GOVERNMENT ACTUARY'S DEPARTMENT

Reducing the Annual Allowance
Setting the valuation factor

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GAD
GOVERNMENT ACTUARY'S DEPARTMENT

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13 October 2010

Dear Mr Glassborow

I have pleasure in providing my report on the valuation of accruing benefits in defined benefit pension schemes, in the context of the proposed reduction in the Annual Allowance. This report contains a recommendation for a single factor to be used to value the increase in an individual's pension over a tax year, based on my understanding of the policy as it currently stands.

This report sets out the technical details underpinning my advice on a suitable valuation factor. I am content that the report may be disclosed externally to assist discussion, noting that the report is aimed at an informed audience which is already familiar with the relevant technical terms and approaches.

Yours sincerely

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1 Overview

1.1 I have been asked by HM Treasury to recommend a single factor to be used to value the increase in an individual's pension over a tax year for members of defined benefit pension schemes, for the purpose of applying the Annual Allowance test from April 2011.

1.2 The valuation factor will formally be set by the Government. My role is to provide advice on a suitable factor. HM Treasury has asked me to take the following into account:

- I should assume for the purposes of this report that the Annual Allowance will be set at a level of around £50,000,
- the valuation factor is intended to be suitable for use over the medium term, for say the next five to ten years,
- the valuation factor should represent the actuarial value of the specified increase to pension over a year for those individuals who might typically accrue benefits at the levels which will be restricted by the new Annual Allowance (and conversely that we should not consider individuals who might exceed the new Annual Allowance only occasionally, since it is expected that flexibility in the tax system and action by schemes to amend their design should mean that these individuals do not incur material Annual Allowance charges),
- the increase in the pension over the year should be valued on a leaving service basis. That is, the increase in pension over the year should be valued as if the member leaves pensionable service at the year end,
- the valuation factor should reflect ancillary benefits (for example, indexation and dependants' pensions) which are typical of occupational pension arrangements for senior staff (that is, those staff most likely to be accruing at high levels of benefit),
- the actuarial assumptions should aim to deliver consistency between the treatment of defined benefit and defined contribution members, and
- the choice of valuation factor should avoid discouraging or encouraging defined benefit pension provision unnecessarily.

1.3 The implications of these constraints are discussed in this report, which sets out the technical details underpinning my advice. The choice of a single valuation factor to cover the wide range of affected individuals requires a pragmatic approach. Ideally, we would identify an average valuation factor based on the individuals expected to be affected. However that is not possible because there is inadequate data to identify these people with any degree of accuracy. Following discussion with HM Treasury, I have therefore derived the recommended valuation factor by considering each relevant assumption independently, and selected an average, best estimate or most common value for each assumption. The derived factor has then been checked for reasonableness against those used in the Finance Act 2004 measures and against market annuity rates.

1.4 Based on the assumptions derived in this way, I recommend that HM Treasury should consider a valuation factor of 16:1 for the Annual Allowance test. This factor is to be applied to the increase in pension over the year (as newly defined for Annual Allowance purposes) to derive the Pension Input Amount[1] which is compared to the Annual Allowance limit.

1.5 This recommendation is based on my understanding of the policy as it currently stands. Material changes to the policy might justify the use of a different factor, as might the emergence of robust new evidence which contradicts the assumptions I have made. The factor has been recommended based on expected circumstances over the next ten years, and may not be suitable beyond that period. If there were any material changes to pension provision for a significant proportion of affected individuals, then that might also justify a review of the factor (noting, for example, the work of the Independent Public Service Pensions Commission).

1.6 The factor of 16:1 replaces the previous factor of 10:1, though much of the increase is due to the change in the definition of the increase in pension to which the factor is applied. The new factor may also be compared to the 20:1 currently used in the Lifetime Allowance test. The 20:1 factor is applied at retirement. Using the same assumptions as were used to derive the 16:1 factor recommended in this report, the equivalent factor on retirement at age 60 would be 23.6:1 and at 65 would be 22.2:1. That is, I am effectively assuming that pensions are more valuable than implied by the existing 20:1 Lifetime Allowance factor, since I am assuming higher life expectancy and lower discount rates. In my opinion, this seems appropriate compared to the position of 5 to 10 years ago when the previous factors were adopted.

1.7 We can also compare these factors to market annuity rates. For example, a joint life annuity at age 60 might currently be priced using a factor of around 32:1 (if it were linked to RPI). CPI-linked annuities are not common, but a consistent price might be around 28:1, if they were available on the open market.

[1] The Pension Input Amount is defined in Finance Act 2004 and the Registered Pension Scheme Manual. The concept will carry forward to the new Annual Allowance test, though some of the definitions may be amended to reflect the new arrangements.

2 Background

2.1 The Government announced in the June 2010 Budget that it would continue with plans to raise revenue by restricting pensions tax relief. However, having listened to the concerns of the pensions industry and employers, the Government had reservations about the approach adopted in Finance Act 2010 (April). It believed that that could have unwelcome consequences for pension saving, bring significant complexity to the tax system, and damage UK business and competitiveness. As such, the Government has considered an alternative approach involving the reform of existing allowances, including a significantly reduced Annual Allowance.

2.2 HM Treasury published a paper "Restriction of pensions tax relief: a discussion document on the alternative approach" on 27 July 2010. This set out the practical issues which would need to be addressed.

2.3 HM Treasury has commissioned me to recommend a valuation factor for the calculation of the Pension Input Amount in defined benefit pension schemes in the context of a significantly reduced Annual Allowance. This report sets out the technical details underpinning my recommendation. As such, it is aimed at an informed audience which is already familiar with the relevant technical terms and approaches.

2.4 I have been instructed to base my recommendation on the points set out in the remainder of this section.

Current system

2.5 The new proposals build on the existing Annual Allowance system. The existing system includes a single valuation factor of 10:1. This was set in Finance Act 2004.

2.6 The 10:1 factor is applied to the defined increase in accrued pension from the beginning to the end of the year. This defined increase includes not only the increase in pension relating to the extra year's service but also the whole of the increase in pension arising from increases in pensionable salary. This definition is expected to change with the introduction of the significantly reduced annual allowance.

