



**Report for the
Financial Services Authority**

**Contracting out of SERPS/S2P
to an Appropriate Personal Pension:
a quantification of relative impact**

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OAC_{plc}

OXFORD ACTUARIES AND CONSULTANTS

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Contents

	PAGE
1. Introduction, scope and summary of results	1
2. Methodology	6
3. Assumptions	10
4. Financial assessment of rebates paid from individual tax years	12
5. Identification of key variables affecting financial impact	14
6. Overall historical analysis	17
7. The impact of contracting out in 2005 and beyond	21
8. Comparison with Which? and Alexander Clay reports	22
Appendix 1 - Documents relied on and referred to in preparing this report	24
Appendix 2 - Assumptions for calculating loss and a comparison with GAD and SMPI	25
Appendix 3 - Graphs and tables of results	32

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1. Introduction, scope and summary of results

Introduction

- 1.1 OAC plc has been asked by the Financial Services Authority (FSA) to assist it to quantify the relative financial impact of investors' past decision to contract out of the State Earnings Related Pension Scheme (SERPS) and the State Second Pension (S2P) via Appropriate Personal Pension Plans (APPPs).
- 1.2 OAC is an actuarial consultancy specialising in the fields of life assurance and pensions. We have specific experience in quantifying loss for assistance in dispute resolution proceedings and have developed our own systems and software to assist us with such work.
- 1.3 We believe that our report currently provides a robust indicator of investors' relative financial position and the key variables and issues in assessing that position. We have given careful consideration to the assumptions we have made and the parameters we have chosen, and they represent our view of the likely future economic situation. However should that situation change then it is quite possible that a similar review carried out at some later date would produce different results.

Scope

- 1.4 There are three areas of focus to our report:
 - Historical analysis – a quantification of the relative financial impact in contracting out to date;
 - A review of the financial impact of contracting out in 2005 and beyond;
 - A high level comparison of results from the Which? reports on contracting out published in 2003 and the Alexander Clay report titled: "Contracting out of SERPS via Appropriate Personal Pensions" of May 1996.
- 1.5 This report does not consider whether, in terms of compliance against the regulatory framework in place at the time, it was appropriate for investors to have contracted out of SERPS/S2P in the past. Our report simply quantifies the potential financial loss or gain that particular cohorts of investors may experience from having contracted out over various historic time periods.
- 1.6 Our report provides an estimate of the direct relative financial benefit of contracting out of SERPS/S2P for certain specific investor cohorts. It does not take account of specific features of contracting out – such as the ability of an APPP to form part of an investor's estate if he or she dies before retirement age – which might be particularly valued by some investors. Nor does our report quantify the position of investors who have died. Our report may also not necessarily be appropriate for extrapolating the relative financial impact of contracting out for the general population as a whole. The degree of any correlation will depend on the actual profile of investors who have contracted out to date against the cohorts we have reviewed. Our work may, however, be helpful in providing the FSA and others in determining a proportionate response to the issue and considering what further work should be undertaken.
- 1.7 Where our analysis suggests that investors who contracted out may have been financially disadvantaged, we have not sought to explore any causation aspects of that potential loss i.e. the extent to which those potential losses were caused by any inappropriate advice or failure to contract back into SERPS/S2P.
- 1.8 Our report may not necessarily be appropriate for determining a cost/benefit analysis for any further work as such an assessment will depend on many further variables e.g. age distribution of new business sales, that we have not considered in this report.

- 1.9 Our report makes a number of assumptions of future experience and of the provision of future benefits. In particular we assume that accrued SERPS/S2P benefits will not be reduced at any point in future and we note that this is an area of considerable uncertainty.
- 1.10 This report has been produced by OAC at the request of the FSA. The FSA has asked for our consent to make this report publicly available by posting it on their web-site. We have agreed to this request on the understanding that:
- It is not intended that anyone other than the FSA should act or refrain from acting as a result of the information in this document.
 - Publication of this report to anyone other than the FSA is for information purposes only and no person other than the FSA should place any reliance on this report.
 - OAC does not assume any responsibility and disclaims any liability to any person other than the FSA to whom this report is addressed.
- 1.11 Appendix 1 details the external data sources we have relied upon in preparing this report.

Summary of results

Overall approach

- 1.12 Our overall approach has been to develop a picture that will illustrate the current estimated financial position of investors had they decided to contract out of SERPS/S2P over various periods since 1987 relative to remaining in SERPS/S2P. Our framework seeks to distinguish between investors with different age, sex, income and marital status characteristics and then further analyse how the results may vary for a range of contracting out periods, past investment returns, APPP charging structures and on a range of future economic scenarios.
- 1.13 For a particular case we have expressed the financial position as either a potential “loss” or a potential “gain”. This has been defined as a comparison of the current value of SERPS/S2P benefits the investor would have foregone (expressed as the estimated cost, to the investor, of securing these benefits on the open market at State Pension Age (SPA), discounted to the current effective date of calculation) to the estimated current value of the national insurance rebates the investor would have received (allowing for historic investment returns and typical product charges). Section 2 of this report provides further detail of the methodology we have adopted.
- 1.14 Our approach requires assumptions of past and future investment growth and the rates at which pensions can be purchased at retirement. It is thus not a definitive calculation of the financial position of an investor (which can only be known when they attain SPA) and should instead be seen as a guide to the current value of the financial potential loss or gain on the assumptions adopted. References to “loss” and “gain” are thus prefaced by “potential” as the actual outcome will only be known on retirement.
- 1.15 We have generally adopted a “market consistent” approach to the valuation of future pension benefits, namely one that is consistent with general market views of future experience. This is consistent with the environment in which investors, having contracted out, will be operating. Ultimately, the benefits that can be secured in respect of the relevant contracted out rebates will be dictated by market conditions during the period to retirement and market annuity rates at this date. Section 3 and Appendix 2 to this report detail the assumptions we have used together with their rationale.
- 1.16 The model inevitably uses a number of approximations and assumptions in estimating the relative financial impact with resulting limitations in scope of application. We have, however, sought to minimise our reliance on subjective assumptions of future experience (where reasonable to do so) and therefore believe that the model provides a sufficiently robust indicator of investors’ relative financial position and the key variables and issues in assessing that position.

Historical analysis

- 1.17 Our report reviews the key variables and assumptions that affect the quantification of financial impact for investors who have contracted out of SERPS/S2P, together with their relative importance.
- 1.18 Section 4 of this report covers our assessment of rebates paid from individual tax years on a range of ages to identify the particular years' rebates that are most likely to contribute to any material potential loss or gain.
- 1.19 Section 5 then seeks to distinguish these results between investors with different age, sex, income and marital status characteristics and then further analyse how the results may vary on a range of contracting out periods, past investment returns, APPP charging structures and on a range of future economic scenarios.
- 1.20 Section 6 brings together the results of Sections 4 and 5 by generating a series of case studies to illustrate the likely financial position investors may now find themselves as a consequence of contracting out. In particular we show how, for particular cohorts, they vary over each of the four main contracting out time periods: 1988 – 1992, 1993 – 1996, 1997 – 2001 and 2002 to date, and assuming that investors have contracted out to date or over a shorter, 5 year, period.
- 1.21 Our results show that the primary (ignoring assumption differences) variables affecting potential loss are:
- Age at time of contracting out. The older the age at the time of contracting out the greater the likely potential loss (lower the likely gain).
 - Date of first contracting out. Gains are only likely to emerge if the investor contracted out in the period 1988 – 1992 (with potential losses emerging on contracting out rebates paid after 1992).
 - Period contracted out. This is a function of the previous variable in that given investors have generally suffered losses if they were contracted out after 1993, then the greater the period of contracting out, the greater the likely loss.
 - Income. Potential losses and gains are broadly proportionate (pre S2P) to an investor's level of income.
 - Sex. The potential loss for females with a SPA 60 compared with those with males (SPA of 65) is increased by around 50% of the value of accrued APPP funds.
- 1.22 Secondary variables are:
- Fund performance. The effect on potential losses and gains is dependent on the period since rebates have been paid. In general, losses reduce (gains increase) by around 10% for "good performance" and losses increase (gains reduce) by 10% for "poor" performance.
 - Effect of charging structure. Holding a pre "Stakeholder" type policy is likely to increase the potential loss (reduce the gain) by around £530 depending on the term of the APPP to retirement.
- 1.23 Our calculations assume that real post-vesting yields will increase marginally to 2% per annum. The scale of any potential losses will be significantly reduced if future post-vesting real yields increase to their long-term average of 3.5% per annum.

1.24 Based on the key variables identified, we have run our model for a series of 144 investors each with different primary variables. A summary of the median values of potential loss (of these 144 cohorts) is detailed below:

- Investors who have contracted out throughout (but are assumed to contract back in from 2005):

	Males	Females	Combined
Median¹ shortfall in APPP fund vs. SERPS/S2P foregone²	£4,100	£3,750	£3,900
Equivalent to a lost weekly pension of³	£3.88	£3.92	£3.90

For 50% of those in our sample the shortfall is in the range £1,600 to £7,000 equivalent to a lost weekly pension of between £1.58 and £6.95.

- Contracted out for 5 years only (but in any event no later than 2004):

	Males	Females	Combined
Median shortfall in APPP fund vs SERPS/S2P foregone	£2,200	£1,700	£1,950
Equivalent to a lost weekly pension of	£2.28	£1.78	£2.03

For 50% of those in our sample the shortfall is in the range £1,300 to £3,200 equivalent to a lost weekly pension of between £1.44 and £3.35.

1.25 Investors most likely to have benefited from contracting out are those who:

- Were 35 and under at the time they first contracted out; and
- Contracted out in the period 1988-1992; and
- Contracted back in to SERPS/S2P within 5 years of having contracted out.

1.26 Investors most likely to suffer the greatest financial potential losses are those who:

- Were aged over 40 (males) and over 35 (females) at the time they first contracted out; and
- Contracted out in the period 1988 to 1996; and
- Have remained contracted out for periods in excess of 5 years.

¹ The median is the figure with 50% of the observations below it and 50% above it. This median is drawn from the model and is not weighted to reflect the actual population of those who have contracted out.

² This is the amount by which current APPP funds fall short of accrued SERPS/S2P benefits.

³ Expressed in terms of today's prices.

- 1.27 Adjustments to these results can be made in the event that investors have a pre “Stakeholder” APPP or have good/poor investment returns:
- Pre “Stakeholder” type APPPs: Increase the size of any potential loss (or reducing the gain) by approximately £530.
 - Fund performance: In general, potential losses reduce (gains increase) by around 10% for “good performance” and losses increase (gains reduce) by 10% for “poor” performance.

A review of the impact of contracting out in 2005 and beyond

- 1.28 We were also asked to comment on the financial impact of contracting out, or remaining contracted out, in 2005 and beyond. Section 7 of our report reviews this aspect in the form of both potential loss/gain of APPP benefits over SERPS/S2P on a range of future economic scenarios, and in the form of the yields, in excess of earnings growth, rebates need to earn up to SPA to match the S2P benefits foregone (the “critical yield”).
- 1.29 The GAD is currently reviewing the rebates for contracting out in 2007 and beyond and thus our analysis only considers the position for 2005 and 2006.
- 1.30 We have calculated that the critical yields exceed 2.6% per annum in all cases and are generally in the 3.0% - 3.5% range for all those aged 25 to 40. This implies that investors would need to hold a considerable, perhaps 70% - 100%, equity content underlying their APPP funds throughout their period to retirement just to match the S2P benefits foregone.
- 1.31 The critical yield in respect of those aged over 40 (males) and 45 (females) is 3.5% or more and would require future returns to exceed our long term equity return assumption (i.e. 7.5% per annum).

Comparison with Which? and Alexander Clay reports

- 1.32 Section 8 of our report provides a brief comparison of the results produced by our model against an analysis published by Which? in 2003. We comment briefly on the differences between Alexander Clay’s report of May 1996, commissioned by the Securities and Investment Board (SIB), “Contracting Out of SERPS via Appropriate Personal Pensions” and provide indicative reasons for the different outcomes between their report and ours.

2. Methodology

Overall

- 2.1 Our overall approach has been to develop a picture that will illustrate the current estimated financial position of a notional investor had they decided to contract out of SERPS/S2P over various periods since 1987 relative to remaining in SERPS/S2P. Our framework seeks to distinguish between investors with different age, sex, income and marital status characteristics and then further analyse how the results may vary on a range of contracting out periods, past investment returns, APPP charging structures and on a range of future economic scenarios.
- 2.2 For a particular case we have expressed the financial position as either a potential “loss” or a potential “gain”. This has been defined as a comparison of the current value of SERPS/S2P benefits the investor would have foregone (expressed as the estimated cost, to the investor, of securing these benefits on the open market at SPA, discounted to the current effective date of calculation) with the estimated current value of the national insurance rebates the investor would have received (allowing for historic investment returns and typical product charges). This may be expressed mathematically as:
- + Estimated open market cost of securing the amount of SERPS/S2P pension benefits foregone, payable from SPA, discounted to the date of calculation
 - Estimated value of the rebates payable to the APPP, net of any charges and expenses, accumulated in line with assumed investment growth to the date of calculation
 - = Estimated current value of the potential "loss" or “gain” caused by the decision to contract out
- 2.3 Positive results to the formula in 2.2 are referred to in the remainder of this report as a “loss”. This represents the shortfall in the estimated value of the investor’s APPP relative to the current value of SERPS/S2P foregone. Likewise a negative result represents a “gain” and illustrates the amount of excess in the estimated value of the investor’s APPP.
- 2.4 This approach requires assumptions of past and future investment growth and the rates at which pensions can be purchased at retirement. It is thus not a definitive calculation of the financial position of an investor (which can only be known when they attain SPA) and should instead be seen as a guide to the current value of the financial potential loss or gain on the assumptions adopted. References to “loss” and “gain” are thus prefaced by “potential” as the actual outcome will only be known on retirement. Section 3 and Appendix 2 to this report detail the assumptions we have used together with their rationale.
- 2.5 The model inevitably uses a number of approximations and assumptions in estimating the relative financial impact with resulting limitations in scope of application. We have, however, sought to minimise our reliance on subjective assumptions of future experience (where reasonable to do so) and therefore believe that the model provides a sufficiently robust indicator of investors’ relative financial position and the key variables and issues in assessing that position.

Historical analysis

- 2.6 We have not had access to individual company data i.e. access to specific case examples, so our analysis has been built up on “model investors” chosen to provide a reasonable representation of typical investors who may have contracted out over the period 1987 to 2004. Given the nature of contracting out it is possible to derive a myriad of potential scenarios to assess investors’ relative financial position. We have therefore adopted a three-stage process.

2.6.1 Firstly, we have sought to identify how the financial position varies over the periods in which investors may have contracted out. We have therefore analysed the potential losses and gains in respect of rebates from individual tax years for:

- single males;
- on average income;
- assuming they contracted out for one year only;
- between each of the years 1987 to 2004; and
- on a range of sample contracting out ages: 25, 30, 35, 40, 45 and 50.

2.6.2 Secondly, we have sought to identify the key variables that affect the size of potential loss or gain. We have therefore selected a “model point” representing the typical attributes for an average investor who contracted out for one year only over the period 1987 – 2004, and then quantified the sensitivity of potential loss or gain by sequentially changing each of the following variables:

- Income;
- Sex;
- Marital status;
- Past investment returns;
- Effect of policy fees;
- Charging structure; and
- Future economic experience.

2.6.3 Finally, we have sought to combine the results of the two stages above to show the likely overall financial impact investors are likely to experience for each of the key variables identified. Our analysis considers investors across a range of ages (25, 35 and 45), income (low, medium and high), contracting out start dates (1988, 1993, 1997 and 2002) and contracting out periods (contracted out to date and for a period of 5 years only) for both males and females. In all cases we have assumed that investors contract back in to SERPS/S2P no later than 2005.

2.7 The estimated financial impact is expressed in a variety of formats: in monetary terms i.e. as a capitalised value of potential loss or gain; as a weekly amount of pension, expressed in today's prices; as a percentage of APPP funds; and in the form of the required future rate of annual investment return an APPP will need to earn in excess of earnings growth between now and retirement in order to match the SERPS/S2P benefits foregone (the “critical yield”).

The impact of contracting out in 2005 and beyond

2.8 We have used the results for contracting out in the 2004 tax year to provide a guide as to the impact of contracting out in the remaining period for which the current rebate rates apply i.e. to 2006/07. Our results show both the likely monetary impact on contracting out and the critical yields for males and females on a range of ages and incomes.

2.9 The Government Actuary's Department (GAD) is currently reviewing the rebates from the 2007 tax year. Our report only considers the position up to 2006 after which different considerations (depending on the outcome of the GAD's review) may apply.

- 2.10 The simplified tax regime for pensions comes into effect on 6 April 2006 (“A- Day”). Whilst this may provide some further flexibility to the way in which APPP benefits may be taken, we do not believe that it materially alters the way in which such benefits should be valued.
- 2.11 The government has declared its intention to review state pension provision as part of its wide-ranging review of pension planning. Our report assumes that current accrued SERPS/S2P benefits will not change. We note, however, that this represents an area of uncertainty.

Basis of SERPS/S2P benefits

- 2.12 We have assumed that the government will not seek to reduce the value of accrued SERPS/S2P benefits retrospectively in particular with regards to the rate of accrual, SPA, or pension increases. This is a significant assumption as the government has historically reduced the value of accrued SERPS benefits e.g. by increasing female SPA from 60 to 65 for those born after 6 April 1955.

Contracting out before 6 April 1997

- 2.13 Investors who contracted out of SERPS via an APPP before 6 April 1997 may still be entitled to a small SERPS pension after SPA because of the technicalities of the way in which state benefits are provided. Such investors have their full pre 6 April 1997 SERPS entitlement calculated but reduced by a “Contracted Out Deduction” (COD). These will, at SPA, be the same so that an investor receives no overall SERPS pension. However, SERPS pensions increase each year in line with increases in the RPI whereas COD’s increase by the lower of the increase in the RPI and 3% each year. Thus on the occasions that RPI exceeds 3%, investors will receive a SERPS pension equal to the difference between the respective increases. An example may help illustrate the circumstances:

Example:

An investor, male, contracts out for one year in 1990 aged 45. Had he not contracted out he would have accrued a SERPS pension in that year of £100 per annum. This might provide a pension at age 65 (SPA), allowing for increases in line with earnings to SPA of 65, of £210 per annum.

Age	Increase in RPI	Notional SERPS	COD	SERPS pension payable
45		£100	£100	
...				
65		£210	£210	NIL
66	2.5%	£215	£215	NIL
67	3.5%	£223	£222	£1
68	3.2%	£230	£228	£2

As can be seen, only in the years when the increase in the RPI exceeds 3% is there any increase in the SERPS pension payable. Given future likely rates of price inflation (2% - 2.5%) our model makes no allowance for this additional SERPS pension on pre 6 April 1997 APPP rebates.

State Pension Age

- 2.14 Our model assumes SERPS/S2P benefits will come into payment from current SPAs, being 65 for males and on a sliding scale of 60 to 65 for females (60 if born before 6 April 1950, increasing to 65 for those born after 6 April 1955).

Assumed contracting out ages

2.15 Our historical analysis only covers investors who, at the time of contracting out, were aged 20 to 50, as we believe that provides a reasonable age profile of the investors who are likely have contracted out over the 1987-2004 period. Results for investors outside this age range may be estimated from the implied trends of the 20-50 age group.

Personal Pension Providers

2.16 We have not reviewed the fund returns or charges of specific APPP providers. We have instead adopted a generic approach assuming:

- Fund returns vary in line with CAPS Balanced fund performance (with an equity backing ratio of approximately 80%) at various levels of over/under performance.
- “Stakeholder” type policy charges of 1% per annum annual management charge. We also show the effect of different charging structures, based on one that might have applied pre “Stakeholder” where appropriate.

