

**Occupational Pension Receipt in  
the Pensioners' Incomes Series**

**The Pensioners' Incomes Series  
Methodological Paper No. 1**

**September 2000**

## **Foreword**

This paper is based on a review of a certain aspect of methodology used in the production of *The Pensioners' Incomes Series* (PI), prior to the 1997/8 edition.

The review looked at the practice of adjusting estimates of proportions in receipt of occupational pension income, using information from the Government Actuary's Department's (GAD) Survey of Occupational Pensions. It concluded that, in the light of new and more detailed information from both the Family Resources Survey and the GAD Survey, the arguments for adjustment were not as strong as had been thought in the past. Therefore, it was recommended that estimates of occupational pension receipt (including estimates for earlier years) should no longer be adjusted according to the GAD survey.

The review took place in the second half of 1999. Therefore, any references to the 'current situation' or use of the present tense in this paper refers to the methodology used prior to the 1997/8 edition of PI. The 1997/8 edition was published on 27 January 2000 and followed the recommendations made in this paper.

Please note that at the time of the review, the 1995 GAD Survey had not been published, and all figures quoted here from the GAD Survey are provisional. Since then, there have been changes in the methodology used by GAD to convert estimates of pensions into estimates of pensioners. In particular, the process is now based on FRS data rather than Retirement Survey data. However, it is unlikely that the published figures will be significantly different to the ones quoted in this paper, or that the conclusions drawn from this review will be affected.

The main focus of this paper is on the methodology used for adjusting estimates of occupational pension receipt in PI, but it also serves as a useful assessment of the quality of information on occupational pension receipt from household surveys, compared to a survey of the pension funds themselves.

Any comments on this paper would be gratefully received.

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# Occupational Pension Receipt in the Pensioners' Incomes Series

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## Executive Summary

Estimates of proportions of pensioners in receipt of an occupational pension (OP), published in *The Pensioners' Incomes Series* (PI), are currently adjusted according to data from the Government Actuary's Department (GAD) Survey of Occupational Pensions. This has traditionally been seen as a more accurate source, since it is based on information from pension schemes themselves, while household surveys such as the Family Expenditure Survey (FES) and Family Resources Survey (FRS) are thought to under-report numbers in receipt. However, it does have a number of limitations when used by DSS in this way.

The current 'GAD adjustment' involves a number of assumptions that are either simplistic or based on out of date information. An improved method is proposed, which makes use of new more detailed and more timely information from the Family Resources Survey on the characteristics of OP recipients and the type of pensions they receive. The improved method also takes account of some of the differences in coverage between the surveys.

Given the reliance of this method on the characteristics of OP recipients in the FRS, a simpler, more transparent alternative method is proposed whereby FRS-based estimates are increased in line with GAD estimates using a single adjustment factor. However, this method is rejected since information from the GAD survey on the relative numbers with each type of pension is effectively lost.

Having examined methodological differences between the two surveys, the paper addresses the question of whether the evidence of under-reporting in the FRS is strong enough, or the scale of any under-reporting large enough, to warrant any adjustment at all. The observed differences between the FRS and the GAD survey (after adjustments for coverage) could be explained by biases in the GAD grossing procedure. We would expect any such bias to have the same impact on all pension types, so the fact that under-reporting seems more likely for widows/dependants OPs than for former employee OPs might suggest that under-reporting does genuinely occur. However, there are also potential biases in the FRS grossing procedure which could explain why under-reporting appears more pronounced for widows/dependants pensions.

The paper concludes that the improved method represents the most appropriate method of adjustment, but assessing the size of the adjustment needed is still subject to considerable uncertainty. There is a real risk of making spurious adjustments. Indeed, if the true extent of FRS under-reporting were only half the size of the FRS-GAD survey gap (which is plausible given margins of error), then the adjusted figures would be no more accurate than unadjusted figures.

Therefore it is recommended that, for both PI(FRS) and PI(FES), no adjustment is made to estimates of proportions in receipt of occupational pensions; and that the relevant tables should include a footnote indicating that estimates may be subject to under-reporting.

## 1. Introduction

This paper examines the current methodology for adjusting estimates of occupational pension receipt in The Pensioners' Incomes Series. Adjustments are made using the Government Actuary's Department (GAD) Survey of Occupational Pensions. The paper explores the extent to which the adjustments are an improvement on raw FRS data (if at all), by looking both at the surveys themselves and at the assumptions that are made in order to convert the GAD data into adjustment factors.

Suggested improvements to the current methodology are given and alternative methods discussed.

It should be noted that the GAD survey is intended primarily as a measure of pension coverage in the UK, based on information from pension providers. The methodology under examination is *the DSS method* of using this data to improve its own estimates of occupational pension receipt. Any criticisms of the GAD survey should be regarded as criticisms of how the GAD data is used by DSS, rather than of the GAD survey itself.

## 2. Rationale for current methodology

Estimates of occupational pension receipt in The Pensioners' Incomes Series are adjusted in line with results from the Government Actuary's Department's Survey of Occupational Pensions. *These adjustments affect estimates of proportions in receipt of occupational pension income only (the top section of Table 10 in the 1996/7 edition).* They do not affect estimates of the mean or median amount of occupational pension received; they do not affect estimates in any other part of the publication.

The GAD survey is used to derive the weighting factors which are applied to PI data when estimating the proportions in receipt of occupational pension (referred to hereafter as 'OP'), such that the numbers in receipt are consistent with the GAD survey. This process is referred to hereafter as the 'GAD adjustment', although it should be made clear that DSS are responsible for the methodology and carrying out the adjustment, using published GAD figures.

The adjustment is made because it was thought that household surveys such as the Family Expenditure Survey (FES) and Family Resources Survey (FRS) underestimate the number of people with OP income. The main reason was thought to be respondent error. Conversely, the GAD survey was thought to be more accurate because it is based on data from the pension funds themselves. This view has been perpetuated by the fact that the 'GAD adjustment' has always led to an increase in estimated numbers in receipt (although this may have been partly a product of the assumptions used in the adjustment – see below).

