Review of the financial model prepared by the Government Actuary’s Department for use in examining the costs of the Financial Assistance Scheme

Department for Work and Pensions

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Executive summary

The Government Actuary’s Department (GAD) has constructed a model in Microsoft Excel to estimate the cashflows likely to be paid to claimants from the Financial Assistance Scheme (FAS). The model has been applied to sample data supplied by a range of pension scheme administrators to identify expected cashflows in respect of claims from the representative sample (and hence model the full population) of candidates for the FAS.

We have been retained by the Department for Work and Pensions (DWP) to review the model prepared by GAD and to assess its fitness and accuracy. As part of our work we have reviewed:

– the data supplied by scheme administrators

– the methodology for estimating likely costs

We have estimated the effect on the predicted likely costs resulting from uncertainties in the operation of scheme winding-up and the amounts available to candidate members for financial assistance.

Overall conclusion

The model is well-constructed to provide a reasonable estimate of the likely cashflows from FAS.

The model allows the user flexibility to model a change in the rules or level of coverage and in our view is capable of being used to illustrate the change in cashflows as a result of changing, amongst other things, the percentage assistance or the age from which the member is eligible for assistance from FAS.

Actual cashflows of FAS could be different from those indicated by the model because of the way in which trustees of pension schemes choose to spend the funds they have available, the change in the cost of buying-out pensioner annuities, the moratorium on buying-out annuities and experience being different from that assumed.

If index-linked pensions were secured by scheme trustees for deferred pensioners, rather than the level pension assumed in the methodology of the model, the cost to FAS could be higher than determined by the model due to the higher level of assistance required to bring the FAS beneficiaries up to the given proportion of their Expected pension. The specification of the form of pensions to be purchased appears to be a matter of policy consideration and use of the model should reflect whatever policies follow the moratorium. DWP has advised that it is looking to ensure that the assessment provisions of the FAS be redesigned so that the value of any unreasonable indexation may be taken into account in assessing the level of required FAS assistance. DWP may also wish to consider whether further changes may be made in order that any indexation may be taken into account. Given that only around a quarter of potentially eligible schemes have completed their winding-up, and we understand that the majority of these will have used available assets to secure level pensions in line with the priority orders, the effect of this uncertainty should be capable of being limited.

Data

Data was requested from ten scheme administrators for members potentially eligible to be members of FAS. While the data request was more limited than we would normally expect to see for full member calculations, overall, the quality of data is at a level we would expect from typical administration departments and so we have no material concerns on the use of the data on a “fit for purpose” basis for the modelling of FAS cashflows.
From a total of 18,448 member records, GAD identified 12,362 valid records, with almost half of the valid records being from one administrator alone. This data set represents approximately 10% of around 120,000 candidate applicants for FAS. Such a large sample size gives high confidence in the accuracy of any predictions made for the population as a whole.

It is impossible to determine exactly how much uncertainty there is in a 10% sample of a large population of data. We would expect it to be unlikely that the modelled FAS overall costs were outside a range of +/-5% from the correct figure.

We have performed analyses on the funding levels, pension size, age profile and scheme size, and confirm there is no material bias from the concentration of the data being from the one administrator, and that the 12,362 records closely match the records of members from wound-up schemes held by the FAS Operational Unit (FASOU).

Hardware restrictions mean the model has had to be run on a subset of 4,945 (40%) of the 12,362 records. We have examined this subset and can confirm that this is representative of the full data and thus enables the results to be used with confidence with a consequently higher grossing-up factor of approximately 24.3 (120,000 / 4,945) than would have been needed were the full set of records used.

Differences in the priority orders given to various benefit slices and member categories by administrators, the shape of pensions they have purchased or committed to purchase (level or increasing) and the change in the cost of buying-out annuities, does however mean there are some limitations.

Full detail of our review of the data is in section 2 of this report.

**The Model**

We have reviewed version 5.9 of the model, which incorporates changes made as a result of our comments on earlier versions, as they were being developed by GAD. A detailed description of the methodology adopted and our comments are included in Appendix A.

In most cases the data contains, firstly, the member’s entitlement under the scheme rules (Expected pension), as at date of leaving, and secondly, the amount of assets available from the scheme to provide benefits (of necessity lower than the scheme rules would have provided) for that member.

The model then takes the assets available for the member and estimates the amount of pension which could be secured (Actual pension) using annuity values which reflect the mortality assumptions used in buy-out calculations by typical insurers.

The model has been written to allow the user to change the shape of FAS assistance, to reflect potential legislative changes to FAS e.g. the model can accommodate changes to percentage level of assistance, ceilings and post-97 increases.

The model is complex and requires an understanding of consistency between the data in the model and the full FAS population projections which are made. Adjustments are available to alter the output on the basis of funding level reduction and enhancement factors.

Full detail of our review of the model is in section 3 and Appendix A of this report.

**Sensitivities**

The assumption that a level pension is secured by trustees simplifies the reality of the winding-up of a pension scheme. In practice, scheme rules would tend to entitle the member to a mix of GMP, some of which may have fixed increases, and excess pension, which may have inflation-linked increases. In deciding

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1 The model excludes pensioners, and 120,000 is the DWP estimate of the number of deferred pensioners potentially eligible for FAS
on the method to use in winding up a scheme, trustees of the different schemes who provided the data have taken different approaches in the allocation of available assets and provision of pension increases.

The sensitivities specified in our report are based on the assumptions stipulated in section 3.4. Full detail of our review of the modelling sensitivities and a table of uncertainties is in section 4 of this report.

Based on all the uncertainties around the data sampling and modelling, a reasonable estimate of the range of uncertainty is that costs could be as much as 12% lower or 7% higher than central point estimates. This range includes a 5% estimate by us of the possible deviation in the predicted cashflows as a result of data sampling.
1. Introduction

1.1 Our remit

Our remit is to provide validation (or otherwise) on the following areas of the model:

- Consistency of data items and whether data has been processed in accordance with FAS rules.
- Whether the data in the model is a sufficient and random sub-sample, representative of the sample data cleansed by GAD and the data on wound-up schemes supplied by FASOU.
- Validation of the model including a review of methodology used and whether the methodology is in line with actual FAS rules.
- Consideration of the range of assumptions made in the model, with an assessment of resulting likely sensitivity.
- Comment on the ability of the model to adjust to changes in the FAS structure over time.

We do not in our work cover the legal analysis of the rules of FAS, sections 73-75 of the Pensions Act 1995 and sections 18-19 of the Pensions Act 2007, insofar as they relate to the amounts paid by FAS to individual claimants.

1.2 Financial Assistance Scheme

FAS offers financial help to some people who have lost out on their pension because their scheme did not have sufficient funds to pay them their entitlement under the scheme rules when it started to wind-up, and the employer is insolvent or no longer exists.

Pensions Act 2004 made provision for assistance from FAS to be payable to members from age 65 where their pension scheme began to wind-up in the period 1 January 1997 to 5 April 2005. Members of schemes which began to wind-up from 6 April 2005 receive protection through PPF. FAS regulations and Pensions Act 2007 have since modified the eligibility conditions and level of assistance payable to members.

From December 2007, subject to passage of the regulations, the level annual pension now to be payable from FAS is that required to top up the Actual pension to 80% of the member’s Expected pension, irrespective of the member’s proximity to NRA, with the cap on the total annual pension payable to the member increased to £26,000. Where the Actual pension is 80% or more of the Expected pension, no assistance is available from FAS.

1.3 Model

The model is in Microsoft Excel format and illustrates the expected cashflows arising from FAS on a year-by-year basis for each future year, on the basis that members receive assistance from FAS from a specified age. In practice, there are delays in the assistance being made available to members due to work in progress by pension scheme administrators in developing initial claims.

The model allows the user to change the shape of FAS assistance to reflect future potential legislative changes to FAS, e.g. the model can accommodate changes to the age from which members are eligible for assistance from FAS, percentage of levels of assistance, caps on the total pension received by the member and possible indexation, whether on post-97 assistance or on total assistance.
2. Data

2.1 Source of data

Data for individuals who may qualify for FAS was requested from ten consultant firms and insurers responsible for the administration of pensions for those schemes likely to be FAS candidates, in a letter dated 30 May 2007 from Andrew Young. This letter is reproduced in Appendix B. Seven of the ten firms responded with 18,448 records to be used for the data sample for the model. This compares to a total actual estimated FAS claimant population of around 120,000 members (plus another 5,000 or so pensioner records).

We understand from our conversations with firms supplying the data that there was very limited data supplied to DWP in respect of pensioners. We do not consider this to be surprising as pensioners are unlikely to qualify for FAS as in most (but not all) cases, they are entitled to full benefits as a result of having higher priority charge on the assets of their pension scheme. Thus, the majority of the information supplied was for deferred members.

2.2 Data Request:

The data requested was relatively limited, being:

- Date of birth
- Sex
- Date of leaving employment
- Scheme normal retirement age
- Total GMP at date of leaving
- Excess pension subject to statutory revaluation at date of leaving
- Excess pension not subject to statutory revaluation at date of leaving
- Estimate of pension likely to be secured with available assets at normal retirement age
- Assets available to secure pension if estimate of pension not provided
- Date of estimate

Dates of starts of wind-up added to the data by the DWP, based upon the administrative data for schemes held by FASOU.

For some members, the date of joining scheme has also been supplied and included in the data set; for the most part, however, the date of joining has been estimated for the splitting of pension into pre and post 97 periods.

2.3 Chosen sample

The modelling has been undertaken for a sample of 4,945 records, determined as follows:

a) information on 18,448 members received from the firms which responded

b) from these, data on 12,898 members has been deemed as usable by GAD, following rejection of 5,550 members deemed unusable because of absence of key information or inconsistencies. Data in
respect of pensioners who retired prior to scheme wind-up and so are already receiving their full benefit entitlement were also excluded at this stage.

c) from these, 536 members have been excluded on the basis that their Actual pension is greater than their Expected pension at NRA, under the 2004 FAS OU annuity factors, and hence funding level exceeds 100%, so would not be eligible for assistance from FAS

d) from the remaining 12,362 members the model sample of 4,945 has been selected randomly

From a total of 18,448 member records with 12,362 valid records, this data set represents approximately 10% of around 120,000 candidate applicants for FAS. Such a large sample size gives high confidence in the accuracy of any predictions made for the population as a whole. It is impossible to determine exactly how much uncertainty there is in a 10% sample of a large population of data. We would expect it to be unlikely that the modelled FAS overall costs were outside a range of 5% from the correct figure.

2.4 Data quality

The data held for each member is more limited than we would normally expect to see for full member calculations. Whilst there is a small proportion of records which show inconsistencies, we would note that overall, the quality of data is at a level we would expect from typical administration departments and so have no material concerns on the use of the data on a "fit for purpose" basis for the modelling of FAS cashflows. Had time permitted, we expect the quality of data could have been improved. However, since the supply has been done voluntarily in response to a request for help, the approach of concentrating on the supplied data appears to be sensible – so excluding non-sensible or incomplete data - seems reasonable.

