expect to retire at an average of 62.6, while respondents saying that they think (very) intensively about retirement expect to retire at 58.4.[30] Respondents who think about retirement, but not (very) intensively, expect to retire as early as 61.0. This could indicate that early retirement remains an option for people who are sufficiently interested in their own pension arrangements. This explanation runs counter, however, to the result that people who know more about their own pension provisions expect to retire later. The negative correlation between intensity and retirement age may alternatively be explained as a selection effect: people who would like to retire early are also more intensively engaged in exploring how to achieve this goal. This explanation is also in line with the arguments used by Chan and Stevens (2003) who pose that people who stand to benefit most from information about retirement options are also the ones who most actively seek this information. The analysis further shows that, on average, men expect to retire nearly eighteen months later than women, while respondents with a partner expect to retire a year earlier, on average, than those without. On average, income has a downward effect on the expected retirement age, which again supports the hypothesis that the expected retirement age is influenced in part by financial feasibility (cf. De Nederlandsche Bank, 2004). Finally, respondents with a physically strenuous job expect to retire earlier.

4.5 **Incentives for working longer**

This section deals with how employees can be stimulated to work longer. Before confronting the panel with hypothetical financial incentives, section 4.5.1 charts the preferences for continuing to work at an older age, and the underlying factors. The respondents were found to be quite willing to continue working beyond 65. This preparedness is dissected in section 4.5.2, while section 4.5.3 discusses whether respondents can be motivated to work longer by a reduction of marginal wage tax rates.

4.5.1 Classifying preferences

Respondents were asked whether they would consider working longer if a) they were given a higher pension in exchange, b) they were to earn higher net wages in exchange, c) the direct working environment requested them to do so, or d) they could do so part-time. The first two possibilities were included in order to check whether respondents mainly valued short-term financial rewards (i.e. higher net wages) or whether they appreciate primarily long-term financial rewards (i.e. higher pensions) for working longer. The results are presented in Table 4.1. Around 60% of the respondents indicated that they might consider working longer than they had indicated earlier, for a number of reasons. To begin with, 19% said they would if they could do so part-time. In the second place comes continuing to work for higher net

Table 4.1 Ranking preferences

Respondent prepared to delay retirement?	Response (as % of total)				Average gain (# years by which retirement is delayed) [2]		
	1st choice	2nd choice	3rd choice	1st to 3rd choice	Total	Up to 65	After 65
Yes, for a higher pension	9	11	6	27	1.1	0.4	0.7
Yes, for higher wages	12	13	7	32	1.3	0.5	0.8
Yes, for colleagues	6	7	6	20	0.8	0.3	0.5
Yes, part-time	19	12	5	37	1.5	0.6	0.9
Other [1]	14	-	-	14	0.6	0.3	0.3
No	39	17	18				

1 The reply 'Other' could not be given as second or third choice.
2 The average gain is expressed as the unconditional number of years that the panel members delay retirement for the reason stated; i.e. the product of the chance that the respondent is prepared to continue working for the reason stated, and the average number of years indicated. See Appendix 4.2 for the breakdown of this gain into the gain up to 65 years of age and the gain from 65 onwards.

wages (12%), just before higher pensions (9%). Finally, 14% said they might wish to continue working for another reason, enjoyment of their work being a much-cited reason. Continuing to work because the direct work environment requests it is relatively unpopular, with a mere 6% of respondents citing this as the primary motive for delaying retirement.

The respondents were also asked to state their second and third most important motives for delaying retirement. For 37% of respondents, the possibility of working part-time is one of the three main reasons for working longer, followed by higher net wages (32%) and higher pensions (27%). This means that the largest increase in the participation rate of older workers can simply be achieved by (further) stimulating part-time working of older employees. A major step in the right direction has already been set by the conversion of final-pay into average-pay systems, so that the implicit penalty on part-time working at the end of one's career has been removed.[31] Further gains can be made by expanding the possibilities for part-time retirement.

A higher net wage is a more important incentive for delaying retirement than a higher pension. This suggests that, on average, people react more strongly to financial incentives which make themselves felt in the short term. In line with this, a logit analysis – controlling for the degree of risk tolerance – shows that respondents who are stimulated to work longer primarily by higher net wages are more impatient than those who give higher net wages as the second or third incentive.[32]

Table 4.1 also shows the average number of years that respondents are prepared to work longer per motivation. This reflects the order of the preferences; if they can work part-time, the panel members are prepared to delay retirement by, on average,

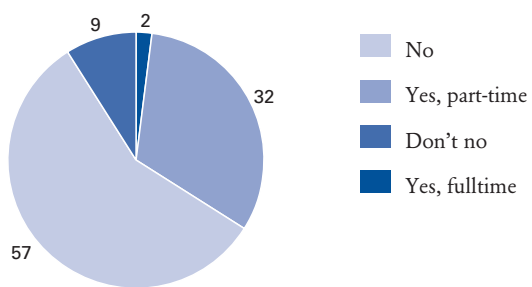
1.5 years[33]; for higher net wages, 1.3 years; and for a higher pension 1.1 years. The table furthermore shows how many years the respondents are prepared to continue working, on average, before and after 65; this is derived from the expected retirement age in combination with the number of years by which respondents say they are prepared to go on working per motivation (see Appendix 4.2 for an extensive explanation of this breakdown). The results of this exercise are remarkable, because they show that most of the extra years worked will be from 65 onwards.[34] In the following section, we will be checking whether the respondents were fully aware of this fact by asking directly whether they are prepared to continue working from 65 onwards.

4.5.2 Working beyond one's 65th birthday

As in previous waves of the DHS, the panel members were again asked directly whether they would be prepared to work from 65 onwards, the age at which they become eligible for a state old age pension, if they were able to keep that pension. The answers are summarised in Chart 4.3. The Chart shows, first of all, that the panel's answers in the survey of January 2005 are comparable to those in earlier surveys; 34% of respondents are prepared to continue working from 65 onwards (either full-time or part-time), 56% are not prepared to do so, and 9% don't know.[35] Also, the response is roughly the same as the preparedness to continue working part-time, as discussed in the preceding section (37% being prepared to continue working part-time, see Table 4.1). On average, the respondents are prepared to continue working two days a week for 1.4 years, from 65 onwards, which means that, compared to Table 4.1, they are willing to work six months longer.[36] This leads us to conclude that the respondents, when ranking their preferences, were already consciously indicating

Chart 4.3 Are you prepared to work from 65 onwards?

Percentage of respondents



Source: DNB Household Survey, January 2005

that they were prepared to continue working from 65 onwards. In addition, roughly 30% of retired respondents said they would like to re-enter the work force. Like those still working, the retired are also prepared to work about two days a week for about 1.4 years.

Analysis of the characteristics of the respondents who are prepared to work from 65 onwards shows that notably younger and male respondents, and those without a partner, indicate that they would be prepared to do so. Respondents with a lower income, a higher education or a higher risk tolerance are also more prepared to delay retirement. The panel members were further asked if they expected pension arrangements to become more sober (more generous) as a result of Government policy, and whether they expect to have to work longer (be able to retire earlier). The more people are convinced that they will have to work longer and that the pension system will be toned down, the more they are prepared to delay retirement. Thus the notion that our pension provisions should be more sober in order to make them sustainable seems to be reflected already in expectations.

4.5.3 Higher net wages for older workers

The results show that one in eight respondents sees higher net wages as the primary motive for working longer, while one in three sees it as one of the main three motives for delaying retirement (see Table 4.1). This financial incentive can come in several guises. One possibility is to stop an employee's pension accrual at a certain age, even though he continues to work (part-time). The employer's and employee's pension contributions are then stopped, which creates scope for higher net wages.[37] The alternative laid before the panel was a reduction of the marginal wage tax rates from a certain age onwards. This option was chosen notably because it is unlikely to be misunderstood by the panel, while allowing for a broader interpretation of the results.

All panel members were explicitly asked if they would work longer than they had indicated earlier if they were to enjoy a wage tax reduction from a certain age onwards. We proposed a 10 percentage point reduction of the marginal wage tax rates. The age at which employees become eligible for such a reduction varies from 61 to 63. The results are summarised in Table 4.2. 22% of the respondents are willing to delay retirement if this reduction is applied to wages earned as from 63. This percentage rises marginally, if the age is lowered to 62. A more discernible increase is recorded if the reduction starts at 61; 27% of respondents are then prepared to work longer.[38]

Next to the summary, Table 4.2 also shows how this translates into the average number of years which the respondents are prepared to work longer per motivation. This reflects earlier results (cf. Table 4.1); the panel members are prepared to continue working 1.3 years when the tax reduction applies from 61 onwards of, which about one quarter before they turn 65 and about three quarters after that. The smaller the period over which they enjoy the wage tax reduction, the less prepared the panel members are to continue working.

