

# SOCIAL SECURITY AND THE CONSULTING ACTUARY

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## 1. Introduction

- 1.1. Many consulting actuaries may feel that they do not need to concern themselves greatly with social security arrangements. Social security schemes are perceived as unresponsive publicly administered schemes, which do not operate in accordance with generally accepted actuarial principles, in particular through not funding in advance for future liabilities. Some have requirements for actuarial reporting, but it is not always clear that politicians want to hear what the actuary has to report and there is a tendency for political considerations to predominate over professional ones.
- 1.2. However, even if few consulting actuaries have direct experience of giving actuarial advice on social security schemes, some knowledge of the provisions and modus operandi of social security in countries where they are advising is essential. For actuaries giving financial advice to individuals, their likely entitlement to social security benefits in different circumstances is essential background to the design of appropriate arrangements. For actuaries advising complementary pension plans, social security structures may be directly relevant to benefit design features, affecting the appropriate level of target benefits, whether or not there is direct integration. In the United Kingdom, social security provisions have a particularly direct bearing on occupational pension plans through the contracting out arrangements, which affect the benefit structure and require specific actuarial certification.
- 1.3. The whole structure of social protection in a country has a fundamental impact on the nature of complementary plans and even on whether there is a role for consulting actuaries in the pension area. The scope of the compulsory social security arrangements defines how big a role there is for complementary and supplementary plans and often determines society's attitude to private provision and to the advantages and disadvantages of funding and of private management. It may also affect the range of funding vehicles available and the depth of the capital markets. Concerns about the future financing of pay-as-you-go social security arrangements affect market sentiment and behaviour. Heavy government borrowing requirements to meet social security commitments may force up interest rates and have a generally adverse effect on the economy.
- 1.4. Even the consulting actuary advising insurance companies needs to be familiar with the structure of social security in the country as it may affect product design, particularly for risk benefits, including income protection benefits in situations of sickness or long term incapacity or the costs of damages for personal injury or fatal accident, as they flow through as liability insurance claims.
- 1.5. However, the main focus of this paper is on the role of the consulting actuary advising social security schemes. As Government Actuary of the United Kingdom, I am responsible for an actuarial consulting service to the

UK government, to a wide variety of government departments and public sector organisations, and to a number of overseas governments. One of our major areas of consulting work is on social security matters. The role of the Government Actuary in UK social security is described in more detail later. Many social security schemes employ in-house actuaries. However, there are a great many social security schemes around the world which do not have access to in-house actuarial expertise. Some of these have formal statutory requirements for regular actuarial reports. Even where they do not, they should still be having actuarial advice, especially on long-term financing issues, and there is probably an increasing awareness of the importance of taking a long-term look at financial viability.

## **2. Actuarial roles in social security schemes**

- 2.1 Social security schemes involve the making of long-term commitments which can have a major impact on the economy, however they are financed. Such commitments should not be entered into without proper actuarial advice on the financial effects in the long term, as well as in the short and medium term.
- 2.2 As with other financial security systems, the extent of the future liabilities, and the adequacy of the financing arrangements, ought to be subject to regular actuarial review.
- 2.3 Actuarial reviews of the financial stability of social security schemes, or of their long-term financing requirements, should be carried out by qualified actuaries with professional independence, if the results are to have the necessary credibility with Parliament and with the public at large.
- 2.4 Actuarial reports on social security schemes should meet professional standards in terms of transparency, disclosure of methodology and assumptions, sensitivity analysis and explanation of the significance of the results.
- 2.5 The role of the actuary may differ according to the nature of the social security arrangement. However, in many cases financial projections will need to be based on demographic projections. Ideally the actuary should have professional responsibility for the assumptions underlying the demographic projections (future fertility, future mortality by cohort, with suitable allowance for mortality improvement, future levels and age/sex structure of migration flows in and out, assumptions relating to marital condition, including marriage rates, divorce rates, cohabitation rates (where relevant), mortality experience according to marital condition). However, it may be possible to rely on suitable demographic projections carried out by other professionals, e.g. demographers in a national statistical office.
- 2.6 The actuary will need to make estimates of future benefit outgo and the yield from contributions or ear-marked taxes. The period of projection may vary from situation to situation but is likely to be at least 25 years. Moreover, the period should have regard to significant demographic or

scheme features and should normally be extended (even if on a more approximate basis) to show the effects of the maturing of scheme provisions and demographic turning points (e.g. the acceleration or the reversal of a trend towards worsening dependency ratios).