2.7 My recommendation on the new valuation factor reflects assumptions based on current expectations of future financial and demographic experience, and on the new definition of the Pension Input Amount which is expected to be implemented.

Form of the calculation

2.8 HM Treasury propose that the deemed increase in the individual's pension over the year will be calculated as follows[2]:

$$DIP = A1 - [A0 \times (1+ r)]$$

where

DIP = deemed increase in pension over the year,

A1 = total accrued annual pension at end of year, assuming the member leaves pensionable service then,

A0 = total accrued annual pension at start of year, assuming the member had left pensionable service then, and

r = a revaluation factor based on inflation, consistent with the revaluation of deferred members' benefits (see paragraph 2.13 below).

2.9 This formula provides that the deemed increase in the pension over the year should be interpreted as being the increase in the member's benefits which would be payable on withdrawal from pensionable service at the year end, allowing for the additional pensionable service and any pensionable salary growth in excess of revaluation on the accrued pension at the start of the year. The deemed increase in pension should be valued accordingly.

2.10 It is proposed that the value of the deemed new accrual (that is, the Pension Input Amount) should be determined as follows:

$$PIA = DIP \times F$$

where

PIA = the Pension Input Amount, to test against the Annual Allowance, and

F = a valuation factor.

[2] The legislation might express the calculations slightly differently, but with the same practical effect.

2.11 The valuation factor F will therefore apply to all defined benefit accrual, regardless of the age and sex of the individual concerned, and ignoring such variables as the normal retirement age, the form of any rights to increases in deferment or payment, and any contingent dependants' benefits, etc.

2.12 The inclusion of the revaluation factor r is a material difference from the Finance Act 2004 system. All other things being equal, this change in the calculation of the increase in the pension over the year would justify a higher factor than the current 10:1.

2.13 I understand that the definition of the revaluation factor r is to be based on CPI. HM Treasury consider the use of a specified index to be necessary for practical, tax policy-making reasons. However, it should be noted that the practical requirements for this part of the formula create a conflict with the objectives underlying the fourth (and possibly sixth) instruction (listed under paragraph 2.15) for some schemes, though schemes may well move to revaluation in line with CPI in the next few years. I have taken this into account when setting the assumptions, to make sure that the end result (that is, the valuation factor together with the defined increase in pension over the year) is coherent overall and consistent with all the objectives. The alternative of using a scheme's own revaluation method would result in a slightly higher factor linked to a typically lower pension increase.

2.14 The treatment of any lump sum accrual will be set out in regulations. I have not been asked to advise on this aspect and so I have not considered this further.

Considerations which should be taken into account

2.15 The valuation factor will formally be set by the Government, though the decision will be informed by advice I provide in my role as Government Actuary. In formulating my recommendation I have been instructed by HM Treasury to consider the following:

- I should assume for the purposes of this report that the Annual Allowance will be set at a level of around £50,000,
- the valuation factor is intended to be suitable for use over the medium term, for say the next five to ten years,
- the valuation factor should represent the actuarial value of the specified increase to pension over a year for those individuals who might typically accrue benefits at the levels which will be restricted by the new Annual Allowance (and conversely that we should not consider individuals who might exceed the new Annual Allowance only occasionally, since it is expected that flexibility in the tax system and action by schemes to amend their design should mean that these individuals do not incur material Annual Allowance charges),

- the increase in the pension over the year should be valued on a leaving service basis. That is, the increase in pension over the year should be valued as if the member leaves pensionable service at the year end,
- the valuation factor should reflect ancillary benefits (for example, indexation and dependants' pensions) which are typical of occupational pension arrangements for senior staff (that is, those staff most likely to be accruing at high levels of benefit),
- the actuarial assumptions should aim to deliver consistency between the treatment of defined benefit and defined contribution members, and
- the choice of valuation factor should avoid discouraging or encouraging defined benefit pension provision unnecessarily.

3 Assumptions to derive the valuation factor

Framework for determining actuarial assumptions

3.1 A valuation factor based on the rationale set out in section 2 represents the value of a deferred annuity. The relevant assumptions and parameters affecting the value of a deferred annuity may include:

- the current age of a relevant individual,
- the retirement age at which benefits are payable,
- the expected mortality rates of the individual and any dependants (which may depend on sex and state of health),
- the expected increases awarded in deferment and payment,
- marital status at retirement,
- the expected numbers of eligible dependants claiming benefits,
- the average age of eligible dependants,
- the proportion of an individual's benefits payable to an eligible dependant,
- minor elements of the benefit design (for example, payment frequency and any guarantee period), and
- a discount rate to reflect the time value of money.

3.2 I am instructed to recommend a single factor which will be used for all members of defined benefit schemes as part of the Annual Allowance test. In recommending such a factor, I am instructed to have regard to the characteristics of individuals who would typically be affected by an Annual Allowance restriction at the expected level (which is taken to be around £50,000). That is, the people in schemes which will continue to provide new annual accrual above this level (and also those who will routinely save at close to this level). Those who formerly enjoyed high rates of pension accrual but cease to accrue before the new measures come into force are not relevant.

3.3 A wide range of individuals will be subject to the Annual Allowance test and valuation factors for each would usually vary materially, either due to personal characteristics (such as their current age), their scheme's characteristics (such as retirement age) or actuarial assumptions (such as discount rates). In this case we will be averaging out this variation between individuals to set a single factor. This means, among other things, spurious levels of accuracy in the derivation of the factor are inappropriate.

3.4 In the following discussion I set out some of the main considerations affecting my recommendation. The choice of a single valuation factor to cover the wide range of affected individuals requires a pragmatic approach. Ideally, we would identify an average valuation factor based on the individuals affected, however that is not possible because there is inadequate data to identify these people with any degree of accuracy. Following discussion with HM Treasury, I have therefore derived the recommended valuation factor by considering each relevant assumption independently, and selected an average, best estimate or most common value for each assumption.

3.5 In choosing the assumptions, I have had regard to the possibility that individuals may change their behaviour – the assumptions should be chosen to reflect individuals affected by the reduced Annual Allowance in future, not necessarily those who would be affected based on their current pension arrangements.