Table 4.2 Will you continue working if wage tax is reduced from age...

	Response (as % of total)			Average gain (# years by which retirement is delayed) [1]		
	Yes	No	Don't Know	Total	Up to 65	From 65 onwards
... 63?	22	58	20	0.9	0.2	0.7
... 62?	23	56	21	1.1	0.3	0.8
... 61?	27	51	22	1.3	0.3	1.0

1 The average gain is expressed as the unconditional number of years by which the panel members delay retirement for the reason stated: i.e. the product of the chance that the respondent is prepared to continue working for the reason stated, and the average number of years indicated. See Appendix 4.2 for the breakdown of this gain into gain up to 65 and gain from 65 onwards.

The background characteristics of the respondents who are prepared to delay retirement show again that these are notably younger, male and better educated, as well as those without a partner. There are also indications that, like respondents investing in shares, lower-income respondents are more inclined to continue working for the tax reduction. Finally, respondents who have above-average knowledge of their own pension arrangements seem more prepared to work longer. This is probably due to the fact that the overwhelming majority of respondents who are willing to continue working wish to do so part-time, i.e. about two-and-a-half days a week. Respondents who know much about their own pension provision are probably more aware of the fact that most pension schemes have been converted from final-pay to average-pay, which means that working longer part-time does not detract from the eventual pension benefit.

4.6 A higher pension benefit for delayed retirement

The results presented in the preceding section show that one out of eleven respondents considers a higher pension the primary motive for delaying retirement, whereas one in four respondents sees it as one of the main three incentives. In this section, we will try to quantify this incentive. With the aid of two lists of questions, we seek to gain insight in sections 4.6.1 and 4.6.2 into the intertemporal substitution and wealth effects in retirement decisions. Here, intertemporal substitution refers to the trade-off between the costs of working an extra year and the benefits of a higher annual pension benefit. The wealth effect refers to the influence which accumulated (pension) wealth has on retirement decisions. With the aid of a third list of questions, we then check in section 4.6.3 the consistency of our findings.

4.6.1 Intertemporal substitution

Blake (2004) describes the intertemporal substitution effect as the preparedness to delay retirement in exchange for a higher annual pension benefit. The intertemporal substitution effect – if relevant to a retirement decision – is obviously a major issue in the reform of the pension system towards a more actuarially neutral system. After all, such a reform is meaningful only if people really make an intertemporal choice when considering when to retire. The measure of intertemporal substitution by respondents in the DHS was charted by asking them directly how much longer they would continue working, or how much earlier they would stop working, at a given increase/decrease in the annual pension benefit.

Appreciation of a higher pension benefit

The panel was first asked whether they would be willing to work longer for a 5 percentage point increase in their annual pension benefit. As an alternative for working longer, respondents could indicate that they were willing to pay a higher pension contribution, possibly in combination with working longer. Respondents could also indicate that they were not prepared to work longer or to pay higher pension contributions. Over 50% of the respondents stated that they were not prepared to work longer for the above increase, see Table 4.3. More than 20% of the respondents are willing to continue working, while a further 25% are prepared to (partly) pay a higher contribution for a higher pension benefit.

Depending on their willingness to work longer or to pay for a higher pension, the respondents were asked to quantify this willingness. Respondents willing to work longer for a higher pension indicated that they are prepared to do so for nearly two years. Those ready to pay more for a higher pension are, on average, willing to sacrifice 2½% of their gross wages. Respondents who opt for a combination of working longer and paying a higher contribution were then asked how long they were prepared to go on working and how much extra contribution they were prepared to pay. They turned out to be willing to work more than 1½ years longer, and to pay a higher contribution, averaging 2% of gross wages.[39] Although this means that they are less prepared to continue working, and to pay less extra contribution, their readiness to pay resembles that of respondents who have opted for either working longer or paying more. This outcome suggests that the succession of the two extra questions is not interpreted by the respondents as such.[40] In the further analysis, we therefore found little difference between respondents willing to continue working and pay extra contribution and those willing to work who are not prepared to pay extra. It is notably younger, male respondents, and those without a live-in partner who are prepared at all to work longer or to pay for a higher pension benefit. In addition, notably respondents with a lower income are willing to work longer for a higher pension, while respondents with higher incomes are more prepared to pay extra for a higher pension. A preference for a combination of working longer and paying extra is also evinced relatively more often by home owners.

Table 4.3 Effort required for a 5 percentage point increase in the pension benefit

a) What are you prepared to do for a 5 percentage point increase in your pension benefit (for example, from 70% of final pay to 75%)?	
– I am prepared to work longer	21%
– I am prepared to pay a higher contribution	10%
– I am prepared to work longer *and* pay a higher contribution	13%
– I am satisfied with the level of my pension benefit and am not prepared to work longer nor to pay a higher contribution	56%
b) How many years are you prepared to work for this 5 percentage point increase in your pension benefit?	
– half a year	
– one year	
– one-and-a-half years	
– two years	
– two-and-a-half years	
– three years	
– more than three years	
c) How much contribution, as a percentage of your wages, are you prepared to pay for a 5 percentage point increase in your pension benefit?	
– 1% of my gross wages	
– 2% of my gross wages	
– 3% of my gross wages	
– 4% of my gross wages	
– 5% of my gross wages	
– 6% of my gross wages	
– more than 6% of my gross wages	

The will towards intertemporal substitution can be summarised as follows. 21% to 34% of respondents say they are willing to work 1½-2 years for a 5 percentage point higher pension. On the basis of a conservative estimation (21% willing to work 1½ years longer)[41], it follows that the panel is prepared to delay retirement by 0.3 year in order to raise their pension benefit by 5 percentage points. An optimistic estimation (34% willing to work 2 years longer) puts the average period by which retirement is delayed at 0.7 year. The economic consequences of these results are discussed in detail later.

Compensation for a lower pension benefit

In order to gain insight into the symmetry of the intertemporal substitution effect, the panel members were also asked their opinion on a lower pension benefit in

exchange for early retirement or a lower pension contribution. Here, too, the respondents could indicate whether they wished to be compensated for a 5 percentage point reduction of the pension benefit in the form of early retirement and/or lower pension contributions, or whether they consider such a reduction of the pension benefit totally undesirable in the face of the compensations proposed, see also Table 4.4. Nearly 50% of the respondents considered the proposed compensation for the lower benefit sufficient. Yet it would seem that it is not only the prospect of being able to retire early which explains the preparedness to accept a lower pension benefit, as the number of respondents demanding to be fully compensated in the form of early retirement remains roughly 20%. The large difference is accounted for by the share of respondents who consider a combination of early retirement and lower pension contributions a satisfactory compensation for a lower pension benefit. This is now 18%, as against 13% who are ready to work longer and pay a higher contribution in order to receive a higher pension benefit.

Another difference vis-à-vis the preceding scenario of a higher pension benefit is that, on average, respondents desire a greater compensation for a reduction of their pension benefit than they are prepared to give for the same increase of their pension benefit. Respondents who consider as a full compensation for lower pension benefits a lower contribution, wish to contribute an average of 4½% of their gross wage less, while being prepared to pay a mere 2½% of their gross wage extra for the same increase in their pension benefits.[42] Here, too, respondents who consider a combination of early retirement and lower contributions a satisfactory compensation seem, on average, to seek the desired combination mainly in the sum of the two. On average, they wish to retire 2½ year earlier, and to pay, on average, about 4% less pension contribution.[43] Respondents who consider retiring earlier to be full compensation for a lower pension benefit wish to retire, on average, over 2 years earlier, statistically the same number of years that they are prepared to continue working for the same increase of the pension benefit. In terms of the intertemporal substitution effect, it turns out that for a 5 percentage point reduction of the pension benefit, people wish to retire 0.4-0.8 year earlier, which is slightly more, but largely comparable with the earlier estimation of this effect.[44]

In this scenario, too, it is mainly younger, male respondents who are prepared to accept a lower pension benefit in exchange for early retirement and/or a lower contribution. Furthermore, patient respondents and home owners are more prepared to accept a lower pension benefit. For home owners, there is probably the added factor that they can use their home assets as a buffer against a lower pension benefit (cf. Blake, 2004). Respondents with share holdings have a relatively frequent preference for a combination of early retirement and a lower contribution. Finally, respondents with a relatively low income are more inclined to opt for a combination of early retirement and a lower contribution in compensation for a lower pension benefit. Possibly, they cannot afford a full compensation for the lower pension benefit in the form of early retirement, which corresponds with the finding that respondents with a lower income are more prepared to continue working for a higher pension benefit.