- 2.7 For some purposes short-term actuarial projections may also be required. It may be appropriate for these to be on different assumptions from those adopted as long-term averages for the longer term projections, for example to provide best estimates of the immediate prognosis for the scheme, having regard to current economic conditions or to be consistent with (or at least provide the possibility of reconciliation with) short-term forecasts for the economy, by the Ministry of Finance or by independent experts.
- 2.8 Other actuarial roles may depend on the circumstances in the particular country, for example arising out of interactions between social security and complementary (occupational or personal) pension plans.

### **3. Report on long-term financial condition**

- 3.1 Often the most high profile role of the actuary is in relation to reports on the long term financial condition of the social security system. The results of such an exercise may be politically sensitive or controversial if they imply that the present system is economically unsustainable, for example as a result of increasing contribution levels necessary to balance income and outgo.
- 3.2 A report on the long-term financial condition of a social security scheme will need to include estimates of the future outgo, both in aggregate and by type of benefit, possibly disaggregated by different categories of beneficiary. The yield of contribution income (or ear-marked taxes) may be estimated directly in cases where the rates of contribution are specified in advance, e.g. in the law. However, the focus of an actuarial report will often be on the level of future contributions which are expected to be required to balance the income and expenditure of the scheme. This may be on a pure year by year pay-as-you-go basis, if no fund is maintained, or if the income from the fund is to be ignored. Alternatively, it may take into account investment income or varying degrees of partial funding, whereby funds may accumulate over some periods and be drawn down in other periods.
- 3.3 Careful consideration needs to be given to the terms in which any estimates are presented. Estimates of future income or outgo would not normally be presented in terms of absolute monetary amounts, since these would be unduly distorted by the effect of inflation. Instead, they would usually be expressed in “real terms”, for example at constant prices, constant earnings or constant benefit levels. Contribution rates can be expressed in terms of percentages of covered earnings, which provides comparability with current contribution levels, or in terms of a broader economic indicator, such as salary mass or gross domestic product (GDP).
- 3.4 Attention will need to be drawn to the level and timing of the likely future

increases in contributions or tax rates which may be needed. It may be appropriate to assume that any such increases are within the current structure or to suggest alternative ways in which increased contribution income may be obtained, e.g. by changes in the range of applicable earnings, or by applying differential changes for different types of contributor. If the existing structure has a built-in tendency to shift the burden from one type of contributor to another (or to or from the government budget), this should also be pointed out.

- 3.5 In cases where a fund is maintained, consideration should be given to reporting on the expected future size of the fund and on the impact of future investment returns on the financing of the plan. The size of the fund will often be considered as a multiple of annual benefit outgo, rather than in terms of accrued liability for future benefits, since entitlement to benefit is not always built up regularly over time and very few such plans have an objective to fund in advance for accrued rights, relying instead on some variant of the pay-as-you-go financing principle.
- 3.6 The main focus of an actuarial report on a social security plan is usually on its future financing. However, the actuary should consider whether attention should be drawn to the implications of the plan for members, particularly if the impact of the benefit levels can be expected to change significantly over time, or if there are significant (and in particular changing) redistributive consequences.
- 3.7 The actuary should explain the principal methodologies used and the assumptions adopted. It would usually be wise to point out that projections of future income and outgo are not predictions and to emphasize the uncertainty of future cash-flows. This might best be done by including a sensitivity analysis to show the effect of varying some of the major assumptions. In some circumstances a stochastic model might be useful.
- 3.8 The extent to which the report should look at possible changes to the scheme will depend on the terms of reference of the assignment. However, it might be appropriate to draw attention to particular areas of risk or uncertainty and to aspects which appear not to be functioning as intended. This could extend to providing pointers to aspects which should perhaps be reviewed in the future.
- 3.9 Appendix 1 provides a summary of the main points which will usually need to be covered in such a report on the long-term financial condition of a social security plan. The Social Security Committee of the International Actuarial Association is developing some guidelines on actuarial reporting for social security plans.

