

## **Variant Projections of the Update of the Government Actuary's Quinquennial Review of the National Insurance Fund as at April 2000**

1. Under legislation the Government Actuary is required to carry out a review of the finances of the National Insurance Fund of Great Britain every five years. This is known as the Quinquennial Review (QR) and its main purpose is to estimate the contribution rates required to be paid to the National Insurance Fund in future years in order to meet expenditure on a pay-as-you-go basis. The report on the latest such review was published in October 2003 (Cm 6008). An Update of the principal results in that QR taking into account additional information that has since become available was published on 23 December 2004 and this report shows the effect of varying the assumptions adopted for the Update.
2. The QR and the Update consider projections of future income and expenditure up to the year 2060/61. Projections over such long time periods are subject to considerable uncertainty. It is necessary to bear in mind how the results of the projections would change if future experience differed from the assumptions used. This was previously considered in sections 7 and 8 of the report on the QR. The results set out below show how the results in the Update would vary if different assumptions are made about the future.
3. For further background on the QR, including a description of the assumptions adopted and a summary of the benefit and contribution rules, the reader should look at the report and Update published in 2003 and 2004, respectively. Both reports are available from our website at [www.gad.gov.uk](http://www.gad.gov.uk).

### *Assumptions*

4. Any estimates of future expenditure and contribution income for the National Insurance Fund, especially those made far into the future, are inevitably subject to wide margins of error. The projections which have been carried out for the Update depend on a large number of assumptions that have been made. It is certain that future experience will differ, to some degree, from these assumptions. This is the reason for the legislative requirement to keep the long-term financial position of the National Insurance Fund under regular review.
5. When considering the results of the review, it is vital that not too much emphasis should be placed on a single set of estimates. Instead, it is important to consider the potential effects on the future financial position of the Fund if actual experience differs from the assumptions which underlie the main projections. This report illustrates the effect on the principal results of the review of varying certain assumptions. The assumptions considered in this report are those which are the major sources of uncertainty in terms of their impact on the required future contribution rates.
6. Apart from the population projections, the method and assumptions adopted for the Update were the same as those used for the QR published in 2003, except that where new data has become available this has been taken into

account. The Update outlines some of the more important points about the assumptions, but the reader should also refer to the report on the QR for further details.

7. The main results in the Update show the effect of assuming either price or earnings uprating of flat-rate benefit rates and earnings limits, and the effect of assuming either 1.5% or 2% per annum real earnings growth. For simplicity of presentation, the results in this report are based on an assumption of 2% per annum real earnings growth.
8. The National Insurance Fund is financed on the pay-as-you-go principle, such that the contributions paid in a year are broadly sufficient to meet expenditure in that year. The contribution rates shown are the joint (employer and employee) Class 1 rates payable on earnings between the earnings threshold and the upper earnings limit for the employee and on all earnings above the earnings threshold for the employer<sup>1</sup>. They exclude the contributions allocated to the National Health Service. The existing balance of the Fund and any investment return it earns are ignored.
9. The results in this report may be compared with the results in sections 7 and 8 of the QR (see Tables 7.5 to 7.6 and 8.1 to 8.6). The effect of varying the assumptions is broadly the same as the QR. The greatest differences are in the mortality variants since this is the area in which the assumptions have changed significantly.

#### *Demographic factors*

10. The main results in the Update are based on the principal 2003-based interim population projections. Variant population projections, based on different assumptions for future fertility, migration and mortality, were produced along with the principal population projection. Each variant projection considers the effect of varying separately the fertility, migration or mortality assumptions in isolation. Table 1 summarises the assumptions used for the variant projections. In each case, the *high* variant results in a higher projected population than in the principal projection, and a *low* variant produces a lower projected population. For example, the *high life expectancy* variant assumes higher expectations of life, or equivalently lower mortality rates, than the main projection.

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<sup>1</sup> Other contribution rates e.g. for the self-employed, would vary in line with the change in the joint Class 1 rate.