Investors' income

2.17 We have modelled investors' income assuming they fall into one of three income bands: low, average and high. We have assumed that investors' income remains in the same bands throughout. We have defined these bands as follows:

Band	Definition of earnings
Low	1/3 middle band earnings plus the Lower Earnings Limit
Average	2/3 middle band earnings plus the Lower Earnings Limit
High	Earnings in excess of the Upper Earnings Limit

3. Assumptions

- 3.1 Our approach to assessing the financial position of investors is to compare the capitalised value of SERPS/S2P benefits foregone with the value of APPP benefits gained (as described in Section 2 above). This requires assumptions of future economic and demographic experience such that the combined value of the APPP benefits and the value of potential gain or loss will provide exactly the right funds at SPA to purchase the SERPS/S2P benefit stream on the open market.
- 3.2 Our starting point for determining an appropriate suite of assumptions is that implied by the market, for example what rate of return can funds currently earn, and what rates do insurance companies use to convert funds into pension? Some assumptions will also be driven by historical analysis, for example using historic mortality experience to predict future rates of mortality.
- 3.3 There is scope for considerable differences of view as to what each assumption should be and much will depend on an individual's personal judgement and the use to which those assumptions will be put. For example:
- The Government Actuary's Department (GAD) adopted a certain set of assumptions in assessing the level of rebates payable to occupational and personal pension schemes for the period 2002 – 2006.
 - Money purchase pension schemes are required to provide benefit illustrations to investors on a basis currently set by the Faculty of Actuaries and the Institute of Actuaries (the Actuarial Profession). These are known as Statutory Money Purchase Illustrations (SMPI).
 - The Financial Services Authority (FSA) require illustrations to form part of key features documentation showing the potential variation of pension benefits on a range of real (of earnings growth) returns.
- 3.4 In setting our assumptions we have sought to minimise differences between these alternative bases as small variations can have a significant, and potentially spurious, impact on results.
- 3.5 Details of our assumptions and their rationale are summarised, together with a comparison of the assumptions used by GAD in setting the 2002 – 2006 rebates, and those recommended by the Actuarial Profession for current benefit illustrations, in Appendix 2. Key points from this are detailed below.
- 3.6 For the avoidance of doubt, references in this report to “real” returns refer to those in excess of price inflation (as measured by increases in the RPI). In certain instances, particularly when assessing investment returns before retirement, it is helpful to consider returns in excess of earnings growth and in those circumstances we have sought to make it clear to which index any reference to “real” refers.
- 3.7 We have generally adopted a “market consistent” approach to the valuation of future pension benefits, namely one that is consistent with general market views of future experience. This is consistent with the environment in which investors, having contracted out, will be operating. Ultimately, the benefits that can be secured in respect of the relevant contracted out rebates will be dictated by market conditions during the period to retirement and market annuity rates at this date.
- 3.8 There is one particular area where we have departed from this “market consistent” approach and that relates to rates of return available at retirement (post-vesting real yields). Current real yields are 1.6% and the forward real yield curve suggests yields may fall to around 1.1% in 25 years' time. These are, by historical standards, unusually low and we have departed from the “market view” by assuming that yields will increase to 2% over the coming ten years (see Appendix 2 for further details). There is clearly scope for differences of view on this issue so our report also shows the financial impact of two contrasting post-vesting real yield assumptions:
- yields to fall in line with that implied by the forward real yield curve to 1.1% per annum in 25 years' time; and

- yields to increase to 3.5% by 2017 (as assumed by the GAD in setting the 2002-2006 rebates).
- 3.9 There is a “cost” in securing a pension that increases in line with the RPI currently equivalent to a reduction in the post-vesting real yield of around 0.6%. This cost reflects the nature of the guarantee that would otherwise be provided under SERPS/S2P benefits. We have assumed that this cost will, in future, be equivalent to a reduction in the real post-vesting yield of 0.5%, consistent with that used for SMPI.
- 3.10 We have assumed that APPP funds will earn an average return of 2% per annum (gross of charges) in excess of earnings growth between now and retirement.

Summary of assumptions	
Price inflation (where relevant)	2.5% per annum
Earnings growth	4.0% per annum
Real (of price inflation) rate of return available at the time of retirement	1.6% increasing to 2.0% over the next 10 years
Future APPP fund growth	6.0% per annum
Cost of annuity purchase	We have generally adopted a market consistent approach (except allowing for assumed increases to real yields available at retirement as detailed above). This allows for the cost of securing an RPI linked annuity by reducing the real yield by 0.5%. Future anticipated mortality improvements are assumed to be in line with 90% of standard mortality tables PMA/PFA92 mc (year of use = year of attaining SPA).

4. Financial assessment of rebates paid from individual tax years

- 4.1 All graphs and tables referred to in the remainder of this report are shown in Appendix 3. The additional notes on the reverse of each graph and table refer to the basis and assumptions used and, for graphs, the underlying data.
- 4.2 Graph 1 shows the potential loss or gain for a single male on average income assuming he contracted out for one year only between 1987 to 2004 on a range of sample ages: 25, 30, 35, 40, 45 and 50. Results are provided for each individual tax year from 1987 to 2004 and for each of the ages specified. In other words they indicate the potential loss or gain arising on individual rebates.
- 4.3 Investors aged 35 and under, who contracted out between 1988 and 1992, are the only group likely to have made any material gain as a result of contracting out. All other investors (i.e. those aged 40 and over or those who contracted out after 1992) show a potential financial loss (or at best a marginal gain). The (un-weighted) median potential loss on individual rebates for all age groups shown over all periods is £467.
- 4.4 Results may be separated into three distinct periods:

Period	Median loss	Lowest loss	When	Highest loss	When
1987 – 1992	-£34	-£1,260	1989, age 25	£2,337	1987, age 50
1993 – 1996	£520	£19	1993, age 30	£1,709	1993, age 50
1997 – 2004	£530	-£103	2001, age 50	£948	1998, age 50

- 4.5 The highest potential losses are generally at the highest age considered (age 50). The potential loss would be higher for any investor that contracted out at a higher age.
- 4.6 The 1987 – 1992 period had flat rebates with 2% incentives thus showing a wide variation in potential loss by age. The 2% incentive provided sufficient margin for investors aged 35 and under to show potential gains despite subsequent deterioration in investment returns and annuity purchase costs.
- 4.7 The 1993 – 1996 period retained the flat rebate structure except provided a 1% enhancement to the over 30s, and dropped the 2% incentive. There is thus a limited narrowing of the range in potential losses, but without the benefit of the 2% incentive, all age ranges show a potential loss.
- 4.8 The 1997 – 2004 period provided age related rebates and this is reflected in a significant narrowing in the range of potential losses, with those in 1997 - 2000 being slightly higher than those in later years. There remain potential losses at all ages (other than 50 year-olds – see 4.13 below), reflecting the deterioration in investment returns and annuity purchase costs since the GAD set the rebates for those years.
- 4.9 The results for 1987 reflect investors' increased rate of SERPS accrual in that year (25% vs 20% post 5 April 1988), not reflected fully in the corresponding rebates.
- 4.10 The "W" shape of potential losses in 1989 to 1991 is caused by variations in investment returns over those years. Investment of each year's rebate is assumed to occur on 1 October following the end of the relevant tax year. In October 1991 (when the 1990 rebate was invested) asset values were high relative to October 1990 and 1992 and hence the subsequent investment return earned on the 1990 rebate is relatively lower thus increasing the potential loss (reducing the gain) for that year.

- 4.11 The steady increase in potential losses over the period 1993 to 1999 is caused by the effect of the severe market falls in 2000 to 2002. Thus the 1999 rebate is invested at the peak of the equity market and subject to a 30% reduction in value over the period to 31 March 2003.
- 4.12 The temporary dip in results in 2001 is caused by the equity market recovery since 2003 i.e. investment of the 2001 rebate is assumed to occur in October 2002 at the bottom of the equity market and has thus benefited from the subsequent recovery in markets to date.
- 4.13 The reduction in potential loss for 50 year olds in 2000 – 2002 reflects the basis on which GAD set the rebate payments. 50 year olds in 2000 have a date of birth in 1950 where the female SPA is 60 and that is the basis on which the GAD calculated the rebates. If in fact SERPS/S2P benefits are payable later, as in the case of males with a SPA of 65, so investors who contract out will gain by the earlier assumed payment of that benefit.

5. Identification of key variables affecting financial impact

5.1 We now show how the results vary over a range of the key parameter and assumption variables noted in 2.6.2. We have again considered individual years of contracting out (i.e. in respect of individual rebate payments) and provided results on this basis. We have taken, as our base model point, a 35 year-old single male on average income. In reviewing these results it should be remembered that the graphical distribution is not necessarily typical for all ages. The distribution for other ages may be gauged from the shape of the relevant part of Graph 1. Graphs 2 to 8 simply demonstrate the relative difference in results caused by variations in key parameters and assumptions.

Change in income

5.2 Graph 2 shows how the results vary for investors on low and high incomes against the “base” average income model point.

5.3 Up to 2001, results are proportionate to an investor’s level of income. For example, the financial impact on an investor with a high income is 50% higher than the average and for someone on low income is 50% lower than the average. Based on the result in 4.3, this is equivalent to saying that the median potential loss for someone on high income is of the order $1\frac{1}{2} \times £467$ per annum = £700 and for someone on low income is of the order $\frac{1}{2} \times £467 = £233$.

5.4 There is significantly less variation in results by income with the introduction of S2P in 2002, with investors on low income exhibiting potential losses some 15% lower than those on average income, and those on higher income exhibiting potential losses some 20% higher than those on average income.

Sex

5.5 Graph 3 shows how results compare between the “base” 35 year-old single male and a 35 year-old female where the SPA for both is 65; and for those aged 45, how potential losses vary as the SPA for females increases from 60 to 65. The effect of the difference in female SPAs is shown by the difference in potential loss for 45 year-olds: female SPAs are 60 for those contracting out before 1995 (1995 implying a date of birth of 6 April 1950), gradually increasing to 65 from 1995 to 2000 (2000 implying a date of birth of 6 April 1955).

5.6 The results for females born after 6 April 1955 are slightly lower than those for males. This reflects:

- the equalisation of SPAs; and
- the requirement to purchase annuities on a unisex basis. Females have a lower contingent value of spouse’s benefits because the spouse (a male) is assumed to be 3 years older i.e. aged 68. This compares with a male’s contingent value of spouse’s benefits which is based on a spouse (female) aged 62 i.e. 8 years younger than the equivalent for females.

5.7 The additional potential loss (or reduction in gain) for females with a SPA 60 compared with males with a SPA of 65 is around 50% of the value of APPP benefits.

Marital status

5.8 Graph 4 shows that the results are broadly unaffected by changes in marital status. This is caused by the use of unisex annuity pricing and the assumption that this will generally reflect female rates (as used for SMPI). As females tend to live longer than males, then the value of the spouse’s (a male) pension is relatively small. For example, the value of a SERPS/S2P pension of £1 per annum payable to a female aged 65 for life is around £24, but the extra value of providing the 50% male spouse’s pension is only an extra £1.

Variability of returns

5.9 Graph 5 shows how results vary on a range of lower, median and upper quartile fund growth returns to date based on CAPS +2%, +1% and +0%. The variation, as expected, is greatest on earlier years of contracting out reflecting the greater durations over which such over/under performance can apply.

Effect of policy fees

5.10 One of the influences on the performance of an APPP, particularly on smaller policies, is the level of any fixed deduction or policy fee. We have therefore compared the results on the “base” model point, which assumes a flat 1% “stakeholder” type annual management charge, against an identical model point except with a policy fee of £1 per month increasing in line with RPI each year.

5.11 Graph 6 shows that the approximate increase in potential loss per £1 per month fee is £350 (shown by the difference between the potential loss with a policy fee and the potential loss without the policy fee). This can be significant, especially on small policies, and may potentially eliminate the full value, or at least a significant part, of such funds.

Effect of charging structure

5.12 Of course the above analysis is not strictly comparable because one is simply determining the value of policy fees. In practice, different companies will levy a wide range of different charging structures, typically including policy fees in the late 1980s and early 1990s before moving to the more stakeholder type charging basis in the later 1990s. Graph 7 therefore compares the effect on results of charges on a “typical” policy levied in the late 1980s and early 1990s with the current 1% stakeholder charge. The charges assumed are:

Charge type	Assumption
Annual management	0.75% per annum
Policy fee	£1.50 per month indexed to increases in RPI
Allocation rate	97%
Bid/offer spread	5%

5.13 This shows that the overall increase in potential loss (reduction in gain) is approximately £530 (again shown by the difference between the potential loss between the two charging structures), consistent with simply allowing for a £1.50 policy fee and 1% annual management charge.

Future economic experience

5.14 As discussed in Section 3 of this report, a key variable is the post-vesting real yield assumption. In addition to our central assumption that real yields will increase to 2% per annum, Graph 8 shows the effect of assuming:

- yields to fall in line with that implied by the forward real yield curve to 1.1% per annum in 25 years’ time; and
- yields to increase to 3.5% by 2017 (as assumed by the GAD).

5.15 Results assuming yields increase to 3.5% show a broadly financially neutral effect. Our model investor shows a gain of up to £1,287 for the 1989 tax year before falling to a potential loss of £399 the 1999 tax year. Each of the following 4 tax years (2001 to 2004) shows almost negligible potential losses or gains. This might be expected given that was the basis on which the 2002 – 2004 rebates were set.

5.16 With the deterioration in real yields so the extent of potential gains reduces (and losses increase), with the impact on results assuming yields fall in line with the forward yield curve being about 50% higher than those assuming yields increase to 2% per annum.

Analysis of sensitivity testing

5.17 Our results show that the primary (ignoring assumption differences) variables affecting potential loss are:

- Age at time of contracting out. The older the age at the time of contracting out the greater the likely loss (lower the likely gain).
- Date of first contracting out. Gains are only likely to emerge if the investor contracted out in the period 1988 – 1992 (with potential losses emerging on contracting out rebates paid after 1992).
- Period contracted out. This is a function of the previous variable in that given investors have generally suffered potential losses if they were contracted out after 1993, then the greater the period of contracting out, the greater the likely loss.
- Income. Potential losses and gains are broadly proportionate (pre S2P) to an investor's level of income.
- Sex. The potential loss for females with a SPA 60 compared with those with males (SPA of 65) is increased by around 50% of the value of accrued APPP funds.

5.18 Secondary variables are:

- Fund performance. The effect on potential losses and gains is dependent on the period since rebates have been paid. In general, potential losses reduce (gains increase) by around 10% for "good performance" and potential losses increase (gains reduce) by 10% for "poor" performance.
- Effect of charging structure. Holding a pre "Stakeholder" type policy is likely to increase the potential loss (reduce the gain) by around £530 depending on the term of the APPP to retirement.

5.19 In addition, the scale of any potential losses will be significantly reduced if future post-vesting real yields increase to their long-term average of 3.5% per annum.

6. Overall historical analysis

- 6.1 Based on the key variables identified, we have run our model for a series of 144 investors each with different primary variables:
- A range of ages that investors are first assumed to contracting out on (25, 35 and 45);
 - Commencing contracting out in various years (1988, 1993, 1998 and 2001);
 - On various income levels (low, average and high); and
 - Assuming they contracted out for the duration to 2004 (and then contract back in from 2005); and assuming they contract out for a period of 5 years only (and in any event no later than for 2004).
- 6.2 Tables 1 and 2 show the results for 72 male investors and Table 3 and 4 show the results for the equivalent 72 female investors. These are further divided into 36 each of those who have remained contracted out to date (and contract back in from 2005) (Tables 1 and 3) and those who have contracted out for a period of 5 years only (but in any event no later than 2004) (Tables 2 and 4).
- 6.3 It should be noted that the median figures quoted represent the value in the middle of the cohort. They are therefore not necessarily representative of those who have actually contracted out, but they can be used to provide a guide to investors' relative financial position in the circumstances specified.

Male investors

- 6.4 Table 1 shows that the median potential loss of the 36 male investors who have remained contracted out throughout, and who are assumed to contract back in from 2005, is £4,100. This is the amount of money by which we estimate, on the basis of assumptions of future experience, an investor's current APPP falls short of comparable SERPS/S2P benefits. There are alternative ways of expressing this potential loss such as:
- A potential loss of £3.88 weekly pension (this is expressed in today's prices); or
 - Requiring a 33% uplift in APPP funds; or
 - Requiring APPP funds to grow by 3.8% in excess of earnings growth for each year between now and SPA.
- 6.5 The results improve somewhat on the assumption that investors contract out for a period of 5 years only (and in any event no later than 2004). Table 2 shows that the median potential loss for these cohorts is £2,200. This can also be expressed as a potential loss in weekly pension of £2.28, a 36% uplift to APPP funds, or requiring APPP funds to grow by 3.7% in excess of earnings growth for each year between now and SPA.
- 6.6 Graph 9 provides a graphical presentation of the financial impact on male investors on average income by age and date first contracted out assuming they contract back in to S2P from 2005. Graph 11 is similar except it assumes that investors contract out for 5 years only (and in any event no later than for 2004). These graphs show the extreme variation in results depending on the year of contracting out, investors' age at that time and the period of contracting out.
- 6.7 Tables 1 and 2 and Graphs 9 and 11 show that there are not universal potential losses. Males likely to gain from contracting out are those who:
- Were 35 and under at the time they contracted out; and
 - Contracted out in the period 1988-1992; and

- Contracted back in to SERPS/S2P within 5 years of having contracted out.
- 6.8 For example, Table 2 shows that a male who contracted out in 1988 aged 25 on high income, and who contracted back in for 1993, is currently estimated to have an APPP fund £6,200 in excess of the financially comparable SERPS/S2P benefits, equivalent to an additional £6.30 weekly pension.
- 6.9 This “best case” scenario however contrasts sharply with the “worst case”. Table 1 shows that a male who contracted out in 1988 aged 45 on high income, and who is assumed to contracted back in from 2005, is currently estimated to have an APPP fund £33,600 below the financially comparable SERPS/S2P benefits, equivalent to a potential loss of £27.30 weekly pension. The results from Table 1 and Graphs 9 and 11 suggest that the largest potential losses are likely to arise on males who:
- Were aged over 40 at the time they contracted out; and
 - Contracted out in the period 1988 to 1996; and
 - Have remained contracted out for periods in excess of 5 years.
- 6.10 In Tables 1 and 2, the potential loss, when expressed as a percentage of the current APPP fund, exceeds 25% (sometimes significantly so) in the vast majority of the cohorts reviewed, irrespective of income levels and periods of contracting out.
- 6.11 Further adjustments to these results can be made to approximate the effect of investors having a pre “Stakeholder” type APPP by increasing the size of any potential loss (or reducing the gain) by approximately £530. This is a very approximate figure but will provide a reasonable estimate of the allowance for the additional charges such policies might incur. We note that this charge can, in some cases, eliminate the entire proceeds of an APPP where the policy is small e.g. investors on low income and contracted out for a short period only.
- 6.12 Graph 13 shows that “good” investment performance can be approximated by increasing the results in Table 1 and Graphs 9 and 11 by 10%. “Poor” performance can be approximated by reducing the results by 10%.

Female investors

- 6.13 The results for females differ to that of males as described in section 5.6 i.e. females sometimes have a lower SPA thus increasing the potential loss (reducing the gain), and the age of their spouse is assumed to be 3 years older thus reducing the potential loss (increasing the gain). The effect of the lower SPA, where it arises (only on females born before 6 April 1955), dominates the effect of spouse’s age. Thus losses will be greater on older females but lower on younger females.
- 6.14 Table 3 shows that the median potential loss of the 36 female investors who have remained contracted out throughout, and who are assumed to contract back in from 2005, is £3,750. This can also be expressed as a potential loss of £3.92 weekly pension or requiring a 31% uplift in APPP funds; or requiring APPP funds to grow by 3.4% in excess of earnings growth for each year between now and SPA.
- 6.15 These results are marginally better than the male results reflecting the greater sample of younger females analysed (see 6.13 above).
- 6.16 The results also improve on the assumption that investors contract out for a period of 5 years only (and in any event no later than 2004). Table 4 shows that the median potential loss for these cohorts is £1,700, equivalent to a potential loss in weekly pension of £1.78, a 28% uplift to APPP funds, or requiring APPP funds to grow by 3.2% in excess of earnings growth for each year between now and SPA.