Table 4.4 Compensation for a 5 percentage point reduction of the pension benefit

a)	What do you consider satisfactory compensation for a 5 percentage point reduction of your pension benefit (e.g. from 70% of final pay to 65%)? [1]	
	– being able to retire earlier	18%
	– paying a lower contribution	12%
	– being able to retire earlier *and* pay a lower contribution	18%
	– there is no satisfactory compensation in the form of earlier retirement and/or a lower contribution	53%
b)	How many years earlier would you like to retire in exchange for a 5 percentage point reduction of your pension benefit?	
	– half a year	
	– one year	
	– one-and-a-half years	
	– two years	
	– two-and-a-half years	
	– three years	
	– more than three years	
c)	By how much should your contribution be reduced, as a percentage of your wages, to compensate for a 5 percentage point reduction of your pension benefit?	
	– 1% of my gross wages	
	– 2% of my gross wages	
	– 3% of my gross wages	
	– 4% of my gross wages	
	– 5% of my gross wages	
	– 6% of my gross wages	
	– over 6% of my gross wages	

1 Due to rounding, percentages do not add up to 100%.

Discussion

As a large share of the respondents indicated that they are prepared to work longer for a higher pension benefit, it is useful to look at employees' individual knowledge of their own pension arrangements on this point. In line with earlier results (see De Nederlandsche Bank, 2003 and 2004), people turn out to have limited knowledge of their own pension arrangements. For instance, over 40% of respondents have no idea whether delaying retirement (early retirement) pays (costs). Roughly 75% of the respondents indicating that delaying retirement (early retirement) pays (costs) have no idea how much. We found that the respondents who considered a higher pension a reason for working longer are just as knowledgeable (ignorant) on this point

as respondents who do not consider this a reason to delay retirement. This is an indication of the uncertainty margin with which we must interpret the efficacy of this financial incentive.[45] It also indicates that much may be gained by providing more information.

The results in this section also show that the effects of a reform of the pension system on behaviour depend largely on the nature of the reform(s). On the one hand, employees may be given the choice between delayed retirement with a higher pension benefit and early retirement with a lower pension benefit. According to our results, people with lower incomes will continue working in order to supplement their old age income. With the conversion of early retirement schemes into pre-pension schemes, the retirement age has already become flexible, with consequences for the level of the pension benefit. This means that part of the gain in terms of the participation rate has already been achieved. However, as many people are not aware of these incentives, some gains may as yet be achieved via an information campaign. On the other hand, employees can be given more freedom to vary the level of the pension contribution, with consequences for the level of their pension benefits. Our results show that, in this case mainly higher-income employees are prepared to pay more contribution for a higher benefit. This all seems to suggest that reform of the pension system also has distribution aspects.[46]

4.6.2 The wealth effect

We saw above that relatively wealthy respondents take a different view of a change in the pension benefit than relatively poor respondents. A purely intertemporal substitution effect is clearly hard to distinguish from a wealth effect. The wealth effect summarises the effect of greater wealth or a higher guaranteed pension income on pension decisions (cf. Blake, 2004). In this section, we seek to isolate this wealth effect by asking the panel members to give their opinion on an increase of the pension accrual percentage, in combination with an unchanged pension contribution.[47] We then check whether the respondents react to this exogenous increase in (pension) wealth mainly by retiring early, or whether they prefer a higher pension benefit. In order to show the (a)symmetry of the wealth effect, we also asked them to comment on the same decrease of the accrual percentage. The results are summarised in Table 4.5.

The respondents could indicate whether they would react to a change in the accrual percentage by retiring earlier or later, by accepting a higher or lower pension benefit, or a combination of both. In reaction to an increase in pension wealth (a higher accrual percentage), 40% of respondents indicated that they would opt for earlier retirement, and 34% for a higher pension benefit. The remaining 26% chose a combination of early retirement and a higher pension benefit. Of the latter, a wide majority set equal store by retiring early and a higher pension, while 6% preferred early retirement and the remaining 4% a higher pension. This means that a total 46%

of respondents wish to use the increase in pension wealth mainly for early retirement and a slightly smaller share want to use it mainly for a higher ultimate pension benefit. In reaction to the same decrease of the accrual percentage, a slightly larger proportion, of 42%, wishes to delay retirement. A likewise slightly larger proportion, 36%, accepts a lower pension benefit. Of the remaining respondents opting for a combination of delayed retirement and a lower pension benefit, the majority still set equal store by working longer and receiving a lower pension. Overall, around 47% of respondents react to a fall in pension wealth mainly by delaying retirement.[48] 40% of respondents now accept mainly a lower pension benefit. The symmetry may be slightly surprising and contrary to the prevailing impression that most people cannot wait to stop working.[49]

In order to summarise the wealth effect, we note that lowering the accrual percentage from 2.00% to 1.75% means, effectively, that it takes 40 instead of 35 years to build up a 70% pension. This means raising the standard retirement age by 5 years. As 42% of respondents indicated that they would compensate for this change by working longer, they will be delaying retirement by 5 years. If we assume, conservatively, that the respondents who react to this change largely (though not entirely) by continuing to work, do so for 2.5 years,[50] the average retirement age will rise by (0.42x5 + 0.05x2.5 =) 2.2 years for the entire panel. In other words, for each year by which the standard retirement age is raised, people will, on average, be working 0.4 year longer.

Table 4.5 Effect on behaviour of changes in pension wealth

a)	Accrual percentage raised from 1.75 to 2.00	
1	Early retirement	40%
2	Higher pension benefit	34%
3	Combination of both	26%
	with equal weight	16%
	with the greatest weight on:	
	– early retirement	6%
	– higher pension benefit	4%
b)	Accrual percentage lowered from 2.00 to 1.75	
1	Delayed retirement	42%
2	Lower pension benefit	36%
3	Combination of both	22%
	with equal weight	13%
	with the greatest weight on:	
	– delayed retirement	5%
	– lower pension benefit	4%

Incidentally, the wealth effect is not the same for all respondents. Further (logit) analysis shows that female respondents and those with relatively minor share holdings, those who do not own homes and those who, on average, have a lower income are more inclined to opt for a higher pension benefit when the accrual percentage is raised. When the accrual percentage is lowered, it is mainly home-owners with a relatively high income, who have a relatively stronger preference for a lower pension benefit rather than for a higher retirement age. Staying in work is chosen relatively often by respondents with a mentally light job and a relatively low income, or by respondents who do not own a home or shares. Here, too, pension reform is attended by a distribution issue.

4.6.3 Robustness: preferences revealed

Finally, in order to gain insight into how these incentives affect the choices made, the panel members were shown six different pension arrangements (see Table 4.6). Schemes A, B and C have the same standard retirement age of 62 years, which corresponds almost completely with the expected retirement age cited earlier by the respondents (62.1). The schemes differ in terms of the costs (gains) of early (delayed) retirement. These costs (gains) are the lowest in scheme A, where – rounded – 6% of the pension benefit is relinquished (gained) by retiring one year earlier (later).[51] They are the highest in scheme C where – rounded – 10% of the pension benefit is relinquished (gained) by retiring one year earlier (later). In scheme B, these costs (gains) are 8%. Schemes D, E and F have the same cost-benefit structure, but differ from A, B and C because their standard retirement age is one year higher, viz. 63. The panel members were asked to state the desired retirement age for every one of these schemes. The average retirement age is shown in the last column.

Intertemporal substitution

To begin with, it is worth noting that the respondents choose to retire at an average of 63.2 years in scheme A, which is more than one year later than they had indicated earlier. In scheme A, working in one's 63rd year yields a 4 percentage point higher pension benefit. It seems that the respondents react more strongly to the intertemporal substitution incentive than they had indicated in section 4.6.1 for a hypothetical prospect of a 5 percentage point higher benefit, to wit 0.3-0.7 years.