A limitation on the validity of the data is the lack of information on the benefits provided to the pensioners, who are commonly not candidates for FAS. In some cases, because of recent changes in pensioner buy-out costs, we have been informed by administrators that they believe that the amount of assets needed to provide pensioner benefits may be lower today than it was when the assets were determined for allocation between pensioners and non-pensioners and thus allow more for the provision of future pensions for non-pensioners. It is impossible in the absence of actual pensioner data to estimate the effect of recent improvements but we expect the impact of cheaper costs of securing pensions for those pensioners not yet bought-out by scheme administrators, to result in perhaps 5% more assets available to non-pensioners, which itself would reduce total cashflows of FAS by about 3%.

2.5 Exclusion of data points deemed unusable by GAD

We have viewed the comments made by GAD, on a scheme-by-scheme basis, setting out their reasons for any exclusion which tend to be data being in the incorrect format or incomplete. Our review of the exclusions supports the approach taken by GAD, in particular in endeavouring to avoid the bias which would have been created in relation to schemes where older and younger members had been treated differently by the administrators.

A further 536 members have also been excluded by GAD, with agreement from DWP, on the basis that these members have funding levels greater than 100%, under the 2004 FASOU annuity factors. The need for such removal of these members suggests:

- this may be in part because of the way in which the model has estimated what may be provided from the funds available;
- potential issues with the quality of the original data sent, or cheaper annuities such that full pensions can now be provided and hence their scheme has sufficient funds and so these members are unlikely to be candidates for FAS;
- significantly different assumptions used by the scheme actuary in determining the share of fund, perhaps by way of allowing for increasing pensions;
• overvaluing of FAS assistance if such members are representative of the population

If the full population of FAS applicants contains a similar population, then excluding them from the model will have the effect of overstating the average level of compensation for the remaining cases. The excluded nil compensation cases represent about 4% of the population and so the maximum level of such overstatement will be 4%.

There is a risk that by losing the 536 members, some accuracy of the model is lost, however given the quantum of such exclusions we are content that the exclusion of these members from the subset of the population in the model does not materially skew the results obtained from the model, when rating up the subset to the overall population set.

2.6 Internal consistency of data

Given the data supplied and the extent of our remit, we have not audited the data provided by the various firms. We have however performed consistency checks within the member records in the model sample, to ensure existence of relevant data, and sensible dates of birth, joining & leaving and tests on statutory revaluation.

We have also had conversations with six of the seven firms who responded to the data request from DWP to see if there is consistency in the treatment of converting the pension which the member is entitled to within the scheme rules to an affordable capital value, and consistency with the treatment as set out in regulation. Our understanding following these conversations is that the calculation of the Actual pension provided by the firms (which offsets the assistance due from FAS) varies between scheme priority rules and those under s73, though most adopt the allocation from the s73 breakdown. The model assumes that level pensions are provided from the estimated funds available per member and therefore does not depend on an allocation of funds by class of benefit.

2.7 Representativeness

We have analysed the data to assess the representativeness of the records for the 12,362 members and also against the data on wound-up schemes held by FASOU.

The following anonymised table sets out the number of members for whom data was supplied by each of the seven firms.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Total number of members</th>
<th>Number of schemes</th>
<th>Average members per scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>449</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>B</td>
<td>447</td>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>C</td>
<td>7,151</td>
<td>32</td>
<td>223</td>
</tr>
<tr>
<td>D</td>
<td>1,681</td>
<td>9</td>
<td>187</td>
</tr>
<tr>
<td>E</td>
<td>3,906</td>
<td>13</td>
<td>300</td>
</tr>
<tr>
<td>F</td>
<td>2,958</td>
<td>8</td>
<td>370</td>
</tr>
<tr>
<td>G</td>
<td>1,357</td>
<td>16</td>
<td>85</td>
</tr>
<tr>
<td>Total</td>
<td>17,949*</td>
<td>92*</td>
<td>195</td>
</tr>
</tbody>
</table>

*The final dataset supplied by the DWP to GAD was actually 18,448 members from 93 schemes – the difference in member/scheme numbers is due to one further scheme being added to the final dataset when compared to the dataset the above analysis was conducted on.
The 12,362 cases retained are broken down in the table below, by the firm which supplied the data, with the “Usable proportion” being the number of members retained as a percentage of total number of members.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Number of members retained</th>
<th>Usable proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>300</td>
<td>67%</td>
</tr>
<tr>
<td>B</td>
<td>446</td>
<td>100%</td>
</tr>
<tr>
<td>C</td>
<td>6,038</td>
<td>84%</td>
</tr>
<tr>
<td>D</td>
<td>703</td>
<td>42%</td>
</tr>
<tr>
<td>E</td>
<td>1,210</td>
<td>31%</td>
</tr>
<tr>
<td>F</td>
<td>2,656</td>
<td>90%</td>
</tr>
<tr>
<td>G</td>
<td>1,009</td>
<td>74%</td>
</tr>
<tr>
<td>Total</td>
<td>12,362</td>
<td>69%</td>
</tr>
</tbody>
</table>

The usable proportion varies between firms, reflecting the varying degrees of quality of the data, possibly on account of the degree of progress made by each firm in examining the information relating to the schemes for which they are responsible, though we have not had access to the firms and their data in order to investigate this further.

We are comfortable with the work done by GAD in determining the usable data and do not find the inability to use 31% of the data unusual in the context of the voluntary nature and time constraints under which the data was obtained from administrators, in respect of schemes that are generally still going through the wind-up process. In reality great care is taken over the lengthy wind-up period to ensure that inconsistencies in occupational pension records are fully resolved to ensure correct pensions are paid.

In practice, the model has been run on a random sample (whose randomness we have verified) of 4,945 members (40% of the full data) because of hardware restrictions.

In order to identify whether or not the sample data is representative of the data on wound-up schemes held by FASOU we have conducted tests on the distribution of the schemes, by firm.
Test 1: Comparison of the number of members covered by schemes of various sizes, analysed by firm. The following graph shows the number of members in schemes of fewer than 50 members, 50 – 100 members, 100 – 200 members and over 200 members in the final sample used for the model.

Firm C, which supplied the largest amount of data has a higher than average proportion of small schemes, but in terms of the number of members, these small schemes constituted well under 10% of the data set. Overall, 80% of the population included in Firm C’s data set comes from schemes with more than 200 members. Firms A and G have relatively small schemes, accounting for only 12% of the total population and so are unlikely to have seriously affected the distribution of the final answer.
Test 2: Comparison of the funding levels to assess impact of data from firm C.

We have been supplied with data for 5000 members - a subset of the 12,362 with the records supplied from firm C removed. This has been done in order to allow us to consider whether the data supplied by firm C, which constitutes the majority of the full sample, is very different to data supplied by other firms. We have therefore compared the distribution of funding levels for this sample of 5000 with the full sample, by illustrating the percentage of members in each sample that fall into the particular funding level bands, in the chart below. It can be seen that the maximum deviation in the two samples is 5%, on the basis of which we believe there is no problem in relying so heavily on company C for the data sample.

It should be noted that our analysis of funding levels above was undertaken using a model version prior to the latest version, 5.9 which strengthened the basis upon which funding levels are assessed. However, the differentials and conclusions that may be drawn will be broadly unchanged.
**Test 3:** We have done some extensive work (again using a model version prior to the latest version 5.9) looking at the bias (if any) introduced by the degree to which firm C may not be representative of the population as a whole.

Firm C constitutes just under half of the usable sample data population (6038 out of 12362) whereas correspondence between firm C and DWP indicates they constitute only 8% of the total FASOU population compared with 52% of the total population represented by the 7 firms supplying data (meaning the weighting on the data from firm C is 8/52). So in theory the data sample from firm C could be scaled down to reflect their actual FASOU population proportion.

The funding level averages 34.1% for the 4945 sample but 36.5% for the 5000 sample, suggesting that the sample from firm C has a slightly smaller funding level than the average and thus a slightly higher FAS cost. Taking 32% of the 4945 sample plus 68% of the 5000 sample produces the correct weighting of 8/52 for firm C and a funding level of 35.7%. On this basis, we can conclude that a balanced population has a funding level 1.6% (35.7% - 34.1%) higher than the biased population.

Turning to the estimate of overall FAS costs, we have examined these on the basis of a population of 120,000 cases, by rating up the results obtained using the model sample and the sample of 5000 members (which excludes firm C).

Using the full sample, using a discount rate of 5.5% and assumptions being as received from GAD we estimate that this overstates the result by around 4% on an undiscounted basis and 6% on a discounted basis compared with figures obtained by interpolating to correct the minor bias from the cases supplied by firm C. In our view, this kind of difference is very minor (and might well be accounted for by statistical random variations in the populations anyway).

We have not made any adjustments for the composition of cases from other firms supplying data. We could go that far and adjust each firm's data to the proportion which their cases represent but this would have only minor effect overall on the results, which appear very similar as between firms.

Running the results above on version 5.9 will result in lower funding level averages; however the *differentials* and *conclusions* that may be drawn will be broadly unchanged.
Test 4: As a further check, we have examined the levels of both the Actual pension and Expected pension for the full sample and the sample of 5,000 (which excludes firm C), which shows similarity in its distribution by size.

Test 5: Comparison of the age profile within the model sample and the FASOU data.

To ensure there is no systematic bias in the age profile of the membership, we have compared the age profile within the model sample and that in the data held by FASOU. As can be seen in the graph below, while the FASOU cases tend to be slightly older, the difference is not material.
3. Model

3.1 Methodology

There are four main stages in the calculation of expected cashflows from FAS, within the model.

Stage 1

Calculation of the fund value available to each member or Actual pension amount – one of these two to be provided by the scheme actuary

The model can work with data containing either a “fund value” amount or a rate of “actual pension”.

For the majority of members in the model, there is no explicit data item for the Actual pension. In about 90% of the modelled cases, a fund value has been supplied instead, relating to the scheme assets available for each member, to be used to secure a pension from the scheme.

Following our discussions with six of the seven firms who provided data in response to the request by DWP, it is clear there is variation in the approach adopted – and legal advice received - by different trustees, in regards to the type of pension purchased and the priority order applied in the allocation of scheme assets to different classes of members and different types of pension. Our conversations indicate that some trustees have adopted scheme priority winding up orders, though most now use s73 priority orders.

We discuss the shape of the Actual pension purchased and priority orders in more detail in section 4.

Stage 2

Conversion of the fund value provided by the scheme actuary into an Actual pension amount.