**Table 1: Summary of demographic assumptions underlying the variant population projections**

	<b>Assumption for principal projection</b>	<b>Low variant</b>	<b>High variant</b>
Fertility	Long-term average number of children per woman is 1.74	Long-term average number of children per woman is 1.54	Long-term average number of children per woman is 1.94
Migration	Long-term annual net inward migration of 130,000	Long-term annual net inward migration of 70,000 (i.e. 60,000 lower than for the principal projection)	Long-term annual net inward migration of 190,000 (i.e. 60,000 higher than for the principal projection)
Life expectancy	Annual improvement in mortality rates converging to 1% by 2027, thereafter annual improvement halving every twenty-five years	Annual improvement in mortality rates converging to nil by 2027, thereafter mortality rates remaining constant	Annual improvement in mortality rates converging to 2% by 2027, thereafter annual improvement halving every twenty-five years

11. An additional variant population projection has been produced, assuming mortality improvement matches that under the high life expectancy variant up to 2027, but thereafter allows for the rate of improvement to remain constant (rather than halving every twenty-five years). Using these improvement factors, cohort life expectancy<sup>2</sup> for a man aged 65 rises from about 19 years in 2002 to about 29 years in 2050. Fertility and migration assumptions are unchanged from the principal projection. The effect on the results of the review of using this *constant improvement* variant has also been considered.
12. Table 2 shows the effect of the variant population projections on the future pensioner support ratio, being the ratio of the number of people in the population at working ages to those over pension age.

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<sup>2</sup> Cohort life expectancy is calculated using the mortality rates that a particular cohort is projected to experience. For instance the cohort life expectancy for a 65 year old in 2002 will be calculated using the mortality rate for a 65 year old in 2002, for a 66 year old in 2003, for a 67 year old in 2004 and so on.

**Table 2: Future pensioner support ratio based on the variant population projections**

	2003	2010	2020	2030	2040	2050	2060
Principal projection	3.3	3.1	3.2	2.6	2.3	2.3	2.2
<i><b>Fertility variants</b></i>							
Low	3.3	3.1	3.2	2.6	2.2	2.2	2.0
High	3.3	3.1	3.2	2.7	2.4	2.4	2.4
<i><b>Migration variants</b></i>							
Low	3.3	3.1	3.1	2.5	2.2	2.2	2.1
High	3.3	3.1	3.3	2.7	2.4	2.4	2.2
<i><b>Life expectancy variants</b></i>							
Low	3.3	3.1	3.3	2.7	2.5	2.6	2.5
High	3.3	3.1	3.1	2.5	2.2	2.1	1.9
Constant improvement	3.3	3.1	3.1	2.5	2.1	2.0	1.8

13. The effect of the variant population projections on the projected pay-as-you-go contribution rates needed to match income and expenditure in each year under price uprating is shown in Table 3. The corresponding results for earnings uprating are in Table 4. In each case, the table shows the difference (in percentage points) between the required contribution rates using each separate variant population projection and the required contribution rates using the principal population projection.

**Table 3: Effect of variant population projections on the projected joint (employer and employee) Class 1 pay-as-you-go contribution rate required to balance income and expenditure in the year, excluding the contributions allocated to the NHS, based on real earnings growth of 2% per annum with price uprating**

	2004-05	2010-11	2020-21	2030-31	2040-41	2050-51	2060-61
Principal projection	19.3%	18.8%	17.3%	17.7%	17.2%	16.9%	17.1%
<i><b>Fertility variants</b></i>							
Low	0.0%	0.0%	0.0%	+0.1%	+0.4%	+0.8%	+1.4%
High	0.0%	0.0%	0.0%	-0.1%	-0.4%	-0.8%	-1.2%
<i><b>Migration variants</b></i>							
Low	0.0%	+0.2%	+0.3%	+0.6%	+0.7%	+0.6%	+0.5%
High	0.0%	-0.2%	-0.3%	-0.5%	-0.6%	-0.5%	-0.5%
<i><b>Life expectancy variants</b></i>							
Low	0.0%	-0.1%	-0.2%	-0.6%	-1.0%	-1.3%	-1.6%
High	0.0%	+0.1%	+0.2%	+0.6%	+1.0%	+1.3%	+1.6%
Constant improvement	0.0%	+0.1%	+0.2%	+0.6%	+1.1%	+1.7%	+2.3%