3.6 The derived factor has then been checked for reasonableness against those used in the Finance Act 2004 measures and against market annuity rates.

Data limitations

3.7 Ideally, we would choose our assumptions based on the characteristics of the individuals who will be directly affected by the reduced Annual Allowance. Unfortunately, there is very little published data directly relating to individuals who currently build up their pensions at rates which will be affected by the new Annual Allowance. I have therefore had to rely on scant or limited indirect evidence, as discussed for each assumption below.

Margins of prudence

3.8 In some situations it is appropriate for actuarial assumptions to include a margin of prudence, for example funding calculations. Other calculations, for example transfer values, may be set using 'best estimate' bases which do not include any material margins of prudence.

3.9 For the purposes of the Annual Allowance, HM Treasury has specified that:

- the actuarial assumptions should aim to deliver consistency between the treatment of defined benefit and defined contribution members, and
- the choice of valuation factor should avoid discouraging or encouraging defined benefit pension provision unnecessarily.

3.10 Both considerations imply that the actuarial assumptions for the valuation factor should not include any material margins of prudence or optimism, and HM Treasury has instructed me to develop my recommendation accordingly.

Members affected

3.11 My instructions are to base my recommendation having regard to the characteristics of typical individuals who regularly accrue benefits in excess of the proposed new Annual Allowance limit, and not on individuals who might exceed the new Annual Allowance only occasionally (since they are not expected to pay material Annual Allowance charges, since there will be flexibility in the tax system and schemes are expected to amend their benefit design).

3.12 This has material consequences for the derived valuation factor, which depends on the characteristics assumed for the members whose benefits are being valued. Unfortunately, there is no easily available evidence on the characteristics of individuals who currently enjoy regular large accruals in defined benefit schemes.

3.13 An individual can routinely accrue a large pension in the following situations (and in many intermediate situations):

- the person is a high earner in a typical defined benefit pension scheme, or
- the person is in a very generous defined benefit scheme.

3.14 Examples of these situations are given in Appendix A. These examples illustrate two of the ways an individual might routinely exceed the new Annual Allowance. Overall, they suggest that the typical member affected by the new Annual Allowance on a routine basis will tend to be a relatively high earner.

3.15 It is possible to contrive examples of lower-earning individuals who would regularly exceed the new Annual Allowance, but in my opinion they would be quite strained. The second example in the appendix (the generous scheme example) is a fairly extreme example, and requires a current salary of £62,000 a year (increasing steadily in real terms) combined with the generous pension scheme to exceed the limit on a routine basis.

Mortality rates

3.16 Mortality rates depend on the personal characteristics of the individual. For this project, we know that the individuals concerned are members of occupational pension schemes who are accruing large pension entitlements. I have therefore adopted mortality assumptions from the standard S1 tables which are derived from a national sample of occupational schemes, and in particular I have used assumptions which reflect the lighter mortality[3] of individuals with higher levels of pension.

[3] Lighter mortality means that people have lower death rates and so live longer. (Heavier mortality means higher death rates and shorter life spans.)

3.17 Using these mortality tables, and using the assumptions for spouses' pensions and discount rates given later in this report, the valuation factors for men and women would be very similar. High earners are typically male, see the data in Appendix A. I have therefore assumed a male individual with a female spouse, as the 'most common' situation.

3.18 The specific mortality assumptions are as follows:

- member's mortality in line with the standard table S1NMA_L,
- spouse's mortality in line with the standard table S1DFA_L, and
- mortality improvements in line with the Office for National Statistics' 2008-based principal population projections.

3.19 Given the averaging that is involved in setting a single valuation factor, in my opinion it would be spurious to reflect wider ranges of mortality assumptions.

3.20 In relation to mortality improvements, the Office for National Statistics does not express an opinion on the likelihood that its mortality projections will be borne out in practice, but in my opinion the principal population projections are a good estimate of expected future mortality improvements for this purpose, being used by most public sector schemes and at the less 'optimistic'[4] end for private sector schemes.

3.21 Overall, these are intended to represent best estimate assumptions for future mortality experience.

Spouses' benefits

3.22 Spouses' pensions are often set at 50% or 67% of the members' pension, particularly for high earners.

3.23 I also need to make an assumption about the proportion of individuals who are married or otherwise entitled to a dependant's pension. I have assumed that between 70% and 80% of relevant individuals will currently be eligible for dependants' pensions, by virtue of marriage, civil partnership or (in some schemes) cohabitation or similar dependency. This is consistent with Office for National Statistics data on the proportion of the population which is formally married, with a small loading to allow for other dependents' pensions.

[4] 'Optimistic' in this context means that people are assumed to live shorter lives than might otherwise be expected.

3.24 Combining the assumption of 70% to 80% eligibility with a spouses' pension of 50% to 67% would give a combined percentage of around 45%. However, eligibility for a large pension gives a strong financial incentive to formalise relationships at an appropriate time, so I have assumed that a 50% pension would be payable on the death of the member[5].

3.25 I have assumed that wives are three years' younger than husbands. This is consistent with population data taken from the 2001 national census, which is the latest available.

3.26 It is impracticable to reflect marital status using a single valuation factor, and it is appropriate that we recognise in the factor that the majority of people are married (or equivalent). This assumption is not too material for married individuals. The use of a single factor for both married and unmarried members is significant for unmarried members – they would otherwise have a materially lower factor. This issue is a consequence of using a single factor.

Other benefit design assumptions

3.27 I have assumed that pensions are payable for life and guaranteed for five years, which is typical of actual practice.

3.28 We have not made any allowance for the value of any life insurance cover provided during the year. Many schemes provide lump sum benefits in the event of death in service. The formula to determine the increase in the member's pension over the year (see paragraph 2.8) is predicated on the member's leaving service rights acknowledging that the member has survived to the year end. Ignoring the value of any life insurance cover is consistent with the treatment of such cover for Annual Allowance purposes in the defined contribution context.

3.29 Other minor design elements have been ignored on grounds of immateriality in this context.

3.30 These assumptions represent my understanding of the most common benefit designs.

Discount rates and expected pension increase rates

3.31 To determine the required valuation factor, we require discount rate assumptions which are net of the expected pension increase rates in payment and deferment. The choice of discount rate has a material impact on the valuation factor which is derived.