The model uses fixed annuity factors to convert fund values provided by the scheme actuary into an Actual pension amount. The mortality assumptions underlying these annuity factors reflect what we believe to be a typical insurer’s buy-out basis. The main details of the basis used for deriving annuities in the model are as follows:

- Increases on the actual pension in line with RPI (presumably capped at 5%) pre-retirement
- No increases in payment
- Member mortality: PFA92 (B=Year of birth) long cohort with 2% underpin on improvements (underpin takes effect immediately in 1992)
- Spouse mortality: PMA92 (B=Year of birth) long cohort with 2% underpin on improvements (underpin takes effect immediately in 1992)
- Proportion married: 80%
- Interest rate pre retirement: 1.5% representing a "central" index-linked gilt yield of 2% less a 0.5% margin
- Interest rate after retirement: 4.0% representing a "central" conventional gilt yield of 4.5% less a 0.5% margin
- Expense allowance: 2%
Our checks on the annuity factors, which are hard-coded in the model, confirm consistency with this basis.

A market value adjustment factor (MVA) amends the interest rate assumptions underlying the annuity factors above to reflect market yields at the Estimate date. Strictly the MVA factor should be based on the same mortality assumptions as underlying the annuity factors; however we note that the MVA factors in the model continue to be based on the mortality assumptions underlying the 2004 FASOU factors as used in previous versions of the model.

To illustrate the potential misstatement that might arise, we would note that if fixed interest gilt yields were to drop to 3.5% (1% below the central assumption) and an individual’s actual pension reflected at least half of their FAS target assistance, we estimate that using MVA factors with a mortality basis consistent with that underlying the annuity factors inherent in version 5.9 of the model, rather than that of the FASOU factors could increase FAS cashflows by up to 1.5%.

However, in practice the understatement is likely to be rather less than 1.5%, reflecting the fact that typical funding levels for the FAS member data-set are often a smaller proportion of the FAS target assistance rate, so any over-estimate of actual pension will have less of an impact on the estimate of the FAS assistance needed.

The impact of continuing to adopt the 2004 FASOU MVA factors will also depend upon the differential between actual market gilt yields on the date of use, compared to the central assumption of 4.5% that is assumed by the model for yields on fixed-interest gilts. In fact, current market yields on fixed interest gilts are actually higher than the 4.5% central assumption implicit in the MVAs, and so not updating the MVAs will result in annuity factors currently being over-stated, hence under-stating the FAS actual pension, and thereby over-stating (very slightly) the FAS assistance cashflows.

We therefore conclude that we believe the impact of not updating the MVAs is not material within the context of other sensitivities that impact the model.

**Stage 3**

**Calculation of the amount of assistance that each individual is entitled to**

The model calculates the amount of FAS assistance that the individual is entitled to, by:

1) Calculating the full pension entitlement under FAS (related to the member’s scheme “expected pension” scaled according to the parameters used in the model to set the FAS level of assistance)

2) Taking the individual’s actual pension available from the Scheme (as calculated in Stage 2)

3) Calculating actual FAS assistance as the FAS entitlement in (1), offset by the individual’s actual scheme benefits.

The actual assistance from the FAS in (3) above is then used by the model in the next Stage 4 to assess future cashflows resulting on the FAS.

**Stage 4**

**Conversion of the assistance from FAS into cashflows over future years.**

This involves the application of the chosen mortality assumptions (which may be different to those underlying the annuity factors) to the assistance from FAS, to reflect the longevity of the individual and his/her spouse. The model provides a number of mortality tables with which the user can choose to project cashflows into the future. Actuarial tables included in the model are:

- “00” mortality tables
• “92” series tables with a choice of short, medium, long and no cohort effect
• UK population mortality tables
• High / low life expectancy UK tables

Any of the above tables can be combined with percentage adjustments, age ratings, underpins and mortality improvement factors, allowing the user high flexibility in modelling future cashflows.

DWP have confirmed that they do not require us to give a recommendation on the mortality basis for use in Stage 4.

3.2 Detailed checks undertaken on the programming of the model

We have undertaken a full analysis of the model (version 5.9), provided to us by GAD on 18 October 2007 and set out in Appendix A the structure of the worksheets within the model, the methodology adopted in each of the worksheets and our comments.

3.3 Overview of GAD manual

GAD has delivered a draft manual to be used in conjunction with the model.

The draft manual is a detailed document setting out the structure of the model on a step-by-step basis, providing a good audit trail on the process underlying the model.

3.4 Principal variables in the model

The following components are the main variables in the model, which can be set by the user, to enable flexibility to principally:

(i) cope with changes to the FAS basis over time;

(ii) reflect adjustments to size/shape of sample data; and

(iii) allow scenario testing.

We have included a brief description of the main inputs, together with the value of the assumption set (as per DWP instructions) for each component in version 5.9 of the model.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Brief description</th>
<th>Assumption set for component in v5.9 of the model supplied to us</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification date</td>
<td>The date at which certification of FAS assistance takes place</td>
<td>6 April 2007</td>
</tr>
<tr>
<td>Date from which age is calculated for age groups for summary stats</td>
<td>Date used to group data into age bands – only affects results presentation</td>
<td>6 April 2007</td>
</tr>
<tr>
<td>Date of calculating target assistance level</td>
<td>Used to determine target assistance (when assistance from FAS used to vary by how far individuals were from NRA)</td>
<td>14 May 2004</td>
</tr>
<tr>
<td>Parameter</td>
<td>Brief description</td>
<td>Assumption set for component in v5.9 of the model supplied to us</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Cap / de minimis assistance/ indexation</td>
<td>Allow the user to place caps (with indexation) on assistance from FAS, plus base level (de minimis) levels of FAS assistance</td>
<td>Cap of £26,000 (not indexed), De minimis £0</td>
</tr>
<tr>
<td>Allowing trivial commutation</td>
<td>Allows the user to set the maximum level of FAS benefits that can be taken as a single cash lump sum, rather than a lifetime pension</td>
<td>No</td>
</tr>
<tr>
<td>Age FAS assistance payable from</td>
<td>Whether FAS payable from 65 or scheme NRA</td>
<td>65</td>
</tr>
<tr>
<td>Revaluation of assistance relative to price inflation</td>
<td>Annual percentage rate of revaluation of FAS assistance between certification date and payment at 65 or scheme NRA in excess of revaluation in line with price inflation (can be negative)</td>
<td>Nil</td>
</tr>
<tr>
<td>FAS assistance for spouse</td>
<td>Proportion of FAS assistance payable to spouse on death of member</td>
<td>50%</td>
</tr>
<tr>
<td>Indexation of FAS assistance in payment</td>
<td>Whether FAS assistance is flat in payment or increases at RPI capped at 2.5% (allowing just post 97 and all pensions as options)</td>
<td>Flat</td>
</tr>
<tr>
<td>Method of FAS assistance calculation used</td>
<td>Switch between “current actual – 2 stage revaluation”, “current modelled” or “proposed” methods of calculating FAS assistance</td>
<td>Current actual – 2 stage revaluation</td>
</tr>
<tr>
<td>Target assistance level</td>
<td>Determines level of top up of actual scheme pension to expected scheme pension</td>
<td>80% for all</td>
</tr>
<tr>
<td>Enhancement factor</td>
<td>Allows user to adjust Actual &amp; Expected pension by the same proportion to reflect higher or lower expected FAS assistance</td>
<td>100%</td>
</tr>
<tr>
<td>Funding level reduction factor</td>
<td>Adjusts Actual pension from scheme (but not Expected pension)</td>
<td>100%</td>
</tr>
<tr>
<td>Rating up factors</td>
<td>Rates up sample data in model to full FAS population</td>
<td>120,000 / 4,945 = 24.2669363</td>
</tr>
<tr>
<td>Longevity assumptions</td>
<td>Used to determine the length of the cashflows projected by the model into the future (not used to convert scheme assets to pensions)</td>
<td>85% x UK 2004 population tables with improvements, no age rating or underpin (we are advised by the DWP that model v6.0 updates this parameter to UK 2006 projections)</td>
</tr>
<tr>
<td>Parameter</td>
<td>Brief description</td>
<td>Assumption set for component in v5.9 of the model supplied to us</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>Surviving spouse data</td>
<td>Assumptions for age difference of spouse and proportion married</td>
<td>Husbands 3 years older than wives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80% (70%) Males (Females) married</td>
</tr>
<tr>
<td>Accrual rate in original scheme and upper / lower bounds of pensionable salary</td>
<td>Used to estimate pre/post 97 service split when date of joining scheme not available</td>
<td>Accrual rate: 1/60th</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pensal lower: £5,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pensal upper: £200,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pensal bounds indexed at 6%pa</td>
</tr>
<tr>
<td>Inflation assumption</td>
<td>Used throughout model for indexation, revaluation of FAS assistance</td>
<td>2.87% HM Treasury assumption</td>
</tr>
</tbody>
</table>
4. Sensitivities

The sensitivities specified in our report are based on the model set to the assumptions in section 3.4 as the 'base scenario'.

4.1 Shape of pensions purchased by schemes

Our discussions with the firms supplying the data used in the model indicate that the shape of benefits assumed to be bought (the Actual pension) is not always a level pension.

As noted above, different schemes are adopting different approaches, e.g. many schemes have prioritised GMP increases before excess-GMP, and so have applied some assets to increasing rather than level pensions, resulting in a mismatch between the benefits actually bought by scheme and the benefits implied to have been bought by the model.

This point is discussed further in section 4.7, in particular with regards to the changes in statutory priority orders over time.

This point could result in selection against FASOU where the trustees have had a choice in whether, with the same amount of funds, the Actual pension bought is a level pension or with increases. If an increasing Actual pension is bought, then the initial amount of pension – that which will be offset against the Expected pension to determine the assistance from FAS - will be lower than a level annual pension. Hence the demand on resources of FAS would be higher were an increasing Actual pension bought-out, due to the cost of indexation.

It is not possible to quantify the actual impact on the model due to this point, given that we do not know what shape of benefits has actually been bought by the trustees of each of the individual schemes in the data set.

However, to illustrate the extremes of the sensitivity of the cashflows to this issue, we have considered the difference in the market cost of purchasing an increasing rather than a level pension with an insurer, by reference to the current market rates that we are observing as being adopted by insurers. We may expect a £1 p.a. level pension from age 65 (with half spouse) to cost £16.70, whereas a similar pension fully indexed in line with inflation might cost £28.40.

If the trustees of the schemes which have qualified for FAS all purchase pensions increasing in line with RPI (the extreme scenario) compared to the (other extreme) position where trustees all purchase level pensions, the Actual pension will in fact only be 59% of that calculated in the model (16.7 divided by 28.4). The specification of the form of pensions to be purchased appears to be a matter of policy consideration and use of the model should reflect whatever policies follow the moratorium.

By changing the funding level reduction factor from 100% to 59% we see the total FAS cashflows increase by 26% (based on the assumptions in the model set as per the assumptions detailed in section 3.4). However, the actual impact on modelled costs is likely to be significantly lower as in reality not all trustees will have or would in future purchase pensions fully inflation-indexed. Policy changes may also serve to protect against this strategy being undertaken.