- 6.17 Graph 10 provides a graphical presentation of the financial impact on female investors on average income by age and date first contracted out assuming they contract back in to S2P from 2005. Graph 12 is similar except it assumes that investors contract out for 5 years only (and in any event no later than for 2004). These graphs, as in Graphs 9 and 11, show the extreme variation in results depending on the year of contracting, age at that time and the period of contracting out.
- 6.18 Tables 3 and 4 and Graphs 10 and 12 show that there are not universal potential losses. Females likely to gain from contracting out are those who:
- Were 35 and under at the time they contracted out; and
 - Contracted out in the period 1988-1992; and
 - Contracted back in to SERPS/S2P within 5 years of having contracted out.
- 6.19 For example, Table 4 shows that a female who contracted out in 1988 aged 25 on high income, and who contracted back in for 1993, is currently estimated to have an APPP fund £7,300 in excess of the financially comparable SERPS/S2P benefits, equivalent to an additional £7.99 weekly pension.
- 6.20 However, female investors who were under 27 at the date they contracted out (and contract back in from 2005) are showing very marginal potential gains, unlike their male counterparts who are showing small potential losses. These gains are relatively small and may be considered immaterial.
- 6.21 The results from Tables 3 and 4 and Graphs 10 and 12 suggest that the largest potential losses are likely to arise on females who:
- Were aged over 35 at the time they contracted out; and
 - Contracted out in the period 1988 to 1996; and
 - Have remained contracted out for periods in excess of 5 years.

A female who contracted out in 1988 aged 45 on high income, and who is assumed to contract back in from 2005, is currently estimated to have an APPP fund £51,500 below the financially comparable SERPS/S2P benefits, equivalent to a potential loss of £41.78 weekly pension.

- 6.22 Tables 3 and 4 show that the potential loss, when expressed as a percentage of the current APPP fund, exceeds 25% (sometimes significantly so) in the vast majority of the cohorts reviewed, irrespective of income levels and periods of contracting out.
- 6.23 Further adjustments to the female results can be made in the event that investors have a non-stakeholder APPP or to allow for good or bad investment performance as discussed in section 6.11 and 6.12 above.

Summary

- 6.24 Based on the key variables identified, we have run our model for a series of 144 investors each with different primary variables. A summary of the median values of potential loss (of these 144 cohorts) is detailed on the next page.

- Investors who have contracted out throughout (but are assumed to contract back in from 2005):

	Males	Females	Combined
Median shortfall in APPP fund vs SERPS/S2P foregone	£4,100	£3,750	£3,900
Equivalent to a lost weekly pension of	£3.88	£3.92	£3.90

For 50% of those in our sample the shortfall is in the range £1,600 to £7,000 equivalent to a lost weekly pension of between £1.58 and £6.95.

- Contracted out for 5 years only (but in any event no later than 2004):

	Males	Females	Combined
Median shortfall in APPP fund vs SERPS/S2P foregone	£2,200	£1,700	£1.950
Equivalent to a lost weekly pension of	£2.28	£1.78	£2.03

For 50% of those in our sample the shortfall is in the range £1,300 to £3,200 equivalent to a lost weekly pension of between £1.44 and £3.35.

6.25 Investors most likely to have benefited from contracting out are those who:

- Were 35 and under at the time they contracted out; and
- Contracted out in the period 1988-1992; and
- Contracted back in to SERPS/S2P within 5 years of having contracted out.

6.26 Investors most likely to suffer the greatest financial losses are those who:

- Were aged over 40 (males) and over 35 (females) at the time they contracted out; and
- Contracted out in the period 1988 to 1996; and
- Have remained contracted out for periods in excess of 5 years.

6.27 Adjustments to these results can be made in the event that investors have a pre “Stakeholder” APPP or have good/poor investment returns:

- Pre “Stakeholder” type APPPs: Increase the size of any potential loss (or reducing the gain) by approximately £530.
- Fund performance: In general, potential losses reduce (gains increase) by around 10% for “good performance” and potential losses increase (gains reduce) by 10% for “poor” performance.

7. The impact of contracting out in 2005 and beyond

- 7.1 We have also been asked to consider the implications of this analysis in respect of investors considering contracting out for future years i.e. 2005 and beyond. The GAD is currently reviewing the rebates for contracting out in 2007 and beyond and thus our analysis will only consider the position for the 2005 and 2006 tax years. Given the stability in the rebates between the 2004 to 2006 contracting out years, we have used the results for contracting out in 2004 as a proxy to the results for 2005 and 2006. We believe that this is a reasonable approach given the results that emerge (see below).
- 7.2 Graph 14 shows the potential gains and losses investors aged between 18 to 63 would incur as a result of contracting out in 2004 on the range of post-vesting yield scenarios set out in 3.7 above i.e. assuming real yields increase to 2%, 3.5% or fall in line with the forward real yield curve. This is based on male investors on average income, assuming "stakeholder" type policy charges. The shape will be the same for higher and lower levels of income, and will be broadly similar for females except that there will be no dip after age 49 reflecting the fact that rebates are based on female SPAs.
- 7.3 As can be seen we estimate that investors are, in all cases, likely to be worse off vis-à-vis S2P benefits foregone on the basis of the projected financial variables considered. This suggests that rebates, for those under 50, should be approximately 40% - 50% higher than they are at present in order to ensure financial parity with S2P benefits foregone. Larger losses are likely in the event that post-vesting real yields fall in line with the current forward real yield curve (suggesting increases to the required rebate by around 50% - 70%). Rebates should still be around 10% higher even if real yields increase to 3.5% reflecting the effect investor longevity has had on increased annuity costs.
- 7.4 Table 5 shows the yields in excess of earnings growth (assumed to be 4% per annum) that rebates, received in respect of the 2004/05 tax year, need to earn up to SPA to match the S2P benefits foregone (the "critical yield"). Data is provided for males and females on various income levels. As can be seen the results are broadly similar across all groupings suggesting that the scale for females investors (or perhaps an average between male and female rates) on average income is appropriate for use for all investors.
- 7.5 The critical yields exceed 2.6% per annum in all cases and are generally in the 3.0% - 3.5% range for all those aged 25 to 40. Based on assumed rates of future investment returns by asset class (see Appendix 2), this implies that investors would need to hold a considerable, perhaps 70% - 100%, equity content underlying their APPP funds throughout their period to retirement just to match the S2P benefits foregone.
- 7.6 The critical yield in respect of those aged over 40 (males) and 45 (females) is 3.5% or more and would require future returns to exceed our long term equity return assumption (i.e. 7.5% per annum).

8. Comparison with Which? and Alexander Clay reports

Comparison with Which? 2003 report

8.1 In July 2003, Which? published a report highlighting the potential losses suffered by investors by contracting out of SERPS/S2P. These figures were calculated as at March 2003 when equity markets were close to their lowest point for some time and were expressed as a range of equivalent SERPS/S2P pension by product provider. We have conducted our own analysis of the financial impact of contracting out based on the methodology set out in Section 2 and the assumptions as detailed in Section 3 and Appendix 2. We calculated the potential loss as at March 2003 and converted that to an equivalent percentage of the SERPS/S2P benefits foregone⁴ as Which? had done. Our results are broadly comparable:

Case	Which? report					OAC basis % Serps
	Age c/o	C/o year began	Lower % Serps	Upper % Serps	Average	
Fred	25	1989	45	107	76%	71%
Wilma	25	1989	45	107	76%	71%
Barney	35	1989	42	80	61%	63%
Betty	35	1989	40	76	58%	60%

Comparison with Alexander Clay 1996 report

- 8.2 In 1996, the Securities and Investments Board (SIB) requested Alexander Clay to report on the extent to which individuals may face expected losses or gains as a consequence of their decision to contract out of SERPS.
- 8.3 Alexander Clay concluded that (amongst other things), over 96% (on the basis of the assumptions they made concerning future experience) of all A PPPs were expected to gain (i.e. the proceeds are likely to exceed the contracted out deduction given up under SERPS).
- 8.4 The scope of our review does not extend to quantifying potential gains or losses at an industry level. Instead our report seeks to identify the risk factors affecting gains and losses, and the likely gains or losses for individual investors with specific “at risk” characteristics. Our findings suggest that the potential for loss is likely to be significantly greater than those suggested by the Alexander Clay report.
- 8.5 The differences in the assumptions underlying the calculations may explain some element of the different outcomes. Alexander Clay used assumptions specified by SIB for the purpose of prospective loss assessments in connection with Opt-Outs in SIB’s October 1994 report that applied for the period 1 October 1994 to 31 October 1995. For the purposes of our report we have generally used “market consistent” assumptions of future experience amended as described in section 3 of this report. A comparison of the two bases is given on the next page.

⁴ The “% Serps” figures above represent the likely pension the A PPP will provide at SPA expressed as a proportion of the SERPS/S2P pension foregone.

Assumptions
<p>Real (of earnings growth) future APPP fund growth:</p> <ul style="list-style-type: none"> ■ Alexander Clay used term dependent rates between 2.5% and 4.2%. ■ We have assumed a flat 2% assumption.
<p>Real (of price inflation) rate of return available at the time of retirement:</p> <ul style="list-style-type: none"> ■ Alexander Clay used real yields of 4.5%. ■ We have assumed real yields of 1.6% increasing to 2.0% by 2015.
<p>Cost of annuity purchase:</p> <ul style="list-style-type: none"> ■ Alexander Clay do not specify the basis on which annuities are purchased but we assume they would be based on real yields of 4.5% and mortality of PA(90) rated down one year. ■ We have generally adopted a market consistent approach (except allowing for assumed increases to real yields available at retirement as detailed above). This allows for the cost of securing an RPI linked annuity by reducing the real yield by 0.5%. Future anticipated mortality improvements are assumed to be in line with 90% of standard mortality tables PMA/PFA92 mc (year of use = year of attaining SPA).

- 8.6 Without full details of the basis used by Alexander Clay it is difficult to make any firm conclusions but the different rates of pre and post-vesting yields and different mortality assumptions are likely to be a contributory factor in explaining the differences. It is beyond the scope of this report to analyse these differences further.

Appendix 1

Documents relied on and referred to in preparing this report

Government Actuary's Department – "Occupational and Personal Pension Schemes – Review of certain contracting-out terms", March 2001.

Which? Reports on contracting out titled: "Contracting out of SERPS – Was it worth it", July 2003; "Contracting out of the State pension – were you mis-sold?", July 2003; and "Contracting out – What now?", August 2003.

The Actuarial Profession's "Technical Memorandum TM1: Statutory Money Purchase Illustrations" version 1.1.

Financial Services Authority Handbook of Rules and Guidance – Business Standards – Conduct of Business, Chapter 6: "Product disclosure and the customer's right to cancel or withdraw".

Financial Services Authority Comparative Tables Database as at 2 June 2005.

Bank of England: Government liability yield curve: <http://www.bankofengland.co.uk/statistics/yieldcurve>.

Bank of England: "Remit for the Monetary Policy Committee", letter to the Governor of the Bank of England from the Chancellor of the Exchequer, March 2005.

Bank of England: "Highlights of The New Inflation Target", speech by the Governor of the Bank of England, January 2004.

Office for National Statistics: <http://www.statistics.gov.uk>

Securities and Investment Board's: "Review of Past Business Part II Specification of Standards and Procedures", Appendix H.

"The Risk Premium of Ordinary Shares" by AD Wilkie, British Actuarial Journal Volume I, Part II, pages 251-330.

"Global evidence on the equity risk premium" by E Dimson, P Marsh and M Staunton, London Business School, September 2002

Inland Revenue CA17: "Employee's guide to minimum contributions", January 2005.

The Pensions Service NP46: "A guide to State Pensions", April 2004.

Institute for Fiscal Studies: "Green Budget 2005".

CAPS Pooled Pension Fund Survey 1988 – 2005: Balanced fund.

Alexander Clay: "Contracting out of SERPS via Appropriate Personal Pensions", report to the Securities and Investments Board, May 1996.

Appendix 2

Assumptions for calculating potential loss – rationale

Price inflation

- A2.1 An assumption concerning price inflation is not strictly necessary as our approach is to cost benefits on a real rates of return. However it is helpful to consider the current economic climate to determine how such an assumption may then drive other variables e.g. prospective real and nominal rates of return.
- A2.2 There are currently a number of price inflationary measures ranging from the Consumer Price Index (CPI), the Retail Prices Index (RPI) to the RPI excluding mortgage interest payments (RPIX). Of most relevance to pensions is the RPI measure as that currently drives pension increases to, amongst other things, state pensions. Such a measure though has a number of disadvantages:
- It is based on an arithmetic (as opposed to geometric) average of constituent indices;
 - It includes distortions caused by variations in mortgage interest payments, council tax and house prices.
- A2.3 As such, the current preferred basis for measuring price inflation is the CPI and the Chancellor of the Exchequer has charged the Bank of England⁵ to maintain increases in this index to an average of 2% per annum. This rate is generally consistent with an average RPI of 2.5% per annum. Given the relative economic stability within the UK at present, it seems reasonable that these two assumptions are appropriate depending on the purpose to which they are applied:
- In measuring economic inflationary expectations, the CPI target of 2% per annum is likely to be a more reasonable guide;
 - In measuring the likely changes to future SERPS/S2P benefits or in assessing the real yield on index linked gilts, an RPI assumption of 2.5% is likely to be more reasonable. This is the key assumption pertinent to our review.

Earnings inflation

- A2.4 Earnings inflation affects the ultimate SERPS/S2P pension payable from SPA. Simply changing the earnings growth assumption however does not affect the results: it is the relative difference between this and the assumed pre-vesting yield that affects results. It is useful, however, to consider likely future earnings growth to ensure that the assumptions, overall, look reasonable.
- A2.5 Historic analysis suggests that earnings inflation exceeds RPI increases by approximately 2% per annum. However more recent experience suggests that this relationship may be narrowing with increases over the five years to 2003 averaging just 1.4%.
- A2.6 It is unclear whether the recent reduction in earnings growth relative to RPI is a temporary feature or one that is likely to remain for the next 20-30 years. Inflationary expectations are considerably lower than they were during much of the 1960s to mid 1990s and this may well be reflected in lower average wage growth. On balance we feel that adopting a long-term earnings growth assumption of 1.5% in excess of RPI (2% in excess of CPI) is reasonable in the current economic climate.

⁵ Letter to the Governor of the Bank of England from the Chancellor of the Exchequer 16 March 2005.

Definition of “real”

A2.7 For the avoidance of doubt, references in this report to “real” returns refer to those in excess of price inflation (as measured by increases in the RPI). In certain instances, particularly when assessing investment returns before retirement, it is helpful to consider returns in excess of earnings growth and in those circumstances we have sought to make it clear to which index any reference to “real” refers.

Post-vesting real yields

A2.8 As benefits are linked to RPI inflation a key assumption in assessing the value of SERPS/S2P benefits is the real rate of return available at the time an investor vests his or her pension benefits (the post-vesting real yield). We have defined “real yield” as the implied instantaneous 15-year real spot rate as published by the Bank of England⁶.

A2.9 Current real interest rates stand at around 1.6% per annum⁷. The forward real yield curve suggests such yields will reduce: the 25 year forward real rate of return currently stands at 1.1% per annum, although this may simply reflect a larger inflationary risk premium at these longer durations. Such yields are, by historical comparison, low. Real rates of return have broadly averaged 3.5% per annum since 1985 until 1997 when they started to drift towards 2% and since 2004 have fallen to their current levels of 1.6% per annum.

A2.10 In setting the 2002 – 2007 rebates, the GAD considered the question of post-vesting real yields in some depth. The GAD concluded⁸: “Over long periods when there was little or no inflation (over the medium and long terms at least), the yield available on fixed interest government securities in the United Kingdom averaged 3.70%. I propose, therefore, to use a yield after retirement relative to price increases of 3.5% a year.”

A2.11 The 3.70% figure quoted by the GAD was calculated as the average yield on Consols over the period 1756 to 1956. This is stated to be a real rate of return on the basis that inflationary expectations were zero. It is not clear that such a corollary is correct: price inflation over the period 1900 to 1956, for example, averaged (subject to some variation) 2.2% reducing the “real” return from 3.7% to 1.5%. Whilst there may not have been any significant inflationary expectation at that time, it seems unlikely that some element of inflation was not allowed for within the available yields. Furthermore it is questionable whether data pertinent to the 18th and 19th centuries is necessarily a reliable guide to investment expectations over the coming 20 to 30 years.

A2.12 The primary reasons for the recent reduction in real yields is likely to be related to factors of supply and demand. The UK bond market has recently seen considerable additional demand for UK gilts:

- Equity volatility during 2000 – 2002 has seen a general reduction in insurers’ and pension funds’ appetite for high equity backing ratios;
- New prudential solvency requirements require less capital the more gilt based assets held;
- Insurers are seeking greater protection against the risks facing their annuity business portfolio (and, to a lesser extent, their remaining insurance liabilities) by matching liabilities to conventional or index linked gilts and other fixed interest assets.

A2.13 This additional demand occurred at a time when there has been a general shortage of supply, the UK government having been a net redeemer of gilts for a number of years until 2002/03.

⁶ <http://www.bankofengland.co.uk/statistics/yieldcurve>

⁷ Based on the 15 year real spot yield; source: Bank of England instantaneous 15 year real spot rate 1 June 2005.

⁸ Government Actuary’s Department – “Occupational and Personal Pension Schemes – Review of certain contracting-out terms”, March 2001.

A2.14 Since then, however, some relief to the general shortage of supply may come from the government which is expected to be a net issuer of gilts of approximately £20-£40bn per annum¹⁰ over the coming years. Whether this will be sufficient to bring yields back to the pre 1997 levels is debatable but should at least provide a degree of relief.

A2.15 On balance, we believe that it is optimistic to expect real yields to increase to their historic levels of around 3.5% but likewise pessimistic that yields will fall in line with the current forward real yield curve. Accordingly, we have assumed that real yields will increase from their current level of 1.6% per annum to a long-term rate of 2% per annum over the next ten years. There is clearly scope for differences of view on this issue so our report will also show the financial effects of the two contrasting post-vesting real yield assumptions:

- yields to fall in line with that implied by the forward real yield curve to 1.1% per annum in 25 years' time; and
- yields to increase to 3.5% by 2017 (as assumed by the GAD in setting the 2002 – 2006 rebates).

Pre-vesting yields

A2.16 The pre-vesting yield assumption should reflect the rate at which APPP funds are expected to grow between now and retirement and will vary depending on the nature of underlying assets:

- Fixed interest - we believe that a suitable long-term rate of return is 4.5% per annum, consistent with real returns of 2% per annum and RPI inflation of 2.5% per annum.
- Equity based - we believe that a suitable long term rate of return is 7.5% per annum, consistent with an equity risk premium of 3% over our fixed interest assumption of 4.5%.

A2.17 We have assumed that funds will consist on average 50% fixed interest and 50% equities, the equity backing ratio on with-profit funds being perhaps slightly lower, but slightly higher on unit-linked funds. Assuming such a split between fixed interest and equities suggests a pre-vesting yield of 6% per annum equivalent to a pre-vesting yield 2% per annum in excess of earnings growth. We believe these assumptions to be reasonable in the current economic climate.