#### **4. Professional issues**

- 4.1 An important practical and professional concern is with the status of the actuarial appointment and the identification of the client. This may not always be as well-defined as would be desirable. The actuarial report will frequently be commissioned by officials of the social security agency or of the government department responsible for social security.

However, the report may be addressed to the responsible Minister, or to the Chairman or Director of the social security agency in cases where the agency enjoys a high level of autonomy.

- 4.2 The actuary will need to be clear whether the report is intended for internal use by the management of the social security agency, whether it is directed at the government or government departments, in order to enable policy to be developed, or whether it is in effect a public document, to be presented to Parliament or otherwise widely promulgated.
- 4.3 Whilst each of these types of assignment may be acceptable, the first two may raise issues about potential suppression of parts of the report which the recipients do not like (or rather, messages they do not want to hear) and the selective release of results purporting to be the advice of the actuary. From a professional point of view it is clearly desirable that reports which are provided on a confidential basis should not be quoted in any way, implicitly or explicitly, to third parties. From a public interest point of view the third category of report (i.e. fully open) is preferable, as it ensures that the results of the actuarial review are exposed to full public scrutiny and can be used to inform public debate. In this case the actuary should regard the wider public as the effective client and should be careful to avoid bias (e.g. in the assumptions used or the conclusions drawn) which might be interpreted as presenting the government's view (or indeed the view of any other particular interest group). This may bring the actuary into conflict with Ministers, or with the officials who commissioned the report, if they have preconceived views as to what the results should show. This might be manifest in attempts to restrict the scope of the report, to resist the presentation of results in a particular way or to seek to insist on the use of assumptions which may result in a more favourable situation being disclosed.
- 4.4 Of course, consulting actuaries are familiar with the desire of clients to influence assumptions or the presentation of results. This may be acceptable professionally, depending on the purpose for which the report or opinion is required and the extent to which third parties (including in particular members of the plan) may be affected. A general rule may be: the more public the report is going to be, and the wider the range of people who may rely on it, the more "independent" or "objective" it should be. On this scale a report on a social security plan often comes at the extreme end of the spectrum as regards wide promulgation and diverse interests relying on it. The actuary needs to be satisfied that the methodology and assumptions are publicly defensible and professionally robust and reliable. Most other types of actuarial report do not get debated in Parliament, dissected by the national and specialist press and analysed and perhaps critiqued by assorted other experts.
- 4.5 There may be other dangers for the actuary, particularly in countries where there is no history of strong actuarial professionalism (or even of actuaries at all). A relatively common situation is for the actuarial report to be given little prominence, honour having been satisfied by having commissioned and received the report, it then being allowed to gather dust on an official's desk. It may be important, therefore, to find ways of raising public expectations

that the actuarial report is imminent, in order to raise the temperature of debate, and so that officials and Ministers cannot just sweep it under the carpet. In this respect a distinguished consulting actuary (especially in many cases one from overseas) will be better placed to have their report given the necessary profile than an in-house actuary would be (or even a local consultant). In some countries the simple fact that an international consulting actuary is visiting may be enough to grab the headlines. Thus, turning up in person to present the report may automatically result in publicity.

- 4.6 Some social security plans employ an in-house actuary (or even an actuarial department) but it may still be desirable for key public reviews to be carried out by a consultant, who can be seen to be acting with professional independence, unless the independence of the employed actuary can be adequately safeguarded. An example where sufficient safeguards are in place might be the Social Security Administration of the United States, which has its own substantial actuarial department, headed by the Chief Actuary. This department provides advice on a confidential basis to the Social Security Commissioner and is also able to carry out costings for Congress and other enquirers. The annual actuarial review is in fact commissioned by the trustees of the Old Age Survivorship and Disability Insurance (OASDI) program and is published as the trustees' report but with an opinion from the Chief Actuary.
- 4.7 In Canada the independence of the publicly employed actuary is safeguarded by having the Chief Actuary within the Office of the Superintendent of Financial Institutions, quite separate from the Canada Pension Plan, on which he is reporting. However, the extent to which the actuary is able to be wholly independent, and not subject to government direction or influence, has come under some discussion recently.
- 4.8 In the United Kingdom we have for many years solved the problem by having a separately constituted Government Actuary's Department, which is in effect a publicly owned firm of consulting actuaries. The way in which this operates, and the role played by the UK Government Actuary in the financing of social security, are discussed in section 5.