DWP has advised that it is looking to ensure that the assessment provisions of FAS be redesigned so that the value of any unreasonable indexation may be taken into account in assessing the level of required FAS assistance. DWP may also wish to consider whether further changes may be made in order that any indexation may be taken into account. Given that only around a quarter of potentially eligible schemes have completed their winding-up, and we understand that the majority of these have used available assets to secure level pensions in line with the priority orders, the effect of this uncertainty should be capable of being limited. The costs will only be higher for those small numbers for whom indexed pensions have already been provided, which we believe is very small. The overall effect on cashflows is unlikely to be more than 2 or 3% in relation to any such situations in the schemes already wound-up.
4.2 Exclusion of member data where Actual pension exceeds Expected pension

GAD has excluded from the 12,898 records 536 records where the model has determined that the funding level is greater than 100% i.e. where the Actual pension is more than the Expected pension. This may be in part because of the way in which the model has estimated what may be provided and in part because there are members in the data who are unlikely to be candidates for FAS. If the full population of FAS applicants contains a similar population, then excluding them from the model will have the effect of overstating the average level of compensation for the remaining cases. The excluded nil compensation cases represent about 4% of the population and so the maximum level of such overstatement will be 4%.

The 536 cases with funding levels greater than 100% have been determined using the 2004 FASOU annuity factors, rather than those embedded in version 5.9 of the model, which are reflective of a typical insurer’s buy-out basis. We expect therefore, that if version 5.9 of the model was re-run for the 12,898 cases, less than 536 members would have a funding level greater than 100%. Given the quantum of the data however, the effect on the cashflows is likely to be immaterial.

4.3 Fund value calculation

Given that the fund values available to each member are converted to an Actual pension using a fixed methodology (described in section 3, under stage 2), differences in determining the fund value - whether by way of different priority orders, different allowances for pension increases or different allowances for spouse’s benefits - will filter through in the conversion of the fund value to an Actual pension amount, resulting in inconsistencies between results for different members.

For those schemes where the annuities for pensions-in-payment have not yet been purchased, particularly where the cost of buying-out these annuities was estimated some time ago (e.g. in 2005), the cost of buying-out pensioner annuities under current market conditions may be lower than at the Estimate date, particularly where the estimate was obtained some time ago. Due to cheaper buy-out costs, the funds available for remaining FAS claimants may possibly be, at a maximum, 5% higher than that assumed in the model, and subsequently, the resulting total cashflows from the assistance paid by FAS up to 3% lower than indicated by the model.

4.4 Mortality assumptions underlying the model

Different mortality assumptions underlie the various stages of the model as detailed in section 3. The difference in the assumptions adopted in stage 1 (to reflect the views of the scheme actuary) and stage 2 (to reflect a buy-out basis typically adopted by insurers – their expected future mortality experience, competition, caution and profit margins) of the model affects less than 10% of the members (as Actual pension has been provided by the scheme actuary for less than 10% of the members). There is not sufficient information to enable us to assess what these differences are and this is not significant in the overall assessment by the model.

The difference in the assumptions adopted between stages 2 and 4 however is not necessarily of concern as the purpose of assumption, and hence, level of caution required, is different. The assumptions in stage 2 reflect those of a buy-out basis, while those in stage 4 depend on the future mortality experience considered appropriate by the user of the model.

Accordingly, the rationale for the mortality assumptions adopted at stage 4 needs to be clearly understood by the user of the model.

In the table overleaf we illustrate the expected age at death for someone aged 65, in increasing order of mortality strength of the adoption of the different standard mortality assumptions in the model for cashflow projection (stage 4) – note that no allowance is made below for the ability of the model to adjust the mortality...
tables for age ratings or underpins. Adoption of such rating factors effectively allows an almost infinite number of mortality bases for use in the cashflow projection.

<table>
<thead>
<tr>
<th>Mortality basis</th>
<th>Narrative</th>
<th>Age 65 in year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCXA00 combined amounts</td>
<td>Actuarial profession “00” tables</td>
<td>n/a</td>
<td>83.26</td>
<td>85.54</td>
</tr>
<tr>
<td>LLE2004 Year of Birth 1942</td>
<td>Low life expectancy variant of the 2004-based UK population projections</td>
<td>2007</td>
<td>83.26</td>
<td>86.03</td>
</tr>
<tr>
<td>PXA92 Year of Birth 1942</td>
<td>Actuarial profession “92” tables</td>
<td>2007</td>
<td>84.20</td>
<td>87.23</td>
</tr>
<tr>
<td>UKX2004 Year of Birth 1942</td>
<td>2004-based UK population projections</td>
<td>2007</td>
<td>84.66</td>
<td>87.28</td>
</tr>
<tr>
<td>HLE2004 Year of Birth 1942</td>
<td>High life expectancy variant of the 2004-based UK population projections</td>
<td>2007</td>
<td>85.22</td>
<td>87.64</td>
</tr>
<tr>
<td>PXA92 Year of Birth 1942 sc</td>
<td>Actuarial profession “92” tables with short cohort longevity improvement factor</td>
<td>2007</td>
<td>85.70</td>
<td>88.60</td>
</tr>
<tr>
<td>PXA92 Year of Birth 1942 mc</td>
<td>Actuarial profession “92” tables with medium cohort longevity improvement factor</td>
<td>2007</td>
<td>86.38</td>
<td>89.28</td>
</tr>
<tr>
<td>85% x PXA92 Year of Birth 1939 mc*</td>
<td>Actuarial profession “92” tables with medium cohort longevity improvement factor and mortality rates scaled to 85% of full rate</td>
<td>2004</td>
<td>87.92</td>
<td>90.92</td>
</tr>
<tr>
<td>PXA92 Year of Birth 1942 lc</td>
<td>Actuarial profession “92” tables with long cohort longevity improvement factor</td>
<td>2007</td>
<td>88.08</td>
<td>91.22</td>
</tr>
</tbody>
</table>

*This is the original FAS model assumption with no pre-age 60 mortality

The table above illustrates that future life expectancy of a man aged 65 in 2007, will vary between 18 and 23 years (20 and 26 years for a woman aged 65 in 2007), depending on the mortality basis adopted by the user, subject to no adjustments.

4.5 Use of the funding level reduction factor

The funding level reduction factor can be used for three purposes to assess sensitivities / uncertainties within the model:
1) To enhance (reduce) the amount available for deferred members on account of there being more (less) funds available after annuities have been bought out for pensioners, as a result of annuities being cheaper (more expensive) at the buy-out date compared with the Estimate date. This reflects the Stage 1 calculation detailed in section 3.1.

2) To increase (decrease) the cost of buying out pensions for deferred members on account of the buyout basis used in the model becoming too weak (strong) compared with the actual cost in the buy-out market. This reflects the Stage 2 calculation detailed in section 3.1.

3) To allow adjustment of the amounts available if it is felt that the sample characteristics are not representative of those of all FAS beneficiaries

4.6 Uncertainties from data supply

Estimated pension for deferred members

In most cases, the estimate of the amount of pension that is capable of being provided with the sums available was not delivered. A fund value available for each member’s liabilities was provided at an Estimate date instead.

This fund value is computed according to complex regulations, which differ depending upon the date of the calculation as the relevant regulations changed several times during the period covered by eligibility for FAS. However, in most cases the calculation would have been based on the minimum funding requirement (MFR) valuation basis, which is significantly less than it actually costs to purchase a pension from an insurance company.

The fund value for each member would have been computed using the MFR basis at the Estimate date in respect of the different components of his/her pension, being a combination of:

- Additional Voluntary Contributions (AVCs) if any
- GMPs (pre and post-1988) without increases
- GMP increases on post-1988 GMPs
- Excess pension above GMP
- Increases on excess pension

These sums would only be included to the extent that there was enough in the pension fund to meet that slice of liability for members as a whole. In the event of a shortfall, a restriction would be made to the lowest category first (in this example, a cut-back to increases on the excess pension first, then to the excess and so on).

However, this computation is only in relation to the regulated value of the pension under MFR rules. The Actual pension purchased depends on the buy-out terms provided by competitive insurance companies (though under Section 19 of the Pensions Act 2007 schemes currently have to meet pension payments directly out of their own resources).

As the data supply preceded the implementation of the Pensions Act 2007, we understand from our conversations with the administrators that the estimated pension for each member has been worked out on the basis of buy-out costs where the administrators have supplied this. Two very different approaches have been used, which the administrators have discussed with us. The data does not disclose which applies to which administrator.
– **Method 1** Some administrators and lawyers are of the view that after computation of the capital sums for each member, it is used to purchase a pension in the same order, so that pensions in full and GMPs in full are provided in that order out of the available funds before an excess pension (if any) is secured if there is any fund left over after buying out the pensions and GMPs at the cost demanded by the insurance market.

– **Method 2** Others take the view that the MFR basis is used to prioritise funds between different slices of benefits, rather than the true cost of buy-out for the purchase of the benefit slice.

An example illustrating the way the two methods above differ is covered in detail below.

**GMP**

No breakdown was provided of the GMP between that part relating to pre-1988 benefits (where no increases are provided on GMPs) and that part related to the post-1988 period (which provides inflation-linked increases up to 3% per annum). This makes it more difficult to determine what the capital available for each member can provide by way of each different slice of benefit.

**GMP Revaluation Method**

The rate of revaluation on GMPs before retirement was not provided, and so for the purpose of the model, it has been assumed that GMPs increase at the relevant fixed rate which applies to the date of leaving for the particular member.

GMPs could revalue by one of three methods:

- the fixed rate of revaluation (which varied between 8.5% per annum for people leaving in 1978 and 4% for leavers since 6 April 2007);
- a limited rate of 5% (in exchange for a State premium to cap a scheme’s future inflation exposure); or
- in line with national average earnings (NAE).

In the private sector, GMP increases in line with NAE growth were unpopular because of the high level of risk this created. Fixed increases were the most popular, with a number of schemes adopting the limited rate approach until it ceased to be available. The population of schemes falling within FAS is quite likely to be predominantly adopting fixed rate revaluation, in turn, the high level of such revaluation (compared with contemporary earnings inflation today) is likely to have worsened the financial health of such schemes.

In the absence of information from data collected on the revaluation method used, the model assumes that all GMP is at fixed rate revaluation. This may make a small difference for the minority which will have used lower levels of revaluation and therefore slightly overstate the proportion of GMP benefits that are subject to 3% per annum pension increases in payment as a priority. This could therefore overestimate the likely FAS payments.

We understand from the FAS DWP team that 94% of members loaded on the system have fixed rate revaluation of GMPs; therefore the impact of any overstatement above is unlikely to have any material impact on the cashflows.