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[5] Strictly, I have assumed a 50% pension payable to a dependant on the immediate death of the member, with the proportion declining over time consistently with the assumed mortality of spouses.

3.32 The discount rates should be gross of tax, for consistency with the tax-free investment return in defined contribution schemes. Discount rates could be set having regard to market yields. Index-linked gilt yields provide a market measure of the risk-free real return over inflation as measured by the Retail Prices Index (RPI). However a discount rate net of RPI may not be appropriate:

- public sector schemes which formerly were linked to RPI have moved to inflation protection based on the Consumer Prices Index (CPI), which is expected to be lower than RPI, and
- few private sector schemes provide uncapped increases based on RPI. Some offer capped increases, some do not offer any increases in payment (for some tranches of accrual), and some are likely to follow the public sector towards linking to CPI.

3.33 Also, a risk-free rate may not be appropriate, since the investment strategy adopted by the required comparator (a wealthy member of a defined contribution pension scheme) will typically include a material allocation to return-seeking assets in the expectation that the investment return will be greater than the market risk-free rate.

3.34 In order to choose appropriate discount rates, we should consider the purpose of the calculation and the implications of the likely behaviour of the individuals affected. We are seeking to value the benefits which the member has accrued in their actual defined benefit scheme. In order to provide consistency with the treatment of members of defined contribution schemes, we should determine the cost they might incur to replicate those benefits in a hypothetical defined contribution scheme, for instance a personal pension arrangement.

Asset allocation

3.35 The cost of replicating benefits in a personal pension arrangement might be assessed by considering the assets which might typically be held in such an arrangement. There is little published information on this point. We have not been able to identify any surveys covering high earners' asset allocations in defined contribution schemes. The Investment Management Association (IMA) has published a survey of fund managers[6] which shows that 63% of retail investments were invested in equities, with a further 4% or so in property. Of course, though the IMA survey covers a large section of the market it should be acknowledged that it is not the whole market, that the retail category is not limited to personal pensions and that the individuals we are considering may invest differently from the average. Conversely, this research does show that a high proportion of retail funds are being invested in return-seeking assets.

[6] Investment Management Association (2010) "Investment Management in the UK 2009-2010: The IMA Survey"

3.36 Similarly, the FTSE PensionDCisions DC Index[7] shows that the default investment strategies adopted by large defined contribution schemes do include a large allocation to return-seeking assets, at least for members who are not close to retirement.

3.37 At retirement, defined contribution assets are often used to purchase an annuity. Annuities are priced using low, nil or negative margins over risk-free rates, and this might justify the use of a low net discount rate post-retirement for the defined benefit valuation factor. However, the high earning individuals affected by the Annual Allowance are the people who would be most likely to continue to leave defined contribution funds actively invested after retirement, so consistency suggests we should make some allowance for this when setting the defined benefit valuation factor.

3.38 For the purposes of deriving a valuation factor I have assumed as a middle ground option (based on Investment Management Association and other anecdotal evidence) that a typical investment strategy is[8]:

- Pre-retirement: 2/3 return-seeking assets, 1/3 index-linked gilts
- Post-retirement: as pre-retirement to age 70, then purchase an annuity.

3.39 In my opinion these asset allocation assumptions represent an expected most common approach for the individuals affected.

Expected investment returns

3.40 Discount rates may be derived reflecting the expected investment returns (after charges and net of expected pension increases) which might be achieved in a defined contribution scheme. We therefore consider:

- the investment return expected to be earned by index-linked gilts,
- the investment return expected to be earned by return-seeking assets,
- the charges which might be deducted from individual accounts in a defined contribution plan, and
- the rates of pension increases in deferment and payment.

3.41 We also need to consider the expected cost of eventual annuity purchase.

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7 See http://www.ftse.com/Indices/FTSE_PensionDCisions_DC_Index_Series/index.jsp

8 For completeness, the assumption of a high allocation to return-seeking assets is predicated on the individual not being close to the Lifetime Allowance, which may possibly involve a different asset allocation. However, individuals who are close to the Lifetime Allowance might be expected to reduce their annual pension saving and so would not be adversely affected by the Annual Allowance.

3.42 Currently, the yields on index-linked gilts are at historically low levels and it seems reasonable to assume a higher long-term yield for the purposes of setting a valuation factor. I have assumed that index-linked gilts will yield 1.5% a year over RPI on average over the long term. This is comparable to the average market yield in the period 2000 to 2010[9]. The yield assumption is intended to be a best estimate.

3.43 There are a range of views on the additional return (over that expected on gilts) which is expected to be earned by return-seeking assets. These commonly range from 2% to 4% a year[10]. I have assumed that this 'risk premium' will be 3% a year. The 'risk premium' assumption is intended to be a best estimate.

Allowance for investment expenses

3.44 I have assumed that charges on invested defined contribution scheme assets will be 1% of fund value a year. DWP research paper 608[11], suggests that in a typical group personal pension plan or stakeholder pension scheme the explicit administration charges are typically between 0.4% and 1.0% and that investment management charges (which may not be explicit) are typically around 0.5%, or higher for active management. Individual personal pension plans may have higher levels of charges than this. High-earners often use SIPPs and SSASs which will generally have additional charges. I am therefore effectively assuming that a typical individual with a substantial pension fund will shop around to achieve charges towards the lower end of the usual range.

3.45 The expenses assumption is intended to represent the most common outcome for the relevant individuals.

Pension increases and inflation

3.46 Discount rates need to be net of pension increases in deferment and payment. Public sector schemes increase benefits in line with the Consumer Prices Index (CPI) both in deferment and payment. In the private sector, increases in line with the Retail Prices Index are more common, albeit with various caps. I have assumed that typically benefits will increase at 0.25% a year more than CPI in payment.

3.47 The assumed rate of pension increases in payment is intended to be an average for the relevant individuals.

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[9] See Appendix F

[10] For examples, see the bibliography in Appendix G.