Mortality pre retirement

A2.18 In accordance with the approach adopted by GAD for setting rebates in 2002 – 2007 and the Actuarial Profession for SMPI, we have ignored the effect of mortality before retirement.

Cost of annuity purchase

A2.19 Our general approach to determining the cost of annuity purchase has been to estimate the cost of securing equivalent SERPS/S2P benefits in the open market i.e. one that provides RPI linked pension increases and 50% spouse's pension benefits. This is consistent with the environment in which investors, having contracted out, will be operating. We took data from the Financial Services Authority Comparative Tables Database as at 2 June 2005 and took the average annuity rates of the best 3 providers offering RPI linked annuities. We were able to calibrate our annuity valuation basis to market rates by making the following assumptions:

Assumption	
Mortality	90% PMA/PFA92 mc (u=2005)
Interest	Real yield (1.6%) less 0.6%
Annuity expense loadings	Capitalised value of fees = £500.00; plus size related loading of 2.5% annuity purchase price

A2.20 There is a “cost” in securing a pension that increases in line with the RPI currently equivalent to a reduction in the real post-vesting yield of around 0.6%. This cost reflects the nature of the RPI guarantee to pension increases provided under SERPS/S2P and it is therefore appropriate to include this cost within the valuation of these benefits. We have assumed that this cost will in future be equivalent to a reduction in the real post-vesting yield of 0.5%, consistent with that used for SMPI.

A2.21 The GAD basis for setting rebates 2002/03 to 2006/07 assumed post-vesting mortality experience in accordance with projected improvements to 85% of standard UK population mortality. The GAD has shown that the expectation of life on such a basis was consistent with PML/PFL 92 with improvement factors projected according to a person’s year of birth. However, this comparison was undertaken in March 2001, before the Actuarial Profession issued updated mortality improvement factors in October 2002. A comparison of the expectation of life between the GAD basis and that using the updated PMA/PFA92 medium cohort improvement factors is given below:

Table of expectations of life:

Year of attaining age 65 (y)	Males		Females	
	GAD basis	PMA92 mc (u=y)	GAD basis	PFA92 mc (u=y)
2005	18.99	21.23	21.42	24.14
2020	19.80	22.19	22.48	25.02
2035	20.16	22.82	23.19	25.61

A2.22 As can be seen there has been a considerable increase in life expectancy resulting in lower prospective rates of annuity purchase.

A2.23 The purchase of protected rights annuities needs to be on a unisex basis and must provide a 50% spouse’s pension if the investor is married at the point of retirement. We have allowed for unisex status by assuming female mortality rates for the provision of the main annuitant’s pension benefits and male mortality rates for provision of the spouse’s pension benefits.

Annuity expense loadings

A2.24 Insurers will typically apply loadings to the annuity purchase price to allow for the expenses and commission of purchasing that contract. This often comprises two elements: a) a fixed cost per policy; and b) one that is dependent on the policy’s size. Where we have analysed APPP rebates individually (but which will form part of a larger policy) as in Sections 4 and 5, we have allowed for a simple flat rate annuity expense loading of 4% of the purchase price. Where a group of rebates is being valued, as in Section 6, the following charges, calibrated to reflect current market annuity rates, have been assumed:

- Fixed cost per policy: £500 increasing by RPI to vesting
- Policy size cost: 2.5% annuity purchase price

Proportions married

A2.25 For ease of calculation, approach and relative insensitivity of results, we have adopted the table of proportions married as set out in Appendix H of the Securities and Investment Board’s: “Review of Past Business Part II Specification of Standards and Procedures”.

Ages, age difference and contracting out periods

A2.26 We have assumed that all people are born on 6 April.

A2.27 We have assumed that, for married couples, males are on average 3 years older than females.

A2.28 We have assumed that investors contracted out for a complete number of tax years and contract back into S2P no later than for the 2005/06 tax year.

Appropriate Personal Pension Plans (APPPs)

A2.29 Rebates to APPPs have generally been assumed to be paid on the 1 October following the end of the tax year to which contracting out relates. The only exception relates to rebates paid in respect of the 1987 year of contracting out which were assumed to be paid on 1 October 1989. Rebates yet to be received i.e. those for the 2004/05 tax year, have been discounted to the date of calculation by the assumed pre-vesting yield.

A2.30 We have assumed that all investors who contracted out over the period 1987 to 1992 were eligible to receive the 2% incentive payment.

A2.31 We have estimated APPP values by rolling up the accumulated value of rebates, net of charges, in line with CAPS Balanced fund performance. Our analysis suggests that CAPS performance may marginally understate general personal pension fund performance by approximately 1% per annum and have thus modelled standard pension returns in line with the CAPS index plus 1% per annum. Upper and lower quartile fund performance has been estimated as +/- 1% average returns so that:

- Upper quartile performance = CAPS + 2% per annum
- Average fund performance = CAPS + 1% per annum
- Lower quartile fund performance = CAPS + 0% per annum

A2.32 We have assumed "Stakeholder" type policy charges with a flat 1% per annum annual management charge unless stated otherwise.

A2.33 We have not made any allowance for the potential SERPS pension that may be payable to investors who contracted out before 6 April 1997 on the grounds that current expectation of RPI increases (of between 2% and 2.5%) are sufficiently below the 3% limit to make this benefit immaterial.

Comparison of basis with GAD and SMPI

Assumption	OAC basis for calculating loss	GAD basis for setting rebates 2002 – 2007	Actuarial Profession basis for SMPI
Price inflation	RPI = 2.5%	RPI = 2.5%	RPI = 2.5%
Earnings inflation	RPI + 1.5% = 4.0%	RPI + 2.0% = 4.5%	2.5%
Post vesting real yields	See below: scale 1.1% to 1.5%	See below: scale 2.3% to 3.5%	See below for detail: 1.2%
Pre vesting yields	6.0%	6.5%	No more than 7%
Mortality before retirement	Nil	Nil	Nil
Mortality after retirement	90% PMA/PFA 92 mc (u=yob+SPA) ⁹	85% projected UK population	100% PMA/PFA 92 mc (u=yob+SPA)
Annuity expense loadings	4.0% ¹⁰	2.0%	4.0%
Charges / expenses before retirement	1% annual management charge	1% annual management charge	Actual charges / expenses
Proportions married	Appendix H, SIB Specification	100%	100%
Age difference	Males three years older than females	Based on UK 1991 census	Males three years older than females
Unisex allowance	Annuity based on female rates with spouse's benefits based on male mortality	Not stated	Annuity based on female rates with spouse's benefits based on male mortality

⁹ Rates have been set to those that currently apply in the market place. This assumption reflects the allowance made for future mortality improvements.

¹⁰ 4% used in projecting the value of single years' rebates which will form part of a larger policy; 2.5% plus £500 (assumed to increase in line with the RPI) used when projecting the total value of all rebates

Table of post vesting yields

Year of retirement	OAC basis for calculating loss ¹¹	GAD basis for setting rebates 2002 – 2007	Actuarial Profession basis for SMPI
2005	1.1%	2.3%	50% of the sum of the FTSE Actuaries Government Securities Index Linked Real Yields over 5 years assuming: (a) 5% inflation and (b) 0% inflation minus 0.5%. The interest rate must be rounded to the nearest multiple of 0.2%. Providers should round down interest rates which are an intermediate exact multiple of 0.1%. Current assumption is 1.2%.
2006	1.1%	2.4%	
2007	1.1%	2.5%	
2008	1.1%	2.6%	
2009	1.2%	2.7%	
2010	1.2%	2.8%	
2011	1.3%	2.9%	
2012	1.3%	3.0%	
2013	1.4%	3.1%	
2014	1.4%	3.2%	
2015	1.5%	3.3%	
2016	1.5%	3.4%	
2017+	1.5%	3.5%	

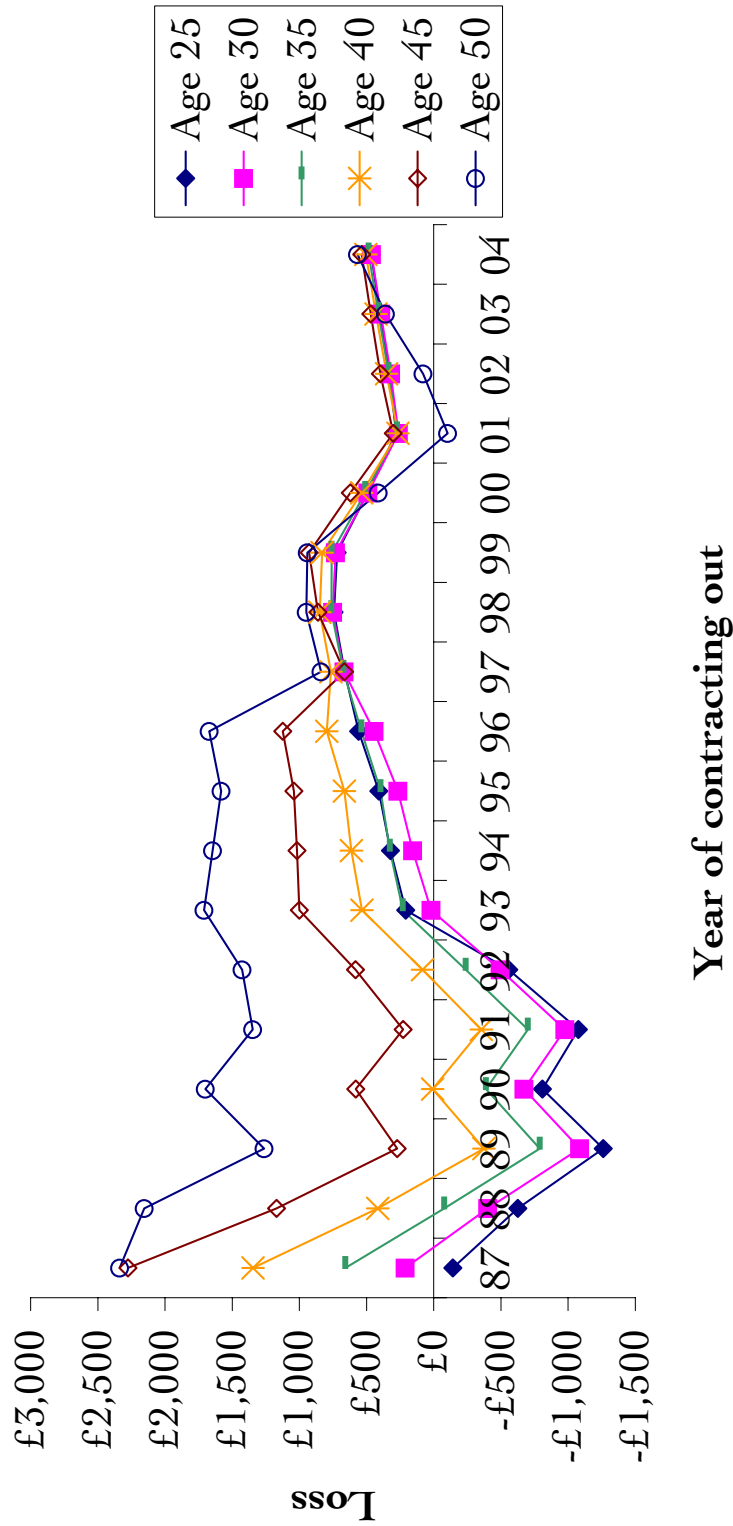
¹¹ These rates based on a graduated scale of real yields from 1.6% in 2005 increasing to 2.0% in 2015, less 0.9% to allow for the cost of RPI linked annuity purchase

Appendix 3

Graphs and tables of results

	PAGE
GRAPH 1: Potential loss on contracting out for one year only, by age and by year of contracting out	33
GRAPH 2: Variation in potential loss on contracting out for one year only: low/medium/high income	35
GRAPH 3: Variation in potential loss on contracting out for one year only: sex	37
GRAPH 4: Variation in potential loss on contracting out for one year only: marital status	39
GRAPH 5: Variation in loss on contracting out for one year only: variability in returns	41
GRAPH 6: Variation in potential loss on contracting out for one year only: policy fees	43
GRAPH 7: Variation in potential loss on contracting out for one year only: charging structure	45
GRAPH 8: Variation in loss on contracting out for one year only: future economic experience	47
GRAPH 9: Aggregated loss by age contracting out began: male investors contracted out throughout (contracting back in from 2005)	49
GRAPH 10: Aggregated loss by age contracting out began: male investors contracted out for 5 years (in any event no later than 2004)	51
GRAPH 11: Aggregated loss by age contracting out began: female investors contracted out throughout (contracting back in from 2005)	53
GRAPH 12: Aggregated loss by age contracting out began: female investors contracted out for 5 years (in any event no later than 2004)	55
GRAPH 13: Analysis of loss with variable rates of investment growth	57
GRAPH 14: Potential loss on future contracting out for 2004 only, on various future post retirement real yields	59
TABLE 1: Cohort analysis of 36 sample male investors - range of ages, income and year of contracting out – contracted out throughout (contracting back in from 2005)	62
TABLE 2: Cohort analysis of 36 sample male investors - range of ages, income and year of contracting out – contracted out for 5 years only (and in any event no later than 2005)	63
TABLE 3: Cohort analysis of 36 sample female investors - range of ages, income and year of contracting out – contracted out throughout (contracting back in from 2005)	65
TABLE 4: Cohort analysis of 36 sample female investors - range of ages, income and year of contracting out – contracted out for 5 years only (and in any event no later than 2005)	66
TABLE 5: Critical real (of earnings growth) yield on future contracting out	68

GRAPH 1 - Potential loss on contracting out, for one year only, by age and by year of contracting out



Graph 1 – Additional notes

This graph shows the potential loss (positive figures) or gain (negative figures) on individual rebates paid in respect of the 1987 to 2004 tax years for the given range of ages.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Section 3 and Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

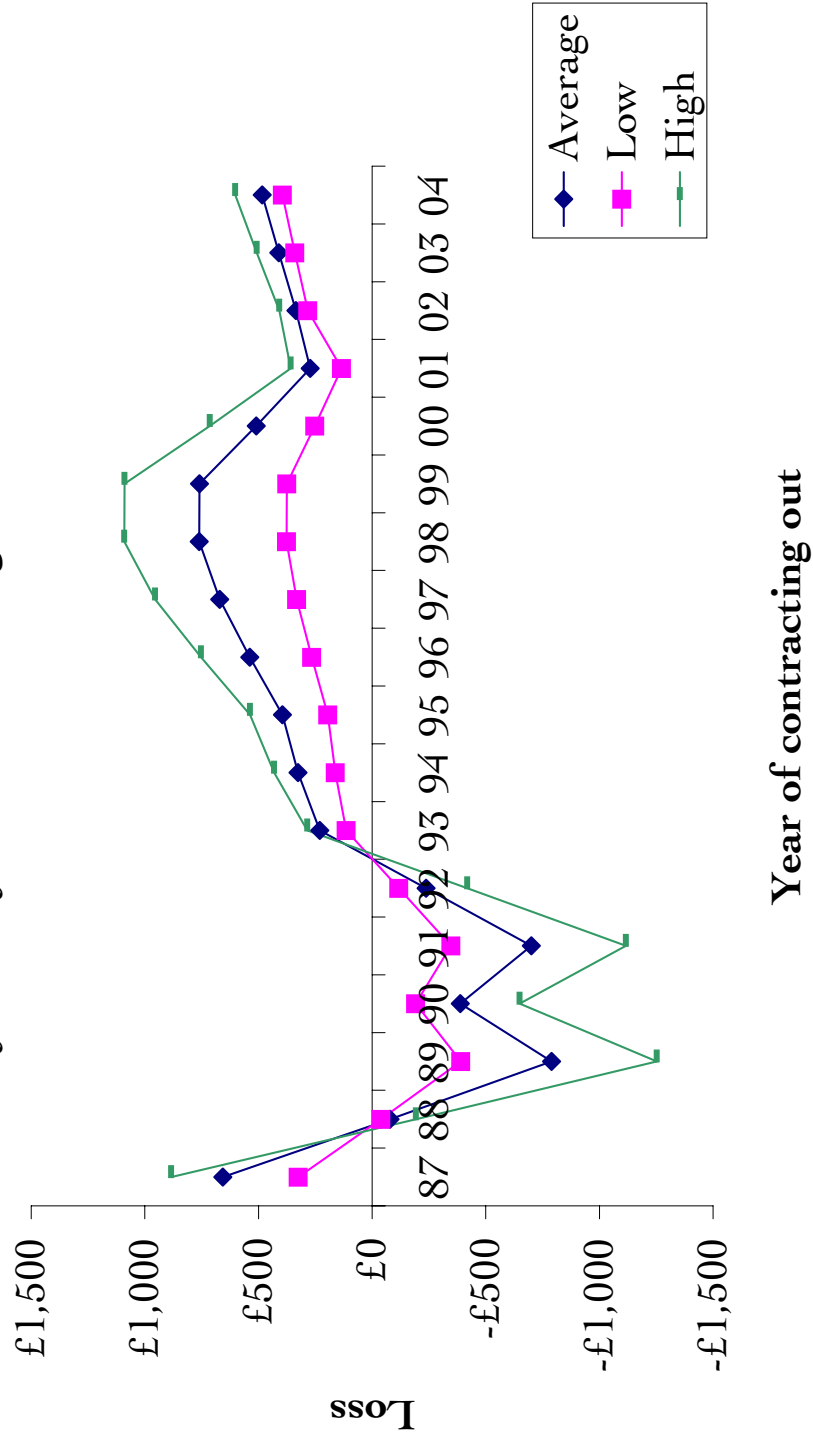
- Male
- Single
- On average income

Age is defined as that at the time of contracting out. An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Age	Year of contracting out																		Median
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
25	-143	-625	-1,260	-809	-1,075	-557	209	323	409	559	664	742	719	493	280	331	399	464	327
30	212	-401	-1,086	-672	-975	-495	19	157	266	444	667	751	731	491	263	320	393	463	264
35	657	-79	-790	-388	-701	-238	230	326	395	538	671	761	759	509	272	335	411	483	365
40	1,345	416	-373	9	-354	84	533	614	665	797	765	848	831	536	267	351	430	505	519
45	2,275	1,169	272	580	228	582	1,000	1,018	1,041	1,123	664	861	927	621	300	397	469	536	643
50	2,337	2,154	1,263	1,699	1,348	1,426	1,709	1,645	1,583	1,672	839	948	940	413	-103	81	360	566	1,305
Median	1,001	168	-581	-190	-527	-77	382	470	537	678	669	805	795	501	270	333	405	494	467

GRAPH 2 - Variation in potential loss on contracting out for one year only: low/medium/high income



Graph 2 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years for the given range of incomes.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Aged 35 at the time of contracting out
- Single

Income is defined as:

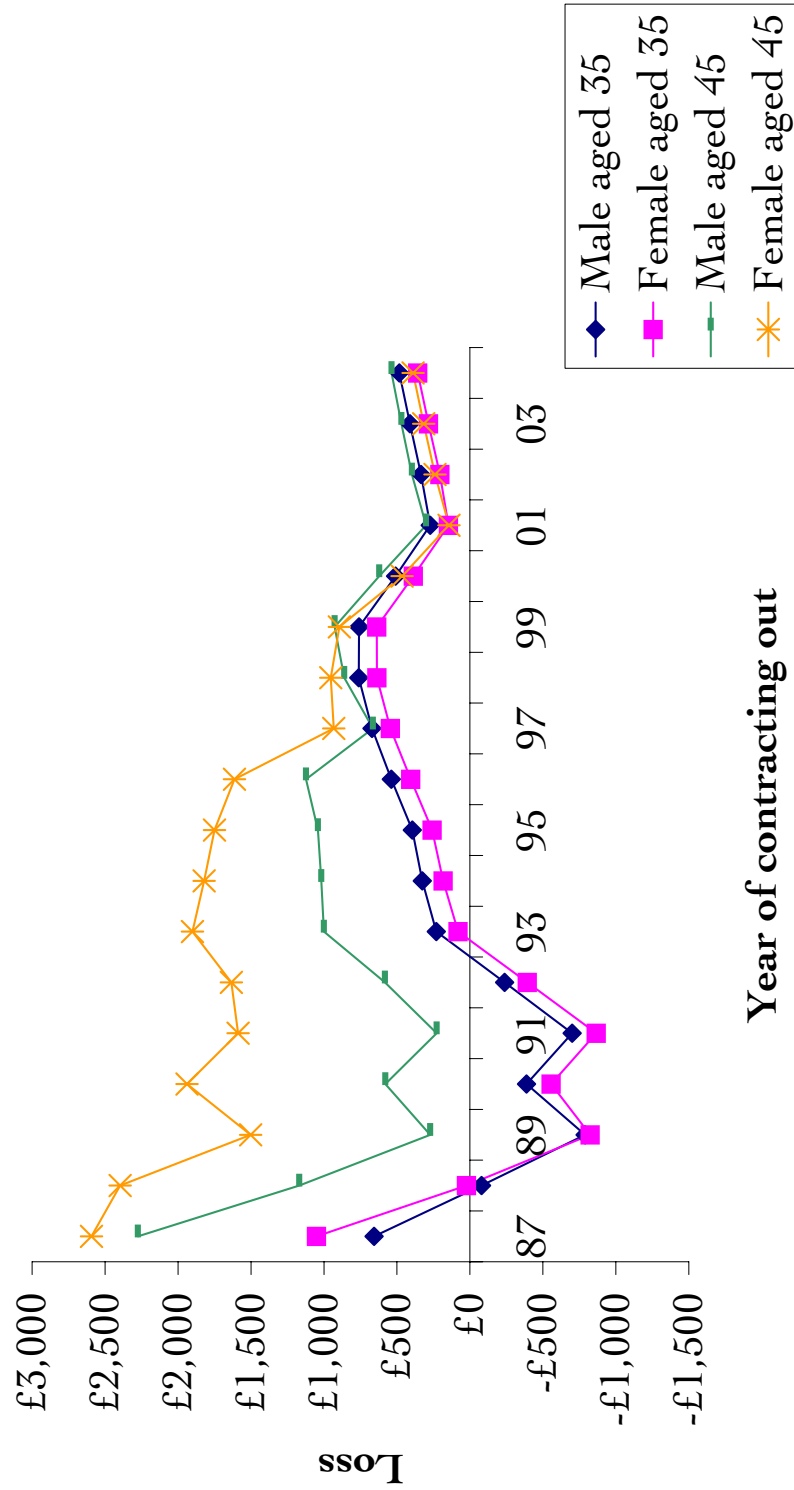
- Low: 1/3 middle band earnings plus LEL
- Average: 2/3 middle band earnings plus LEL
- High: Earnings in excess of UEL

An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Year of contracting out	Income		
	Low	Average	High
1987	325	657	884
1988	-39	-79	-193
1989	-391	-790	-1,253
1990	-192	-388	-649
1991	-347	-701	-1,116
1992	-118	-238	-419
1993	114	230	285
1994	161	326	431
1995	195	395	537
1996	266	538	753
1997	332	671	955
1998	377	761	1,091
1999	376	759	1,089
2000	252	509	714
2001	135	272	358
2002	283	335	409
2003	340	411	507
2004	395	483	602

GRAPH 3 - Variation in potential loss on contracting out for one year only: by sex



Graph 3 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years for males and females aged 35 and 45 at the time of contracting out.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male or female
- Aged 35 or 45 at the time of contracting out
- Single
- On average income

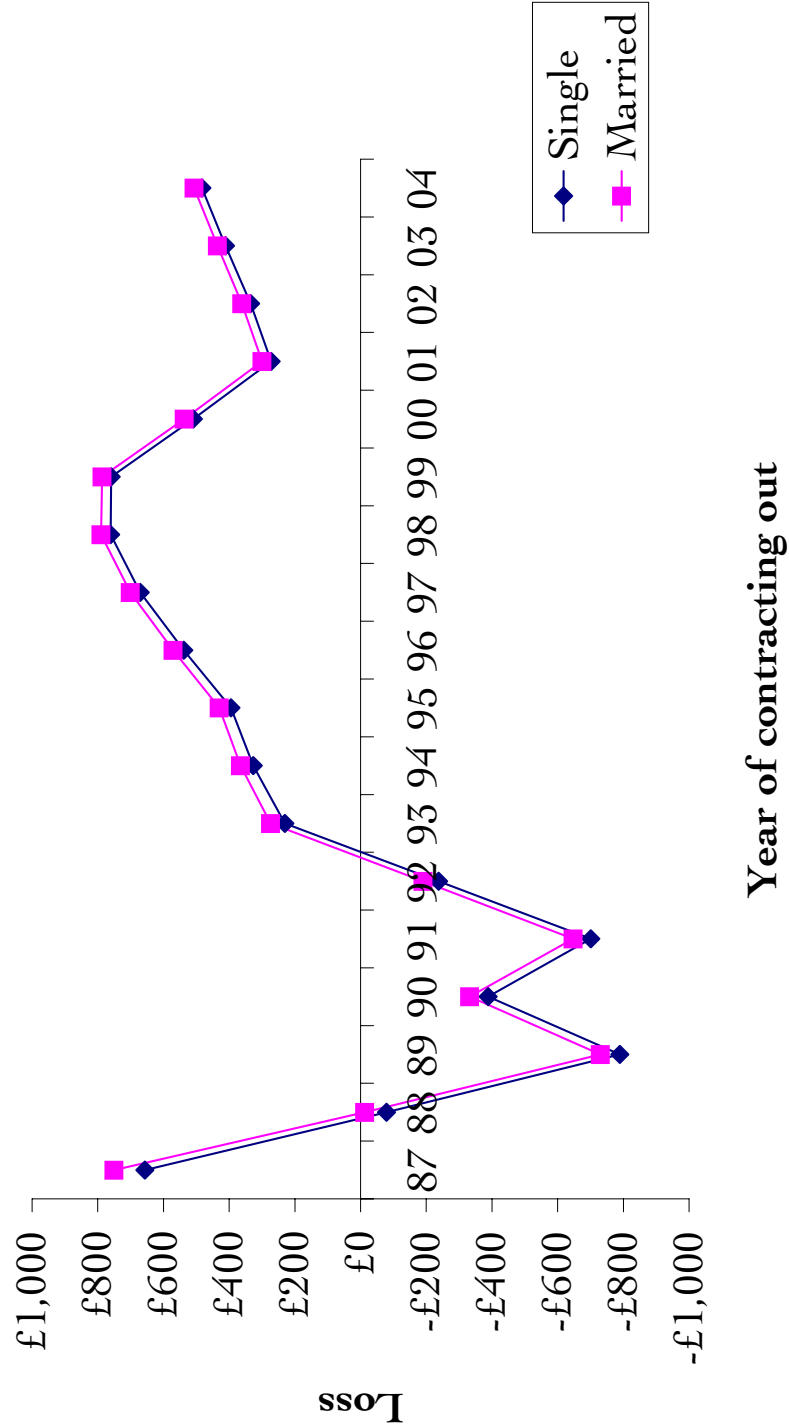
An annuity expense loading of 4% has been assumed.

The average increase in loss for females with SPA of 60 (those aged 45 at time of contracting out in years 1987 to 1995) compared with males with a SPA of 65 is approximately 50% of the current estimated value of rebates for those years.

The data underlying the graph is as follows:

Year of contracting out	Male aged 35	Female aged 35 and SPA	Male aged 45	Female aged 45 and SPA		
1987	657	1,052	63	2,275	2,593	60
1988	-79	23	64	1,169	2,397	60
1989	-790	-824	65	272	1,503	60
1990	-388	-557	65	580	1,939	60
1991	-701	-865	65	228	1,588	60
1992	-238	-393	65	582	1,635	60
1993	230	81	65	1,000	1,901	60
1994	326	183	65	1,018	1,821	60
1995	395	259	65	1,041	1,750	60
1996	538	406	65	1,123	1,613	61
1997	671	545	65	664	933	62
1998	761	637	65	861	953	63
1999	759	638	65	927	895	64
2000	509	387	65	621	465	65
2001	272	147	65	300	144	65
2002	335	206	65	397	239	65
2003	411	284	65	469	317	65
2004	483	358	65	536	389	65

GRAPH 4 - Variation in potential loss on contracting out for one year only: marital status



Graph 4 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years for single and married investors.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

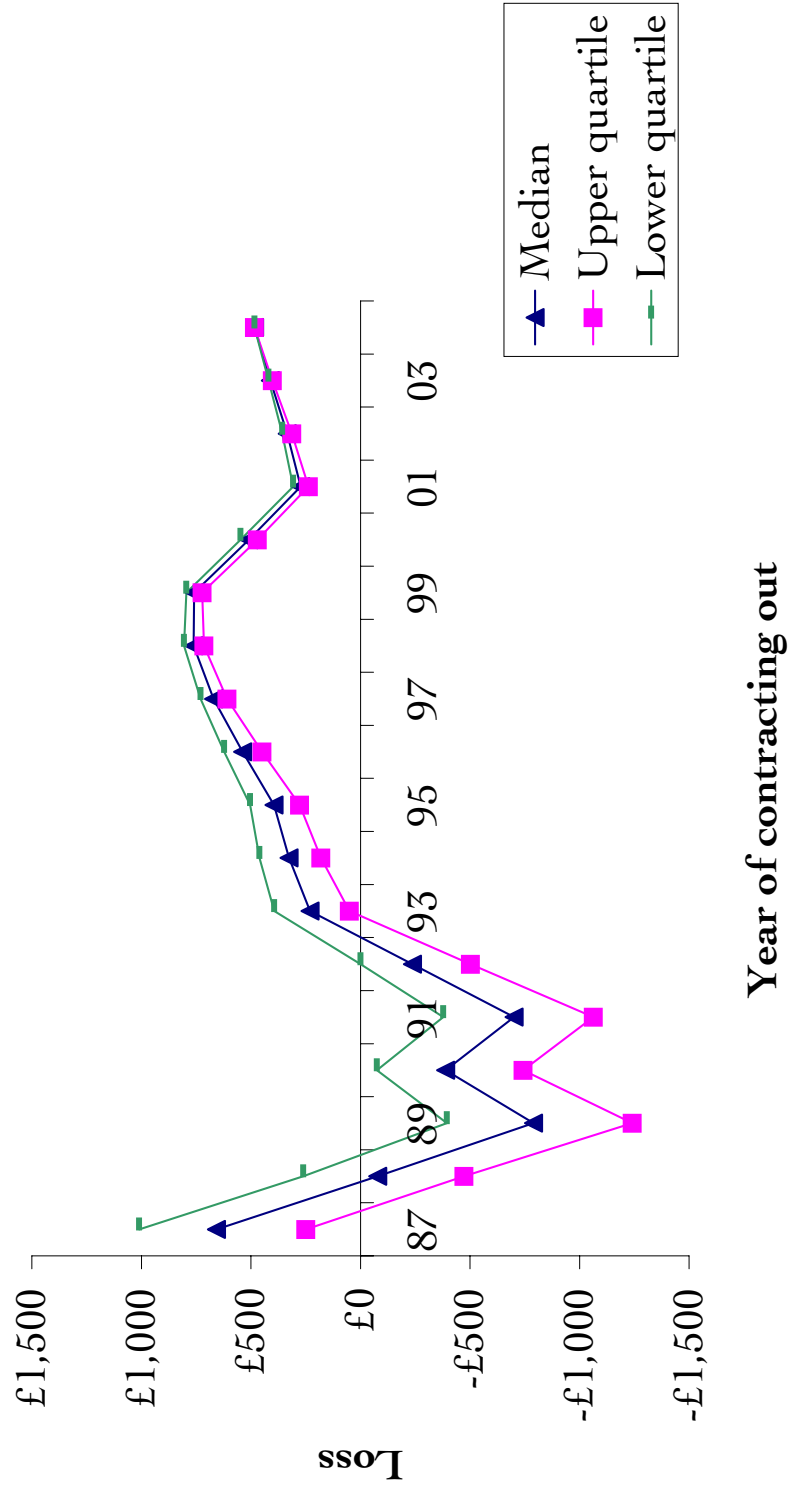
- Single and married
- Aged 35 at the time of contracting out
- On average income

An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Year of contracting out	Marital status	
	Single	Married
1987	657	751
1988	-79	-13
1989	-790	-730
1990	-388	-332
1991	-701	-647
1992	-238	-190
1993	230	273
1994	326	366
1995	395	430
1996	538	571
1997	671	701
1998	761	790
1999	759	787
2000	509	536
2001	272	300
2002	335	362
2003	411	436
2004	483	507
Average	231	272

**GRAPH 5 - Variation in loss on contracting out for one year only:
variability in returns**



Graph 5 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years assuming different rates of relative fund performance.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Aged 35 at the time of contracting out
- Single
- On average income

Relative fund performance has been assumed to be:

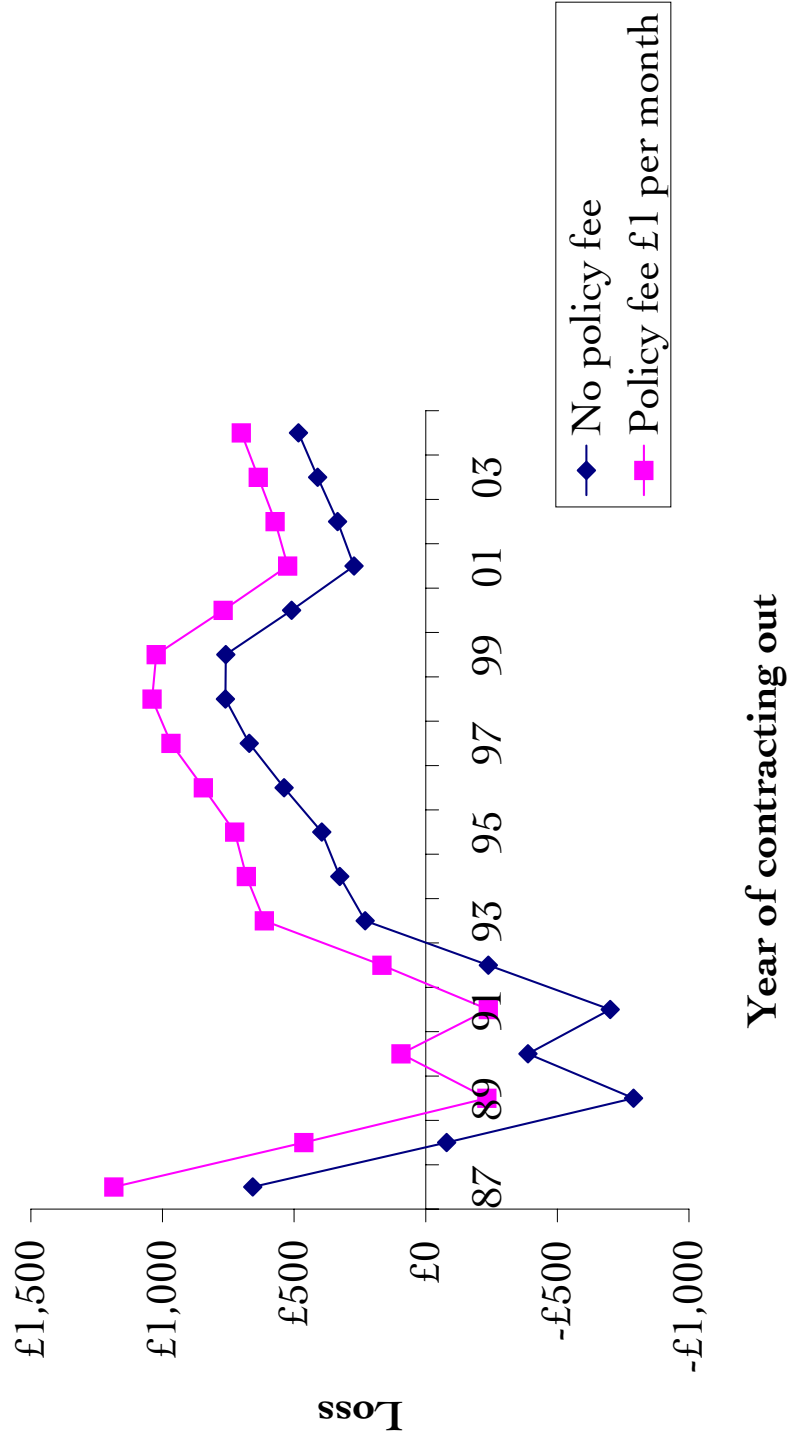
- Upper quartile = CAPS + 2% per annum
- Average = CAPS + 1% per annum
- Lower quartile = CAPS + 0% per annum

An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Year of contracting out	Fund performance		
	Lower quartile	Average	Upper quartile
1987	1010	657	249
1988	261	-79	-473
1989	-395	-790	-1241
1990	-75	-388	-743
1991	-378	-701	-1063
1992	0	-238	-502
1993	393	230	51
1994	460	326	180
1995	504	395	278
1996	622	538	449
1997	729	671	609
1998	806	761	715
1999	795	759	722
2000	547	509	471
2001	307	272	237
2002	357	335	313
2003	420	411	402
2004	483	483	483
Average	380	231	63

GRAPH 6 - Variation in potential loss on contracting out for one year only: policy fees



Graph 6 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years between a policy with and without a policy fee.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Aged 35 at the time of contracting out
- Single
- On average income

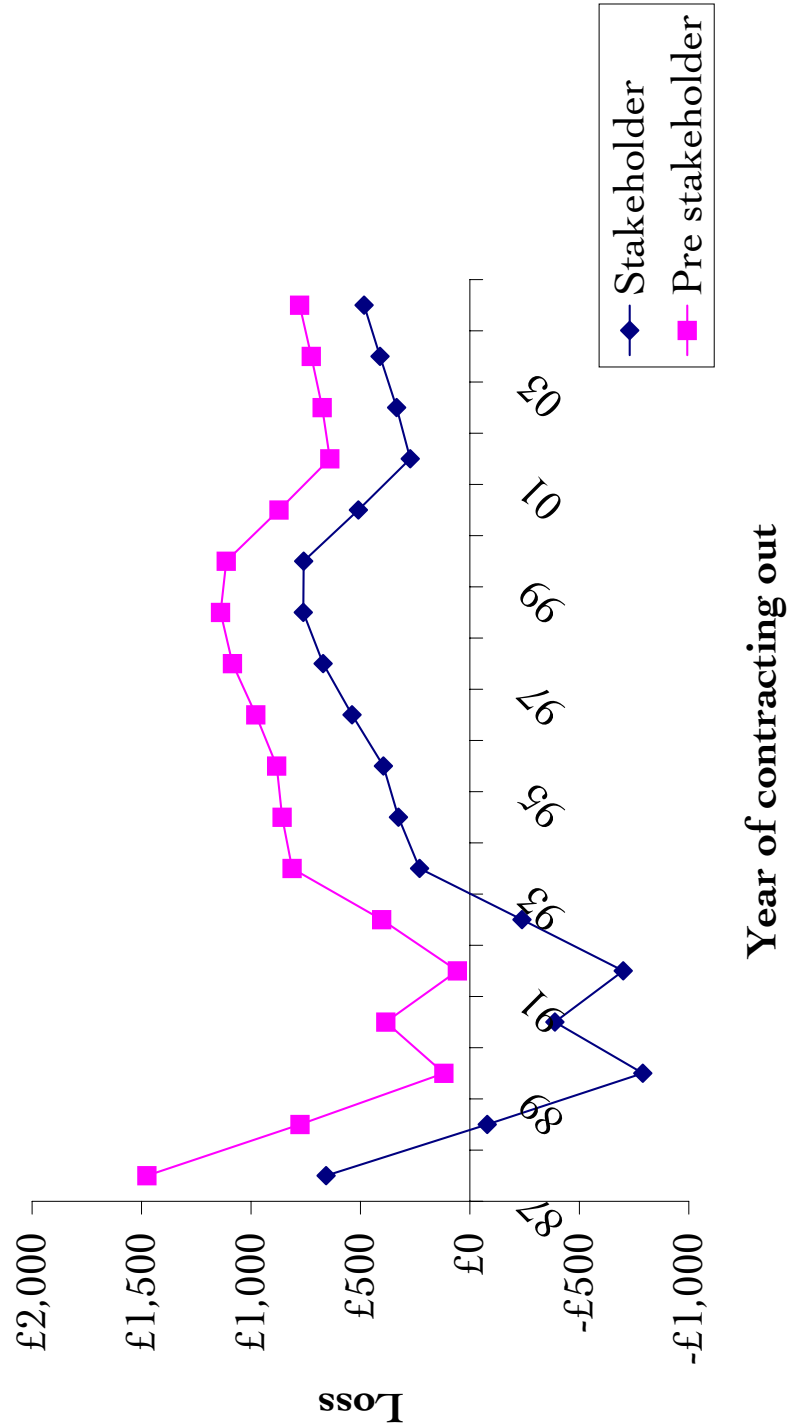
The “No policy fee” charging structure is a “Stakeholder” policy (with a flat 1% annual management charge). The “Policy fee £1 per month” assumes the same except with an additional £1 per month policy. The policy charge is assumed to increase in line with the RPI from policy inception.