**Level of pension increases**

No information was supplied on the level of increases to pensions in payment made by the scheme. To the extent that the model assumes that the available funds are used first to provide level pensions before going on to spend available funds on pension increases, the absence of detail on the pension increases under the scheme rules should not affect estimates of the FAS pension payable.
However, in some cases, the normal retirement age is lower than the FAS payment age of 65. In these cases, the lack of information about the scheme pension increases creates uncertainty as to what the scheme pension would have been at the age of 65.

**Date of joining**

Date of joining was only furnished by a small number of administrators. The date of joining is unlikely to be necessary to an assessment, but has been capable of use in estimating the split between pre and post-97 service, to allow the estimation of the costs of indexing part or all of the FAS assistance payable and between pre- and post-88 service for estimating the split of GMPs between those for which the scheme must meet some indexation and those with no indexation. The impact of incorrect splits between the pre and post-1988 GMP could affect the model estimation of the likely amount of the eventual assistance from FAS, depending on whether level or index-linked pensions were to be provided.

**The form of benefits secured**

The exact splits of GMPs and the way in which the benefits are bought can have a very material effect on the FAS calculations, which is best illustrated perhaps by an example.

Suppose a deferred member has an entitlement to a pension of £2,500 per annum in GMP and £2,500 in excess pension, the excess pension carrying increases in line with inflation.

This member has £1,500 of GMP pre-1988 and £1,000 of GMP post-1988, with revaluation of the GMP at the limited rate of 5% per annum from a date of leaving of 6th April 1996. His excess pension is £2,500.

Suppose the estimated values on the MFR basis of his pension are as follows, with £40,000 available as his share of the overall fund:

<table>
<thead>
<tr>
<th></th>
<th>MFR Valuation</th>
<th>Buy-out Valuation</th>
<th>Method 1 (buy-out priority)</th>
<th>Method 2 (MFR priority)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1988 GMP</td>
<td>£15,000</td>
<td>£22,500</td>
<td>£22,500</td>
<td>£15,000</td>
</tr>
<tr>
<td>Post-1988 GMP</td>
<td>£10,000</td>
<td>£15,000</td>
<td>£15,000</td>
<td>£10,000</td>
</tr>
<tr>
<td>Post-1988 GMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increases</td>
<td>£3,000</td>
<td>£5,000</td>
<td>£2,500</td>
<td>£3,000</td>
</tr>
<tr>
<td>Excess</td>
<td>£20,000</td>
<td>£30,000</td>
<td>-</td>
<td>£12,000</td>
</tr>
<tr>
<td>Excess Increases</td>
<td>£6,000</td>
<td>£10,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>£54,000</td>
<td>£82,500</td>
<td>£40,000</td>
<td>£40,000</td>
</tr>
</tbody>
</table>

Using the second approach (Method 2) results in a larger amount of the member’s share of fund being used to buy future pension increases, resulting in a lower initial pension and therefore a higher potential claim on FAS.

Method 2 appears to be in common use in respect of around 85% of the members covered by the samples supplied.
Impact on FAS
The example above illustrates two main issues. First, the data supplied, lacking full information about the scheme benefits, gives a considerable degree of uncertainty to the predicted amounts payable by the scheme – and thus the amounts of top-up provided by the FAS.

Secondly, the uncertainty as to how assets available for each member are to be used to provide benefits demonstrates the uncertainty to FAS as to what benefits will actually be provided. This may be an area where legislative clarification could assist, for example, in harmonising the way in which different schemes deal with benefits to be provided from available assets, or setting up a logically consistent way for two individual claimants with the same value of scheme benefits to receive the same level of top-up from the FAS, rather than an unpredictable amount dependent on different interpretations of Sections 73 and 74 of the Pensions Act 1995.

Priority Orders and Changes over Time
A further complication for the modelling of the likely assistance (depending on the way in which the priority orders for securing benefits are interpreted) is that the statutory priority orders for determination of the use of available assets for each member changed on a number of occasions during the period from 1 January 1997 to 5 April 2005.

The most significant change likely to affect FAS is that for any winding-up that commenced after 10 May 2004 the increases on pensions in payment and GMPs subsequently rank below the entitlements for deferred members' benefits (without increases). The following table overleaf sets out the basic elements of these changes:
| Date winding up commenced | Insolvency status of employer on date winding up commenced | Valuation basis | Statutory Priority Order for allocation of available assets (NOT for using them)

2 |
---|---|---|---|
1 January 1997 to 5 April 1997 | Not relevant | Depends on Scheme Rules | |
6 April 1997 to 18 March 2002 | Not relevant | MFR Values for all | 1 AVCs and insured benefits |
19 March 2002 to 10 June 2003 | Insolvent | | 2 Pensions in payment |
| 11 June 2003 to 9 May 2004 | Insolvent | MFR Values for all | 3 GMPs and post-97 pensions |
| 10 May 2004 to 14 February 2005 | Insolvent | MFR Values for all | 4 Increases on insured benefits in (1) and (2) |
| 15 February 2005 to 5 April 2005 | Not relevant | Buy-out for all | 5 Increases on (3) |

The statutory priority orders determine how scheme assets are divided between the various scheme pension elements – and hence between scheme members. However, the priority orders do not determine how the assets are used (e.g., whether a level or increasing pension is purchased) regardless of the original scheme pension element that the assets relate to.
For FAS, the most relevant category is likely to be that for insolvent employers during the period from 6 April 1997 to 9 May 2004, during which period the valuation basis was that of the MFR and the statutory priority order allocated available assets to pensions in payment and GMPs and their increases before providing for excess pensions above GMPs for non-pensioners.

For this category, the most important assessment for the modelling of likely assistance from FAS is the way in which the assets available to each member are to be used to provide benefits and whether or not this is in line with the priority order under s73 of the Pensions Act 1995 or in line with the different priority order under the scheme rules.

In the final category of priority benefits is the excess pension and increases thereon, with much flexibility for administrators to choose between level pensions and pensions plus increases.

A pension of £10,000 p.a. with increases would tend to result in more FAS assistance claimed than one of £13,000 p.a. with no increases.

On the assumption that Method 2 (following the s73 allocation) is the legally correct approach to follow, only a small proportion of schemes would need to change their approach. However, the model assumes all pensions are level and the sensitivity to this is covered in section 4.1.

Whilst ideally legal clarification of the priority rules might provide more certainty that the determination of the actual amounts of FAS payments reflect FAS policy, in the absence of such clarification we consider that the model works reasonably and sensibly, with the possibility for the user to undertake sensitivity analysis to reflect such uncertainties.
Table of uncertainties

We have set out below the principal areas we have identified which may result in misstatement by the model of the cashflow results derived

<table>
<thead>
<tr>
<th>Item</th>
<th>Item creating uncertainty</th>
<th>Impact on model of item creating uncertainty</th>
<th>Our estimate of adjustment needed to model</th>
<th>Our estimate of percentage impact on total (undiscounted) FAS cashflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Where firms have provided an Actual pension amount (rather than assets available), the pension may be mis-stated given current buy-out costs may be different from when they were determined by the scheme actuary</td>
<td>Actual scheme pensions may be mis-stated, although only in less than 10% of cases where a figure for Actual pension was provided</td>
<td>Maybe average overall change of +1% to funding level</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Pensions in payment have not yet been purchased, and current buy-out rates are now more favourable than when assessed by the actuaries</td>
<td>If pensioners can be secured more cheaply than assumed, assets available to non-pensioners may increase, improving the non-pensioner funding level</td>
<td>Unlikely to be large, although assessment depends on the unknown proportion of pensioners. The impact on deferred pensions is unlikely to be more than 5% change in overall assets available.</td>
<td>Expect reduction of perhaps 3%</td>
</tr>
<tr>
<td>3.</td>
<td>Shape of benefits to be secured by schemes (with or without increases) is not known</td>
<td>The fund conversion factors assume level pensions are secured. If more costly indexed pensions are secured, scheme benefits will be lower, increasing the call on FAS</td>
<td>Not enough data to properly assess, but in the extreme scenario, if all pensions secured by schemes are assumed to be increasing rather than level, the Actual pension (hence funding level reduction factor) will be around 59% of what is currently assumed. It should be noted that there is currently a moratorium on buy-outs, reflecting this point.</td>
<td>In the extreme situation where all trustees bought increasing pensions and FAS paid higher top-ups, costs would be up to 26% higher. However, if the FAS rules address top-ups by reference to level pensions as in the model, the costs will only be higher for those small numbers for whom indexed pensions have already been provided, which we believe is very small. The overall effect is unlikely to be more than 2 or 3% in relation to any such situations in the schemes already wound-up.</td>
</tr>
<tr>
<td>Item</td>
<td>Item creating uncertainty</td>
<td>Impact on model of item creating uncertainty</td>
<td>Our estimate of adjustment needed to model FAS cashflow</td>
<td>Our estimate of percentage impact on total (undiscounted) FAS cashflows</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------</td>
<td>---------------------------------------------</td>
<td>------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>4.</td>
<td>If FAS were to take on scheme assets</td>
<td>FAS may be able to utilise funds more efficiently than trustees spending funds with insurers</td>
<td>This is the subject of Andrew Young’s review.</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>GMP revaluation rate</td>
<td>Data providers did not specify the GMP revaluation basis used, so all schemes are assumed in the model to adopt the (generally more costly) fixed revaluation method. In practice some schemes are using other methods that generally will result in lower calls on FAS</td>
<td>We understand that only 6% of schemes are contracted-out on a basis other than fixed rate</td>
<td>Insignificant</td>
</tr>
<tr>
<td>6.</td>
<td>Data on date of joining was absent on many member records</td>
<td>Date of joining was used to determine the split of pre and post-97 service. This may result in higher FAS assistance due to use of scheme funds for provision of pension increases</td>
<td>Not possible to estimate in the absence of data.</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Data exclusions</td>
<td>Members have also been excluded by GAD, with agreement from the DWP, on the basis that these members had funding levels greater than 100%.</td>
<td>If the full population of FAS applicants contains a similar population, then excluding them from the model will have the effect of overstating the average level of compensation for the remaining cases.</td>
<td>The excluded nil compensation cases represent about 4% of the population and so the maximum level of such overstatement to cashflows will be 4%.</td>
</tr>
<tr>
<td>Item</td>
<td>Item creating uncertainty</td>
<td>Impact on model of item creating uncertainty</td>
<td>Our estimate of adjustment needed to model</td>
<td>Our estimate of percentage impact on total (undiscounted) FAS cashflows</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>8.</td>
<td>Data sampling error</td>
<td>By using model data that is a 10% sample of the full actual population data, this results in uncertainty in extrapolating the model data to full population projections</td>
<td>It is impossible to determine exactly how much uncertainty there is in using a 10% sample to model the full population; however we have undertaken checks on the representativeness of the model data to the population data and have assessed that modelled FAS overall costs are unlikely to be materially over or understated.</td>
<td>We would expect it to be unlikely that the modelled FAS overall costs will be outside a range of +/-5% from the correct figure.</td>
</tr>
</tbody>
</table>
Glossary

Actual method
This is the method used to determine the level of FAS assistance, by adopting the 2-stage revaluation process to the Expected pension.