[11] DWP Research Report No 608, Dobson and Horsfield (2009) "Defined contribution pension provision"

3.48 It is appropriate that the assumed increases in deferment are consistent with the definition of the revaluation factor r used to determine the increase in pension over the year (see paragraph 2.8). I have assumed that this revaluation factor will be set for all schemes by reference to the increase in the CPI.

3.49 I have assumed that RPI will exceed CPI[12] by 0.75% a year on average[13]. I am content this is a reasonable assumption. I am unaware of any current official positions on this question.

3.50 The assumed gap between CPI and RPI is intended to be a best estimate.

Annuity purchase

3.51 I have assumed that the annuity purchased at age 70 will be priced consistently with gilt yields less 0.25% a year. Market annuity costs can be volatile, but on average should reflect the provider's investment in low-risk assets with a margin for expenses. Our analysis of current market annuity rates is broadly consistent with this interpretation.

3.52 The annuity pricing basis is intended to be a best estimate.

Derived discount rates

3.53 Taken together, these assumptions lead to net discount rates of:

- 3.25% a year before benefits come into payment,
- 3.0% a year after benefits come into payment but before age 70, and
- 1.75% a year after age 70.

3.54 For completeness, the mathematical derivation of these rates from the base assumptions determined above is given in Appendix D. The discount rates are important assumptions: the single valuation factor does vary materially for changes to the assumed discount rates.

[12] Technical aspects of the design of the two indices suggest that RPI will tend to be higher than CPI on average (RPI is an arithmetic mean and CPI is a geometric mean). There are also differences in the goods covered – RPI includes mortgage interest payments.

[13] HM Treasury "Budget 2007" and King, Bank of England "Inflation report press conference – 16 May 2007"

3.55 It should be noted that no allowance is made in the discount rates (or elsewhere) for the risk that a scheme becomes insolvent and fails to pay the benefits to which the charge relates. However, most schemes do not fail so the most common outcome is that benefits are paid. Additionally, it is possible that individuals with generous pension arrangements, particularly if working for companies with a poor covenant, might scale back their accrual so as not to be liable for Annual Allowance charges.

Typical current age and retirement age

3.56 The typical member affected by the reduction in the Annual Allowance limit is expected to be a relatively high earner. Chart 1 of Appendix B shows that the numbers of high earners peaks in the early-40s age band. This is felt to be mainly a feature of earnings patterns rather than an effect of the size of the population at different ages. However, the effects of the closure of many defined benefit schemes to new entrants and the inclusion of self-employed workers in the data (whose earnings may well peak at lower ages) mean that the average age of affected members is likely to be higher than the average age of high earners.

3.57 Chart 2 of Appendix B gives the aggregate figures from Chart 1 split between the public and private sector. Given the retreat from defined benefit provision in the private sector, it is expected that public sector workers will comprise a larger proportion of the individuals affected by the new Annual Allowance than might be implied by the relative numbers of higher earners in this sector. Public sector workers are generally eligible for defined benefit pensions, and so this chart provides direct evidence for the public sector workers who are likely to be affected. The chart shows that high earners in the public sector are on average in their late 40s.

3.58 The tendency of final salary schemes to effectively weight new accrual (as defined for Annual Allowance purposes) towards longer serving staff may also push up the average age of affected members. This occurs because the uplift to pension as a result of real salary rises is counted for Annual Allowance purposes, including the increase in respect of prior years of service. This effect is illustrated in Appendix C.

3.59 The form of the Annual Allowance calculation implies that charges are more likely for individuals who have already accrued substantial pensions. This suggests that the average age of the affected individuals might be weighted by accrued pension which would lead to a higher average age on a weighted basis. However, in the absence of data this has been ignored other than to be thought of as conceptual support for a higher age than shown in the raw data.

3.60 For the purposes of deriving the valuation factor I have assumed that the average age of affected members is 47. This is an important assumption: the factor does vary materially for changes to the assumed average age.

3.61 The choice of assumed retirement age is difficult because there is no robust evidence as to what high earners do in practice. Anecdotal evidence suggests that more take their defined benefit pensions early rather than late. The key date is not when people retire from employment but when the defined benefit pension is taken since (a) the law allows pension to commence while the individual remains in work and (b) many high earners move from single-job employment to a portfolio of jobs later in life without pension or perhaps with defined contribution pension.

3.62 From an examination of typical schemes, most central Government and private sector schemes (for high earners) have a normal retirement age of 60 for long-serving employees. It would be normal practice for late retirement to be neutral whereas early payment of benefits can often be preferential – and pension can be taken while still working. This suggests a reduction in the assumed age for pension to come into payment to below age 60. Without good data, I have chosen to make only a small allowance for this by assuming a retirement age of 59. This is an important assumption: the factor does vary materially for changes to the assumed average age when pensions come into payment.

3.63 Taking all of the above into account, I have assumed that the typical individual will have a current age of 47 and will retire at age 59. The new rules will commence in 2011/12. If the factor is retained for say ten years, the mid-point of the period will be 2016. An individual who is 47 in 2016 will be 59 in 2028. We have therefore assumed mortality consistent with an individual who was born in 1969. This is not a significant assumption, but does have some effect on the mortality rates taken from the standard tables described above.

3.64 The assumed current age is intended to be an average for the relevant individuals.

3.65 The assumed age when benefits come into payment of 59 is intended to represent an average for the relevant individuals.

The derived valuation factor and sensitivity to assumptions

3.66 Based on the assumptions given above, which are summarised in Appendix E, the valuation factor would be 16.1:1. That is, the Pension Input Amount would be taken to be 16.1 times the annual amount of the deemed increase in pension over the year. In practice, this might be rounded to a factor of 16:1.

3.67 The derived valuation factor is particularly sensitive to the assumed discount rates, the assumed current age and the assumed retirement age. All other things being equal:

- if the assumed discount rates were 0.5% higher, then the valuation factor would be 14.0,
- if the assumed discount rates were 0.5% lower, then the valuation factor would be 18.6,
- if the assumed average current age were 42 instead of 47, then the valuation factor would be 13.7,

- if the assumed average current age were 52 instead of 47, then the valuation factor would be 19.0,
- if the assumed average actual retirement age were 61 instead of 59, then the valuation factor would be 14.8,
- if the assumed average actual retirement age were 57 instead of 59, then the valuation factor would be 17.6,
- if the assumed spouse's pension were paid at 67% of the member's pension, then the valuation factor would be 16.6,
- if there were no spouse's pension, then the valuation factor would be 14.5,
- if an annuity were assumed to be purchased at age 65 rather than age 70, then the valuation factor would be 16.8, and
- if the assumed average actual retirement age were 60 instead of 59, and the annuity was assumed to be purchased at age 65 rather than age 70, then the valuation factor would be 16.1.