The fairly considerable difference between the direct and indirect estimation of intertemporal substitution gives rise to the question whether the comparison was underlain by the right assumption. Our assumption was that scheme A summarises reality in terms of the average retirement age (around 62) and the average pension benefit as a percentage of final pay (70%).[52] We can check these assumptions on the basis of the selection of respondents who gave an estimation of the expected pension benefit as a percentage of final pay in the DHS 2004.[53] Table 4.7 contains a summary of all relevant statistics for this selection of respondents.

Table 4.6 Pension benefit (as % of final pay) in different schemes

Scheme	Retirement age									Average retirement age
	< 59	59	60	61	62	63	64	65	< 65	
A	< 55	59	62	66	70	74	79	83	> 88	63.2
B	< 51	56	60	65	70	76	82	88	> 95	63.2
C	< 48	53	58	64	70	77	85	93	> 102	63.3
D	< 52	55	59	62	66	70	74	79	> 83	63.6
E	< 48	51	56	60	65	70	76	82	> 88	63.6
F	< 43	48	53	58	64	70	77	85	> 93	63.7

From the table it follows, first of all, that this selection of respondents anticipates a pension benefit of just below 70% of final pay, but also that, on average, their expected retirement age lies half a year above that of the full sample.[54] These respondents subsequently decide to continue working by an extra 0.4 year in scheme A (by which in this scheme they retire a little earlier than the entire panel indicates on average, compare with Table 4.6). The intertemporal substitution effect of delaying retirement by 0.4 year is much more in line with the earlier results, also given the fact that at age 63 the pension benefit, as a percentage of final pay in scheme A is 5.5 percentage points higher than what they currently expect. This reinforces the presumption that comparison of the average retirement age in scheme A in Table 4.6 with 62.1 not only makes allowance for the intertemporal substitution effect, but is also influenced by the fact that the initial basic situation does not fully correspond with the average retirement age of 62 at 70% of final pay.

Table 4.7 Retirement age chosen, compared with initial expectations

	average	95% confidence interval
Expected retirement age	62.6	[62.3; 62.9]
Expected pension benefit (% of final pay)	68.5	[67.1; 69.9]
Retirement age in scheme		
A	63.0	[62.8; 63.1]
B	63.0	[62.8; 63.2]
C	63.1	[62.9; 63.2]

We also see in Table 4.6 that, on average, the panel members choose the same retirement age of 63.2 in scheme B as in scheme A, and only a slightly higher retirement age in scheme C, where the intertemporal substitution incentive is the strongest.[55] In these schemes, continuing to work in the 64th year yields a higher benefit of 6 and 8 percentage points, respectively. The size of wealth in the basic situation could be decisive for the degree to which people are prepared to undertake intertemporal substitution. We will look into this later. First, it must be noted that the intertemporal substitution incentives contained in scheme C cannot be provided cost-effectively; the Nederlandsche Bank's pension model PALMNET provides for an actuarially neutral remuneration for an extra year's work of roughly 8% (Van Rooij et al., 2004b), while in scheme C (and F, too) the pension benefit is raised by – rounded – 10% for every extra year worked. According to this measure, schemes B and E contain incentives which are exactly cost-effective, while schemes A and D compensate contributors insufficiently, in actuarial terms, for the extra years worked. In this light, the results suggest that pension schemes need not be completely actuarially neutral in order to have major participation effects on older employees; the average retirement age in scheme A is already much higher than indicated earlier by the respondents, while the extra gains from the stronger incentives contained in scheme B are minor. Analysis of the background characteristics of the respondents shows, incidentally, that it is notably younger respondents and those without a live-in partner, with a relatively low income or mentally light work, but also home-owners, who are inclined to continue working when the intertemporal substitution incentives are stronger; this is largely in line with earlier findings.

Wealth effects

Table 4.6 also harbours a wealth effect which we can compare with the answers to the direct questions about wealth and retirement in section 4.6.2. As the standard retirement age in schemes D, E and F is one year higher than in schemes A, B and C, we would have expected, on the basis of earlier findings, the average retirement age in schemes D, E and F to be 0.4 year higher than in schemes A, B and C. These expectations correspond with the average retirement age indicated in the latter three schemes, which is 0.4 year higher than in the corresponding scheme with the lower standard retirement age.[56] This means that toning down pension schemes has a considerable positive effect on the retirement age. Incidentally, boosting the intertemporal substitution incentives has little effect on these leaner schemes, as the average retirement age remains virtually constant at around 63.6 years.[57] Analysis of the background characteristics shows that notably respondents with considerable knowledge of their own pension arrangements, as well as younger and male respondents are prepared to work longer when pensions are toned down. This means that when a pension system is toned down, it may take some time before the effects show up in a higher actual retirement age.

4.7 Summary and conclusions

The survey results discussed in this section indicate that three out of every five Dutch employees can be motivated to delay retirement. (Further) stimulating the possibilities for older employees to continue working, part-time, seems the most effective way of keeping them involved in the labour process. We show that they are then, on average, prepared to continue working one-and-a-half years longer. As most pension schemes have now been converted from final pay to average pay, part-time working at the end of one's career is no longer disproportionately detrimental to the pension benefit. In addition, most people can be motivated to stay in work by means of financial incentives. The survey results show that people are prepared to continue working if they are financially compensated for doing so in the short term. In combination with the above, this outcome suggests, for instance, that part-time retirement has considerable positive effects on participation, especially if part-time retirees are no longer required to pay pension contributions. This would be in line with the preparedness of respondents to continue working, but part-time, and their wish to earn a larger net amount while doing so.

Financial incentives can furthermore be incorporated into (early) retirement schemes in the shape of the level of the benefit and the flexibility of the retirement age with the attending remuneration or, as the case may be, price. Toning down a pension scheme so that employees are required to work one year longer in order to obtain a full benefit makes employees delay their retirement by, on average, half a year. If, in addition, the annual pension benefit increases by 6% for every extra year worked, employees are prepared to delay retirement by, on average, nearly six months more. Apparently, if people are rewarded in their pension schemes for working longer, considerable gains can be achieved in terms of a higher participation rate of older people; moreover, such financial stimuli can be provided in an actuarially neutral manner, and there is even some scope for maintaining intergenerational solidarity. As many pension schemes already include such elements, the extra gains to be made in terms of financial incentives may be limited.

In many early retirement schemes, the generosity of the benefits depends largely on the fiscally friendly accrual of early retirement wealth. The results in this Chapter indicate that cutting down on early retirement schemes – for instance by abolishing such a fiscal facility – may have important positive effects on the participation rate. On the one hand, the abolition of the fiscally friendly payment of early retirement contributions makes saving for early retirement relatively unattractive (with more net pay now having to be surrendered for the same duration of early retirement). On the other, in a defined contribution scheme, the early retirement benefit is reduced when the fiscally friendly treatment of the accrual of early retirement wealth is abolished (as it takes longer to accumulate early retirement wealth when contributions remain the same).

As it is mostly younger people who are prepared to continue working when faced with various measures, the initial effects of alternative incentives could prove mod-

est, however. This needs to be taken into account in an evaluation of the efficacy of policy measures; policy adjustments will only make themselves felt in full in the longer term, when the expectations and behaviour of younger employees have changed. The current austerity measures already seem to be making themselves felt in part among younger employees; on average, they expect to stop working at a later age than their older colleagues. Stimulating employees aged 65 and older to work (part-time) can, however, have a fairly direct result as the survey results indicate that for a substantial proportion of retirees this is an incentive to re-enter the labour process.

Another important conclusion follows from the confrontation of the preparedness to continue working with the income and wealth characteristics of the respondent or his or her household. Policy induced changes in the financial considerations of employees can have major distribution effects. Employees with lower incomes or little wealth are generally more prepared to delay retirement, if this means receiving a higher pension. Employees with a higher income or more wealth, however, are more prepared to pay extra for a higher pension, and prefer to run down their wealth rather than delay retirement. This distribution issue will be given the necessary weight in the discussion about the actual reform of a pension system that has always set great store by solidarity.