### 3. The surveys

The FRS and FES are household surveys which collect detailed information about the full range of sources from which people obtain income. Response to the surveys is voluntary, although overall response rates are reasonably high. Under-reporting of OP receipt may occur if recipients are more likely than non-recipients to refuse to respond to the survey. The effects of non-response *should* be reduced somewhat by 'grossing' results up to population control totals according to age, sex and region (although it is theoretically possible that the effects could increase due to this grossing procedure).

Under-reporting may also result from OP recipients in the survey reporting that they do not receive OP. This is more likely to result from the respondent not knowing what kind of scheme a particular pension comes from, rather than deliberate mis-reporting. The question in the FRS is designed to keep mis-reporting to a minimum by describing each type of pension on a 'prompt card' which is given to the respondent to consider in their own time.

*Are you at present receiving an income from any of the sources shown on this card?*

[CODE ALL THAT APPLY]

- (1) An employee pension from your previous employer
- (2) Widow's Employee Pension (PENSION FROM PREVIOUS EMPLOYER OF DECEASED SPOUSE OR RELATIVE)
- (3) A personal pension
- (4) A pension as a member of a Trade Union or friendly society
- (5) An annuity (includes home income plan or equity release)
- (6) A trust or covenant
- (7) None of these

Each respondent is prompted to report up to four employee pensions and up to three widow/dependant employee pensions.

The FES question was very similar in 1996/7. Respondents are asked whether they receive an income from any of the following sources, shown on a 'prompt card'.

*Are you at present receiving an income from any of these sources?*

*What type of pension is this?*

- (1) An employee pension from a previous employer
- (2) Pension from employer of a deceased spouse or relative
- (3) A private personal pension
- (4) An annuity, home income plan, equity release plan
- (5) A pension as a member of a Trade Union or friendly society
- (6) A payment from a trust or covenant

Each respondent is prompted to report up to six incomes from any of these sources.

However, before 1996/7, there were only two categories to this question in the FES: employee pensions and income from a personal pension/annuity/covenant.

As mentioned above, the GAD survey is based mainly on information from the pension fund administrators rather than OP recipients. For any given pension fund sampled, this should minimise the risk of OP recipients not being identified. However, results are still based on a sample, so results may be affected by non-response bias and sampling variation. Furthermore, 'money purchase' OPs (a small but growing sector of the OP market) are not captured by the main sample (apart from the small number that are paid from the scheme fund) and have to be estimated separately.

The GAD survey seeks information from virtually all public sector OP funds (excluding a few small schemes) and all 'large' private sector OP funds (i.e. those with over 1,000 active members or those run by an employer who employs over 1,500 people). A sample of smaller schemes is also included.

Results are grossed up to take account of the fact that not all schemes are contacted and not all of those contacted respond (89% responded in 1991). The nature of the sample means that there is a bias towards larger schemes. Therefore, different grossing factors are applied according to the size of scheme.

The grossing factors are calculated such that the overall number of active members of OP schemes matches the number of active members derived from data from the General Household Survey (GHS), adjusted to allow for those employees not living in households and extended to cover the whole of the UK. This brings forward two important issues when considering the 'GAD adjustment' to PI data. Firstly, the control totals are largely based on data from a household survey. If we argue that the FES and FRS, as household surveys, tend to under-report OP membership/receipt, the same argument would apply to the GHS.

The second issue is that the grossing factors relate to active scheme members (contributors) rather than scheme pension recipients. While there is likely to be a strong correlation between the two, more recent schemes may have a large number of active members but few pensioners. At the other extreme, some schemes may have no active members, yet still be paying out pensions. Therefore, estimates of numbers of OP recipients in the GAD survey may be affected by biases in the grossing procedure.

Data on the effect of the grossing procedure, kindly provided by GAD, suggests that the ratio of pensions in payment to active members in public sector schemes is largely unaffected by the grossing procedure. For private sector schemes (which account for 59% of active members after grossing), the ratio of pensions to active members is reduced by 8% under the grossing procedure. This may be a fair reflection of the ratio of pensions to active members among all private schemes, but only if the schemes in the sample are representative of all private schemes in terms of their ratio. There appears to be a wide range of ratios among the schemes in the sample: 16% of schemes (weighted by grossed number of active members) have a ratio of more than 2, while 49% have a ratio of less than 0.4. This variation suggests that there is scope for the sample to be unrepresentative and that there may be sampling error in the number of pensions in payment that is not corrected for by the grossing procedure.

Aside from differences in methodology between the FRS/FES and the GAD survey, there are important differences in coverage. The GAD survey covers the UK, as does the FES, whereas the FRS relates to Great Britain only.

Furthermore, the FRS/FES covers only the household population, whereas the GAD survey covers all residents, notably including old people living in residential care. The GAD survey collects information on OP recipients regardless of whether they are living in households or residential care.

Another difference in coverage is that the GAD Survey covers all those receiving OP income from pension schemes based in the UK, regardless of whether the recipient is still living in this country. In contrast, the FRS/FES covers only those who are still resident in this country. On the other hand, the FRS/FES will include people living in this country whose OP is paid by an overseas pension scheme.

#### 4. GAD adjustment to PI data - methodology and assumptions

The GAD survey produces estimates of the number of occupational pensions in payment for

- (a) male former employees
- (b) female former employees
- (c) widows and other dependants

Equivalent estimates are produced for the number of OP *pensioners* in each category by using the ratios of pensions to recipients in the 1988 Retirement Survey. There is no other information on OP pensioners, such as age or marital status, since pension schemes do not consistently hold such information.

Table 10 in the 1996/7 edition of PI gives estimates for

- All pensioner units
- Pensioner couples
- Single pensioners
- All recently-retired pensioner units
- Recently-retired pensioner couples
- Recently-retired single pensioners

Therefore, the GAD figures cannot be directly applied, but are used indirectly to estimate how many OP recipients are in each of the PI categories.