An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Year of contracting out	Policy fee	
	No policy fee	Policy fee £1 per month
1987	657	1184
1988	-79	463
1989	-790	-232
1990	-388	94
1991	-701	-238
1992	-238	166
1993	230	613
1994	326	681
1995	395	725
1996	538	845
1997	671	967
1998	761	1040
1999	759	1024
2000	509	769
2001	272	524
2002	335	572
2003	411	636
2004	483	701
Average	231	585

GRAPH 7 - Variation in potential loss on contracting out for one year only: charging structure



Graph 7 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years between a stakeholder policy (with a flat 1% annual management charge) with a policy charging structure similar to that which may have applied in the late 1980s or early 1990s.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Aged 35 at the time of contracting out
- Single
- On average income

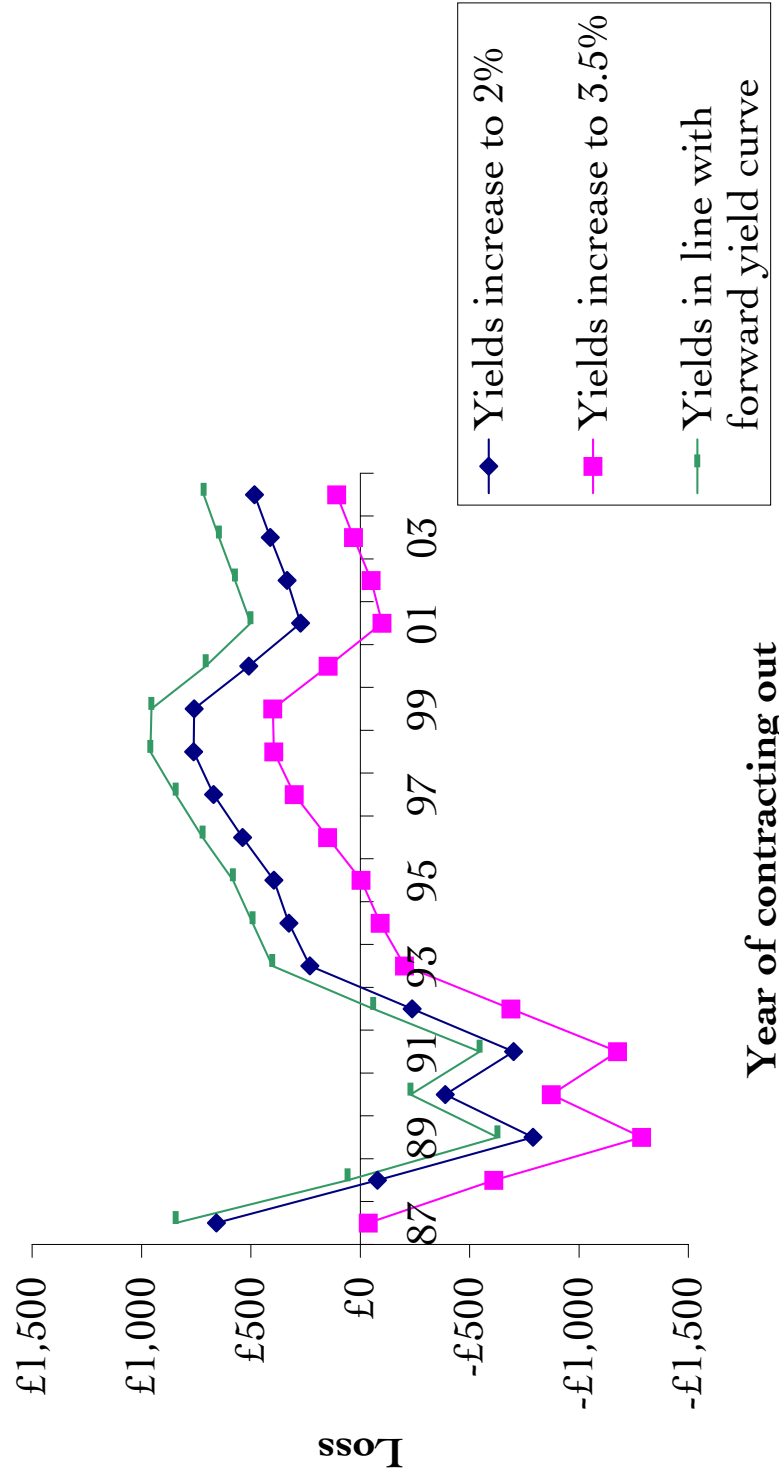
Stakeholder policy charges are assumed to be a flat 1% annual management charge. Pre stakeholder charges assumed are:

- Annual management charge 0.75%
- Policy fee £1.50 per month increasing in line with the RPI (from policy inception)
- Allocation rate 97%
- Bid/offer spread 5%

An annuity expense loading of 4% has been assumed. The data underlying the graph is as follows:

Year of contracting out	Charging type	
	Stakeholder	Pre stakeholder
1987	657	1475
1988	-79	776
1989	-790	119
1990	-388	384
1991	-701	57
1992	-238	403
1993	230	812
1994	326	858
1995	395	882
1996	538	978
1997	671	1085
1998	761	1139
1999	759	1113
2000	509	872
2001	272	640
2002	335	675
2003	411	725
2004	483	778
Average	231	765

**GRAPH 8 - Variation in loss on contracting out for one year only:
variation in future economic experience**



Graph 8 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies on individual rebates paid in respect of the 1987 to 2004 tax years on various post-vesting real yield assumptions.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Aged 35 at the time of contracting out
- Single
- On average income

The assumed post-vesting real yields are:

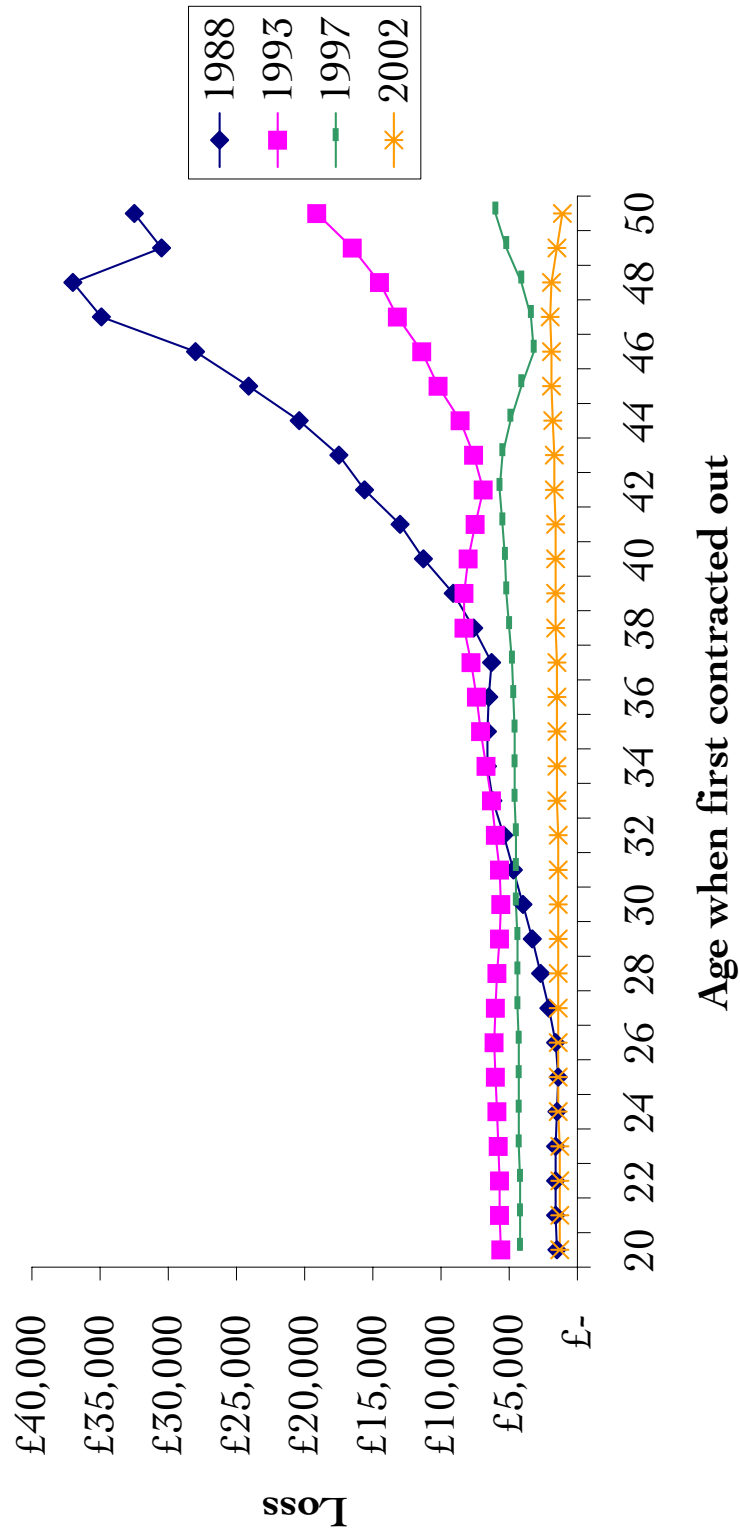
- Yields increase from current levels of 1.6% to 2.0% in 2015.
- Yields increase to 3.5% in 2017 (as assumed by GAD in setting 2002-2007 rebates).
- Yields follow the forward yields curve (yields remaining at 1.6% to 2017 before falling to 1.1% in 2030 and beyond).

An annuity expense loading of 4% has been assumed.

The data underlying the graph is as follows:

Year of contracting out	Assumed post-vesting real yield		
	Increase to 2%	Increase to 3.5%	In line with forward yield curve
1987	657	-37	843
1988	-79	-612	58
1989	-790	-1287	-628
1990	-388	-874	-230
1991	-701	-1177	-546
1992	-238	-689	-60
1993	230	-203	402
1994	326	-92	492
1995	395	-5	582
1996	538	148	720
1997	671	301	843
1998	761	394	959
1999	759	399	954
2000	509	146	705
2001	272	-100	502
2002	335	-51	572
2003	411	30	645
2004	483	107	715

**GRAPH 9 - Aggregate loss by age and date of contracting out:
male investors contracted in from 2005**



Graph 9 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies for male investors on average income by age and date first contracted out assuming they contract back into S2P from 2005.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

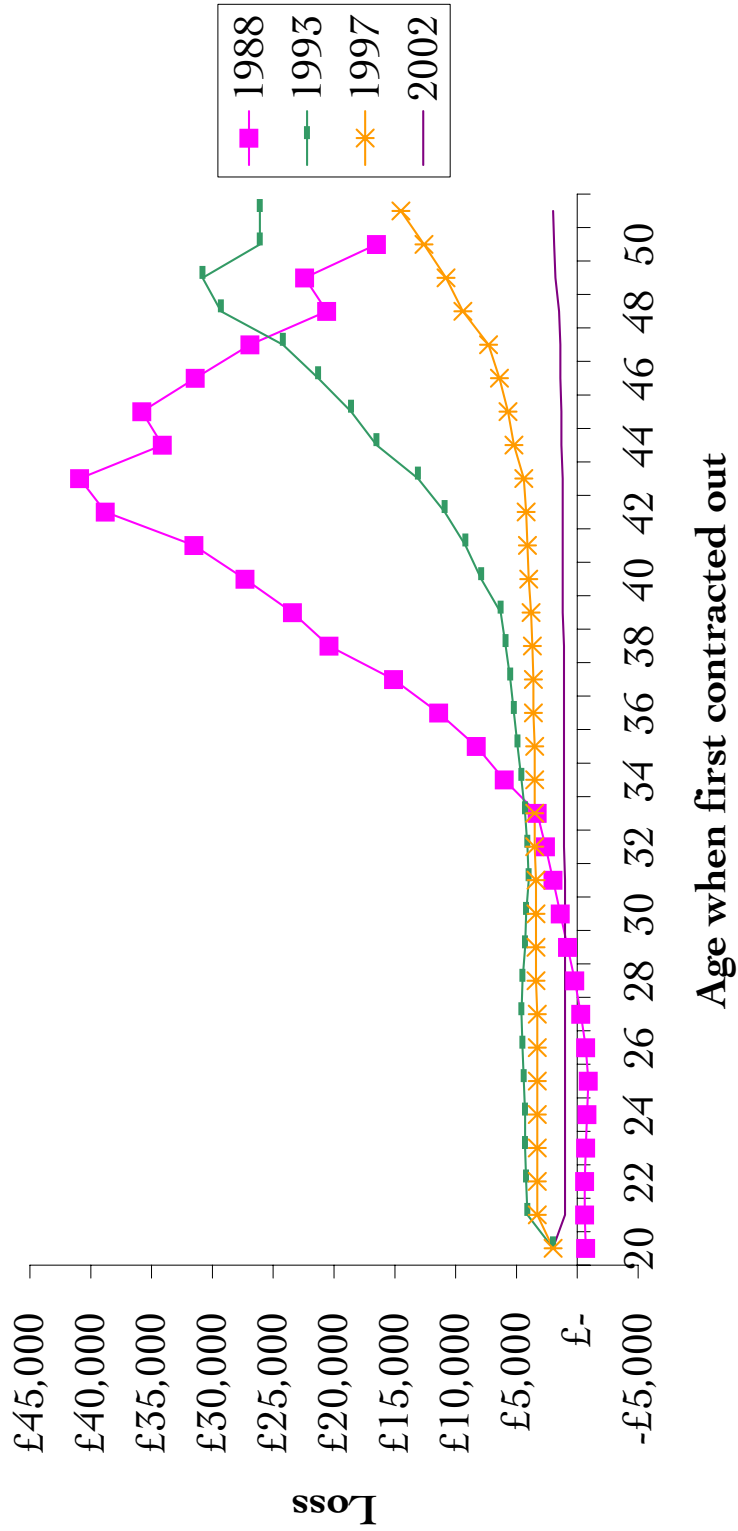
The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is male, married, on average income and contracted out since 1988, 1993, 1997 and 2002 (contracting back in from 2005).

Age is defined as that on the 6 April of the year in which the investor first contracted out. An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed. The data underlying the graph is as follows:

Age	Year of contracting out			
	1988	1993	1997	2002
20	1,500	5,600	4,200	1,300
21	1,600	5,700	4,200	1,300
22	1,600	5,700	4,200	1,300
23	1,600	5,800	4,300	1,300
24	1,500	5,900	4,300	1,400
25	1,400	6,000	4,300	1,400
26	1,600	6,100	4,300	1,400
27	2,100	6,000	4,400	1,400
28	2,700	5,900	4,400	1,400
29	3,300	5,700	4,400	1,400
30	4,000	5,600	4,500	1,400
31	4,700	5,700	4,500	1,400
32	5,400	6,000	4,500	1,400
33	6,200	6,300	4,600	1,500
34	6,600	6,700	4,600	1,500
35	6,600	7,100	4,600	1,500
36	6,500	7,400	4,700	1,500
37	6,300	7,800	4,800	1,500
38	7,600	8,300	5,000	1,600
39	9,100	8,300	5,200	1,600
40	11,300	8,000	5,300	1,600
41	13,000	7,500	5,500	1,600
42	15,600	6,900	5,700	1,700
43	17,500	7,600	5,500	1,700
44	20,400	8,600	4,900	1,800
45	24,100	10,200	4,100	1,900
46	28,000	11,400	3,200	1,900
47	34,900	13,200	3,400	2,000
48	37,000	14,500	4,100	1,900
49	30,500	16,500	5,200	1,500
50	32,500	19,100	6,000	1,100

**GRAPH 10 - Aggregate loss by age and date of contracting out:
female investors contracted in from 2005**



Graph 10 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies for female investors on average income by age and date first contracted out assuming they contract back into S2P from 2005.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

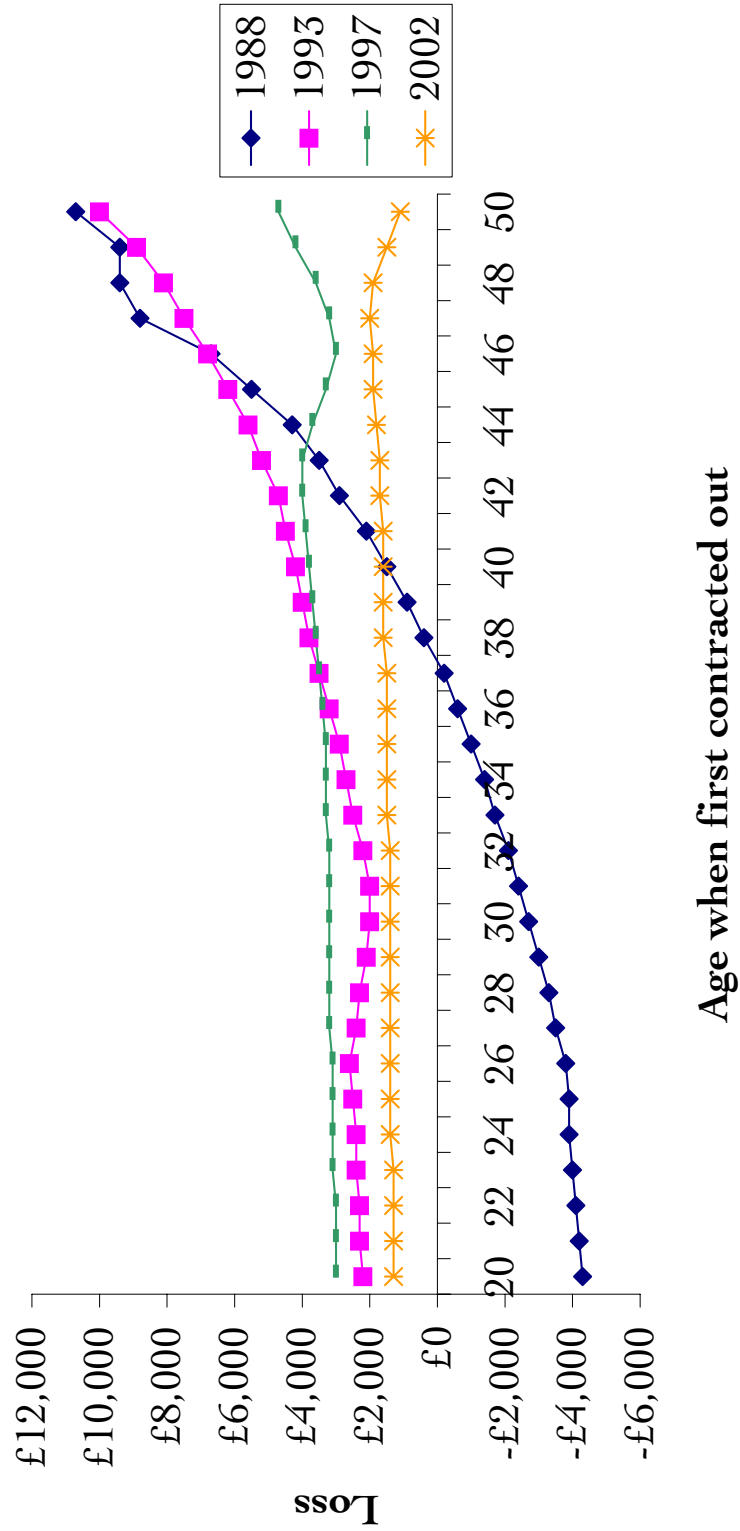
The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is female, married, on average income, and contracted out since 1988, 1993, 1997 and 2002 (contracting back in from 2005).