Moreover, allowance must be made for the fact that three out of four respondents are not thinking (at all) about when to stop working. In addition, the survey results show that many people have little knowledge of their own pension provision. This would indicate that compared to earlier surveys little has changed with regard to the interest displayed by the average Dutch employee in his or her pension arrangements. The ensuing policy recommendation is twofold. To begin with, the government could, under the motto 'What you don't know can't help you', embark on an information campaign in its effort to raise the participation rate of older employees by drawing attention to the financial stimuli already provided for in current pension schemes. Furthermore, policy changes aimed at boosting financial incentives will clearly have to be attended by a well-considered communication strategy in order to have maximum effect.

The general picture emerging from this Chapter is that there are no insurmountable limitations on the supply side of the older segment of the labour market which thwart an increase in the participation rate of older employees. One question which could not be addressed in the household survey remains: Does the supply of older labour automatically create demand? Although this study did not look at the functioning of the older segment of the labour market, it is reassuring to note that in countries where the participation rate of older employees is high, the employment rate of older employees is also high (Casey et al., 2003). Model simulations (see Chapter 2) indicate that the extra supply of labour will eventually be absorbed.

Appendix 4.1
Construction of *pension knowledge, impatience and risk tolerance*

Individual pension knowledge can be gleaned by means of four questions about specific aspects of the respondents' own pension arrangements, see Box A4.1 (cf. Van Els et al., 2004). We assumed that a respondent has knowledge of an aspect of his pension arrangements if he does not answer the question with 'don't know'. With the aid of factor analysis, the knowledge of these four aspects was then summarised in a single figure showing how knowledgeable the respondent is about his own pension provision. Analysis shows that knowledge of all four aspects shares a single common, unobserved factor, which has a positive correlation with the knowledge of each of the four individual aspects.[58] We therefore call this factor pension knowledge.

As the response to question 3 is much lower than to the other questions, we ultimately constructed the variable pension knowledge on the basis of questions 1, 2 and 4 only. This raised the number of useful observations by over one third. Here, too, factor analysis resulted in a single, unobserved, common factor in the answers to

Table A4.1 Pension knowledge

Independent variable	Estimated parameters
Gender	0.28 (6.7)
Age	0.02 (10.8)
Education	0.06 (3.8)
Job	0.16 (2.9)
Pension	0.19 (1.9)
Partner	-0.15 (2.9)
Income	0.15 (6.4)
Home ownership	0.11 (2.2)
Share holdings	0.12 (2.5)
Constant term	-2.02 (14.7)
Number of observations	941
Adj-R^2	27.6

Noten: OLS estimation results. The dependent variable is pension knowledge, i.e. the respondent's knowledge of his or her own pension arrangements, measured on the basis of factor analysis. Absolute t-values are shown in parentheses.

Box A4.1. Knowledge of four aspects of pension arrangements

		# answers
1.	What pension arrangement do you have? 1 final pay 2 average pay 3 defined contribution 4 other 5 don't know	1468
2.	Pension arrangements may contain a provision that the level of pension entitlements, pensions already being paid, or both, will be adjusted. Such an adjustment may be on the basis of a price or wage index, or a combination of both. This is called index-linking. Is your (future) pension index-linked? 1 yes 2 no 3 don't know	1468
3.	What pension entitlements have you accumulated as per 1 January 2002, according to the pension statement, at the pension fund of your current/last employer? These entitlements are the amount paid to you annually, if you had stopped working from then on. Note: The answer to this question should be based on your current marital status. No allowance should be made for your entitlement to a state old age pension. amount in euro 9999999 don't know	915
4.	What percentage of your final net pay do you expect your net pension (including the state old age pension) to be? (For those who have already retired early, this question refers to final pay before early retirement.) percentage of final net pay before retirement 9999 don't know	1520

Table A4.2 Knowledge of individual aspects of pension arrangements
(outcomes and marginal effects in percentage points)

	… how the pension is built up	… indexation	… pension entitlements	… the ultimate level of the pension benefit
% of respondents who are aware of … [1]	71	58	50	54
Gender	12.3 (4.2)	18.1 (5.3)	1.3 (0.3)	15.4 (4.8)
Age	1.3 (8.7)	1.5 (8.1)	1.6 (6.7)	0.6 (3.8)
Education	3.8 (3.9)	2.8 (2.3)	6.5 (4.1)	3.5 (3.0)
Job	9.4 (2.4)	-0.8 (0.2)	10.8 (1.8)	9.3 (2.4)
Pension	-3.6 (0.6)	13.1 (2.1)	27.5 (2.9)	19.9 (2.8)
Partner	-5.1 (1.7)	-7.5 (1.9)	-3.5 (0.7)	-5.3 (1.3)
Income	5.6 (3.9)	11.8 (6.3)	5.9 (2.3)	5.4 (3.1)
Home ownership	6.9 (2.1)	11.1 (2.8)	9.2 (1.8)	2.7 (0.7)
Share holdings	5.6 (1.8)	7.8 (2.1)	1.2 (0.2)	11.4 (2.9)
Number of observations	1132	1132	685	1153
Pseudo-R^2	16.4	21.8	11.4	8.0

Notes: Marginal effects of a change in the independent variable on the chance of a positive answer, on the basis of logit analysis. For 0-1 dummies, the marginal effect refers to a discrete change in the dummy variable from 0 to 1, for the other independent variables the sample average is used as the reference value. Absolute t-values are shown in parentheses.
1 Percentage of the respondents answering anything but 'don't know' to questions on individual pension arrangements (see Box A4.1).

these three questions; this factor again showed a positive correlation with awareness of each of the three individual aspects of pension arrangements. This factor, which we call pension knowledge, has an average value of 0 and varies between a minimum of -1.16 and a maximum of 0.80. Tables A4.1 and A4.2 show the correlation between pension knowledge and a set of personal and household characteristics, as well as the correlation between the underlying components of pension knowledge and the same set of personal and household characteristics. The results are consistent with those of Van Els et al. (2004).

Impatience
Individual impatience can be gleaned from the degree to which respondents agree with twelve statements about the future, in combination with the answers to two questions about their spending habits (see Box A4.2). Someone is impatient when he or she is more concerned with issues with which he/she will be confronted within the near future. An impatient person will therefore be more inclined to agree with

Box A4.2 Indicators of impatience

Statements about the future

Please indicate, on a scale of 1 (indicating total disagreement) to 7 (indicating total agreement), to what extent you agree with the following statements.

1. I think about how things could be in the future, and try to influence them in my daily life.
2. I often think about matters which will only begin to have consequences in several years' time.
3. I only think about current matters, and assume that things will work out in the future.
4. I always think only about the immediate consequences (in terms of days or weeks) of whatever I am doing.
5. Convenience is a major consideration in my decisions and actions.
6. I am prepared to sacrifice my current well-being for certain results in the future.
7. I believe it is important to take warnings about the negative consequences of my actions seriously, even if these negative consequences were to make themselves felt only in the distant future.
8. I believe it is more important to think about matters which will have major consequences in the future, than about matters which have immediate but less important consequences.
9. I generally ignore warnings about future problems because I think they will solve themselves.
10. I consider it unnecessary to make sacrifices for future matters because they can always be sorted out later.
11. I react only to immediate problems, on the assumption that I will deal with later problems when they present themselves.
12. I get clear results in my daily work; this is more important to me than working with vague results.

Questions on spending behaviour

1. Some people spend all the money they receive immediately. Others save for a nest egg. Please indicate on a scale of 1 to 7 what you do with the money left after you have paid for food, the rent, and other daily necessities, with 1 indicating that you intend to spend your money immediately and 7 that you intend to save as much as possible.
2. People use different time horizons when deciding how much of their income to spend or to save. Which of the time horizons set out below is MOST IMPORTANT to you when making spending and saving decisions?
   1 the next couple of months
   2 the next year
   3 the next few years
   4 the next five to ten years
   5 more than ten years ahead

statements 3, 4, 5, 9, 10, 11 and 12 and less with the other statements. That person will also score low on the two questions about spending habits.

Factor analysis shows one common factor in the response to these statements and questions.[59] It follows from the factor weights presented in Box A4.3, that this factor summarises the respondent's impatience very well, as the weight is positive for all statements on which we expect impatient respondents to score high and negative for the other statements and the questions, on which we expect impatient persons to score low. Impatience can be determined for 2083 respondents, it has an average value of 0 and moves between a minimum of -2.52 and a maximum of 2.95.