A further issue is that the GAD survey is only produced every four years and results become available some time after the reference period. Thus the latest published results refer to 1991, while 1995 results will be published in the near future.

The various steps of this methodology are outlined below and the key assumptions are identified. Exactly the same method is used for FES- and FRS-based analysis. This paper concentrates on the FRS, due to the additional information available in that survey and for simplicity. The implications for FES-based analyses are discussed towards the end of the paper.

STEP 1: Estimated numbers of OP recipients are published by GAD. They are derived from estimated numbers of pensions using information on people with more than one OP from the 1988 Retirement Survey.

*Assumption 1:* The occurrence of people with more than one OP in the 1988 Retirement Survey is representative of all OP recipients.

STEP 2: Allocate all male former employees to the 'men' category and all female former employees and widows and other dependants to the 'women' category.

*Assumption 2:* All 'widows and other dependants' are women.

STEP 3: Extrapolate the numbers forward to the current year using the growth rate between the last two surveys (currently 1987 and 1991).

*Assumption 3:* The growth rate since the last survey is constant and the same as the average rate between the last two surveys.

STEP 4: Calculate the number of benefit units in the FRS sample where

- (a) the man only is in receipt of OP
- (b) the woman only is in receipt of OP
- (c) both the man and woman in a couple are in receipt of OP

Combine categories (a) and (c).

*Assumption 4:* Any shortfall in reporting of OP receipt in the FRS is the same for categories (a) and (c).

STEP 5: Separately for ‘men/both’ and ‘women’: Calculate the ratio of GAD numbers to FRS sample numbers. Set the GAD-based grossing factor to equal this constant ratio, for every benefit unit with an OP in each category.

*Assumption 5:* The characteristics of the OP recipients in the (ungrossed) FRS sample are representative of the true OP recipient population (particularly age, sex, marital status and whether or not they are in a pensioner unit).

STEP 6: Those with no OP are allocated a grossing factor, such that the total number of benefit units (not pensioner units) matches the grossed FRS.

*Assumption 6:* OP non-recipients are over-estimated at the same rate for pensioner units and non-pensioner benefit units.

STEP 7: The GAD-based grossing factors are applied to FRS data in calculating the proportion of pensioner units in receipt of OP for all pensioner units, couples, singles and the equivalent groups for the recently-retired.

*Assumption 7:* The split between recently-retired and non-recently retired OP recipients in the FRS sample is representative of the true OP recipient population.

## 5. Validity of assumptions

### *Assumption 1:*

The assumption of the 1988 Retirement Survey being representative of true OP recipients is problematic for two reasons. Firstly, characteristics are likely to have changed in the eleven years since the survey was conducted. Secondly, the survey samples only people who are a few years either side of state retirement age. This means that results will be biased towards younger OP recipients, who are more likely than OP recipients in general to have more than one OP.

The FRS includes detailed information on multiple OP receipt (see Annex A). Overall, there was an average of around 1.10 pensions per recipient in the FRS. This compares with around 1.11 pensions per recipient for 1991 GAD figures adjusted according to the Retirement Survey and extrapolated to 1996/7.

The ratios differ more between sources when we look at different types of pension. The Retirement Survey ratios being used by GAD to produce provisional figures were 1.20 for male former employees and 1.03 for females. [There is no ratio applied directly to widows/dependants pensions because assumptions have to be made about overlap with the other pension types]. The 1996/7 FRS estimates ratios of 1.10 for male former employees, 1.05 for women and 1.04 for widows/dependants.

There will also be overlap between the pension categories. The GAD survey makes an allowance for the fact that recipients can receive pensions both as a former employee and as a widow/dependant (such people are included in the 'former employee' category and excluded from the 'widows/dependants' category in the GAD publication). Once again, the overlap is estimated using the 1988 Retirement Survey, which appears to indicate less overlap (and therefore higher numbers of OP recipients) than the FRS.

These figures indicate that there are underlying differences between the Retirement Survey and FRS estimates, even though the overall ratios are similar. It is possible that there are two sources of bias in the Retirement Survey figures that are counterbalancing one another (namely the bias towards younger recipients and the fact that the data relate to 1988). In any case, the FRS figures would appear to be a sounder basis for estimating the average number of pensions per recipient, since they are considerably more up to date and cover all age groups. Furthermore, the FRS results in Annex A seem stable over time (apart from figures for men with a widows/dependants pension, which fluctuate due to small sample size but have very little effect on overall results). Although we might expect the average number of pensions per recipient to increase gradually over the long term, the stability in FRS estimates in the short term means we can be more confident in the figures.

### *Assumption 2:*

It is not possible to tell from the GAD survey what the gender of people in the 'widows and other dependants' category is. It is thought that the majority will be widows, but there will be a minority of men (widowers or male dependants). It is possible to estimate the proportions of men and women receiving a widows/dependants occupational pension, using the FRS: Around 3% of such

individuals (including 2% of such individuals in pensioner units) are men. This suggests that, other things being equal, the current methodology over-estimates OP receipt for women and underestimates for men. This will impact particularly on estimates for single pensioners, the majority of whom are women.

The assumption is likely to become less accurate over time as the number of men with widowers/dependants pensions increases, reflecting increased OP membership of women in previous decades.

*Assumption 3:*

The assumption of a constant trend in OP receipt between 1987 and 1996/7 is clearly a strong one, particularly when the latest GAD estimates relate to 1991. Intuitively, the growth should be uneven given that the growth in scheme membership since the 1950s has itself been uneven. This is born out by earlier estimates from the GAD survey (although pre-1987 figures relate to pensions not pensioners). Between 1987 and 1991, the growth rate was estimated at around 3% per annum. Over the previous four-year period it was 1% p.a., and before that 7% p.a. These variations are likely to be due to a mixture of genuine changes in the trend, sampling variation and changes in survey methodology.