## **5. The role of the Government Actuary in Social Security in the UK**

- 5.1 The role of actuaries in U.K. social security arrangements can be traced back to 1912, when Alfred Watson was appointed Chief Actuary to the National Health Insurance Joint Committee, heading up a small sub-department to advise the Committee on actuarial and financial matters in connection with the National Health Insurance Act 1911. He was given the title of Government Actuary in 1917 and in 1919 was made the head of a separate and independent government department - the Government Actuary's Department.
- 5.2 The current statutory position is that the Social Security Administration Act 1992 requires there to be a report by the Government Actuary whenever the

Secretary of State lays an Order before Parliament concerning the annual uprating of benefits, which the Act requires to be at least in line with the increase in the Retail Price Index.

- 5.3 Proposals for the annual uprating of benefits are now usually made at the same time as the annual review of contribution rates and the earnings bands to which they are applied, but separate provision is made under the Act for the Government Actuary to make a report when the Secretary of State lays an Order before Parliament on proposed changes to contributions (or indeed on proposals to leave them the same).
- 5.4 In addition to these responsibilities to produce annual reports in connection with the uprating of benefits and amendments to contributions (which are in practice usually combined into a single report, Section 166 of the Act lays down a requirement for a review of the operation of the Act to be carried out by the Government Actuary at intervals of no more than 5 years. This gives a remit to the Government Actuary to look at the long term, as well as in some sense reviewing the past, and focuses on the future costs of benefits, the yield from contributions and the level at which the National Insurance Fund itself stands. These reviews are known as Quinquennial Reviews (Government Actuary's Department, 1995, 1999). To give a flavour for the nature of such reports, a summary of the conclusions of the most recent Quinquennial Review is given as Appendix 2 of this paper.
- 5.5 When new social security legislation is introduced into Parliament by the Government, involving any significant long-term consequences, the Bill is accompanied by a report from the Government Actuary on the long-term financial implications (Government Actuary's Department, 1994, 2000).
- 5.6 When the additional earnings-related pension was introduced by the Social Security Pensions Act 1975, provision was made for occupational pension schemes providing benefits of a requisite standard to contract out of the State earnings-related pension, in return for a reduction in the rate of contribution payable by the employer and employees to the National Insurance Fund. Section 42 of the Pension Schemes Act 1993 requires the Government Actuary to produce a report on the reductions in contribution rates, or rebates, which are appropriate to take into account the cost to occupational pension schemes of providing benefits of an equivalent value to those in the State earnings-related scheme which are forgone by members who are contracted out (Government Actuary's Department 1996, 1998).
- 5.7 Sections 42B and 45A similarly provide for the Government Actuary to report on the age-related rebates appropriate for those who choose to be contracted out of the State earnings-related pension scheme by means of membership respectively of contracted-out money purchase schemes (COMPs) or appropriate personal pensions (APPs).
- 5.8 In addition to these statutory responsibilities where the Government Actuary is named specifically in the law, the Government Actuary's Department provides a regular stream of advice to Ministers and officials of the

Department of Social Security and the Treasury on a wide variety of questions concerning the cost of National Insurance benefits and the financing of the National Insurance Fund. The Government Actuary's Department is responsible for producing the projections for about 40% of social security expenditure in the annual White Paper detailing the Government's public expenditure plans. Estimates are given to the Treasury on the flow of contribution income for the purposes of the national accounts and for economic forecasts. Costings are made for the Department of Social Security and the Treasury whenever any proposals are put forward for changes in the structure of contributions or in any of the benefits payable from the National Insurance Fund.