Risk tolerance

The measure of risk tolerance determines what weight a respondent assigns to risk and return in a (financial) decision. The greater the risk tolerance, the more value people attach to return and the less to the uncertainty of this return. The greater the risk aversion, however, the greater the weight given to uncertainty, and consequently a lower the return is accepted in exchange for a more certain return. We gleaned the individual measure of risk tolerance from the measure of agreement evinced by the respondents with six questions about saving and risk-taking, in combination with information about their investment behaviour and preferences with regard to pension arrangements, see box A4.4.

Risk tolerance was determined in three ways by means of factor analysis. First of all, on the basis of the six statements about saving and risk-taking only. This resulted in a single common factor which – given the factor weights in Box A4.5 – sufficiently summarised the risk tolerance of 1967 respondents.[60] In the second analysis, we also included the characteristics of the respondent's investment behaviour. We

Box A4.3 Factor weights on impatience

Statement 1	-0.42
Statement 2	-0.53
Statement 3	0.69
Statement 4	0.24
Statement 5	0.07
Statement 6	-0.29
Statement 7	-0.27
Statement 8	-0.34
Statement 9	0.58
Statement 10	0.63
Statement 11	0.71
Statement 12	0.53
Question 1	-0.21
Question 2	-0.34

Box A4.4 Indicators of risk tolerance

Statements about saving and risk-taking
Please indicate, on a scale of 1 (indicating total disagreement) to 7 (indicating total agreement), to what extent you agree with the following statements.

1. I prefer safe investments and a guaranteed return rather than take risks in the hope of achieving the highest return.
2. I shall never invest in shares because I consider the risk too great.
3. If I believe an investment will be profitable, I am prepared to borrow to make that investment.
4. I want my investments to be sound.
5. I am increasingly convinced that I need to take more financial risk if I wish to improve my financial position.
6. I am prepared to risk loss, in order to make money.

Characteristics of investment behaviour
Investing in shares: 1 = invests in shares or investment funds; 0 = does not invest in shares or investment funds.
Investing in derivatives: 1 = owns/writes put options, call options, falcons, warrants; 0 = does not own/write derivatives.

Preferences as to pension arrangements and risk-taking
Pension1 Which of the following statements applies to you most?

1. I prefer to pay less contribution for a pension which is expected to be equally high on average, but where the ultimate pension benefit may be higher or lower, as a result of the investment form chosen (pension assets invested largely in shares). (risk tolerant)
2. Don't know. (risk neutral)
3. I prefer to pay more contribution for a guaranteed pension (pension assets invested largely in bonds). (risk averse)

Pension2 Imagine the following two pension arrangements:
A: your pension is guaranteed to be 70% of final pay.
B: your pension is:
A chance of 1 in 10 - 50% of final pay
A chance of 2 in 10 - 60% of final pay
A chance of 4 in 10 - 70% of final pay
A chance of 2 in 10 - 80% of final pay
A chance of 1 in 10 - 90% of final pay
Suppose the standard pension arrangement is B.
How much extra contribution are you prepared to pay monthly for the security of arrangement A?
1. No extra contribution, preference for arrangement B. (risk tolerant)
2. Don't know. (risk neutral)
3. 0.25% to over 2% of gross wages. (risk averse)

expected that more risk-tolerant respondents would also be more inclined to invest in shares and derivatives. This more detailed determination of risk tolerance could be constructed for 1611 respondents; it also resulted in a single common factor and – given the correlation with the first risk tolerance analysis – is in line with the less detailed exercise. In the final analysis, we also included risk preferences in the pension domain. This most detailed analysis again resulted in a single common factor, reflecting the degree of risk tolerance of 1113 respondents, and showed a strong correlation with the other two less detailed measures of risk tolerance.[61]

Box A4.5 Factor weights on risk tolerance

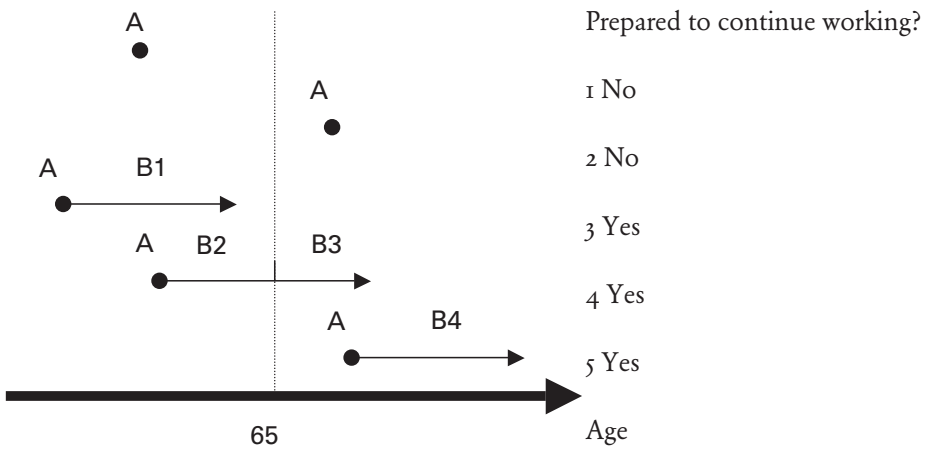
	1	2	3
Statement 1	-0.11	-0.11	-0.13
Statement 2	-0.19	-0.24	-0.22
Statement 3	0.15	0.14	0.12
Statement 4	-0.12	-0.12	-0.12
Statement 5	0.21	0.18	0.17
Statement 6	0.48	0.41	0.42
Share holdings		0.12	0.11
Holdings of derivatives		0.03	0.02
Pension1			-0.04
Pension2			-0.02
# observations	1967	1611	1113
correlation with			
1		0.986	0.986
2			0.998

Appendix 4.2
Preparedness to continue working before 65 and from 65 onwards

This appendix briefly explains how the preparedness to delay retirement was broken down by the preparedness to continue working before 65 and from 65 onwards. This breakdown was made for two reasons. To begin with, respondents indicating a preparedness to continue working for higher net wages, for a higher pension benefit, if allowed to do so part-time, if colleagues ask them to do so, or for another reason, indicate, on average, that they are willing to work for another four years. Given the expected average retirement age of roughly 62, this raises the question to what extent people are prepared to continue working after the (possibly psychological) age limit of 65. Secondly, the breakdown allows us to compare later results on the preparedness to continue working from 65 onwards with these results.

The breakdown was made as follows. Respondents indicated at what age they expect to stop working; this is A in Figure 4.1. They then indicated per motivation whether they are (situations 3, 4, 5) or are not (situations 1 and 2) willing to continue working. Where they indicate that they are not prepared to continue working, this may coincide with an expected retirement age below 65 (situation 1) or an expected retirement age of 65 and over (situation 2). For our purposes, the distinction has lit-

Figure A4.1 Preparedness to continue working before and after the 65th birthday



tle relevance. Where respondents indicate that they are prepared to continue working, this may also coincide with an expected retirement age below 65 (situations 3 and 4) or 65 and over (situation 5). The total number of years worked before the 65th birthday is B1 times the number of respondents in situation 3, plus B2 times the number of respondents in situation 4. The average number of years that respondents are willing to work for a given motivation before the 65th birthday is obtained by dividing the total number of years by the total number of respondents in situations 1 to 5. In the same way, B3 and B4 and the number of respondents in situations 4 and 5 yield the average number of years that respondents are prepared to work after their 65th birthday.

5 Summary and policy considerations

5.1 Labour market participation of ageing workers

The ageing problem is caused by the growing number of elderly people, with a rising life expectancy to boot. At the same time, birth rates in many countries are falling. The burden of an ageing population will consequently weigh increasingly heavily on the shoulders of a steady or even contracting labour force. Where the financial burden of ageing is concerned, a distinction should be made between the various ways in which pension schemes are financed. In the capital funding system, which forms the second pillar of the Dutch pension system, the growing cohort of elderly people accumulated their own pension wealth during their working lives. In the pay-as-you-go system which forms the first pillar, the Dutch state old age pension system, the pensions of a growing group of elderly people are funded by the steady or contracting group of people who work. In an ageing society, increasing pressure is consequently brought to bear on a pay-as-you-go system. The international comparison in Chapter 2 shows that the Anglo-Saxon countries and the Netherlands, with large accumulated pension reserves, compare favourably in this respect. In the Netherlands, the average effective retirement age is, however, virtually the same as it was thirty years ago. In this context, it must be noted that, between the early 1970s and the mid-1980s, the participation rate of older workers in the Netherlands dropped far below the European average. The catching-up process, which only began in the early 1990s, has now brought the participation rate of older Dutch employees back to around the European average. The participation rate of both Dutch and European older workers is low, over 25 percentage points below the current Swedish rate. In this respect, much can still be gained in the Netherlands and Europe from policy measures aimed at stimulating older employees to continue working. This is shown in model simulations. These show that an individual Dutch stimulus will already yield considerable economic gains in five to ten years' time. The results show that raising the Dutch participation rate to the Swedish level will generate over 1½% more economic activity in the Netherlands in five years' time. The Netherlands stands to benefit even more from a joint European approach, because the economic activity of our European trading partners will then also expand. After five years, the Netherlands will then have economic gains of nearly 2¼%. These potential economic gains justify analysis of possible policy measures which could make the participation rates of older workers go up that much.