Further information on recent trends can be obtained from the FRS. Even if we conclude that the FRS under-estimates OP receipt, it is reasonable to assume that the degree of under-estimation does not fluctuate wildly over time. Therefore, the trend in the FRS might be a reasonable estimate of the true trend. Between 1994/5 and 1996/7, OP receipt in the FRS increased by 2% p.a. Although this is based on just a two-year period and may be subject to sampling fluctuations, it is broadly consistent with the GAD-based estimate of 3% p.a. However, even estimates as close as 2% and 3% lead to very different results when extrapolated over a five-year period – total growth of 13% and 18% respectively.

Therefore, the assumption of a constant trend over time will at best approximate the true trend. When extrapolated over a five-year period, even a small difference in trend can lead to a significant difference in final estimates.

Provisional figures from the 1995 GAD survey (see Foreword) suggest that the number of OP recipients grew at 4% p.a. between 1991 and 1995, rather than the assumed 3%.

*Assumption 4:*

Given that couples where both receive an OP cannot be separately identified in the GAD figures, it is necessary to estimate their level of under-reporting with reference to either men or women. Assuming they have the same rate of under-reporting as men is quite arbitrary, but so too is assuming the same rate as women or indeed an average of the two. In fact, it could be argued that the level of under-reporting among couples where both are OP recipients is likely to be lower than for either men or women, because both people in the couple would have to mis-report in order for the couple to be mis-classified as non-recipient. However, there is no way of either substantiating or quantifying this theory.

*Assumption 5:*

The assumption that the characteristics of OP recipients in the (ungrossed) FRS sample (particularly age and marital status) are the same as true OP recipients is debatable. By using the FRS sample rather than FRS figures grossed to population levels, we do not take account of different response rates among different groups. For example, if couples were more likely to respond to the FRS than singles, then we would overestimate the proportion of OP recipients who were in couples.

A further issue is that any under-reporting of OP receipt in the FRS may be concentrated in particular groups. For example, people in receipt of a widows/dependants OP may be less likely to report it, leading to under-representation of single women.

Of particular concern is the assumption that OP receipt is under-reported at the same rate for both pensioner units and non-pensioner benefit units. This may be a necessary assumption in the absence of an age split in the GAD data, but the implications of an incorrect assumption are large. In one extreme case, all under-reporting occurs among non-pensioner benefit units and adjustment of FRS data is unnecessary. At the other extreme, all under-reporting is among pensioner units and the GAD adjustment is not large enough.

*Assumption 6:*

Given that under-reporting of OP receipt is assumed to occur at the same rate for pensioner units (PUs) and non-pensioner benefit units (non-PUs), it seems sensible on first consideration to assume that OP non-receipt is over-reported at the same rate for those two groups. However, this leads to changes in the overall numbers of PUs and non-PUs.

This occurs due to the big difference in rates of receipt between PUs and non-PUs. PUs include more recipients than non-recipients, so under the GAD adjustment the number of recipient PUs increases more than the number of non-recipient PUs decreases. The reverse is true for non-PUs.

In short, the GAD adjustment leads to a transfer of benefit units from non-PUs to PUs. This in turn means that, other things being equal, the *proportion* in receipt are under-estimated for PUs (and over-estimated for non-PUs).

The problem would not arise if PUs and non-PUs were adjusted separately, but the GAD data does not allow us to split OP recipients by age.

*Assumption 7:*

The same arguments apply as for assumption 5.

## **6. Improving current methodology**

Most of the scope in improving the current methodology lies in basing the assumptions on more detailed information (much of which, from the FRS, was not available at the time that the original methodology was developed).

The GAD survey offers very limited information on which to base our assumptions, whereas the FRS has detailed information. Using FRS information would give a sounder basis for assumptions 1, 2 and 5. Further improvements to assumptions 5 and 7 would be gained from adjusting grossed FRS data rather than sample data.

Assumption 3 would arguably be better based on FRS data, at least for growth over the period covered by FRS (1994/5 onwards). This is effectively replacing the assumption of constant trend since 1991 with an assumption that any under-estimation in the FRS is constant over time.

Although somewhat arbitrary, there is no obvious way of improving the rationale behind assumption 4.

As discussed above, assumption 6 is particularly problematic. The solution of adjusting PUs and non-PUs separately could be achieved by assuming that the PU/non-PU split in the FRS is representative of true OP recipients.

Further improvements to methodology can be made by taking account of differences in coverage between the FES/FRS and the GAD survey. The FRS is on a GB rather than UK basis. It is possible to use the FES to estimate what proportion of OP recipients in the UK live in Northern Ireland. According to the 1996/7 FES, 2% of OP recipients lived in Northern Ireland. The GAD figures could be reduced by 2% as an estimate of the GB level, before using them to adjust PI(FRS) figures.

In addition, the FES and FRS do not cover the non-household population, including old people in residential care. It would not be appropriate to adjust PI data to take account of the non-household population because all other estimates in the publication are based on the household population only. The current methodology could be improved by trying to remove non-household OP recipients from the GAD figures before conducting the adjustment. However, it is not possible to estimate the size of this group with any degree of certainty (an approximate figure is derived in Section 9 below).

Finally, GAD estimates include OPs paid by UK schemes to people now living abroad. It is not known how many people fall into this category, or the extent to which this is offset by people in the FRS/FES who receive their OP from an overseas scheme. Therefore it is not possible to adjust for this difference in coverage (the potential numbers involved are discussed in Section 9 below).

In summary, the improved methodology would be based on the following steps:

- Take the published GAD figures for the number of pensions (not pensioners).
- Extrapolate from 1991 to 1994/5 using current methodology, and from 1994/5 to the current year using the growth in the number of pensions in the FRS. (N.B. when 1995 GAD data is published, extrapolation can be based entirely on FRS growth rates).
- Reduce by the percentage of pensions received by people not in pensioner units (PUs) from the FRS.