- 5.9 To underpin advice on the long-term financial impact of social security legislation, GAD has, from its earliest days, prepared population projections. Following some arguments between government departments, and between the constituent parts of the United Kingdom, on the projected population to be taken into account for planning purposes (and, in particular, for allocation of financial resources), the Treasury decided in 1954 that the official national population projections should be prepared by the Government Actuary. GAD is required to consult with the Registrar-Generals of England and Wales, Scotland and Northern Ireland and, especially now, following the establishment of separate Scottish and Welsh Assemblies, with the statistical offices of the four countries, and also with other government departments which have a particular interest in the projections. The official GAD projections, complete with variant projections, are published every two years and are required to be used as the basis for the preparation of projections by region and local authority or health authority districts, projections of the labour force, of the school population, etc. GAD publishes details of the assumptions used, nowadays on the web site (<http://www.gad.gov.uk>) but also in a published booklet for each projection round (Office for National Statistics, 1998, 2000). Projections of the population by marital condition (and by de facto status) are also prepared from time to time.
- 5.10 GAD prepares life tables for the UK and its constituent countries each year, based on the estimated deaths and population exposed to risk in the year. GAD also prepares the official English Life Tables and Scottish Life Tables at ten year intervals, using the population estimated at the decennial census and deaths in the three calendar years around the Census. This continues a series which was prepared in the 19<sup>th</sup> century by a succession of famous actuaries and demographers, usually at that time in the capacity of Registrar General. ELT15, based on the deaths in 1990-92, was published in 1997 (Office for National Statistics, 1997).
- 5.11 It is reasonable to argue that the high degree of financial stability of the UK contributory social security scheme owes much to the financial discipline which has been imposed on governments and on Parliament by the regular reports of a professionally independent Government Actuary. Of course, critics of the UK social security system might argue that this has resulted in the UK having a relatively low level of social security benefits compared to some other countries. This may be the case, although the decisions

regarding the level of benefits have always been taken at the political level. What can be affirmed is that political decisions have been taken in full knowledge of the longer term financial consequences, which has not always been the case in some other countries where actuarial advice has not been taken (or has been taken and ignored).

- 5.12 Those outside the UK may wonder how possible it is for the Government Actuary, as a civil servant on a permanent contract (to retirement age) to be professionally independent. Professional independence is safeguarded by the formality of the appointment, by the necessity of affiliation as a fully qualified member of the UK actuarial profession and by the separate status of the department, effectively operating as consultants, rather than the employment of actuaries within the various government departments and regulatory bodies, which could dilute professional independence.
- 5.13 This tradition of professional independence has also underpinned GAD's long-standing responsibility for the production of national demographic projections, a task which in most other countries would be assigned to the national statistical office.

## **6. The role of actuaries in social security reform**

- 6.1 In recent years many countries have been undergoing social security reform, stimulated by greater awareness of the ageing of the population, other problems in existing social security plans and urgent needs for restructuring resulting from economic transition (in former Communist countries) or structural adjustment (in developing countries). Unfortunately, actuaries have not always been as prominent in these reform programmes as might have been expected from the perspective of countries such as the UK, the USA or Canada, where actuaries are intimately involved in all proposals to legislate for social security or to amend existing schemes. This has arisen partly because of the relative absence of actuaries in many of the countries undergoing reform and partly because of the dominance of economists in the international agencies which are often driving the reform (e.g. the World Bank, the IMF, the Asian Development Bank, etc).
- 6.2 In fact, just as the ongoing finances of a social security plan should be subject to regular actuarial review, reform proposals should also be based on actuarial analysis covering:
- the future costs of the existing plan
  - options for change
  - costings of various favoured options
  - design and financing of the transitional arrangements
  - formal report on proposed new scheme to accompany Parliamentary consideration of the necessary legislation

- 6.3 Actuarial advice should also be taken on the design of the funded second pillar (complementary schemes, often now set up as defined contribution individual accounts), the implications for the annuity market and the requirements for regulation of the second pillar.
- 6.4 Another reason why actuaries have not been seen as the key players in some of these reforms is because the focus has been on the macroeconomic effects of social security and the interaction with government expenditure. Actuaries generally focus on the financing of the social security scheme as a separate institution, rather than on the impact which it might have on management of the economy. In order to play a fuller role in social security reform, actuaries need to demonstrate awareness of the broader economic impact and may need to supplement actuarial models of the social security scheme itself with simple macroeconomic models to demonstrate the interactions of the social security, tax and private pensions systems and to model the overall impact on public expenditure.