Actual pension
This is the total pension at NRA that either the scheme has provided, or the pension derived within this model from the estimate of the fund value provided by the scheme actuary as the member’s share of the fund.

Certification date
The date at which certification of FAS assistance takes place. In the model, the Certification date is also the date which is the starting point of the cashflow projections, with any payments due before the Certification date treated as payments in arrears.

Critical date
This is the date at which the FAS assistance is initially calculated, before increases in line with RPI to FAS payment age. Under the Actual method, the critical date is the Certification date, under the Modelled method, it is 14 May 2004.

Estimate date
This is the date that the scheme actuary has used for the calculation of the Actual pension at NRA due to each member, or instead, the fund value attributable to each member.

Expected pension
This is the total pension that a member would expect to receive based on their accrued service in the scheme. If it is at NRA, then it includes fixed rate increases on the GMP, and statutory revaluations on the revaluing excess, to NRA.

Modelled method
This is the method that reflects the calculations carried out in the previous FAS model, based on a 1 stage revaluation process.

Status of member
Pensioner: someone whose age has surpassed their scheme NRA as at the date of start of wind-up
Non-pensioner/Deferred: someone who is not a pensioner

Technical guide
This is the draft Financial Assistance Technical Guide, version 004, dated 3rd January 2007
## Appendix A

### Worksheet: Notes

| Purpose | This sheet provides admin information, the list of the worksheets and issues to note. |

### Worksheet: Change log

| Purpose | This sheet sets out a list of the changes made to version 5.1 of the model to the current stage. |

### Worksheet: Input data

| Purpose | This sheet sets out the anonymised data, provided by DWP to GAD. |
| Methodology | We understand from GAD that this data has been derived from the member-level data collection exercise run during 2007 by DWP with assistance from the FAS Asset Review industry working group. Sex of each member is entered either as “M” or “F”, and the Status of the member is denoted as “P”, if at the date of the start of the wind-up they had attained their scheme normal retirement age, and “N” otherwise. Any changes made to this worksheet will filter through to the rest of the model. |
| Our comments | While validating the data in full is outside our remit, we have nevertheless undertaken high level sense checks on the data to check for internal consistency within a member record e.g. checks on the existence of relevant data, date of joining/leaving consistency and tests on statutory revaluation. Whilst there are some member records that show inconsistencies, we note that overall, the quality of data is at a level we would expect from typical administration departments and so have no material concerns on the use of the data on a “fit for purpose” basis for the modelling of FAS cashflows. |

### Worksheet: Assumptions

| Purpose | This worksheet contains all the parameters that the user can set as the underlying assumptions in the model. If any of the longevity assumptions are changed, the user will need to run a macro to populate the mortality spreadsheets with the selected longevity assumptions. |

### Worksheet: Detailed longevity assumptions

| Purpose | This worksheet collates the longevity assumptions from the “Assumptions” worksheet and allows the user to input age- and year-specific rating adjustments. |
Worksheet: Assumptions database

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This worksheet contains various sets of assumptions and allows the user to run macros to copy assumptions from the database to the &quot;Assumptions&quot; worksheet or vice versa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>As instructed by DWP, at the meeting on 15th August, we have not checked this database.</td>
</tr>
</tbody>
</table>

Worksheet: Input data – additional basic info

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This is one of the most important worksheets and determines the following major aspects of the model: Total Expected pension as at NRA Actual pension at NRA, where not provided by scheme actuary Suggested split of service into pre and post 97 periods</th>
</tr>
</thead>
</table>
| Methodology | **Expected pension at NRA**

a) GMP is revalued at a fixed rate (varies by date of leaving) from the tax year of the date of leaving to the tax year in which the member reaches NRA or the tax year in which the member reaches GMP age -1, if earlier. The GMP age -1 is more likely to bite for women who have a GMP age of 60 compared with 65 for men.

b) The revaluing pension in excess of GMP, is increased in line with the revaluation orders from the date of leaving to the last date of the revaluation orders in the model (1/1/2007) and then in line with RPI to NRA. If the member’s NRA is before 1/1/2007, the revaluation orders are applied to NRA, with no further increases in line with RPI. The total Expected pension at NRA is the sum of a), b) and the non-revaluing excess.

This value of the Expected pension at NRA is only used to determine the funding level for the member. It is not used to determine the level of FAS assistance as the approach to revaluation in determining the Expected pension at Certification date is different.

**Derivation of Actual pension at NRA**

The estimate of the fund value attributable to each member is converted to an Actual pension at Estimate date, with the treatment dependent on the Status of the member. The formula used is shown in the table below

| Pensioner: | Estimate of fund value
Immediate annuity * fixed-interest gilt MVA |
| Deferred: | Estimate of fund value
Deferred annuity * fixed-interest gilt MVA * index-linked gilt MVA |
The mortality assumptions underlying the annuity factors now reflect what in our view is a typical insurer’s buyout basis. The MVA is the market value adjustment made to reflect the difference in yields of fixed-interest and index-linked gilts, from those used in the basis and those as at the Estimate date, however, these are based on the mortality assumptions underlying the FAS OU annuity factors from 2004.

For Pensioners, the Actual pension at Estimate date is the Actual pension at NRA. For Deferreds, the Actual pension at Estimate date is revalued in line with the expected change in RPI between Estimate date and NRA.

**Suggested split of service**

An estimate is made of the portion of service attributable to pre-97 and post-97 period, using the date joined scheme if available, or as a proxy estimating the date joined scheme as the mid-way point between when the member turned 18 and the member’s date of leaving pensionable employment.

**Pension arrears**

As the annuity rate is based on the age of the member at the Estimate date, the implicit assumption in the model seems to be that where a member has surpassed his/her NRA by the Estimate date, the scheme will have been paying his/her pension from NRA to Estimate date at a level commensurate with the funding level of that member. Therefore, the estimate of the fund value at the Estimate date is based on pension payments that only need to be paid from the Estimate date, with no allowance for any potential arrears.

<table>
<thead>
<tr>
<th><strong>Our comments</strong></th>
<th><strong>Expected pension at NRA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) GMP has been revalued to NRA or GMP age -1 if earlier.</td>
</tr>
<tr>
<td></td>
<td>We note that the comment inserted in column AB, headed “GMP revalued to earlier of tax year of reaching (GMP payment date - 1 year) and tax year of reaching NRA” does not reflect either the corresponding formula or the column heading.</td>
</tr>
<tr>
<td></td>
<td>The model does not allow for GMPs to be revalued in line with s148 orders, or limited rate as specified in the Technical Guide. However, we believe this lack of flexibility is acceptable as most schemes will tend to have fixed rate revaluation, though it should be understood that fixed-rate revaluation tends to be more generous than s148 orders, which would result in overstatement of FAS assistance needed for schemes with GMP revaluation lower than that resultant from fixed rate.</td>
</tr>
<tr>
<td></td>
<td>b) We note that the model revalues the excess pension for the integer number of years between date of leaving and NRA. Although the Technical Guide specifies revaluation to be for complete calendar years (paragraph 79) the approach taken in the model is correct.</td>
</tr>
<tr>
<td></td>
<td><strong>Actual pension at NRA</strong></td>
</tr>
<tr>
<td></td>
<td>We have concerns in the derivation of the Actual pension, due to the differences in the approach between each scheme, such as:</td>
</tr>
<tr>
<td></td>
<td>the buying out of GMPs (full/partial)</td>
</tr>
<tr>
<td></td>
<td>priority order, which could see two members with similar levels of accrued pension being offered a very different estimate of the fund value, due to their age at wind-up</td>
</tr>
<tr>
<td></td>
<td>We have commented on this under the “Sensitivities” section of the report.</td>
</tr>
</tbody>
</table>
**Service split**

The service split approach adopted by the model appears sensible considering the lack of information. Whilst on an individual level the splits can be unrealistic, on a global basis we believe the splits are reasonable, as the approach taken results in about a third of the service allocated to post-97 service and two-thirds to pre-97 service.

**Worksheet: Input data for summary stats**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This worksheet contains the intermediate calculations enabling summary statistics to be derived, for comparison across genders and ages.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>Date as at which the summary statistics are calculated is 31 December 2006 (6 April 2007 – equal to certification date – in versions 5.9 and 6.0). This is a variable in the inputs. Funding level: this is derived as the Actual pension / Expected pension at NRA, both as calculated on the “Input data – additional basic info” worksheet. We understand that from the data set of 12,898 cases for 536 members the funding level was greater than 100%, indicating that the Actual pension at NRA, as either provided by the scheme actuary or as determined in the model, is greater than the Expected pension at NRA. These 536 members have been removed from the data set. The need for such removal of these members suggests potential issues with the quality of the original data sent, or cheaper annuities such that full pensions can now be provided significantly different assumptions used by the scheme actuary in determining the share of fund, perhaps by way of allowing for increasing pensions overvaluing of FAS assistance if such members are representative of the population The 536 exclusions were based on the derivation of the Actual pension under the 2004 FAS OU annuity factors. These may not be valid exclusions under the annuity factors now in the model, which reflects the expected typical insurer buy-out basis.</td>
</tr>
</tbody>
</table>

**Worksheet: Summary statistics**

| Purpose | This worksheet provides a summary of the statistics of the members, providing a breakdown by ages, sex & member status, of the numbers of members, annual pension (GMP, excess pension with and without revaluation), funding level (actual/ expected pension) and NRA |

**Worksheet: FAS assistance – current actual**

| Purpose | This worksheet calculates the expected level of assistance required from FAS in accordance with the proposed 2-stage revaluation procedure, to top up benefits for all affected members to X% of their Expected pension at Certification date, subject to a cap, where X% is specified in the “Assumptions” worksheet. |
**Methodology**

**Expected pension at Certification date: 2 stage revaluation process**

**a) First stage revaluation**

GMP is revalued at a fixed rate (varies by date of leaving) from the tax year of the date of leaving to the tax year of the date of start of wind-up or the tax year in which the member reaches GMP age -1, if earlier.

Revaluing excess pension is increased in line with the revaluation orders for complete years from date of leaving to the earlier of the date of start of wind-up or NRA.

**b) Second stage revaluation**

The total revaluing pension, as at the date of start of wind-up, is increased in line with the lower of the two methods below, subject to no decrease to the pension amount (to allow for cases where the date of start of wind-up is after the Certification date/NRA)

- RPI increases from 2 months before date of start of wind-up to 2 months before Certification date
- 5% p.a increases for time between date of start of wind-up and the Certification date.

This when added to the non-revaluing excess pension gives the total Expected pension at Certification date.

**Actual pension at Certification date**

If the Actual pension at NRA has been provided by the scheme actuary, this is stripped back to the Certification date by the change in levels of RPI, unless the NRA is before the Certification date, in which case there is no inflation adjustment and the Actual pension at Certification date remains as the Actual pension at NRA.