*All the following steps relate to PUs only*

- Reduce by the ratios of recipients to pensions in the FRS to get estimates of recipients.
- Allocate widows/dependants to the 'men' and 'women' categories according to the ratio in the FRS, and taking account of the overlap between employee pensions and widows/dependants pensions in the FRS.
- Make allowance for differences in coverage (remove estimated number from Northern Ireland and from the non-household population).
- We now have adjusted GAD estimates for the total number of men and women OP recipients.
- Create weights for the GAD adjustment in the same way as the current method, except restricted to PUs and using grossed instead of sample FRS numbers.

## **7. Disadvantages of improved methodology**

The overall thrust of these improvements is to utilise FRS data, replacing several possibly flawed assumptions with a general assumption that OP recipients in the grossed FRS are representative of true OP recipients. This general assumption may not be entirely accurate, but the extent to which any difference between FRS and true OP recipients will affect estimates depends partly on the extent to which FRS under-estimates the total number of recipients (see Section 9 below).

It is difficult to assess the degree to which characteristics of OP recipients in the grossed FRS are representative of true OP recipients. Under-reporting may be concentrated in certain groups (such as single women with widows OPs). Any such differences will not necessarily be corrected for by the FRS grossing procedure, which controls to known population totals by age, sex and region. Regarding pensioners in general, the grossed FRS number will match the known population total, but smaller subgroups by age will not necessarily match the known population. For example, broad comparisons with more precise sources of population data have suggested that younger pensioners were over-represented (and older pensioners under-represented) in FRS 1997/8 – although there was little evidence of this pattern in other years.

The improved methodology assumes that trends over time in FRS estimates of OP receipt are representative of the true trend. In other words, it assumes that the level of under-reporting is constant over time. The trend may also be distorted by random sampling variation, but the same is true of all PI estimates. The results in Annex A suggest that the characteristics of the OP recipient group captured by the FRS do not fluctuate much from year to year.

Assumption 4 – that couples where both have OP income have the same level of under-reporting as men – is retained from the existing methodology.

Also retained from existing methodology is the reliance on an accurate GAD estimate of the total number of pensions in payment. As discussed in Section 3 above, this may contain inaccuracies since the GAD grossing procedure is based on active scheme members rather than pensions in payment.

## **8. Alternative method#1 – single adjustment factor**

An alternative method that could be used for adjusting FRS-based PI data, is to apply a single adjustment factor to FRS-based results (rather than adjusting the data itself). This factor represents the estimated level of under-reporting in the FRS and is derived from comparison between overall levels of OP receipt in the FRS and the GAD survey.

In most respects, this method is the same as the improved methodology outlined above, since it is assumed that characteristics of OP recipients in the FRS are representative of true OP recipients.

The key difference, other than the relative simplicity and transparency of the method, is that the single adjustment factor method assumes that couples under-report at the same rate as singles (not just men as in the current method). As mentioned above (*Validity of assumptions, Assumption 4*), it could be argued that couples are less likely to under-report than singles, but this assumption is no more arbitrary than the existing assumption 4. Once again, the degree to which any error in this assumption will affect final results will depend on the level of under-reporting.

## 9. To what extent does the FRS ‘under-report’?

In order to examine the level of under-reporting in the FRS, the 1995/6 FRS was used to try to replicate the provisional 1995 GAD survey figures (see Foreword) for the number of pensioners (of all ages). The initial results show a lower number pensions in the FRS (7.1 million) than the GAD survey (8.5m). When converted to numbers of recipients using FRS ratios, this gives 6.4m and 7.5m recipients respectively (Table 1).

The first point to note is that the two surveys relate to slightly different time periods. When the GAD figures are extrapolated from 1995 to 1995/6, using the same method as in the current GAD adjustment process, the total increases to 7.6m.

As discussed above, there are differences in coverage between the two data sources. The first difference is that the GAD figures include Northern Ireland. It is estimated that Northern Ireland accounts for around 2% of OP scheme membership in the UK. Likewise, the FES 1996/7 indicates that around 2% of OP recipients live in Northern Ireland. Reducing the GAD figures by this proportion means that the number of OPs is estimated at 7.5m in GB.

**Table 1: Differences in coverage between GAD survey and FRS**

	<i>Millions</i>	
	<b>GAD 1995 (Provisional)</b>	<b>FRS 1995/6</b>
Initial estimates – pensions	8.5	7.1
Convert to recipients using FRS ratios	7.5	6.4
Extrapolate GAD figure to 1995/6	7.6	6.4
Estimated number in Northern Ireland	0.2	-
Estimated number in non-household population	0.2	-
Estimated number of OP recipients no longer resident in the UK <i>less</i> Estimated number of UK residents receiving OP from an overseas scheme.	Not known	-
Estimated number reporting OP as annuity in FRS	-	*
Estimated number of OP recipients in the household population, GB, 1995/6	7.3	6.4

\*Less than 0.05 million. Components may not sum to totals due to rounding.

The second difference is that the GAD Survey includes OP recipients who are not living in private households. Among pensioners, this group largely consists of those in residential care and nursing homes. It may be possible to reduce GAD figures by an estimate of the number of non-household OP recipients. It is estimated that approximately 500,000 people in the UK live in residential care of some description<sup>1</sup> (around four-fifths of whom are women<sup>2</sup>). It is not known how many are OP recipients. It could be argued that people over 70 years old living in households would be a reasonable proxy for this group, since most people in care are over this age. The FRS suggests that around 65% of men and 36% of women over 70 were OP recipients. Therefore, if we assume that the grossing procedure for the GAD survey is entirely successful in accounting for the non-household population, just over 200,000 of the recipients identified could be outside the coverage of the FES/FRS. When applied to GAD figures, the estimate is reduced to 7.3m.

The third difference in coverage is the inclusion in the GAD Survey of non-UK residents receiving OP income from UK schemes; and the exclusion of UK residents receiving OP income from overseas schemes *only*. As mentioned above, the size of these two groups is not known. To get a rough idea of numbers in the first group, we note from DSS administrative statistics that around 900,000 overseas residents currently receive a state Retirement Pension (RP) from the UK. This could be viewed as a proxy for people who have spent some part of their working life in the UK, then retired abroad. As such it can be interpreted as the *maximum* number of people who may have contributed to an OP then retired abroad. If around two-thirds contributed to an OP (as is the case for UK residents), this group would account for some 600,000 of the difference between GAD Survey estimates and FRS estimates.