## **7. Conclusions**

- 7.1 The role of the actuary in social security has been recognised for a very long time. There are many examples of social security legislation which provide explicitly for regular actuarial reviews. One of the most active sections of the International Social Security Association (ISSA) is that relating to actuarial activities. Although this also embraces statisticians, economists and others concerned with the financial aspects of social security, it has historically been, and remains today, biased towards an actuarial emphasis.
- 7.2 The Social Security Department of the International Labour Office (ILO) has a Chief Actuary, who oversees a team of actuaries and others who provide consultancy services to social security schemes, mainly in developing countries. The ILO and the ISSA have put some effort into providing training to staff of social security organisations in actuarial methods and techniques. The ILO are publishing several textbooks on actuarial aspects of social security (Iyer, 1999; Plamondon and Drouin, 2000).
- 7.3 Some government actuaries also provide services to social security schemes in developing countries (notably the Office of the Actuary of the US Social Security Administration) and the UK Government Actuary's Department is specifically constituted so as to be able to provide consultancy services on a commercial basis, and advises a number of social security schemes. A handful of other consulting actuaries specialise in this sort of work, including some sole practitioners, and retired actuaries with prior experience of working for one or other of the organisations mentioned.
- 7.4 The International Actuarial Association has established a Social Security Committee. Apart from working on the guidelines referred to earlier, the Social Security Committee is charged with seeking to raise the profile of the actuarial profession in the social security area. To some extent this task will be shared with the Supranational Committee, which will be trying to raise

awareness of the role of actuaries within international organisations such as the World Bank. An important role can be played by actuaries who are active internationally in the social security field, especially perhaps through the ISSA.

- 7.5 Social security is an important area, of intense public and political interest, where actuaries should be “making financial sense of the future”.

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## **Appendix 1**

### **Main contents of actuarial report on long term financial position of a social security plan**

The following items would normally be covered in an actuarial report on the long-term financial position of a defined benefit or notional defined contribution plan financed on a pay-as-you-go or partial funding principle:

1. Executive summary
2. Introduction
  - (a) To whom report is addressed
  - (b) Plan or plans to which report relates
  - (c) Legislative authority for investigation
  - (d) Purpose of investigation
  - (e) Position/status of reporting actuary
  - (f) Limitations on scope of report
  - (g) Date or period to which investigation relates
  - (h) Period for which projections are made
  - (i) Date or period to which previous investigation related (and by whom it was carried out, if different from the current actuary)
  - (j) Warning about future uncertainty
3. Description of scheme
  - (a) Description of most important benefits
  - (b) Description of contribution structure (and other financing mechanisms)
  - (c) Changes in benefit provisions and/or benefit rates since last investigation
  - (d) Changes in contribution structure and/or contribution rates since last investigation
  - (e) Principles of financing of plan
  - (f) Description of any formal control measures or tests to be applied
4. Data
  - (a) Assets held (in different categories) by market value (and book value if different)
  - (b) Return on fund in recent years (where relevant)
  - (c) Summary of accounts of plan since date of previous investigation or for period of current investigation
  - (d) Numbers and average salaries (where relevant), with age/sex distribution, of contributors
  - (e) Numbers and average benefit levels, with age/sex distribution, of main categories of beneficiaries
  - (f) Demographic data (for whole population) where appropriate and where reliance is not being placed on an independently produced population projection
  - (g) Any caveats about data availability, completeness or accuracy
  - (h) Scheme experience data relevant to determination of key assumptions for the future

5. Methodology and assumptions
  - (a) Description of main actuarial methodologies employed
  - (b) Description of (and justification for) principal assumptions, especially:
    - economic assumptions, such as real earnings growth, absolute average level of price or benefit increases, rate of return on fund
    - demographic assumption, such as future total fertility rate, overall level of net migration, mortality basis (including allowance for future improvement)
    - biometric assumptions, such as incapacity inception rates, proportions married, proportions entitled to benefit
  - (c) Terms in which results are presented (e.g. constant 1999 prices)