**Table 4: Effect of variant population projections on the projected joint (employer and employee) Class 1 pay-as-you-go contribution rate required to balance income and expenditure in the year, excluding the contributions allocated to the NHS, based on real earnings growth of 2% per annum with earnings uprating**

	2004-05	2010-11	2020-21	2030-31	2040-41	2050-51	2060-61
Principal projection	19.3%	20.4%	21.7%	25.4%	27.5%	28.9%	30.8%
<b>Fertility variants</b>							
Low	0.0%	0.0%	0.0%	+0.1%	+0.7%	+1.5%	+2.5%
High	0.0%	0.0%	0.0%	-0.1%	-0.7%	-1.4%	-2.3%
<b>Migration variants</b>							
Low	0.0%	+0.2%	+0.4%	+0.8%	+1.1%	+1.0%	+1.0%
High	0.0%	-0.2%	-0.4%	-0.8%	-1.0%	-0.9%	-0.9%
<b>Life expectancy variants</b>							
Low	0.0%	-0.1%	-0.3%	-0.9%	-1.7%	-2.5%	-3.2%
High	0.0%	+0.1%	+0.3%	+0.9%	+1.7%	+2.5%	+3.2%
Constant improvement	0.0%	+0.1%	+0.3%	+0.9%	+1.8%	+3.1%	+4.7%

14. The effects shown in Table 3 and Table 4 make no allowance for any consequential effects of demographic changes on economic activity rates or the rate of unemployment. It might reasonably be expected that a change in the size of the working age population would result in changes in the labour market, and hence on employment and unemployment rates. However, it is not considered that such effects could be sufficiently reliably quantified to enable allowance to be made in the projections, particularly in the more distant future.

***Basic retirement pension entitlement***

15. The principal estimates of expenditure on the basic retirement pension assume certain average amounts of pension entitlement in the future. These assumptions are described in Appendix E of the QR. The effect on the results of the review of varying these assumptions has been considered using two variants, which are described in Table 5.

**Table 5: Variant assumptions for the average future amount of entitlement to the basic retirement pension**

	Low variant	High variant
Awards for men	Approximately 2% lower from 2025	Approximately 2% higher from 2025
Awards for married women receiving Category A pension only	Approximately 2% lower from 2025	Approximately 2% higher from 2025
Awards for single and divorced women	Approximately 2% lower from 2025	Approximately 2% higher from 2025
Awards for widows	Unchanged	Unchanged

16. The effect of these alternative assumptions for future entitlement to the basic retirement pension on the projected joint pay-as-you-go contribution rates needed to match income and expenditure in each year is shown in Table 6. The table shows the difference (in percentage points) between the required contribution rates using each variant assumption and the required contribution rates using the principal assumption.

**Table 6: Effect of alternative assumptions for future entitlement to the basic retirement pension on the projected joint (employer and employee) Class 1 pay-as-you-go contribution rate required to balance income and expenditure in the year, excluding the contributions allocated to the NHS, based on real earnings growth of 2% per annum with price uprating**

	2020-21	2040-41	2060-61
Principal projection	17.3%	17.2%	17.1%
Effect of low variant	0%	-0.1%	-0.1%
Effect of high variant	0%	+0.1%	+0.1%

***Employment and unemployment factors***

17. The principal estimates in the Update are based on the economic activity rates described in Appendix E of the QR. The changes in activity rates over time reflect many demographic, economic and social factors. In general, the trends over the past 20 years have been towards lower activity rates for men, and higher activity rates for women. It is possible that some of these trends may be reversed in the future, particularly at ages over 55. For instance in the last five to ten years economic activity rates for older men have been increasing.
18. In order to consider the possible implications of this, results have been recalculated approximately on the basis that an additional 10% of the population aged 55 to 59 and an additional 20% of the population aged 60 to 64 are economically active. The effect of the increase in economic activity would be to increase contribution income to the Fund. However, this would be offset by increased expenditure, particularly on contracted-out rebates, Incapacity Benefit and the additional component of retirement pension. As a

result, the overall effect on the required joint Class 1 pay-as-you-go contribution rate under price uprating in 2060/61 would be a small reduction.