In practice, this factor is likely to explain a much smaller part of the difference, because the number of people in this group will be offset by UK residents (covered by FRS) who receive OP income from an overseas scheme only. The size of the latter group is not known.

Therefore it is not possible to adjust GAD estimates to take account of this particular difference in coverage.

Differences between GAD and FRS figures may occur due to the different treatment of people who receive income from an annuity purchased with an OP. Information on such people from pension schemes themselves is limited, but the GAD survey does include an adjustment to take account of these. However, it is possible that not all such people are included in the PI analysis of the FRS. It is likely that a significant number of respondents will regard such an annuity as occupational pension income and report it as such. However, some people in the FRS report annuities which are identified in subsequent questions as having been bought with an OP lump sum. These are not included in the PI definition of occupational pension income. The number of such cases is small in the context of this paper (under 50,000 individuals), but it will be necessary to consider elsewhere whether such income should be included under occupational pension income in future.

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<sup>1</sup> *With Respect to Old Age: A Report by the Royal Commission on Long Term Care*, The Stationary Office, March 1999.

<sup>2</sup> This proportion is based on the gender split of DSS benefit recipients in institutional care (from DSS administrative statistics). This group covers the majority of people in residential care and nursing homes.

After attempting to take account of these differences between sources, the difference between GAD and FRS figures is not as large, standing at 0.9m (12%). It would be more appropriate to use these adjusted figures than the initial figures when calculating the 'single adjustment factor' proposed above, i.e. FRS-based results would be increased by a factor of  $7.3 / 6.4 = 1.14$ .

## **10. Disadvantages of alternative method#1**

The key disadvantage of alternative method#1 is that it is very sensitive to the adjustment factor used. In particular, the appropriate adjustment factor may change over time. Due to the timing of the GAD survey, the adjustment factor could only be updated once every five years and would be immediately out of date. [GAD estimate that future surveys will be published within two years of the reference period]. The adjustment factor above was calculated based on provisional 1995 data from the GAD survey (see Foreword). If it we use 1991 GAD data (extrapolated), the adjustment factor would be 1.12 rather than 1.14. This has a significant impact on results.

Another issue is that the adjustment factor calculated for all recipients may not be appropriate for OP recipients in pensioner units (PUs). It is not possible to calculate an adjustment factor for people in PUs in the same way, since the GAD data contains no information on age. However, if we assume that the PU / non-PU split in the FRS is accurate, we can apply the characteristics of the FRS OP recipients in PUs to the GAD figures in order to calculate a PU adjustment factor. This method is very similar to the 'improved method' outlined above. This leads to an adjustment factor of 1.09 (using 1991 GAD data) or 1.13 (using provisional GAD 1995 data). Results using each of these factors are given in Table 2 later in the paper.

Comparing the single adjustment factor to the 'improved method' highlights another of its disadvantages. A single adjustment factor does not take account of differences in under-reporting between different pension types. For male former employees the under-reporting, if any, appears to be very minor; under-reporting appears to be slightly more likely among female former employees; but most of the difference between FRS and GAD figures appears to be due to widows/dependants pensions. Since widows/dependants are mostly women, using a single adjustment factor would lead to over-estimation of male OP recipients and under-estimation of females (and hence under-estimation of singles).

## **11. Alternative method#2 – no adjustment**

The ‘single adjustment factor’ method assumes that, once differences in coverage have been taken into account, the GAD survey figures are more accurate than FRS figures. The key advantage of the GAD survey – that it is largely based on information from pension funds – still holds. But we cannot be certain that the GAD figures (adjusted for coverage) are closer to the true level of OP receipt. Aside from the approximate nature of the adjustments for coverage, and the fact that some differences in coverage cannot be quantified, there is uncertainty surrounding the effect of the GAD survey grossing procedure. There is also a separate adjustment needed for ‘money purchase’ pensions in payment. Under a ‘money purchase’ arrangement, the scheme pays out a one-off lump sum (which the recipient uses to fund an annuity) and has no further contact with the recipient, so the scheme cannot provide information on the recipient to the GAD survey. Likewise, a separate estimate is made for recipients of pensions from schemes with no active members.

If the true level of OP receipt was, say, half-way between the FRS and GAD estimates, then a single-factor adjustment would bring no gain in accuracy. A second alternative method would be to make no adjustment to FRS-based figures at all. Although, on balance of probabilities, the FRS under-reports OP receipt, we cannot be sure to what extent. It is debatable, therefore, whether there are sufficient grounds for adjustment of FRS data. A policy of no adjustment has the advantages of being simple to understand and leads to figures consistent with the rest of the PI publication.

In contrast there is evidence to support a genuine difference between GAD and FRS figures. Most notably, the numbers in receipt of OPs as a former employee, particularly men, are fairly similar for the two surveys, while the numbers in receipt of widows/dependants pensions are much lower in the FRS. If there were biases in the GAD survey (such as the grossing procedure) specific to estimates of pensions in payment, we might expect all types of pension to be affected. It seems a more likely explanation would be that FRS respondents are much more likely to fail to report a widows/dependants pension (or confuse it with a different source of income) than a pension that was based on their own contributions. However, this argument is clouded by the fact that the (apparently) greater under-reporting of widows/dependants pensions could potentially be explained by biases in the FRS grossing procedure (see Section 7).

## 12. Results of each method

There are major differences between the various adjustment methods discussed above, but it is not obvious how these affect the final results published in PI. Table 2 shows the estimates that would have been obtained under each method in the 1996/7 publication.

The results using the improved method indicate a slightly lower proportion in receipt than the current method. The difference is surprisingly small given the number of changes to assumptions that have been made. One would expect the main difference to result from the changes to assumption 6 (to avoid the ‘transfer’ of benefit units from the non-pensioner to the pensioner group), leading to significantly higher estimates using the improved method. It seems likely that the various other improvements (particularly allowing for differences in survey coverage) have had a counter-balancing effect.