6. Results
  - (a) Summary of future projected population by sex and age-groups
  - (b) Projected numbers of contributors by category, sex and age-group
  - (c) Projected numbers of beneficiaries by category, sex and age-group
  - (d) Projected benefit outgo, subdivided (at least for major categories) by benefit type
  - (e) Projected income from contributions (or ear-marked taxes) by source
  - (f) Projected administrative expenses (unless provided for separately)

Final results will depend on financing method, but might include:

- (g) Contribution rates necessary to break even with contribution income and benefit expenditure (including administrative expenses where appropriate)
- (h) As for (g) but allowing for investment income from fund
- (i) Projections corresponding to (g) and (h) but expressed in terms of percentage of total salary mass or percentage of gross domestic product
- (j) Projected progress of fund on specified assumptions about future contribution (tax) rates
- (k) Unfunded accrued liability
- (l) Sensitivity analysis of results
- (m) Commentary on differences from previous investigation and reasons for these
- (n) Other commentary on principal features of results.

7. Conclusions

8. Signature and date.

## Appendix 2

### **The Quinquennial Review (of the Great Britain National Insurance Fund)**

- 1 The main purpose of the quinquennial reviews is to estimate the contribution rates required to be paid to the Great Britain National Insurance Fund in future years to meet the expenditure on a pay-as-you-go basis under the current benefit and contribution structure.
- 2 The most recent review (Government Actuary's Department, 1999) was based on the legislation in force in March 1999 and therefore reflected the equalisation of pension ages at 65 by 2020, the changes to the State Earnings-Related Pension Scheme (SERPS) and contracting out of SERPS enacted in the Pensions Act 1995 and the contribution rules changes contained in the Social Security Act 1998.
- 3 Results of projections over a period of 60 years or so are subject to considerable uncertainty and the effects of different values for some of the key assumptions are shown in the report.
- 4 The main factors affecting the future contribution rates needed for the National Insurance Fund are:
  - The relative number of contributors and pensioners, as pension benefits account for 80% of benefit expenditure;
  - The rate by which the increase in the general level of earnings exceeds the increase in benefit rates and earnings limits in each future year
- 5 The number of contributors per pensioner is projected to stay fairly constant, at about 1.8, until the year 2020. Thereafter it will decline rapidly to about 1.4 by 2030 before stabilising again. These changes reflect the demographic development of the population, particularly an increase of about 50% in the number of pensioners to some 16.4 million in the year 2040, allowing for the change in female pension age and, to a lesser degree, changing economic activity rates. Other things being equal, the reduction in the number of contributors relative to pensioners would lead to contribution rates increasing by approximately a third by around the year 2030.
- 6 Whether increases in contribution rates will be necessary in practice depends on the policy for increasing flat-rate benefit rates. Increasing benefit rates by less than the rate of earnings increases will result in benefit expenditure rising more slowly than contribution income, which is related to earnings increases.
- 7 The Social Security Administration Act 1992 requires that benefit rates be increased each year at least in line with price inflation. Recent policy has been to increase benefit rates in line with price inflation and all comments by governments in recent years have supported this level of uprating. Historically, earnings have grown faster than prices by approximately 1.5%

to 2.0% a year on average and it is expected that there will be a continuing differential of this order.

- 8 If upratings continue to be based on price increases, the growth in contribution income relative to benefit expenditure, arising from earnings increasing faster than flat-rate benefit rates by 1.5% to 2.0% a year, will offset the decline in the relative number of contributors to pensioners. Contribution rates, as a percentage of relevant earnings, will fall.
- 9 If benefit rates were increased in line with earnings, contribution rates would have to be increased significantly up to the year 2040 before levelling off.
- 10 Table 1 sets out the contribution rates estimated to be required in future to meet benefit outgo on a pay-as-you-go basis, based on the principal assumptions.
11. From April 1999, the employees' National Insurance contribution rate is 10%, as in 1998. The employers' National Insurance contribution rate is 12.2% from April 1999 to March 2001, compared to the main rate of 10% in 1998, but this rate is only payable on earnings above a threshold. After allowing for the proportion of the contribution allocated to the National Health Service (NHS), the combined employee and employer rate from April 1999 is 20.25%, compared to 18.05% in 1998, although the new employers' rate is paid on a smaller proportion of earnings.