3.68 The factor of 16:1 replaces the previous factor of 10:1, though much of the increase is due to the change in the definition of the increase in pension to which the factor is applied. The new factor may also be compared to the 20:1 currently used in the Lifetime Allowance test. The 20:1 factor is applied at retirement. Using the same assumptions as were used to derive the 16:1 factor recommended in this report, the equivalent factor on retirement at age 60 would be 23.6:1 and at 65 would be 22.2:1. That is, I am effectively assuming that pensions are more valuable than implied by the existing 20:1 Lifetime Allowance factor, since I am assuming higher life expectancy and lower discount rates. In my opinion, this seems appropriate compared to the position of 5 to 10 years ago when the previous factors were adopted.

3.69 We can also compare these factors to market annuity rates. For example, a joint life annuity at age 60 might currently be priced using a factor of around 32:1 (if it were linked to RPI). CPI-linked annuities are not common, but a consistent price might be around 28:1, if they were available on the open market.

4 Implications of a single valuation factor

4.1 The choice of a single valuation factor (which I recommend to be 16:1) to cover the wide range of affected individuals is necessarily a pragmatic decision, particularly in the absence of data on the individuals who are expected to be directly affected by the reduction in the Annual Allowance. There is no single objectively correct answer. In section 3 I set out a set of assumptions which lead to a valuation factor of 16:1. Other assumptions are possible, and would generally lead to a different valuation factor, in some cases materially different (as illustrated in paragraph 3.67).

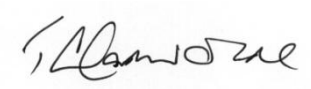
4.2 The use of a single factor means that the Annual Allowance as applied to defined benefit members effectively becomes a limit on the annual amount of new tax-privileged pension which a member can accrue each year (equal to the Annual Allowance limit divided by the valuation factor). Since it is generally accepted that accruing pensions are more valuable for older workers than younger workers, the use of a single valuation factor for all ages means that (all other things being equal) older workers will be able to accrue more valuable benefits than younger workers in a tax-privileged environment.

4.3 This is an unavoidable consequence of using a single factor rather than an age related factor. Of course, younger workers will ultimately become older workers and would then benefit from the opportunity to accrue more valuable benefits, if remaining in a scheme which still accrues defined benefits. I understand that during public consultation HM Treasury received strong representations that a single valuation factor was much preferable to age related factors, on grounds of practicality.

4.4 Similarly, most schemes provide spouses' pensions for married members. The use of a single factor to limit the tax-privileged accrual of both married and unmarried members means that married workers will be able to accrue materially more valuable benefits than unmarried workers in a tax-privileged environment. The factor, of necessity, is less generous for people who are single at retirement – a consequence of having a single factor.

4.5 Thus, it is in the nature of a single valuation factor to be more favourable to some individuals than others. There is no scope to eliminate this variability by adopting a different single factor value.

4.6 I look forward to discussing this report with HM Treasury.



Trevor Llanwarne

Government Actuary

13 October 2010

Appendix A Examples of high accrual

A.1 In this section we show two examples to illustrate how a member of a defined benefit pension scheme could routinely accrue pension which exceeds the expected new Annual Allowance. For these examples we assume that the valuation factor will be 16:1.