19. The principal results are based on the assumption that the rate of unemployment (based on the ILO definition) remains at about 5% throughout the period of the projections. If unemployment were higher, there would be lower contribution income due to the lower number of people in employment, increased expenditure on contributory Jobseeker's Allowance and reduced expenditure on some other benefits (and rebates). If unemployment were assumed to be 50% higher than for the principal estimates (i.e. a rate of about 7.5%), the required joint Class 1 pay-as-you-go contribution rate in 2060/61 would increase by approximately 0.2% under price uprating and by 0.6% under earnings uprating.

*Effect of higher or lower contracting out*

20. Employees who are members of contracted-out occupational pension schemes or who have taken out an appropriate (i.e. contracted-out) personal pension (APP) or Stakeholder pension, do not earn the full State Second Pension (or SERPS before April 2002). Instead they and their employer pay lower National Insurance contributions or a rebate is paid into their pension.
21. It is difficult to make reliable assumptions about the likely future level of contracting out. In order to illustrate the financial impact of a higher or lower number of employees being contracted-out, projections have been prepared using the additional scenarios described in the following table.

**Table 7: Scenarios for the future numbers of employees who are contracted-out through contracted-out salary-related (COSR) occupational pension schemes, contracted-out money purchase (COMP) occupational pension schemes and appropriate personal pension (APP), including Stakeholder, schemes**

	<b>Original assumption for Update</b>	<b>Lower contracting out</b>	<b>Higher contracting out</b>
COSR membership	Proportions contracted-out fall by 25% over the next 30 to 35 years	Proportions contracted-out fall by 50% over the next 30 to 35 years	Proportions contracted-out fall by 10% over the next 30 to 35 years
COMP membership	Proportions contracted-out fall by 50% over the next 30 to 35 years	Proportions contracted-out fall by 100%, i.e. to zero, over the next 30 to 35 years	Proportions contracted-out fall by 25% over the next 30 to 35 years
APP membership	Proportions contracted-out fall by around 50% over the next 40 years	Proportions contracted-out fall to 50% of those under the original assumption over the next 40 years	Proportions contracted-out increase to 50% more than those under the original assumption over the next 40 years

22. The resulting effects on the required joint Class 1 contribution rates under these scenarios are shown in the following tables.

**Table 8: Effect of different contracting out assumptions on the projected joint Class 1 pay-as-you-go contribution rates required to balance income and expenditure in the year, excluding contributions allocated to the NHS, based on price uprating and 2% per annum real earnings growth**

	2004-05	2010-11	2020-21	2030-31	2040-41	2050-51	2060-61
Principal projection	19.3%	18.8%	17.3%	17.7%	17.2%	16.9%	17.1%
Effect of lower contracting out	0.0%	-0.2%	-0.4%	-0.5%	-0.4%	-0.1%	+0.2%
Effect of higher contracting out	0.0%	+0.1%	+0.3%	+0.4%	+0.3%	+0.1%	-0.1%

**Table 9: Effect of different contracting out assumptions on the projected joint Class 1 pay-as-you-go contribution rates required to balance income and expenditure in the year, excluding contributions allocated to the NHS, based on earnings uprating and 2% per annum real earnings growth**

	2004-05	2010-11	2020-21	2030-31	2040-41	2050-51	2060-61
Principal projection	19.3%	20.4%	21.7%	25.4%	27.5%	28.9%	30.8%
Effect of lower contracting out	0.0%	-0.2%	-0.4%	-0.6%	-0.5%	-0.2%	+0.1%
Effect of higher contracting out	0.0%	+0.1%	+0.3%	+0.4%	+0.4%	+0.2%	-0.1%

23. These figures illustrate that, with the assumption of a lower proportion contracted-out, expenditure is deferred (by reducing contracted-out rebates while individuals are employed and replacing this with increased pension spending once they have retired). This has the effect of reducing the required contribution rate in the short to medium term but increasing it in the longer term. The converse is true where a higher proportion of employees is assumed to be contracted-out.