Age is defined as that on the 6 April of the year in which the investor first contracted out. An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed. The data underlying the graph is as follows:

Age	Year of contracting out			
	1988	1993	1997	2002
20	-700	4,100	3,300	1,000
21	-600	4,200	3,300	1,000
22	-600	4,300	3,300	1,000
23	-700	4,300	3,300	1,000
24	-800	4,400	3,300	1,000
25	-900	4,500	3,300	1,000
26	-700	4,600	3,300	1,000
27	-300	4,500	3,400	1,000
28	200	4,300	3,400	1,000
29	800	4,200	3,400	1,000
30	1,400	4,000	3,400	1,000
31	2,000	4,100	3,500	1,100
32	2,600	4,300	3,500	1,100
33	3,300	4,600	3,500	1,100
34	6,000	4,900	3,500	1,100
35	8,300	5,200	3,600	1,100
36	11,400	5,500	3,600	1,100
37	15,100	5,900	3,700	1,100
38	20,400	6,300	3,800	1,200
39	23,400	7,900	4,000	1,200
40	27,300	9,200	4,100	1,200
41	31,500	10,900	4,200	1,200
42	38,800	13,100	4,400	1,200
43	40,900	16,500	5,200	1,300
44	34,100	18,600	5,700	1,300
45	35,800	21,300	6,400	1,400
46	31,400	24,200	7,300	1,400
47	26,900	29,300	9,400	1,500
48	20,600	30,800	10,800	1,800
49	22,400	26,100	12,600	1,900
50	16,500	26,100	14,500	2,000

GRAPH 11 - Aggregated loss by age and date contracting out began: male investors contracted out for 5 years only



Graph 11 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies for investors assuming they contract out for 5 years only (and in any event no later than for 2004).

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

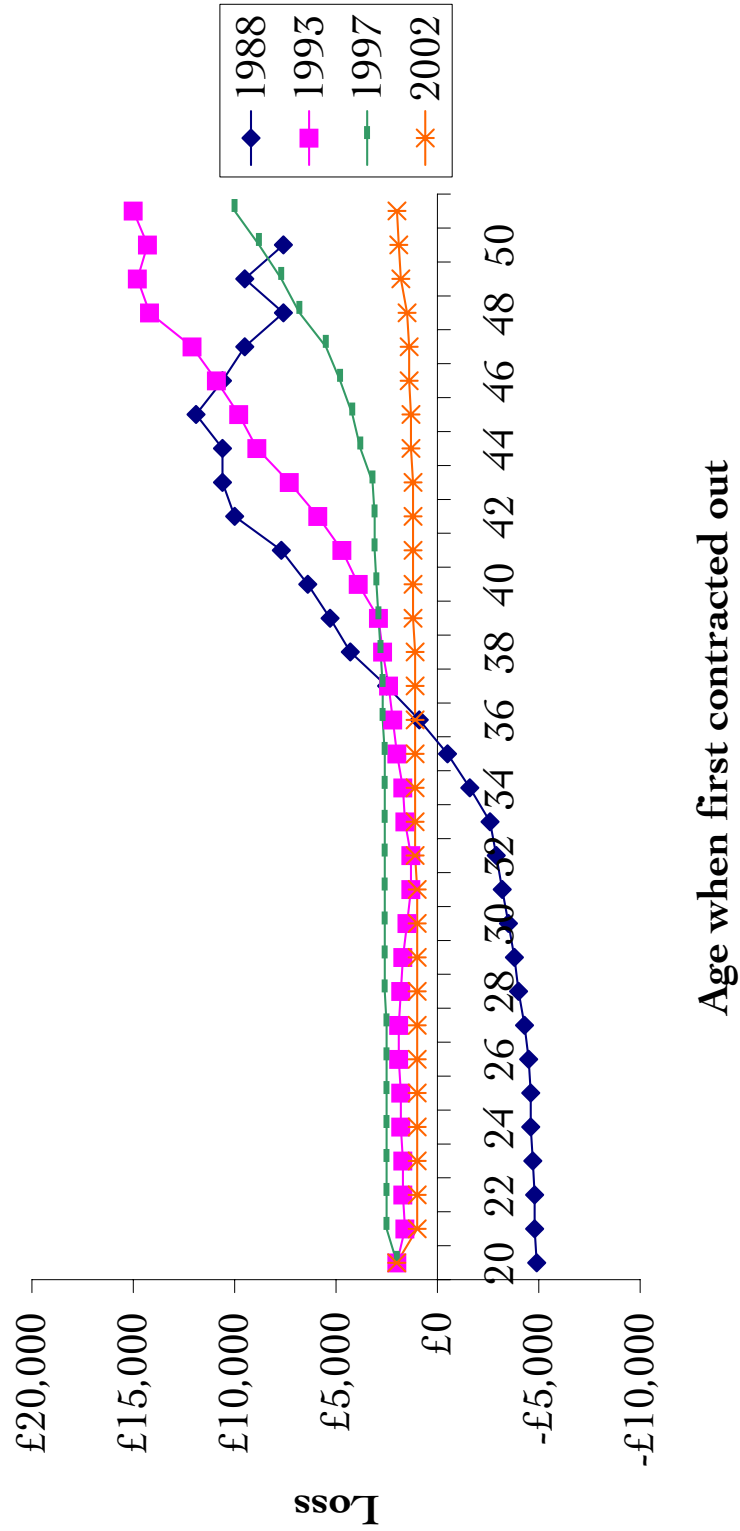
Loss has been calculated on the basis that the investor is:

- Male
- Married
- On average income
- Contracted out since 1988, 1993, 1997 and 2002, contracting back in for 1993, 1998, 2002 and 2005 respectively

Age is defined as that on the 6 April of the year in which the investor first contracted out. An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed. The data underlying the graph is as follows:

Age	Year of contracting out			
	1988	1993	1997	2002
20	-4,300	2,200	3,000	1,300
21	-4,200	2,300	3,000	1,300
22	-4,100	2,300	3,000	1,300
23	-4,000	2,400	3,100	1,300
24	-3,900	2,400	3,100	1,400
25	-3,900	2,500	3,100	1,400
26	-3,800	2,600	3,100	1,400
27	-3,500	2,400	3,200	1,400
28	-3,300	2,300	3,200	1,400
29	-3,000	2,100	3,200	1,400
30	-2,700	2,000	3,200	1,400
31	-2,400	2,000	3,200	1,400
32	-2,100	2,200	3,200	1,400
33	-1,700	2,500	3,300	1,500
34	-1,400	2,700	3,300	1,500
35	-1,000	2,900	3,300	1,500
36	-600	3,200	3,400	1,500
37	-200	3,500	3,500	1,500
38	400	3,800	3,600	1,600
39	900	4,000	3,700	1,600
40	1,500	4,200	3,800	1,600
41	2,100	4,500	3,900	1,600
42	2,900	4,700	4,000	1,700
43	3,500	5,200	4,000	1,700
44	4,300	5,600	3,700	1,800
45	5,500	6,200	3,300	1,900
46	6,700	6,800	3,000	1,900
47	8,800	7,500	3,200	2,000
48	9,400	8,100	3,600	1,900
49	9,400	8,900	4,200	1,500
50	10,700	10,000	4,700	1,100

GRAPH 12 - Aggregated loss by age and date contracting out began: female investors contracted out for 5 years only



Graph 12 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies for investors assuming they contract out for 5 years only (and in any event no later than for 2004).

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

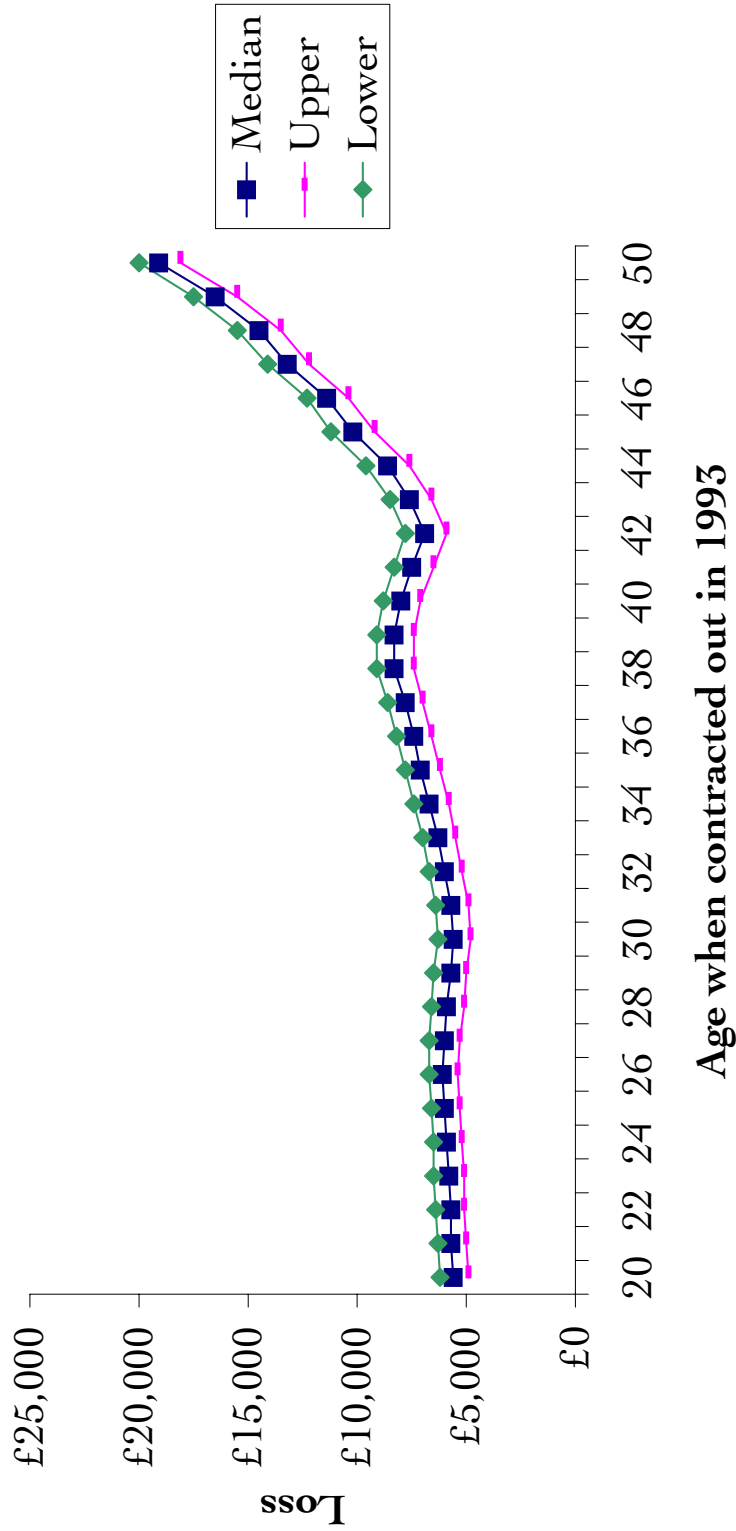
Loss has been calculated on the basis that the investor is:

- Female
- Married
- On average income
- Contracted out since 1988, 1993, 1997 and 2002, contracting back in after 5 years i.e. for 1993, 1998, 2002 and 2005 respectively.

Age is defined as that on the 6 April of the year in which the investor first contracted out. An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed. The data underlying the graph is as follows:

Age	Year of contracting out			
	1988	1993	1997	2002
20	-4,900	1,600	2,500	1,000
21	-4,800	1,700	2,500	1,000
22	-4,800	1,700	2,500	1,000
23	-4,700	1,800	2,500	1,000
24	-4,600	1,800	2,500	1,000
25	-4,600	1,900	2,500	1,000
26	-4,500	1,900	2,500	1,000
27	-4,300	1,800	2,600	1,000
28	-4,000	1,700	2,600	1,000
29	-3,800	1,500	2,600	1,000
30	-3,500	1,300	2,600	1,000
31	-3,200	1,300	2,600	1,100
32	-2,900	1,600	2,600	1,100
33	-2,600	1,700	2,600	1,100
34	-1,600	2,000	2,600	1,100
35	-500	2,200	2,700	1,100
36	900	2,400	2,700	1,100
37	2,500	2,700	2,800	1,100
38	4,300	2,900	2,900	1,200
39	5,300	3,900	3,000	1,200
40	6,400	4,700	3,100	1,200
41	7,700	5,900	3,100	1,200
42	10,000	7,300	3,200	1,200
43	10,600	8,900	3,800	1,300
44	10,600	9,800	4,200	1,300
45	11,900	10,900	4,800	1,400
46	10,600	12,100	5,500	1,400
47	9,500	14,200	6,800	1,500
48	7,600	14,800	7,700	1,800
49	9,500	14,300	8,800	1,900
50	7,600	15,000	10,000	2,000

GRAPH 13 - Analysis of loss with variable rates of investment growth



Graph 13 – Additional notes

This graph shows how the potential loss or gain (loss is a positive number, a gain is a negative number) varies for investors contracted out on a range of relative investment fund growth rates assuming they contracted out in 1993 and contract back into S2P from 2005.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is male, married, on average income, contracted out since 1993 and assumed to contract back in from 2005.

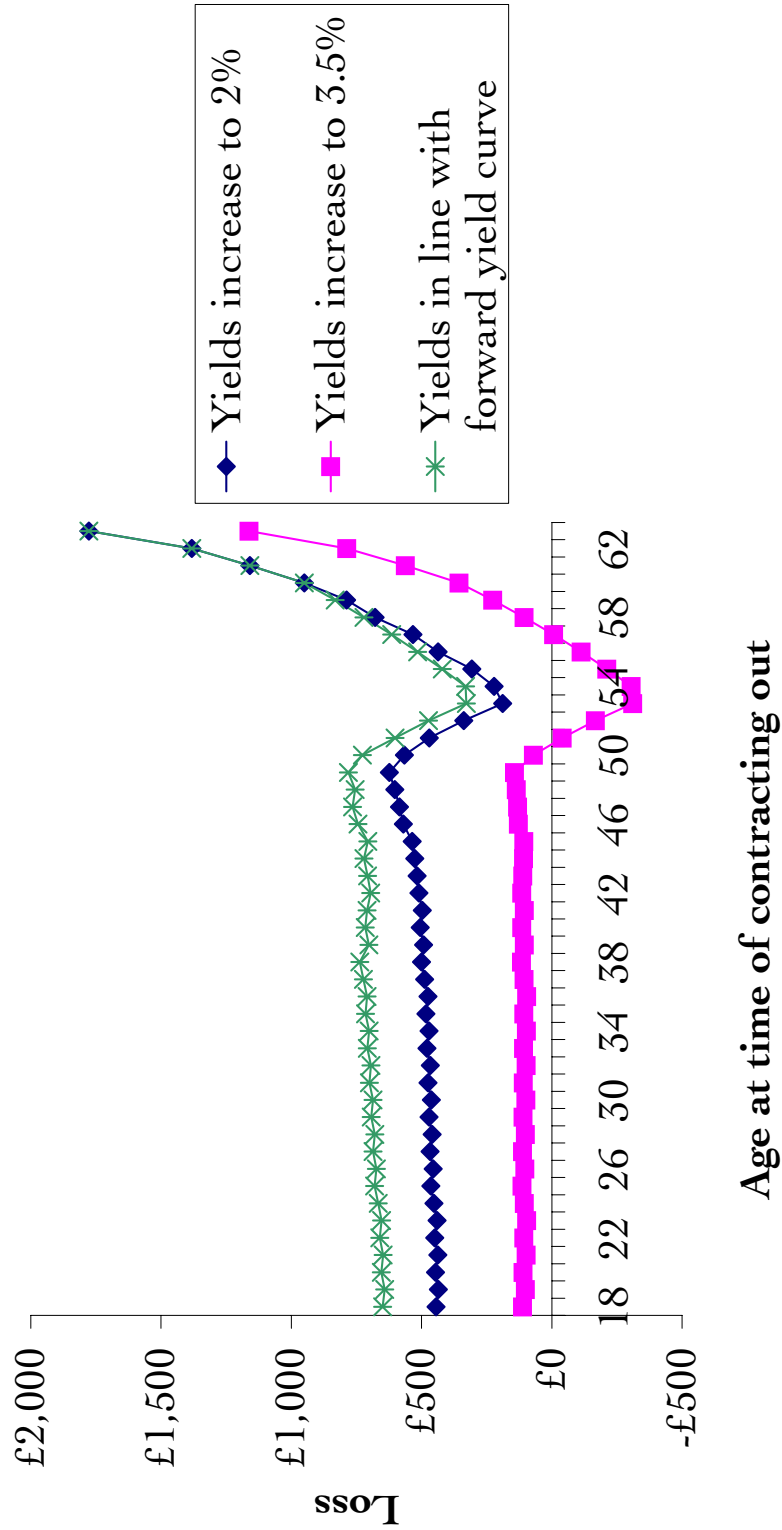
Relative fund performance has been assumed to be:

- Upper quartile = CAPS + 2% per annum
- Average = CAPS + 1% per annum
- Lower quartile = CAPS + 0% per annum

Age is defined as that on the 6 April of the year in which the investor first contracted out. An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed. The data underlying the graph is as follows:

Age	Fund performance		
	Median	Upper	Lower
20	5,600	4,900	6,200
21	5,700	5,000	6,300
22	5,700	5,100	6,400
23	5,800	5,100	6,500
24	5,900	5,200	6,500
25	6,000	5,300	6,600
26	6,100	5,400	6,700
27	6,000	5,300	6,700
28	5,900	5,100	6,600
29	5,700	5,000	6,500
30	5,600	4,800	6,300
31	5,700	4,900	6,400
32	6,000	5,200	6,700
33	6,300	5,500	7,000
34	6,700	5,800	7,400
35	7,100	6,200	7,800
36	7,400	6,600	8,200
37	7,800	7,000	8,600
38	8,300	7,400	9,100
39	8,300	7,400	9,100
40	8,000	7,100	8,800
41	7,500	6,500	8,300
42	6,900	5,900	7,800
43	7,600	6,600	8,500
44	8,600	7,600	9,600
45	10,200	9,200	11,200
46	11,400	10,400	12,300
47	13,200	12,200	14,100
48	14,500	13,500	15,500
49	16,500	15,500	17,500
50	19,100	18,100	20,000

GRAPH 14 - Potential loss on contracting out for 2004 only, on various post retirement real yields assumptions



Graph 14 – Additional notes

This graph shows how the potential loss and gain (a loss is a positive number, a gain a negative number) investors aged between 18 to 63 are likely to incur as a result of contracting out in 2004 on a range of post-vesting real yield scenarios. These figures are in respect of a single rebate payment (i.e. that for 2004) only.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Loss has been calculated on the basis that the investor is:

- Male
- Married
- On average income

The assumed post-vesting real yields are:

- Yields increase from current levels of 1.6% to 2.0% in 2015.
- Yields increase to 3.5% in 2017 (as assumed by GAD in setting 2002-2007 rebates).
- Yields follow the forward yields curve (yields remaining at 1.6% to 2017 before falling to 1.1% in 2030 and beyond).