Where the scheme actuary has instead provided a share of fund value attributable to the member, the Actual pension at Estimate date calculated on the worksheet “Input data-additionl basic info” is revalued to the Certification date, or NRA if this is reached before the Certification date, by the change in levels of RPI in this period.

The Actual pension at Certification date then has the enhancement factor and funding level reduction factors (inputs in “Assumptions” worksheet) applied to it to determine the Actual pension at Certification date (or NRA if earlier) with margins.

**FAS assistance**

The FAS assistance at Certification date is determined by the user as a percentage (eg 80%) of the Expected pension at Certification date less the Actual pension at Certification date (or NRA if earlier), with application of margins, cap and de minimis also determined in the user assumptions.

The Expected pension at Certification date with margins is the Expected pension at Certification date calculated earlier on this worksheet, with the application of an enhancement factor (same as used for Actual pension).

The FAS assistance at FAS payment age is then determined by the expected change in RPI from the Certification date to the FAS payment age, subject to a maximum increase of 5% p.a. and subject to no decrease.
Allowance for indexation of FAS assistance

The model allows the user to separately specify the FAS assistance at Certification date and FAS payment age that will be indexed, depending on the IndexSwitch, with a choice of no indexation on any of the assistance, full indexation or indexation only on the post-97 service portion of total service (as estimated). Where indexation is switched on, the level is LPI 2.5%, as used in the various “Cashflows” worksheets.

Trivial commutation

If the total level of FAS assistance is no higher than the maximum amount that can be commuted, it is assumed that the member will commute (where commutation is permitted as an assumption). The total sum then payable to the member at FAS payment age is the product of the FAS assistance at FAS payment age and the annuity factor at the FAS payment age. The user is also able to specify whether or not this maximum amount will be indexed in line with RPI to the FAS payment age.

Our comments

Expected pension at Certification date

First stage revaluation

Revaluation of excess: there is no revaluation applied in cases where date of leaving is before 6/4/1971, even if the member data identifies a portion of increasing excess pension. Given that a very small number of members with a leaving date prior to 6/4/1971 would be eligible for FAS assistance, we consider this simplification acceptable; although it does mean that for such members the model undervalues the required FAS assistance.

FAS assistance

The model now correctly does not apply revaluation to the Actual pension at NRA, where this is reached before the Certification date, in determining the Actual pension at Certification date. It also correctly underpins the FAS assistance at FAS payment age to the FAS assistance at Certification date.

By revaluing the Expected pension to the Certification date, members who reach their NRA just a little before the Certification date are not treated less favourably than those who reach it much before the Certification date. This is in line with the decision taken by DWP.

Finally, we have noted an inconsistency in that the revaluation of the maximum amount for trivial commutation is in line with RPI, whilst indexation of FAS assistance (if any) is in line with LPI 2.5%, however agree with GAD that this is not material.

Worksheet: FAS assistance – current modelled

Purpose

This worksheet calculates the FAS assistance currently included in the cashflow model written by GAD in 2004. The cashflow model is used by DWP in projecting cashflows, based on a 1 stage revaluation and uses the same target assistance levels as under the current actual method.

Methodology

Expected scheme pension at 14 May 2004

GMP revaluation: fixed rate revaluation from tax year of date of leaving to the earlier of 2004/05 tax year and tax year of reaching GMP age -1, unless date of leaving is after the earlier of the 2004/05 tax year and GMP age -1, in which case there is no
revaluation.

Excess revaluation: in line with revaluation orders for time between date of leaving and 14 May 2004, unless date of leaving is after 14 May 2004, in which case there is no revaluation. There is also no revaluation applied to the excess of the pension of members who left more than 33 years before 14 May 2004.

**Actual pension as at 14 May 2004**

If an Actual pension at NRA has been provided by the scheme actuary, then where the member reaches his/her NRA after 14 May 2004, the Actual pension at NRA is stripped back to 14 May 2004 by the change in the levels of RPI between these two dates. Where the member has reaches his/her NRA by 14 May 2004, there the Actual pension at 14 May 2004 is equal to the Actual pension at NRA.

Where the scheme actuary has instead provided a share of fund value attributable to the member, the Actual pension at Estimate date calculated on the worksheet “Input data-additio! basic info” is revalued to 14 May 2004, or NRA if this is reached before the 14 May 2004, by the change in levels of RPI in this period.

Margins are then applied to both the Expected and Actual pensions as at 14/5/04 as per the approach under “current actual” method.

**FAS assistance**

The level of FAS assistance as at 14/5/04 is

\[ X\% \times \text{Expected pension} - \text{Actual pension}, \text{both with margins and as at 14/5/04, subject to the cap and de minimis, where } X\% \text{ is set in the “Assumptions” worksheet e.g. at 80%} \]

FAS assistance is then revalued to the FAS payment age by the change in levels of RPI.

**Indexation of FAS assistance and Trivial commutation**

As under current actual method.

| Our comments | We understand from GAD that the purpose of this worksheet is to allow DWP and FASOU to compare the levels of FAS assistance under the current modelled method with those under the current actual method, using identical eligibility conditions and target levels (e.g. topping up the pension payable to a chosen percentage of the member’s Expected pension regardless of his/her proximity to retirement age).

Our comments mentioned under the “current actual” section apply to this section too, with references to Certification date replaced with 14 May 2004.

Unlike the methodology adopted under the current actual method, under the current modelled method, de-minimis, cap and trivial commutation maximum amount are set at fixed levels, with no indexation of these amounts even if the indexation switch in the “Assumptions” worksheet was turned on. This is reasonable as indexation was not a policy option under the previous model. |
Worksheet: FAS assistance – proposed method

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This worksheet calculates the FAS assistance in accordance with any future proposed method.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>This sheet is designed to be used to model changes in the assistance from FAS. It is not currently in use and we have therefore not undertaken any checks on it.</td>
</tr>
</tbody>
</table>

Worksheet: Cashflows – male - own

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This worksheet shows the cashflows arising from FAS payments to male members each year, who are not eligible for trivial commutation of the assistance from FAS.</th>
</tr>
</thead>
</table>
| Methodology                                                            | **FAS payments from FAS payment age**  
The annual FAS payments payable to each male member are set out, year by year, from the tax year they reach their FAS payment age to no later than the year they reach their Terminal age. The cashflows are based on the age of the member at Certification date, allowing for the probability that the member survives to the first and each subsequent payment year in accordance with the chosen mortality assumptions, for that cohort. If indexation of FAS assistance is selected, indexation is in line with LPI 2.5%.   

Consider a member who reaches his FAS payment age in the tax year 2020, who is not eligible for trivial commutation of his assistance from FAS.   

The cashflow due to him in 2020 is the portion of his FAS assistance as at FAS payment age, which represents the time from his FAS payment age to 5/4/2021, allowing for the probability of his survival to 2020.   

The cashflow due to him in 2021 is then his full FAS assistance, where the indexed element is increased in line with the change in LPI 2.5% from the later of his FAS payment age and 14/5/2004, to 6/4/2021.   

**Arrears of FAS assistance**  
Members who have reached their FAS payment age before the Certification date are due arrears of the assistance from FAS.   

The arrears are calculated such that the member receives their FAS assistance level for every year (and partial year) between their FAS payment age (or 14/5/2004 if later) and the Certification date. So where the Certification date is 6/4/2007 and the member’s FAS payment age is reached on 14/4/2000, the arrears paid are from 14/5/2004, not 14/4/2000, to 6/4/2007. If the assistance is to be indexed, then again this is in line with LPI 2.5% for the level of FAS assistance eligible for indexation. |
| Our comments                                                           | **Other issues**  
We have noted potential confusion in projecting cashflows under the current actual method, as the trigger date for all the cashflows worksheets is the Certification date, whereas in the current modelled method, it is 14 May 2004. We understand from GAD though that this will be cautioned against in their manual, with an explanation of how the model allows for this. |
Note that the cashflows worksheet as it is now gives error values where Certification date is before 1 May 2004 (no LPI 2.5% values)

<table>
<thead>
<tr>
<th>Worksheet: Cashflows – female - own</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose, methodology &amp; our comments</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Worksheet: Cashflows – male - DAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
</tr>
<tr>
<td><strong>Our comments</strong></td>
</tr>
</tbody>
</table>
Worksheet: Cashflows – female - DAR

Purpose, methodology and our comments
As for “Cashflows – male – DAR”, but applied to the survivor of a female member.

Worksheet: Cashflows – male - DBR

Purpose
This worksheet shows the cashflows payable to the survivor of a male member, arising from his death before retirement.

Methodology
Assumes no survivor benefits payable in the Certification year (note that while the Certification date can be varied on the “Assumptions” worksheet for the purposes of this report, it is 6 April 2007).

Consider the assistance payable to the survivor of a member, who had not yet reached his FAS payment age, in the year 2010. The year 2010 has been arbitrarily chosen to illustrate the methodology.

The value of the assistance payable is

\[
\text{value} = \text{non-indexed FAS assistance} \times \text{proportion married} \times \text{proportion inherited} \times (A + B + C),
\]

where

- \(A\) = probability that member dies in 2007-2008 \times probability that spouse is alive in 2010, given that she was alive in 2007
- \(B\) = probability that member dies in 2008-2009 \times probability that spouse is alive in 2010, given that she was alive in 2008 \times \text{RPI (6/10/2008)/ RPI (6/10/2007)}
- \(C\) = probability that member dies in 2009-2010 \times probability that spouse is alive in 2010, given she was alive in 2009 \times \text{RPI (6/10/2009)/ RPI (6/10/2007)}

The assistance payable by FAS which is to be indexed has the same methodology applied, but with increases in line with LPI 2.5%

Our comments
Our checks have been conducted using first principles on certain members as an independent check on the commutation functions method used by GAD.

The model does not allow for the spouse to pre-decease the member which is reasonable, as the proportion married assumptions are “as at death”.