5.2 Micro-financial incentives

In this context, Chapter 3 looks at why the participation rates of older people differ among countries. Earlier studies support the view that differences in the institutional shape of pension schemes are a major determinant of diverging participation rates. Chapter 3 looks at the financial incentives inherent in pension schemes. The international comparison shows up the relatively sober and actuarially neutral nature of pension schemes in the Anglo-Saxon countries, which is attended by a relatively high participation rate of older workers. Pension provisions in the European countries are much more generous, with fewer older employees staying in work, except in Sweden. Incidentally, pension reforms have already been effected or are about to be introduced in various European countries. The nature of these reforms makes allowance for the importance of financial incentives in the participation decisions of older workers. Until recently, most pension schemes were defined-benefit schemes, which did not fully reflect the number of years of pension accrual in the ultimate level of the pension benefit. More and more these schemes are being reformed, with the emphasis now increasingly being shifted to individual capital accrual. This also links pension benefits more explicitly to the number of years of pension accrual, which is an incentive to work longer.

In Chapter 4, the sensitivity of retirement decisions to financial incentives is examined in more detail for the Netherlands, on the basis of a survey held among Dutch households. The survey results show that a considerable proportion of the Dutch population can be (financially) stimulated to retire later. To begin with, (further) stimulation of possibilities for older workers to work part-time as they grow older seems the most effective – and fiscally a relatively cheap – way of keeping them in the labour force. Stimulating part-time working for older employees will even have a fairly direct effect, as the survey results show that retirees also consider this an incentive to re-enter the labour process. Dutch employees are prepared to continue working part-time by nearly eighteen months. Greater variety of part-time retirement arrangements could cater to this preference. Secondly, older employees can be stimulated to work longer if their net wage goes up. In the survey, this financial incentive was presented as a reduction in wage taxes. An alternative could be to allow workers to stop their pension accrual from a certain age onwards, while continuing to work (part-time). Thirdly, stimuli to delay retirement could be found in adjustment of the generosity and actuarial neutrality of pension schemes. Toning down pension provisions by raising the standard retirement age by one year makes workers delay retirement by, on average, six months. Introducing an actuarial adjustment of the level of the pension benefit for workers who stay in work makes them delay retirement by a comparable period. Incidentally, the survey results suggest that pension schemes need not be completely actuarially neutral in order to have a major effect on the participation rate of older employees. This means that there is scope for both maintaining some intergenerational solidarity in the pension scheme and including incentives to encourage people to work longer.

5.3 Policy considerations

These results reflect the preferences of employees, against the background of the current pension system. It must be remembered that these preferences may be seriously distorted by the fiscal support given to early retirement schemes, which makes early retirement seem cheaper than it is. As a result, more people wish to retire early than if the costs and benefits of early retirement were weighed without distortion. Subsidising early retirement was a political choice[62], induced at the time by the desire to stimulate older workers to make way for younger unemployed people. Ageing has changed the labour market situation, and the fiscal support for early retirement is usually no longer seen as desirable. The Balkenende II Government has therefore decided to withdraw fiscal support for early retirement schemes and to contain early retirement possibilities in regular pension provisions. If the withdrawal of fiscal support means that early retirement schemes will be toned down, our survey results indicate that people will work longer. However, in exchange for wage moderation, the possibilities of early retirement within the pension system were widened again last year. In addition, the life course savings scheme was created, which offers employees a tax-friendly facility for individual saving for leave. Early retirement using increased pension accruals, in combination with the individual life course savings scheme, allows for the full or partial compensation for the abolition of fiscal support for other early retirement or pre-pension schemes. Retirement decisions by Dutch employees therefore continue to be determined partly by incentives to stop working.

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Notes

1 If such is the case, a higher labour supply as a result of a lower percentage of part-time jobs will have no wealth-increasing effect. Indeed, for the extra income generated by this extra labour effort (at least) equally highly valued spare time must be sacrificed.
2 These calculations are not available for Germany, France and Italy.
3 Despite the reserves built up, in a capital-funded system, too, the burden of the ageing population is perceivable. Indeed, the value of pensions may fluctuate strongly. Consequently, a pension fund may well find its solvency jeopardized by the magnitude of any negative capital impact and, hence, be compelled to raise contributions. As the ageing of the population continues, these contributions must be borne by a shrinking labour force. See Westerhout et al. (2004).
4 See Chapter 3 for country-specific explanations of the pension system.
5 In France, the official age of retirement is 60. In 2000, the US began raising the age of retirement by annual increments of one month, so that in 2022 a retirement age of 67 years will be reached.
6 The ex ante effectiveness of the life-course saving scheme are ambiguous and only time will tell (De Nederlandsche Bank, 2005a).
7 The gross participation rate reflects the ratio between the number of citizens holding or looking for a paid job of at least 12 hours per week and the total population in the same age category.
8 National Institute of Economic and Social Research in London.
9 Both simulations were performed using the following additional assumptions:
(1) decisions on the capital and foreign exchange markets and in the field of wage determination and monetary policy are made by agents that are characterized by complete rationality and forward-looking behaviour. The latter property implies that expectations regarding future inflation and interest rates make up part of the information on the basis of which decisions are made;
(2) the monetary authority decides on interest rates on the basis of an objective that covers both inflation and nominal GDP growth;
(3) all countries pursue a fiscal policy that precludes unsustainable public deficits.
10 NiGEM is (largely) estimated on data dating from the period before the introduction of the single currency. This entails the possibility of underestimation of the mutual dependency.
11 Referring to the achievement of prolonged life spans as a 'problem' is, of course, an undeservedly negative qualification. Most people want nothing so much as to live to a healthy old age. So what we are dealing with is, in fact, a luxury problem. Nevertheless, we will have to adapt our behaviour and our arrangements to our increased life expectation if we are to continue enjoying solid and sustainable old-age provisions.
12 We should note that Diamond's case is situated in a static world. In the real world, productivity growth generates income growth. Structural growth of labour productivity would reduce the required adjustments.
13 Evidently, a capital funded system is much more expensive to establish than a PAYG system, because the burden is doubled: in addition to current pension benefits, money also needs to go into fund-building for future pensions. Once launched, however, a fully-funded system will to some extent pay for itself from the returns on built-up capital. Because of the extra expense inherent in the build-up phase of a fully-funded system, the switch from a mature PAYG system to a fully-funded system is an extremely costly exercise.
14 The mirror image of this procyclical effect could be observed in the preceding period.
15 Note that this argument assumes implicitly that participants in a DC scheme accept the risk that capital losses will lead to lower pension benefits, and that they will not attempt to hedge this risk with additional personal savings. A further qualifying comment might be that increased flexibility in the retirement age may also serve macroeconomic stability, since it would allow disappointing returns on investments to be (partly) translated into continued participation rather than contribution increases (Bovenberg, 2003).
16 Returns on investments are often measured by a proxy such as the moving average of GDP growth across several years, which is substantially less volatile than, e.g., returns on individual investment funds.
17 The APW is defined as somebody who earns the average income of full-time production workers in the manufacturing sector. Being single, the APW does not qualify for family-related tax benefits. Thus this standard is made fully comparable and may be regarded as the income level earned by such work in any country.
18 Until recently, women's pensionable age used to be 60. Currently, it is being raised to the level of men's pensionable age, 65, under a transition arrangement.
19 In recent years, many pension funds have moved from last-earned wage to average wage systems. The largest two, APB and PGGM, took this step in 2003, leaving only 13% of participants with last-earned wage schemes in 2004, against 54% in 2003 (the Nederlandsche Bank, 2005b).
20 The figures in column 8 represent the changes in pension capital as a result of one year of continued work (see also Figure 3.1), expressed as a percentage of the wages earned that year. In the case of the Netherlands, this means that under the former VUT arrangement, the wages earned during the extra year of work were offset by a net reduction in pension rights (x+y-z in Figure 3.1) of 82% of those wages.
21 This is summarised with the deviation from actuarial neutrality. When delayed retirement is actuarially neutral, the pension benefit is raised so that the individual is compensated fully for the year by which the benefit is delayed and the extra contribution paid (see Chapter 3 for more details and a graphic illustration). If delaying retirement is