An annuity expense loading of 4% has been assumed. The data underlying the graph is as follows:

Assumed post-vesting real yield assumption			
Age	Increase to 2%	Increase to 3.5%	In line with forward yield curve
18	444	112	649
19	435	101	642
20	447	110	655
21	438	98	647
22	449	107	661
23	441	96	653
24	452	105	667
25	464	114	680
26	456	103	673
27	468	112	687
28	459	101	680
29	471	111	693
30	463	100	687
31	475	109	701
32	467	98	694
33	479	108	708
34	471	97	701
35	483	107	715
36	475	96	709
37	488	106	723
38	500	116	737
39	493	105	702
40	505	115	716
41	497	105	710
42	510	115	695
43	517	111	707
44	526	108	721
45	536	107	706
46	570	128	744
47	585	131	765
48	603	136	755
49	624	143	781
50	566	70	727
51	471	-40	602
52	338	-168	474
53	189	-311	328
54	222	-305	331
55	307	-212	421
56	436	-113	515
57	533	-7	615
58	678	106	721
59	788	227	832
60	950	356	950
61	1,159	562	1,159
62	1,382	787	1,382
63	1,777	1,162	1,777

Table 1

Cohort analysis of 36 male investors

Range of ages at time of contracting out, year that contracting out started and income

Contracted out throughout (contracting back in from 2005)

Income	Age when c/o	Contracting out year	Contracted back in from 2005				Critical yield
			Loss (£)	APPP fund	Loss as % APP fund	SERPS loss (£ pw)	
Low	25	1988	1,300	13,900	9%	1.28	2.4%
		1993	3,500	7,000	50%	3.69	3.5%
		1997	2,600	4,500	58%	2.88	3.5%
		2002	1,200	2,200	55%	1.34	3.1%
	35	1988	3,800	16,300	23%	3.58	3.7%
		1993	4,100	8,300	49%	4.01	4.3%
		1997	2,900	4,900	59%	2.88	4.1%
		2002	1,300	2,400	54%	1.36	3.6%
	45	1988	13,100	18,400	71%	10.65	24.1%
		1993	5,600	12,200	46%	4.87	7.1%
		1997	2,500	8,200	30%	2.29	4.3%
		2002	1,600	2,900	55%	1.52	4.5%
Average	25	1988	1,400	26,400	5%	1.41	2.2%
		1993	6,000	12,600	48%	6.31	3.5%
		1997	4,300	7,600	57%	4.69	3.4%
		2002	1,400	3,100	45%	1.57	3.0%
	35	1988	6,600	30,300	22%	6.14	3.6%
		1993	7,100	14,900	48%	6.84	4.3%
		1997	4,600	8,400	55%	4.64	4.1%
		2002	1,500	3,300	45%	1.59	3.4%
	45	1988	24,100	33,800	71%	19.57	24.2%
		1993	10,200	21,300	48%	8.88	7.3%
		1997	4,100	13,600	30%	3.76	4.3%
		2002	1,900	4,000	48%	1.79	4.2%
High	25	1988	900	39,300	2%	0.87	2.1%
		1993	8,100	18,600	44%	8.52	3.4%
		1997	5,800	11,200	52%	6.30	3.4%
		2002	1,700	4,400	39%	1.88	2.9%
	35	1988	8,300	45,100	18%	7.76	3.4%
		1993	9,500	22,000	43%	9.22	4.1%
		1997	6,200	12,300	50%	6.21	3.9%
		2002	1,800	4,800	38%	1.90	3.2%
	45	1988	33,600	50,100	67%	27.30	23.2%
		1993	13,900	31,300	44%	12.13	7.0%
		1997	5,200	19,900	26%	4.83	4.1%
		2002	2,200	5,700	39%	2.14	4.0%
Median Value			4,100	12,250	33%	3.88	3.8%
Best case			900	39,300	2%	0.87	2.1%
			25 year-old male on high income, contracted out in 1988				
Worst case			33,600	50,100	67%	27.30	23.2%
			45 year-old male on high income, contracted out in 1988				

Table 2**Cohort analysis of 36 male investors****Range of ages at time of contracting out, year that contracting out started and income****Contracted out for 5 years only (and in any event no later than 2004)**

Income	Age when c/o	Contracting out year	Contracted back in from 2005				Critical yield
			Loss (£)	APPP fund	Loss as % APPP fund	SERPS loss (£ pw)	
Low	25	1988	-1,800	6,000	-30%	-1.79	0.5%
		1993	1,400	2,400	58%	1.45	3.6%
		1997	1,600	2,400	67%	1.76	3.5%
		2002	1,300	2,900	45%	1.49	3.1%
	35	1988	-300	5,900	-5%	-0.29	1.6%
		1993	1,600	2,900	55%	1.58	4.4%
		1997	1,700	2,700	63%	1.75	4.1%
		2002	1,500	3,100	48%	1.51	3.5%
	45	1988	2,900	5,800	50%	2.39	17.7%
		1993	3,300	3,200	103%	2.87	11.2%
		1997	1,900	4,000	48%	1.75	5.0%
		2002	1,800	3,800	47%	1.71	4.4%
Average	25	1988	-3,900	12,300	-32%	-3.92	0.3%
		1993	2,500	5,200	48%	2.65	3.4%
		1997	2,800	4,600	61%	3.04	3.5%
		2002	1,700	4,300	40%	1.86	2.9%
	35	1988	-1,000	12,300	-8%	-0.95	1.3%
		1993	2,900	6,200	47%	2.86	4.2%
		1997	3,000	5,000	60%	2.98	4.1%
		2002	1,800	4,700	38%	1.89	3.3%
	45	1988	5,500	12,200	45%	4.44	16.6%
		1993	6,200	6,800	91%	5.44	10.8%
		1997	3,200	7,400	43%	3.00	4.9%
		2002	2,200	5,800	38%	2.14	4.1%
High	25	1988	-6,200	18,600	-33%	-6.30	0.2%
		1993	3,400	7,900	43%	3.57	3.3%
		1997	3,800	6,800	56%	4.12	3.4%
		2002	2,000	6,200	32%	2.27	2.8%
	35	1988	-2,100	18,600	-11%	-1.93	1.1%
		1993	4,000	9,400	43%	3.84	4.0%
		1997	4,000	7,500	53%	4.02	3.9%
		2002	2,200	6,700	33%	2.29	3.1%
	45	1988	7,400	18,500	40%	6.00	15.3%
		1993	8,700	10,400	84%	7.60	10.3%
		1997	4,300	11,000	39%	3.97	4.6%
		2002	2,700	8,300	33%	2.60	3.8%
Median Value			2,200	6,100	36%	2.28	3.7%
Best case			-6,200	18,600	-33%	-6.30	0.2%
			25 year-old male on high income, contracted out in 1988				
Worst case			8,700	10,400	84%	7.60	10.3%
			45 year-old male on high income, contracted out in 1988				

Tables 1 and 2 – Additional notes

These tables show the potential losses and gains (loss is a positive number, a gain is a negative number) for various cohorts of male investor.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Age is defined as that on the 6 April of the year in which the investor first contracted out.

Loss has been calculated on the basis that the investor is:

- Male
- Married
- On the range of income levels specified
- At the ages specified (at the time of contracting out)
- Commencing contracting out in the years specified

An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed.

The “loss” is the difference between the current value of SERPS/S2P benefits the investor would have foregone (expressed as the estimated cost, to the investor, of securing these benefits on the open market at SPA, discounted to the current effective date of calculation) and the estimated current value of the national insurance rebates the investor would have received (allowing for historic investment returns and typical product charges).

The “APPP fund” is the estimated current value of the National Insurance rebates the investor would have received (allowing for historic investment returns and typical product charges).

The “loss as % APPP fund” is the “loss” expressed as a percentage of the “APPP fund” and represents the percentage uplift to current funds so that they then provide financially comparable benefits to those under SERPS/S2P.

The “SERPS loss (£ pw)” is the loss converted to a loss of pension income in pounds per week. This is expressed in terms of today’s prices.

The “Required real yield” is the rate at which the APPP funds would need to grow in excess of earnings growth in order to provide financially comparable benefits to those under SERPS/S2P.

Table 3**Cohort analysis of 36 female investors****Range of ages at time of contracting out, year that contracting out started and income****Contracted out throughout (contracting back in from 2005)**

Income	Age when c/o	Contracting out year	Contracted back in from 2005				Critical yield
			Loss (£)	APPP fund	Loss as % APP fund	SERPS loss (£ pw)	
Low	25	1988	0	13,900	0%	0.02	2.0%
		1993	2,600	7,000	37%	3.03	3.2%
		1997	2,100	4,500	47%	2.45	3.2%
		2002	900	2,200	41%	1.12	2.9%
	35	1988	4,800	16,200	30%	4.37	4.5%
		1993	3,100	8,300	37%	3.28	3.8%
		1997	2,200	4,900	45%	2.43	3.7%
		2002	1,000	2,400	42%	1.14	3.2%
	45	1988	17,800	13,700	130%	14.47	0.0%
		1993	11,900	12,100	98%	9.16	30.5%
		1997	3,900	8,100	48%	3.35	6.5%
		2002	1,200	2,900	41%	1.27	4.0%
Average	25	1988	-900	26,400	-3%	-0.98	1.8%
		1993	4,500	12,600	36%	5.14	3.1%
		1997	3,300	7,600	43%	3.95	3.2%
		2002	1,000	3,100	32%	1.26	2.8%
	35	1988	8,300	30,300	27%	7.58	4.3%
		1993	5,200	14,900	35%	5.54	3.8%
		1997	3,600	8,400	43%	3.89	3.7%
		2002	1,100	3,300	33%	1.28	3.1%
	45	1988	35,800	25,600	140%	29.05	0.0%
		1993	21,300	21,200	100%	16.41	31.5%
		1997	6,400	13,600	47%	5.51	6.6%
		2002	1,400	4,000	35%	1.44	3.7%
High	25	1988	-2,400	39,300	-6%	-2.69	1.7%
		1993	5,900	18,600	32%	6.78	3.0%
		1997	4,400	11,200	39%	5.22	3.1%
		2002	1,200	4,400	27%	1.44	2.6%
	35	1988	10,800	45,000	24%	9.87	4.1%
		1993	6,900	22,000	31%	7.29	3.6%
		1997	4,700	12,300	38%	5.10	3.5%
		2002	1,300	4,800	27%	1.46	2.9%
	45	1988	51,500	38,100	135%	41.78	0.0%
		1993	29,900	31,200	96%	23.01	30.5%
		1997	8,500	19,900	43%	7.34	6.2%
		2002	1,600	5,700	28%	1.65	3.5%
Median Value			3,750	12,200	31%	3.92	3.4%
Best case			-2,400	39,300	-6%	-2.69	1.7%
			25 year-old female on high income, contracted out in 1988				
Worst case			51,500	38,100	135%	41.78	N/a
			45 year-old female on high income, contracted out in 1988				

Table 4**Cohort analysis of 36 female investors****Range of ages at time of contracting out, year that contracting out started and income****Contracted out for 5 years only (and in any event no later than 2004)**

Income	Age when c/o	Contracting out year	Contracted back in from 2005				Critical yield
			Loss (£)	APPP fund	Loss as % APPP fund	SERPS loss (£ pw)	
Low	25	1988	-2,100	6,000	-35%	-2.33	0.1%
		1993	1,100	2,400	46%	1.22	3.3%
		1997	1,300	2,400	54%	1.52	3.3%
		2002	1,000	2,900	34%	1.20	2.8%
	35	1988	0	5,900	0%	-0.04	1.9%
		1993	1,300	2,900	45%	1.32	4.0%
		1997	1,400	2,700	52%	1.50	3.8%
		2002	1,100	3,100	35%	1.23	3.2%
	45	1988	6,100	4,400	139%	4.97	0.0%
		1993	5,600	3,100	181%	4.33	44.8%
		1997	2,200	3,900	56%	1.98	6.0%
		2002	1,300	3,800	34%	1.38	3.8%
Average	25	1988	-4,600	12,300	-37%	-5.03	-0.1%
		1993	1,900	5,200	37%	2.16	3.1%
		1997	2,200	4,600	48%	2.59	3.2%
		2002	1,200	4,300	28%	1.44	2.7%
	35	1988	-500	12,200	-4%	-0.44	1.6%
		1993	2,200	6,200	35%	2.32	3.7%
		1997	2,300	5,000	46%	2.53	3.7%
		2002	1,300	4,700	28%	1.46	3.0%
	45	1988	11,900	9,400	127%	9.62	0.0%
		1993	10,900	6,800	160%	8.39	43.4%
		1997	3,700	7,400	50%	3.40	5.9%
		2002	1,600	5,800	28%	1.64	3.5%
High	25	1988	-7,300	18,600	-39%	-7.99	-0.2%
		1993	2,500	7,900	32%	2.83	3.0%
		1997	2,900	6,800	43%	3.46	3.1%
		2002	1,400	6,200	23%	1.66	2.6%
	35	1988	-1,300	18,500	-7%	-1.19	1.3%
		1993	2,900	9,400	31%	3.02	3.5%
		1997	3,000	7,500	40%	3.34	3.5%
		2002	1,500	6,700	22%	1.67	2.8%
	45	1988	16,800	14,300	117%	13.67	0.0%
		1993	15,500	10,400	149%	11.95	41.8%
		1997	5,000	11,000	45%	4.55	5.6%
		2002	1,800	8,300	22%	1.88	3.3%
Median Value			1,700	6,100	28%	1.78	3.2%
Best case			-7,300	18,600	-39%	-7.99	-0.2%
			25 year-old female on high income, contracted out in 1988				
Worst case			16,800	14,300	117%	13.67	N/a
			45 year-old female on high income, contracted out in 1993				

Tables 3 and 4 – Additional notes

These tables show the potential losses and gains (loss is a positive number, a gain is a negative number) for various cohorts of female investor.

The quantification of loss has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

The loss or gain is an estimate of the amount by which the current estimated value of the APPP rebate (for each tax year) falls short (or exceeds) the value of comparable SERPS/S2P benefits foregone.

Age is defined as that on the 6 April of the year in which the investor first contracted out.

Loss has been calculated on the basis that the investor is:

- Female
- Married
- On the range of income levels specified
- At the ages specified (at the time of contracting out)
- Commencing contracting out in the years specified

An annuity expense loading of 2.5% plus a fixed cost of £500 (increasing in line with the RPI from now to SPA) has been assumed.

The “loss” is the difference between the current value of SERPS/S2P benefits the investor would have foregone (expressed as the estimated cost, to the investor, of securing these benefits on the open market at SPA, discounted to the current effective date of calculation) and the estimated current value of the national insurance rebates the investor would have received (allowing for historic investment returns and typical product charges).

The “APPP fund” is the estimated current value of the National Insurance rebates the investor would have received (allowing for historic investment returns and typical product charges).

The “loss as % APPP fund” is the “loss” expressed as a percentage of the “APPP fund” and represents the percentage uplift to current funds so that they then provide financially comparable benefits to those under SERPS/S2P.

The “SERPS loss (£ pw)” is the loss converted to a loss of pension income in pounds per week. This is expressed in terms of today’s prices.

The “Required real yield” is the rate at which the APPP funds would need to grow in excess of earnings growth in order to provide financially comparable benefits to those under SERPS/S2P.

Table 5

Critical yield required (in excess of earnings growth) to match 2004 S2P benefits on a range of ages, income and for males and females

Age	Male Income			Female Income		
	Low	Average	High	Low	Average	High
18	3.0%	2.9%	2.8%	2.8%	2.7%	2.6%
19	3.0%	2.9%	2.8%	2.8%	2.7%	2.6%
20	3.0%	2.9%	2.8%	2.8%	2.7%	2.7%
21	3.0%	2.9%	2.8%	2.8%	2.7%	2.6%
22	3.0%	3.0%	2.9%	2.8%	2.7%	2.7%
23	3.0%	2.9%	2.9%	2.8%	2.7%	2.7%
24	3.1%	3.0%	2.9%	2.9%	2.8%	2.7%
25	3.1%	3.0%	3.0%	2.9%	2.8%	2.7%
26	3.1%	3.0%	2.9%	2.9%	2.8%	2.7%
27	3.2%	3.1%	3.0%	2.9%	2.8%	2.8%
28	3.2%	3.1%	3.0%	2.9%	2.8%	2.7%
29	3.2%	3.1%	3.0%	3.0%	2.9%	2.8%
30	3.2%	3.1%	3.0%	3.0%	2.9%	2.8%
31	3.3%	3.2%	3.1%	3.0%	2.9%	2.8%
32	3.3%	3.2%	3.1%	3.0%	2.9%	2.8%
33	3.4%	3.3%	3.2%	3.1%	3.0%	2.9%
34	3.4%	3.3%	3.2%	3.1%	3.0%	2.9%
35	3.4%	3.3%	3.2%	3.1%	3.0%	2.9%
36	3.4%	3.3%	3.2%	3.1%	3.0%	2.9%
37	3.5%	3.4%	3.3%	3.2%	3.1%	3.0%
38	3.6%	3.5%	3.4%	3.3%	3.2%	3.0%
39	3.6%	3.5%	3.4%	3.3%	3.2%	3.0%
40	3.7%	3.6%	3.5%	3.4%	3.3%	3.1%
41	3.8%	3.7%	3.5%	3.4%	3.3%	3.1%
42	3.9%	3.8%	3.6%	3.5%	3.4%	3.2%
43	3.9%	3.8%	3.7%	3.5%	3.4%	3.2%
44	4.0%	3.9%	3.7%	3.6%	3.4%	3.3%
45	4.1%	4.0%	3.8%	3.6%	3.5%	3.3%
46	4.3%	4.2%	4.0%	3.8%	3.7%	3.5%
47	4.4%	4.3%	4.1%	3.9%	3.7%	3.6%
48	4.6%	4.4%	4.2%	4.0%	3.9%	3.7%
49	4.8%	4.6%	4.4%	4.1%	4.0%	3.8%
50	4.5%	4.4%	4.2%	4.6%	4.4%	4.2%
51	4.2%	4.0%	3.8%	5.0%	4.8%	4.5%
52	3.6%	3.5%	3.2%	5.6%	5.4%	5.1%
53	3.0%	2.8%	2.6%	6.6%	6.4%	6.0%
54	3.2%	3.0%	2.7%	10.4%	10.1%	9.5%
55	3.7%	3.6%	3.3%	14.5%	14.1%	13.3%
56	4.6%	4.4%	4.1%	22.3%	21.7%	20.5%
57	5.6%	5.4%	5.0%	40.6%	39.5%	37.4%
58	7.2%	7.0%	6.5%	In excess of 100%		
59	9.2%	8.9%	8.3%			
60	12.8%	12.4%	11.6%			

Table 5 – Additional notes

This table shows the yields that rebates, received in respect of the 2004 tax year, need to earn in excess of earnings growth (assumed to be 4% per annum) up to SPA to match the S2P benefits foregone (the “critical yield”). Data is provided for males and females on various income levels.

The quantification of relative financial benefits (upon which the critical yield has been calculated) has been calculated in accordance with the methodology in Section 2 of this report, using the assumptions specified in Appendix 2.

Age is defined as that on 6 April 2004.

Policy charges have been assumed to be a flat 1% annual management charge i.e. stakeholder based.

An annuity expense loading of 4% has been assumed.



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