At the aggregate level, the results using the single adjustment factor (based on 1991 GAD data) are very similar to the current and improved methods. However, there are major differences between couples (where the proportion in receipt of OP is much higher) and singles (lower). The main reason lies in the fact that under-reporting appears to be higher for women, particularly relating to widows/dependants pensions. As discussed above, applying the same adjustment factor to both groups leads to over-estimation of male OP recipients and under-estimation of female OP recipients. Since the majority of single pensioners are women, this means that singles will be under-estimated and couples over-estimated. This also explains why there is a higher proportion of recently-retired pensioners (most of whom are couples) using this method.

The results using a single adjustment factor (based on 1995 GAD data) are typically two or three percentage points higher than the same method based on 1991 GAD data. This illustrates the impact of not being able to regularly update the adjustment factor.

Not surprisingly, making no adjustment to FRS data leads to lower estimates – typically four percentage points lower than the improved method. The difference lies entirely with single pensioners, while estimates for couples are virtually the same as when using the improved method. This is because the improved method uses the same factor to adjust couples where both partners are in receipt as it does for men in receipt. Since the difference between adjusted GAD figures and FRS figures is very small for men, the adjustment factor is close to 1.00. Couples where the woman is in receipt and the man is not are adjusted by the (much larger) women’s factor, but there are too few of these couples to have a significant impact on overall results for couples. Therefore, OP receipt among couples is virtually the same under the improved method as when no adjustment is made. In contrast, the proportion of OP recipients among singles is significantly lower when no adjustment is made. This is because the single pensioners group comprises mainly women, who have higher levels of under-reporting.

**Table 2: Estimated proportion of pensioner units in receipt of occupational pension income 1994/5-1996/7**

	1994/5	1995/6	1996/7
<b>All pensioner units</b>			
Current method	60	65	65
Improved method	61	62	64
Single adjustment factor (GAD91)	62	64	65
Single adjustment factor (GAD95) <sup>2</sup>	65	66	68
No adjustment	57	58	60
<b>Pensioner couples</b>			
Current method	73	75	77
Improved method	72	73	74
Single adjustment factor (GAD91)	79	80	81
Single adjustment factor (GAD95) <sup>2</sup>	82	83	84
No adjustment	72	73	74
<b>Single pensioners</b>			
Current method	53	60	60
Improved method	55	55	58
Single adjustment factor (GAD91)	52	53	56
Single adjustment factor (GAD95) <sup>2</sup>	54	55	58
No adjustment	48	48	51
<b><u>Recently-retired</u><sup>1</sup></b>			
<b>All pensioner units</b>			
Current method	65	67	69
Improved method	67	66	69
Single adjustment factor (GAD91)	71	70	73
Single adjustment factor (GAD95) <sup>2</sup>	74	73	75
No adjustment	65	64	66
<b>Pensioner couples</b>			
Current method	75	75	77
Improved method	74	73	75
Single adjustment factor (GAD91)	81	80	83
Single adjustment factor (GAD95) <sup>2</sup>	84	82	85
No adjustment	74	73	75
<b>Single pensioner</b>			
Current method	53	58	59
Improved method	57	55	58
Single adjustment factor (GAD91)	56	54	57
Single adjustment factor (GAD95) <sup>2</sup>	58	56	59
No adjustment	51	49	52

Notes:

(1) Recently retired pensioner units are defined as: single women aged 60-64; single men aged 65-69; and couples in which the man is aged 65-69.

(2) Single adjustment factor (GAD95) estimates are based on provisional data (see Foreword).

### 13. Discussion – potential changes to PI(FRS) methodology

The *total* number of OP recipients estimated in the GAD survey is likely to be more accurate than the FRS, since it is based on information direct from the pension schemes themselves. A significant part of the observed difference between FRS and GAD figures can be explained by legitimate differences between the two surveys. However, the evidence suggests that there is still some under-reporting of OP receipt in the FRS, and so on first consideration some kind of adjustment would still be appropriate.

A key concern regarding the current adjustment methodology is that the GAD data contains little detail on characteristics of OP recipients, so the control total for adjusting FRS numbers is derived from GAD figures by way of a number of crude assumptions. It appears that using FRS data on the characteristics of OP recipients would be more appropriate than the current method. Two ways of doing this are presented above as the ‘improved method’ and ‘alternative method#1’.

Alternative method#1 uses a single adjustment factor and is effectively a simplification of the improved method. Despite its attraction in terms of simplicity and transparency, this method would not be appropriate since it leads to over-estimation of male OP recipients and under-estimation of females (and hence under-estimation of singles) (see Section 10).

The ‘improved method’ seems to be the most appropriate of the three methods of adjustment considered, yet this still has several disadvantages common to all the adjustment methods. In particular, the method is reliant on the accuracy of estimates of the *total number* of OP recipients from the GAD survey and *characteristics* of OP recipients from the FRS.

There is uncertainty in GAD estimates of total numbers, due to the grossing procedure. Estimates based on the GAD sample of schemes are grossed up according to the number of active members in each scheme, rather than according to the number of pensions in payment. This reflects the fact that the main focus of the GAD survey is on active members, but it does mean that the grossed numbers of pensions in payment may not be entirely accurate.

It is possible that the difference between FRS and GAD estimates (after adjusting for coverage) is entirely due to the GAD grossing procedure. This theory is not supported by the fact under-reporting appears to be much larger for widows/dependants pensions. If the GAD grossing procedure led to over-estimation of pensions in payment, we would expect the degree of over-estimation to be similar for all pension types – this is not the case. On the other hand, it is possible that in some years the FRS grossing procedure (see Section 7) could exaggerate under-reporting of widows/dependants OPs (mainly relating to older women) and understate the under-reporting of male former employee pensions (mainly relating to younger men). Therefore the evidence is mixed.