not actuarially neutral, there is an implicit tax (subsidy) on continuing to work if the individual receives an insufficient (excessive) increase in the pension benefit as compensation for delaying retirement and the extra contributions made.
22 Blake (2004) also demonstrates that collective schemes stimulate (early) retirement, whereas individual provisions usually mean retiring later.
23 As noted earlier, at the end of the 19th century, life expectancy was around 65, while people received old age pensions when they reached 70. At the beginning of the 21st century, life expectancy is creeping up to 80, while old age pensions are paid from 65 onwards.
24 See also Feldstein (1974), Boskin (1977), Sheshinski (1978), Boskin and Hurd (1978), Crawford and Lilien (1981), Browning (1982), Coile and Gruber (2000).
25 Van Rooij et al. (2004a) also conclude that the average Dutch employee is not really motivated to augment his knowledge on this point.
26 In order to be able to absorb shocks to the pension system, however, people should react as rapidly as possible. The longer the adjustment is postponed, namely, the more painful it typically turns out.
27 Variable constructed on the basis of the household's exact annual income, at least when known to the respondent (959 respondents), supplemented with household incomes on the basis of rough categories of incomes for respondents who did not know the exact household income (975 respondents).
28 For the other background characteristics (*education, pension knowledge, partner, income, shares* and *mental burden*) no link was found with the intensity with which the respondent thinks about retirement.
29 In this case, we made use of regression analysis, given the continuous nature of the dependent variable.
30 A discrepancy which differs statistically from 0 with a 99% confidence level.
31 The results in this section suggest that the conversion of final-pay into average-pay systems not only augments the pension funds' financial position via the direct channel of lower pension liabilities, but also has favourable indirect effects because participants contribute longer.
32 Respondents who consider higher wages one of the three primary motives for delaying retirement turn out to be neither more impatient nor less risk tolerant than respondents who see a higher pension benefit as one of the primary motives to continue working.
33 It must be noted that, in man-years, workers will work less than eighteen months longer.
34 This result is partly based on the observation that those who indicate that they are prepared to work longer, for some reason or another, indicated earlier that they expected to retire later than those who cannot be motivated to continue working. While the average expected retirement age is 62.1, the respondents who can be motivated to delay retirement said that, *in the absence of this incentive*, they would be prepared to continue working until, on average, 62.8.
35 In June 2004, 28% of the respondents answered that they would be willing to continue working, either full-time or part-time, 60% were not prepared to do so and 12% didn't know.
36 Which differs statistically from 0 with 95% confidence.
37 Possibly in combination with lower total wage costs for the employer.
38 We asked the respondents to assume, when answering these questions, that the marginal tax rates for 2005, including the lower rates already applicable to those aged 65+, would remain in force during their entire working life. Van Els et al. (2004) show, however, that half of the respondents expect the tax advantage for people aged 65 and over to be reduced in the future. Those panel members who also expected this set less store by labour income from 65 onwards than by labour income before 65. This would distort the answers against the preparedness to continue working into old age. In order to estimate the relevance of this selection effect, we coupled our figures to the information available to Van Els et al. (2004). We were then able to identify the respondents who expect the tax advantage for those aged 65+ to be reduced in the future, and the respondents who expect it to remain unchanged or have no idea. We found no correlation between the preparedness to continue working at lower marginal rates and the expected development of the tax advantage for people aged 65+.
39 The discrepancies vis-à-vis respondents who are willing to work longer or pay more contribution differ statistically from 0 with 99% reliability.
40 The respondents indicating they are prepared to delay retirement and pay a higher contribution for a higher pension benefit were first asked how many years they are prepared to continue working and then how much extra contribution they are ready to pay. If the respondents interpret the succession of these two extra questions as they are meant to do, it may be expected that respondents who are, for example, relatively more prepared to work longer, are also relatively less prepared to pay extra contribution. In other words, we then expect a negative correlation between the number of years that people are prepared to continue working and the level of the extra contribution which they are ready to pay. There is, however, a positive correlation between the preparedness to pay by working longer and the preparedness to pay in the form of an extra contribution.
41 And also assuming that the other respondents (including those who were prepared to pay a higher contribution for a higher pension) will not as yet decide to work longer.
42 This discrepancy differs statistically from 0 with a 99% confidence level.
43 Statistically, it is smaller than the 4½%, (with 95% confidence) desired by respondents who desire a lower contribution only.
44 The conservative estimate is that 18% of panel members retire two years earlier; the liberal

estimate that 36% retire 2½ years earlier.
45 The knowledge of the cost (reward) of early (postponed) retirement correlates positively with pension knowledge (cf. Van Els et al., 2004). Additionally, older respondents and those with longer decision horizons (scoring lower on impatience) are more aware of these incentives. Also see Appendix 4.1.
46 In their search for a shockproof pension system, Westerhout et al. (2004) arrive at the same conclusion.
47 A higher accrual percentage, in combination with unchanged contributions and the same number of accrual years results in higher pension wealth. We therefore use an increase in accumulated pension wealth and a rise in the accrual percentage interchangeably in the rest of this Chapter.
48 Statistically, they cannot be distinguished from those who opt to retire early when their pension assets undergo an exogenous increase.
49 Where state old age pensions are concerned, De Nederlandsche Bank (2004) concludes that people prefer a lower benefit to a later benefit.
50 Given the very small proportion of respondents to which this assumption relates, it has only a limited influence on the ultimate estimation of the wealth effect. Assuming that these respondents will continue working by 0 to 2.5 years, the wealth effect varies from 0.420 to 0.445 year. However, if they are prepared to continue working 3 to 5 years, the wealth effect varies from 0.450 to 0.470 year.
51 In scheme A, continuing to work at 62 yields a 4 percentage point increase in the pension benefit, from 70% to 74%; this is an increase of 5.7%.
52 Although most schemes have now been converted to average-pay schemes, the pension benefit was expressed in the question as a percentage of final pay, for the sake of simplicity. We suspect that for many people, final pay still represents a measure of the level of the pension benefit; this formulation is largely in line with the way respondents think about their pension.
53 29% of the respondents who answered the questions in Table 4.6 gave this percentage, the remainder didn't know or was not consulted in the DHS 2004.
54 This is not surprising, as we already saw in the construction of *pension knowledge* (see Appendix A4.1) that people score higher on *pension knowledge* when they know what percentage of final pay they will get. In addition, the results discussed earlier (see section 4.2) show that people who score high on *pension knowledge* on average expect to retire later.
55 Statistically, there is a 46% chance that the retirement age in schemes A and C is the same.
56 Statistically, the differences exceed 0 with a 99% confidence level in all cases. They lie between 0.2 and 0.5 year, with a 95% confidence level.
57 There is a 31% chance that the average retirement age in scheme F equals that in scheme E.
58 The hypothesis that there is no common factor is rejected ($\chi^2(4)=435{,}46$), as is the hypothesis that there are more common factors ($\chi^2(2)=35{,}09$).
59 The hypothesis that there is no common factor is rejected ($\chi^2(14)=3986{,}39$), as is the hypothesis that there are more common factors ($\chi^2(77)=2522{,}02$).
60 The hypothesis that there is no common factor is rejected ($\chi^2(6)=1680{,}08$), as is the hypothesis that there are more common factors ($\chi^2(9)=674{,}27$).
61 The hypothesis that there is no common factor is rejected ($\chi^2(10)=1255{,}04$), as is the hypothesis that there are more common factors ($\chi^2(35)=574{,}92$). Nevertheless there are indications that the measure of risk tolerance could be refined further, in the form of three additional factors which combined have little extra explanatory power. These factors indicate specific risk-avoiding behaviour with regard to pension arrangements, a specific risk-aversion with regard to share investments, and a specific risk tolerance aimed at investment return.
62 It goes without saying that subsidising regular old age pensions is also a political choice.

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