**Table 1 Estimated rates of contribution to the National Insurance Fund in respect of employed earners to balance income and expenditure on a year by year pay-as-you-go basis.**

Year	JOINT EMPLOYEE AND EMPLOYER CONTRIBUTION RATE* %	
	Earnings upratings of benefit rates	Price upratings of benefit rates
1999-00	20.0	20.0
2000-01	20.2	19.9
2010-11	21.6	18.9
2020-21	23.2	18.1
2030-31	26.7	18.6
2040-41	27.6	17.1
2050-51	27.3	15.2
2060-61	27.6	14.0

\* These rates exclude that part of the rates allocated to the NHS. They are based on the revised Class 1 contribution regime introduced by the 1998 Social Security Act. These changes took effect from April 1999.

12. The rates in the table below assume that the future rates of contribution by the employee and the employer will be kept proportional to each other and that the revised structure of the National Insurance contribution system applicable from April 1999 will be maintained thereafter. Contribution rates for other contribution classes are assumed to alter proportionately.
13. The contribution rates in Table 1 are not easy to interpret, especially where employees' contribution limits are indexed to prices rather than earnings, resulting in them paying contributions on an ever decreasing proportion of their earnings. A more representative view of the changes in the cost of future National Insurance Fund expenditure (excluding contracted-out rebates) can be obtained by relating the expenditure to the projected gross domestic product (GDP). This is illustrated in Table 2 below.

**Table 2 National Insurance Fund expenditure for all benefits as a percentage of projected GDP**

	TOTAL EXPENDITURE AS A PERCENTAGE OF PROJECTED GDP (%)	
Year	Earnings upratings of benefit rates	Price upratings of benefit rates
1999-00	5.5	5.5
2000-01	5.5	5.4
2010-11	6.4	5.6
2020-21	7.0	5.5
2030-31	7.9	5.5
2040-41	8.1	4.9
2050-51	7.8	4.2
2060-61	7.7	3.7

14. Tables 1 and 2 show that, with price uprating of flat-rate benefit rates, the burden of benefit expenditure falls, slowly at first but more quickly in later years. This is shown by both the pattern of contribution rates required and the costs of National Insurance Fund expenditure relative to GDP. If GDP rises broadly in line with real earnings, the figures indicate that, in the longer term, National Insurance Fund expenditure as a share of GDP will fall significantly, even though there will be nearly 50% more pensioners.
15. With earnings upratings of flat-rate benefit rates, the contribution rates required rise considerably, reflecting the change in the ratio of contributors to pensioners, with no counterbalancing effects. The retirement pension share of GDP will increase significantly, broadly in line with the increasing number of pensioners.
16. Employees only pay National Insurance contributions up to the upper earnings limit (UEL), which has fallen steadily relative to earnings, so that it is now only 110% of male full time average earnings compared to a maximum of 136% in 1982 and approximately 115% at the beginning of the

1990s. Continuation of the current policy of uprating earnings limits in line with price inflation would mean that, for employees with earnings above the UEL, a constant National Insurance contribution rate will result in their contributions falling significantly over time as a percentage of their total earnings. A much greater share of National Insurance contributions will be paid by the employer than by the employee, since the employer pays contributions on all earnings above the threshold, i.e. not restricted to earnings below the UEL.

- 17 Real earnings growth will result in working people being relatively better off in future even if National Insurance contribution rates were to be increased to meet the cost of increasing flat-rate benefits in line with earnings. Based on gross pay and real earnings growth of 1.5% a year, real earnings relative to prices will, in the year 2060, be approximately 2.5 times the corresponding level in 1999-00. Allowing for higher National Insurance contribution rates and earnings limits, someone on average male earnings would still have real net earnings, after National Insurance contributions, of approximately 2.4 times current levels.
- 18 Figure 1 shows the total of basic pension and SERPS at award in various years for men on average earnings and with a full contribution record. With earnings limits and flat-rate benefits increased in line with prices, the awards reduce significantly as a percentage of earnings.

**Figure 1 Awards of basic and SERPS pension to men on average earnings as a percentage of average earnings, with flat-rate benefit rates and earnings limits increased in line with prices**