There is also uncertainty regarding the characteristics of OP recipients in the FRS. The improved method assumes that the characteristics of OP recipients in the FRS are representative of true OP recipients. There is no way of verifying this, but it seems unlikely that the propensity to under-report OP receipt is entirely independent of these

characteristics. The characteristics of OP recipients may also be distorted by potential biases in the FRS grossing procedure (Section 7).

A further disadvantage of the improved method is that the adjustments for coverage made to published GAD figures (i.e. excluding Northern Ireland and non-householders) are necessarily crude, while some differences in coverage cannot be adjusted for at all (i.e. overseas residents receiving OP from UK schemes and vice versa).

In summary, I believe that the improved method represents the most appropriate method of adjustment, but assessing the size of the adjustment needed is still subject to considerable uncertainty. There is a real risk of making spurious adjustments. Indeed, if the true extent of FRS under-reporting is only half the size of the FRS-GAD survey gap (which is plausible given margins of error), then the adjusted figures would be no more accurate than unadjusted figures.

This brings us to ‘alternative method#2’ – no adjustment. The key advantages of this method are that it avoids any spurious adjustments and means that estimates are consistent with the rest of the publication. It should be noted that *The Pensioners’ Incomes Series* includes analyses of other FRS (and FES) variables known to be liable to mis-reporting (e.g. different types of benefits) without adjustment. This raises the question of why OP recipients should be adjusted, but not benefit recipients. The argument that under-reporting of OP receipt is a ‘known’ quantity is not a particularly strong one in the light of analyses in this paper.

A further inconsistency results from the fact that only the proportions in receipt of OP are adjusted (top section of Table 10). The mean and median incomes to those in receipt are not adjusted, effectively assuming that people who mis-report that they don’t have OP income receive the same average amount as those who do report OP receipt. More importantly, there is no adjustment to average OP income in other tables (e.g. Table 1) even though the average would be higher if we assumed the proportions in receipt should be higher.

There is clearly a case for adjustment, not just of proportions in receipt of OP, but also of average OP income (and therefore average total income) in the majority of tables throughout the publication. The evidence suggests that, on balance of probabilities, the FRS does under-report OP receipt; but, crucially, the evidence also suggests that it is not possible to estimate the extent of under-reporting with any degree of accuracy.

*Therefore, it is recommended that the current methodology be changed such that no adjustment is made to PI(FRS) estimates of proportions in receipt of occupational pensions; and that the relevant table should include a footnote indicating that estimates may be subject to under-reporting.*

#### 14. Discussion - potential changes to the PI(FES) methodology

Analysis so far has concentrated on scope for improving the FRS-based estimates in PI, since all new estimates will be FRS-based from 1997/8 onwards. However, the FRS-based series only starts in 1994/5. For earlier years, FES-based series (1979-1996/7) will be used.

The scope for improving the methodology for PI(FES) estimates, using the characteristics of the survey respondents, is more limited. Although in 1996/7 the information collected is comparable to the FRS, this is not the case for earlier years. One option is to use information on characteristics from the FRS or from the 1996/7 FES, but it is unlikely that OP recipients in 1996/7 will be representative of those in 1979.

Likewise, a single adjustment factor could only be derived for 1996/7 and would probably not be applicable to 1979 data.

Given the limited scope for improving the current methodology for PI(FES) estimates, the argument for making no adjustment is even stronger than for PI(FRS) estimates. However, there is an issue over whether the degree of under-reporting in the FES has remained stable over time, particularly given that survey questions were less detailed before 1996/7. Table 3 shows the difference made by the current adjustment for selected years since 1979.

*Table 3: Proportion of pensioner units with occupational pension income in PI(FES)*

Year	Under current adjustment method (%)	No adjustment (%)	Difference (% points)
1979	43	40	3
1989	54	53	1
1990/91	61	54	7
1992	60	56	4
1993	63	57	5
1994/5	62	58	4
1995/6	64	61	3
1996/7	65	57	8

When no adjustment is made, the proportion in receipt appears to fluctuate more over time. This is not surprising given that the GAD adjustment is partly based on interpolating a smooth trend between surveys. The unadjusted estimates are typically 3-4 percentage points lower than the adjusted estimates throughout the period. The two exceptions are 1990/91 (7 percentage points) and 1996/7 (8 percentage points). Sampling fluctuations aside, there is little evidence of any systematic change in 'under-reporting' over time.

*Therefore, it is recommended that the current methodology be changed in line with PI(FRS), such that no adjustment is made to PI(FES) estimates of proportions in receipt of occupational pensions; and again that the relevant table should include a footnote indicating that estimates may be subject to under-reporting.*

## **15. Recommendation**

In summary it is recommended that, for both PI(FRS) and PI(FES), no adjustment is made to estimates of proportions in receipt of occupational pensions; and that the relevant tables should include a footnote indicating that estimates may be subject to under-reporting. This change in methodology should be adopted ahead of the publication of PI 1997/8 and should apply to estimates for all years.

## Annex A: Occupational Pension Receipt in the FRS

<b>(a) Ratio of pensions to recipients</b>	<b>1994/5</b>	<b>1995/6</b>	<b>1996/7</b>
Male former employees	1.11	1.10	1.10
Female former employees	1.05	1.05	1.05
Widows/dependants	1.04	1.05	1.04
<i>of which:</i>			
Men	1.07	1.05	1.02
Women	1.04	1.05	1.04
Any occupational pension	1.11	1.11	1.10

### **(b) Benefit units where more than one partner is an OP recipient**

<i>As a % of all couples with OP</i>	19%	19%	20%
<i>As a % of all benefit units with OP</i>	11%	11%	11%

### **(c) Widows/dependants OPs by sex**

Men	3%	3%	3%
Women	97%	97%	97%

### **(d) Individuals receiving OPs as both a former employee and a widow/dependant**

<i>As a % of all with widows pension</i>	16%	16%	16%
<i>of which:</i>			
Men	36%	39%	42%
Women	16%	16%	16%