Example 1 – high earner, subdued salary growth, typical scheme

Pensionable salary at start of year: £200,000 a year

Salary growth: in line with inflation

Scheme accrual rate: 1/60

Pensionable service at year start: 5 years

Inflation over year: 2%

Pensionable salary at end of year: 200,000 x 1.02 = 204,000

Accrued pension at start of year: 5/60 x 200,000 = 16,667

Accrued pension at end of year: 6/60 x 204,000 = 20,400

Pension Input Amount = 16 x (20,400 – 16,667 x 1.02) = 54,395

Example 2 – steady real salary growth, generous scheme

Pensionable salary at start of year: £62,000 a year

Salary growth: regularly 2.5% over inflation, through steady career progression

Scheme accrual rate: 1/30

Pensionable service at year start: 20 years

Inflation over year: 2%

Pensionable salary at end of year: 62,000 x 1.045 = 64,790

Accrued pension at start of year: 20/30 x 62,000 = 41,333

Accrued pension at end of year: 21/30 x 64,790 = 45,353

Pension Input Amount = 16 x (45,353 – 41,333 x 1.02) = 51,093

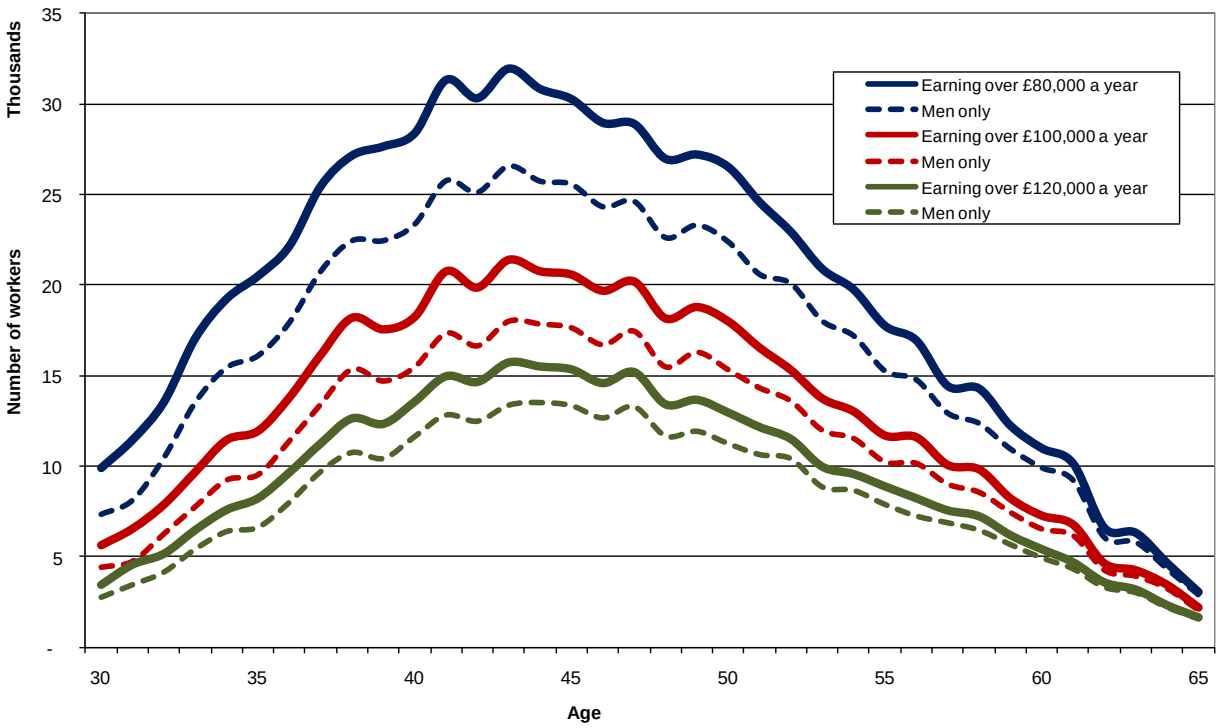
Appendix B Data on high earners

B.1 Her Majesty's Revenue and Customs (HMRC) have provided estimates of the age profile of high earners based on the 2007-08 Survey of Personal Incomes (SPI) data projected to 2010-11[14]. Analysis is limited to taxpayers with pay or self-employment income. While underlying sample sizes are not very large at some specific age levels, they are sufficient to provide an overview of the typical age profile of high earners. The data have been summarised into two charts which show:

- Chart 1: total workers and total men (and hence total women)
- Chart 2: public sector and private sector workers

B.2 Chart 1 gives the age profile for three levels of earnings: over £80,000, over £100,000 and over £120,000 a year. The lines show the number of workers (in thousands) earning above those thresholds at each year of age. The data are estimates for 2010/11. Solid lines are all workers, broken lines are men only.

Chart 1: earnings by age and sex



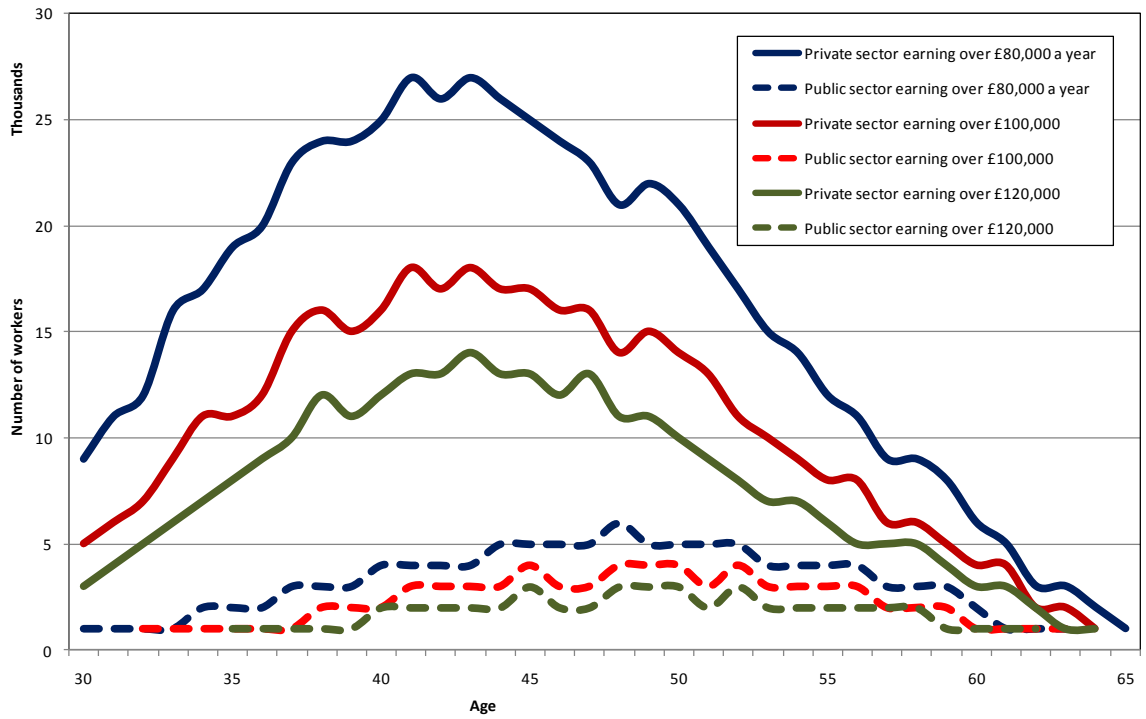
Source: HMRC projections based on 2007-08 Survey of Personal Incomes.

[14] See http://www.hmrc.gov.uk/stats/income_distribution/menu.htm

B.3 The chart shows that numbers of high-earners peak in the early 40s, and that most high earners are men.

B.4 Chart 2 gives the age profile for three levels of earnings: over £80,000, over £100,000 and over £120,000 a year. The lines show the number of workers (in thousands) earning above those thresholds at each year of age. The data are estimates for 2010-11. The SPI records industrial sector for most taxpayers except those already in receipt of pension income. For the purposes of this analysis, GAD has treated workers in the public administration, defence, education, and health and social work sectors as public sector (broken lines), and all those remaining as private sector (solid lines).

Chart 2: earnings by public and private sectors



Source: HMRC projections based on 2007-08 Survey of Personal Incomes.

(GAD's breakdown between public and private sectors is described in paragraph B.4)

B.5 The chart shows that staff on high earnings tend to have a higher average age in the public sector compared to the private sector. Since a higher proportion of public sector workers are in defined benefit pension schemes this helps inform the assumption on the average age of high earning members of defined benefit schemes.