Worksheet: Cashflows – female - DBR

Purpose, methodology and our comments
As for “Cashflows – male – DBR”, but applied to the survivor of a female member.
Worksheet: Trivial commutation cashflows

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This worksheet contains the cashflows of amounts payable to those members who are eligible for trivial commutation of the assistance from FAS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology</td>
<td>Members receive the lump sum amount due to them in the year they reach their FAS payment age, or immediately for those who had already reached their FAS payment age at the Certification date.</td>
</tr>
</tbody>
</table>

Worksheet: Cashflows – results

| Purpose | This worksheet shows the total of all cashflows arising from payments to members, and on the death of the member either before or after retirement, payments to their survivors. |

Worksheet: Cashflows – results reformatted

| Purpose | Reformats the worksheet “Cashflows – results” |

Worksheet: Rated up cashflows

| Purpose | This worksheet rates up the results from the “Cashflows - results” worksheet, in line with the rating up factor assumptions. |

Worksheet: Rated-up cashflows reformatted

| Purpose | Reformats the worksheet “Rated up cashflows” |

Worksheet: Output sheet

| Purpose | Sets out the results from the “Rated-up cashflows” worksheet and the assumptions used |

Worksheet: Mortality calculations

| Purpose | This sheet shows the step by step derivation of the probabilities of death, in accordance with the chosen mortality basis, percentage adjustment, improvement basis, age rating and underpin. |
### Worksheet: lx - males

<table>
<thead>
<tr>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>This sheet shows the number of male lives alive at each age, year-on-year, under the chosen mortality basis, allowing for percentage adjustment, improvement basis, age rating and underpin, assuming there are 100,000 lives in the certification year. The 100,000 is a base figure commonly used in actuarial work. It also provides the commutation functions used in determining the assistance payable to female spouses on death before retirement.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methodology</th>
</tr>
</thead>
</table>
| The commutation functions are derived in a number of stages, for members at each age, for the tax year of the Certification date and each subsequent year. Non-indexing assistance

First stage: Number of males dying over that year / Number of their spouses who are alive * RPI at 6th October of that year

This allows for increases in line with RPI, as these factors will be used for payment of spouse’s benefits on death before retirement (and pre-retirement benefits increase in line with RPI)

Second stage: Cumulative sum of the results from the first stage, summed from the tax year of the Certification date to each subsequent year. This is the MaleDBRCommFacFlat

Indexing assistance

First stage: Number of males dying over that year / Number of their spouses who are alive * RPI at 6th October of that year / LPI 2.5% index at 6th April of that year

Second stage: Cumulative sum of the results from the first stage, summed from the tax year of the Certification date to each subsequent year. This is the MaleDBRCommFacInc |

### Worksheet: lx - females

<table>
<thead>
<tr>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>This sheet shows the number of female lives alive at each age, year-on-year, under the chosen mortality basis, allowing for percentage adjustment, improvement basis, age rating and underpin, assuming there are 100,000 lives in the certification year. The 100,000 is a base figure commonly used in actuarial work. It also provides the commutation functions used in determining the assistance payable to male spouses on death before retirement.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>As for “lx – males”</td>
</tr>
</tbody>
</table>

### Worksheet: qx - males

<table>
<thead>
<tr>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>This sheet sets out the probabilities of death under the chosen mortality basis, after applying the percentage adjustment, improvement factors (under the chosen improvement basis), underpin and age ratings for males.</td>
</tr>
</tbody>
</table>
Our comments | This feeds in directly from the “Mortality calculations” worksheet
---|---

**Worksheet: qx - females**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet sets out the probabilities of death under the chosen mortality basis, after applying the percentage adjustment, improvement factors (under the chosen improvement basis), underpin and age ratings for females.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>This feeds in directly from the “Mortality calculations” worksheet</td>
</tr>
</tbody>
</table>

**Worksheet: Base qx**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet provides the probabilities of death under various bases, tracking the mortality of members from the start year to each subsequent year. This is done for male and female members aged 20 to 120.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>We have done spot checks on the probabilities of death obtained by GAD from STP, using our in-house software program and confirm we are happy with the data used for projections</td>
</tr>
</tbody>
</table>

**Worksheet: Improvement factors**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet shows the change in the probability of death for individuals year-on-year. It is possible for users of the model to set the improvement factors such that the rate of change of the probability of death is in line with an improvement basis which is different to that which might usually be associated with the base mortality table.</th>
</tr>
</thead>
</table>

**Worksheet: Tables for revaluations**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet provides tables for the revaluation of GMPs on a fixed rate basis, the s148 orders, revaluation orders for deferred pensions, RPI index, expected future RPI index and calculations to determine the 2.5% LPI.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>We have done spot checks on the published revaluation rates and checked GAD’s calculations. The model while allowing for a range of inputs, does not allow for the GMPs to increase in line with s148 orders which may be the revaluation method used by schemes. As mentioned earlier, the FAS assistance for such schemes is likely to be overstated. Additionally, if the s148 orders are not used, we do not see the need to keep them in the model although it has been pointed out by GAD these may aid future re-modelling. We observe the assumption made by DWP that expected future increases in inflation will be at 2.87% per annum consistent with HM Treasury’s inflation target for CPI supplied to the Bank of England.</td>
</tr>
</tbody>
</table>
### Worksheet: Financial information

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet shows the yields on fixed-interest and index-linked gilts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>We have done spot checks on these which have not shown any anomalies. The headings do not always match the content as there has been a change in the way that the yields were calculated and published on 30 November 1998, although this has been noted by GAD. As there are no cases where the estimate date is earlier than 30 November 1998, this is not a cause for concern.</td>
</tr>
</tbody>
</table>

### Worksheet: Annuity factors - pensioners

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet lays out the unisex annuity factors for an immediate annuity payable to a Pensioner, calculated by GAD in 2007 to reflect what is expected to be a typical insurer’s buy-out basis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>These annuity factors are only used for projection purposes, to estimate the member and contingent spouse’s pensions that could be bought from the estimate of the fund value. They are based on a level pension being payable to the member for life, and a half-rate pension payable to a surviving spouse, with specific assumptions for proportion married and the age difference between husbands and wives. There is the possibility of inconsistency however, where the assumptions that are input into the model do not correspond to those underlying these annuity factors (e.g. a different proportion married), or indeed, where the form of the benefit being bought-out is different from that assumed (e.g. with pension increases).</td>
</tr>
</tbody>
</table>

### Worksheet: Annuity factors – non-pensioners

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet lays out the unisex annuity factors for a deferred annuity payable to a Non-Pensioner from their scheme NRA, calculated by GAD in 2007, to reflect what is expected to be a typical insurer’s buy-out basis, allowing for pre-retirement mortality.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>As for “Annuity factors – pensioners”</td>
</tr>
</tbody>
</table>

### Worksheet: Conventional gilt MVA

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet includes the market value adjustment (MVA) factors to allow for the difference in the yields as used in the annuity factors to those as at the Estimate date.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>The MVA is exactly 1.00 when the conventional gilt yield is in the range 4.46% - 4.54%. This corresponds to the interest rate after retirement assumption used in the annuity factors basis, where 4.5% represents a “central” conventional gilt yield. It should be noted that the MVAs here are based on the mortality assumption in the “FASOU factors” used in earlier versions of the model. Strictly the MVAs should be calculated reflecting the mortality basis of the actual annuity factors in the model.</td>
</tr>
</tbody>
</table>
Worksheet: Index-linked gilt MVA

<table>
<thead>
<tr>
<th>Purpose</th>
<th>This sheet includes the MVA factors to bring the annuity factors in line with market conditions as at the Estimate date. The index-linked MVA factors are applied only to the annuity factors for non-pensioners.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our comments</td>
<td>The MVA is exactly 1.00 when the index-linked gilt yield is 2%. This corresponds to the interest rate before retirement assumption used in the annuity factors basis, of 1.5%, representing a &quot;central&quot; index-linked gilt yield of 2% less a 0.5% margin in pricing. It should be noted that the MVAs here are based on the mortality assumption in the “FAS OU factors” used in earlier versions of the model. Strictly the MVAs should be calculated reflecting the mortality basis of the actual annuity factors in the model.</td>
</tr>
</tbody>
</table>
Appendix B

LETTER SENT BY ANDREW YOUNG TO PENSION ADMINISTRATORS
Data Collection Exercise in Support of the Financial Assistance Scheme Review of Pension Scheme Assets

30 May 2007

Dear [ ]

Further to your recent conversations with […], I am writing to ask for your help in supporting the work of the team taking forward the Government’s recently announced review of pension scheme assets. The review, announced by John Hutton, Secretary of State for Work and Pensions on 28 March, will examine whether an alternative treatment of the residual funds in affected pension schemes could supplement the committed Government funding of the Financial Assistance Scheme. Further details about the review of scheme assets are available at www.dwp.gov.uk/fasrsa.

As […] has discussed with you, the FAS Assets Review team, in conjunction with the Department for Work and Pensions and the Government Actuary’s Department are engaging in a data collection exercise to inform the modelling of the long term costs of the Financial Assistance Scheme.

I am writing to you to ask if you are able to supply data at an individual level on those pension schemes that are eligible for FAS assistance for which you have responsibility. In addition, if you are able to share this request with your colleagues in […] so that we can gather data for all FAS eligible schemes that […] is responsible for, that would be most helpful.

Please note, we are asking for these data on all scheme members, both deferred members and pensioners, who may be eligible for assistance from FAS following the budget statement by the Chancellor of the Exchequer on 21 March 2007. This does mean that we do not require data for pensioners who will not be eligible for FAS assistance, even after the extension to payments.

I attach a pro-forma to assist in the collation of these data. I do appreciate that you might not be able to supply us with data that fit into this template in the time available – if this is the case, then providing all of our key information requirements are met, an alternative data layout would be acceptable.

Our key requirement is to understand the full pension under the scheme rules and be able to compare that with the amount of reduced pension that the scheme can afford. We appreciate that schemes will be in different stages of winding up and that any estimate of the reduced pension, be it individual asset allocation or priority benefit coverage levels, would be appreciated. As you will see from the pro-forma, the key elements of the data requirements are:

- An anonymised member reference number (in case we need to contact you about data on a specific case).
- Date of birth of scheme member
- Gender
- Date of leaving pensionable employment
- Scheme’s Normal Retirement Age
• Annual rate of GMP at date of leaving pensionable service

• Annual rate of pension in excess of the GMP subject to statutory revaluation at the date of leaving service

• Annual rate of pension in excess of GMP which is not subject to statutory revaluation as at date of leaving service

• Estimate of pension likely to be secured for member at scheme NRA, including all revaluations up to NRA

• If rate of pension is unavailable: amount available to scheme to discharge individual's pension liabilities

• Date of estimate

If you are able to provide these data by **22 June 2007**, this would be extremely helpful in assisting the review meet its deadlines for delivering its initial statement in the summer of 2007. I must, however, stress that this information request is not a substitute for the requirement to provide member data to the FAS Operating Unit as pension schemes wind up.

Please send the completed returns to [...], preferably by email, to: [...]@dwp.gsi.gov.uk. His telephone number is [...].

[...] will be available to help with any specific queries or problems with this exercise. His contact details are:

Mobile:
E mail:
Home number:

I would like to take this opportunity to thank you for your assistance in this exercise. By contributing this critical information you will be helping to ensure that the review team form well founded and workable opinions about the way forward and potentially improving the level of assistance to members of schemes, and to ensure that the Department for Work and Pensions is able to produce further robust costings for FAS.

I would, therefore, appreciate your input and you have my assurance that the information you provide will be treated as confidential.

I do hope that you will be able to help. If you have any further concerns or questions about this exercise, please contact the FAS Assets Review team by emailing adelphi.fas-review@dwp.gsi.gov.uk and one of my team will contact you.

Andrew Young

Head of FAS Assets Review Team