

SOCIAL SECURITY AND THE CONSULTING ACTUARY

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IACA 2000, Hershey, PA

RELEVANCE OF SOCIAL SECURITY

- sets framework for complementary schemes
- may offer scope for integration of benefits
- contributes to overall benefit targets
- affects design of risk benefits
- relevant to individual financial advice
- contracting out available in some countries

SOCIAL ATTITUDES

- acceptance of private schemes
- vehicles available for funding
- implicit government debt
- scale of future ageing problems

ACTUARIAL ROLES IN SOCIAL SECURITY SCHEMES

- demographic projections
- estimates of future benefit outgo
- estimates of future contribution income
- long-term projections of financial balance
- short-term estimates of cash-flow
- interactions with complementary plans

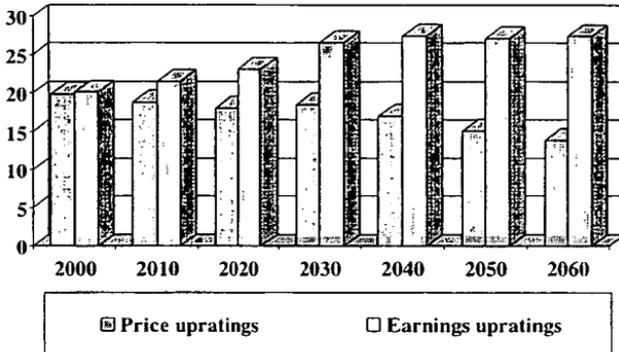
DEMOGRAPHIC PROJECTIONS

- actuarial demographers
- assumptions about future fertility
- mortality assumptions by cohort
- allowance for mortality improvement
- migration assumptions
- marital condition projections

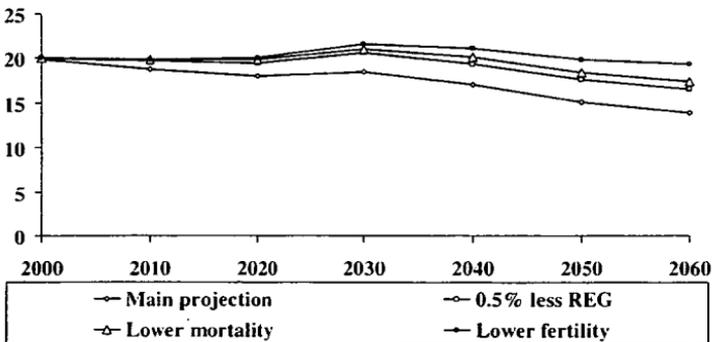
REPORT ON LONG-TERM FINANCIAL CONDITION

- estimates of future outgo on different benefits
- yield of contributions or hypothecated taxes
- adequacy of legislated contribution rates, or....
- contribution rates necessary to achieve balance
- costs relative to GDP or total earnings
- impact of investment earnings on cash-flow
- projected size of funds

CONTRIBUTION RATES AS % OF EARNINGS



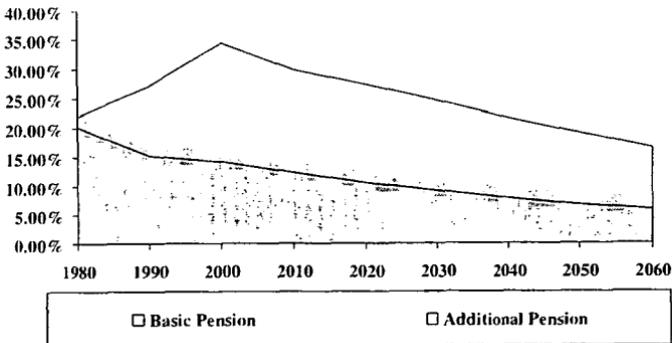
CONTRIBUTION RATES AS % OF EARNINGS - VARIANTS (with price upratings)



OTHER ISSUES

- impact on members and pensioners
- redistribution consequences
- how benefits will be affected by inflation
- sensitivity of results to different factors
- mechanisms to mitigate risk factors

PENSIONS BY YEAR OF AWARD (men) as % of earnings (at average earnings levels)



FORMAL REPORT - 1

- purpose of report/statutory basis
- data sources - comment on inadequacies
- analysis of experience
- summary information about membership
- broad description of methodology
- assumptions (with reasoning)
- basis for projections (e.g. current prices)

FORMAL REPORT - 2

- projections of expenditure (by benefit)
- projections of contribution income
- future financial balance, or.....
- contributions necessary to maintain balance
- impact of investment return
- future size of fund
- sensitivity analysis

ROLE OF ACTUARIES IN SOCIAL SECURITY REFORM

- analysis of costs of existing arrangements
- advice on alternative structures
- modelling the transition
- advice on establishment of second pillar
- regulation of second pillar
- impact on public expenditure/borrowing
- impact on investment markets

CONSULTING IN A POLITICAL ENVIRONMENT

- political impact of reports
- public interest considerations
- maintain independence or satisfy the client
- who is the client?
- maintaining an ongoing relationship

PROFESSIONAL INDEPENDENCE

- political pressures
- interests of government department
- conflicts with government forecasts
- right to extend scope of report
- right to insist on content and assumptions

DANGER AREAS

- issues are not solely technical or actuarial
- advice will have political consequences
- cannot mechanically apply techniques
- unwelcome reports may be side-lined
- others may think they are expert

PROBLEMS OF REPORTING

- normal funding criteria do not apply
- focus on emerging costs
- need to use real terms (price or earnings)
- break-even contribution rates
- impact of fund
- multiple options - choices are political

REPORTING MECHANISM

- actuary should take personal professional responsibility for the report
- assumptions are responsibility of actuary
- report directly to Ministers or Parliament
- signed report presented to Parliament
- signed report in public domain
- discuss recommendations and agree action

ROLE OF CHIEF ACTUARY OF OSFI IN CANADA

- reporting line within OSFI
- statutory role in Canada Pension Plan
- triennial published valuation
- professional independence
- problems of previous Chief Actuary

ROLE OF CHIEF ACTUARY IN THE UNITED STATES

- within Social Security Administration
- report published as report of Trustees
- includes signed actuarial opinion
- effective independence of actuarial opinion

ROLE OF GOVERNMENT ACTUARY IN UK

- consulting service to government
- quinquennial reviews of National Insurance
- reports on annual uprating
- financial consequences of new legislation
- review of contracted-out rebate
- personal responsibility of Government Actuary
- costings and estimates on continuing basis

SOCIAL SECURITY AND THE CONSULTING ACTUARY
Chris Daykin, UK

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.

- 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

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

- 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

and deaths in the three calendar years around the Census. This continues a series which was prepared in the 19th 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).

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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London, May 2000

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

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.

* 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

Year	TOTAL EXPENDITURE AS A PERCENTAGE OF PROJECTED GDP (%)	
	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

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