B.6 Public sector workers tend not to have high levels of variable remuneration, such as bonuses. The data on private sector workers will include variable remuneration and also the earnings of self-employed workers. Since variable remuneration is typically excluded from definitions of pensionable pay, and self-employed workers are not members of defined benefit schemes, this chart may suggest that the high earning members of defined benefit schemes will have a higher average age than the raw data on high earning individuals in the private sector might imply.

Appendix C Accrual in defined benefit schemes

C.1 The table below illustrates the tendency of final salary schemes to weight new accrual (as defined for Annual Allowance purposes) towards longer serving staff. This occurs because the uplift to pension as a result of real salary rises is counted as new accrual for Annual Allowance purposes, including the increase in respect of prior years of service.

C.2 The table assumes that pensionable service starts at age 30, and that the member has a pensionable salary of £70,000 a year at age 40. It assumes that real salary growth is 2% thereafter, being a combination of general salary inflation and promotional salary growth. For simplicity, prices inflation is taken to be zero – this does not affect the point under consideration. Pensions are assumed to be 1/60 of salary for each year of service. The effect is tabulated for ages 40 to 55.

Age	Service	Salary £	Accrued pension £	Annual increase for AA £
40	10	70,000	11,667	1,373
41	11	71,400	13,090	1,423
42	12	72,828	14,566	1,476
43	13	74,285	16,095	1,529
44	14	75,770	17,680	1,585
45	15	77,286	19,321	1,642
46	16	78,831	21,022	1,700
47	17	80,408	22,782	1,761
48	18	82,016	24,605	1,823
49	19	83,656	26,491	1,886
50	20	85,330	28,443	1,952
51	21	87,036	30,463	2,019
52	22	88,777	32,552	2,089
53	23	90,552	34,712	2,160
54	24	92,364	36,945	2,234
55	25	94,211	39,254	2,309

Appendix D Deriving the discount rates

D.1 The financial assumptions underlying the discount rates are discussed in section 3. Net discount rates are then derived from the assumptions as follows (all rates are annual):

Assumptions:

RPI is CPI + 0.75%

Index-linked gilt (ILG) return is RPI + 1.5% = CPI + 2.25%

Return on return-seeking assets (RSAs) is return on ILGs + 3% = CPI + 5.25%

Pension increases in deferment are CPI

Pension increases in payment are CPI + 0.25%

Charges before annuity purchase are 1.0%

Annuities are priced at ILG return – 0.25% = CPI + 2.0%

Investment strategy before annuity purchase = 1/3 ILGs and 2/3 RSAs

Deriving the net discount rates in deferment:

Return on ILGs net of pension increases =

(CPI + 2.25%) – CPI = 2.25%

Return on RSAs net of pension increases =

(CPI + 5.25%) – CPI = 5.25%

Return on portfolio before retirement, net of pension increases and charges =

(2/3 x 5.25% + 1/3 x 2.25%) – 1.0% = 3.25%

Deriving the net discount rates in retirement:

Return on ILGs net of pension increases =

(CPI + 2.25%) – (CPI + 0.25%) = 2.0%

Return on RSAs net of pension increases =

(CPI + 5.25%) – (CPI + 0.25%) = 5.0%

Return on portfolio before annuity purchase, net of pension increases and charges =

(2/3 x 5% + 1/3 x 2.0%) – 1.0% = 3.0%

Discount rate for annuity pricing, net of pension increases =

(CPI + 2.0%) – (CPI + 0.25%) = 1.75%

D.2 Note that we have used arithmetic differences in deriving the discount rates, based on the structure of our assumptions. A rationale involving geometric differences could be adopted to get slightly different discount rates but the ultimate recommendation would not be materially different.

Appendix E Summary of the proposed actuarial assumptions

E.1 The proposed actuarial assumptions are discussed in section 3. They are summarised here for convenience:

The valuation factor is a deferred annuity factor. Pensions are assumed payable for life and guaranteed for five years.

Mortality

Member's mortality in line with the standard table S1NMA_L,

Spouse's mortality in line with the standard table S1DFA_L,

Mortality improvements in line with the Office for National Statistics' 2008-based principal population projections, and

Mortality rates assume that the member was born in 1969.

Typical member

Typical affected individual is a married man. Wives are assumed to be three years' younger than husbands.

The member is assumed to be aged 47 and that benefits come into payment at age 59.

Spouses' benefits

A spouse's pension of 50% of the member's pension (reflecting the overall combination of level of spouse's pension and proportion of members who are currently married).

Net discount rates (after expenses and pension increases)

3.25% a year before benefits come into payment,

3.0% a year after benefits come into payment but before age 70, and

1.75% a year after age 70.

Appendix F Index-linked gilt yields

F.1 The following table provides information on typical index-linked gilt yields in the period 2000 to 2010.

Yield on index-linked gilts*

	1 Jan	1 Apr	1 Jul	1 Oct
2000	1.84	1.85	1.84	2.01
2001	1.92	2.24	2.42	2.40
2002	2.29	2.29	2.18	2.06
2003	2.12	2.03	2.00	2.02
2004	1.96	1.76	1.90	1.78
2005	1.60	1.67	1.44	1.35
2006	1.06	1.12	1.34	1.08
2007	1.11	1.24	1.46	1.20
2008	0.90	0.83	0.75	0.90
2009	0.82	1.04	0.85	0.65
2010	0.65	0.69	0.76	0.57

* this is the yield on over 15 years index-linked gilts, averaging the yields for 0% and 5% inflation. Taken from the previous working day.

Appendix G Bibliography

The following references provide information on the additional return expected to be earned on return-seeking assets:

Siegal (1999) “The Shrinking Equity Risk Premium”

Dimson, Marsh and Staunton (2002) “Triumph of the optimists, 101 years of global investment returns”

Fama and French (2002) “The Equity Premium”

Carhart and Winkelmann (2003) “The Equity Risk Premium, Modern Risk Management”

PricewaterhouseCoopers (2007) “Review of FSA Projection Rates”

Graham and Harvey (2009) “The Equity Risk Premium amid a Global Financial Crisis”