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PPI

**An
evaluation
of the
White Paper
state pension reform
proposals:
Modelling appendices**

July 2006

An evaluation of the White Paper state pension reform proposals: Modelling appendices

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Introduction

An evaluation of the White Paper state pension reform proposals examines four questions for the White Paper proposals:

- How much do state pension reforms cost?
- How do reforms benefit poorer or better off pensioners?
- How do state pension reforms change eligibility for Pension Credit?
- How do state pension reforms interact with Personal Accounts?

These appendices contain details of the modelling used in the main paper.

Appendix 1 provides information on how the cost estimates in Chapter 2 of the main paper compare to the Government's figures.

Appendix 2 provides information on the distributional modelling in Chapter 3 of the main paper:

- The advantages of distributional modelling.
- Compensating for data deficiencies in distributional modelling.
- The uncertainties inherent in distributional modelling.

Appendix 3 provides information on the Pension Credit modelling in Chapter 4 of the main paper.

- The uncertainties around how many people will remain eligible for Pension Credit.
- How the range for the proportion eligible under the White Paper proposals has been derived.
- A comparison of the PPI's projections of Pension Credit for the White Paper reforms with the Government's projections.
- The effect of different scenarios for aggregate private income.

Appendix 4 provides information on the modelling of Personal Accounts in Chapter 5 of the main paper:

- The central scenario for Personal Accounts.
- Additional scenarios to test the impact of different distributional impacts of Personal Accounts on the number eligible for Pension Credit.

The PPI models used have been updated for the paper to take into account new data and the modelling methodology has been refined in places. Appendix 5 briefly outlines the main differences from the models used in previous PPI work.

Appendix 6 describes the common set of assumptions used in the base case scenario presented in the main paper.

Appendix 1: How much does reform cost?

Chapter 2 of the main paper compares the projected cost of alternative reform options.

This appendix provides information on how these projected costs compare to the Government's figures.

In the paper, 'cost' or 'state expenditure on pensions' means the annual cost to the public purse of paying Basic State Pension (BSP), SERPS/S2P, Pension Credit, other pension benefits such as Winter Fuel Allowances, and contracted-out rebates. As explained in Box 2 in Chapter 1 of the main paper, including contracted-out rebates is important, as changes in spending on contracted-out rebates now can have an impact on future spending on pension benefits.

The definition of spending on pensions used in the paper differs from the definition used by the Government. Unlike the Government, the PPI projections include contracted-out rebates. They also include an allowance for increased GDP resulting from a higher state pension age and for increased revenue from income tax as a result of the reforms.

The PPI models also use slightly different assumptions and methodology to the Government's models¹. Projections of the cost of pensions systems therefore differ.

Under the White Paper proposals, Government projections for the future cost of contracted-out rebates are not available as a percentage of GDP. The difference between PPI and Government projections of state expenditure on pensions, excluding contracted-out rebates, is 0.4% of GDP (£4 billion) in 2012, increasing to 0.5% of GDP (£7 billion) by 2050 (Table A1). Differences are slightly larger when expressed as a percentage of GDP, because the PPI allows for the impact of increasing state pension age on GDP but the Government does not.

It is important to note that all projections are ultimately driven by the data and assumptions they use and are subject to considerable uncertainty, even in the short term. The modelling is best interpreted as an illustration of the possible differences between the different reform options considered, rather than as what the numbers would be under each individual option.

¹ See Steventon (2005) for a detailed component-by-component analysis of the differences between PPI and Government projections of the cost of the current pensions system

Therefore, it is more relevant to compare projected differences between the cost of different policies than the absolute projected cost of any one particular policy. The differences between the cost of the current system and the White Paper proposals projected by PPI and Government models are similar².

Table A1: PPI and Government projections of state expenditure on pensions (excluding contracted-out rebates) under the White Paper proposals, as a percentage of GDP and in £ billion, 2006/7 prices

	PPI	Government
2012	4.8%	5.2%
2020	4.9%	5.2%
2030	5.8%	5.9%
2040	6.2%	6.5%
2050	6.2%	6.7%
2012	73	77
2020	90	93
2030	130	128
2040	170	170
2050	210	217

² See Table 1 of the main paper and DWP (2006 WP RIA) page 128

³ Government figures are from DWP (2006 WP) page 24. PPI figures are from the Aggregate and Distributional Model and assume the central scenario for Personal Accounts. Government figures do not include the impact of Personal Accounts on costs but Chapter 5 of the main paper shows that this impact is likely to be small. PPI figures in £ billion are rounded to the nearest £1 billion for 2012 and to the nearest £5 billion in later years.

Appendix 2: Who benefits from reform?

Chapter 3 of the main paper compares the impact of alternative reform options on people over state pension age with low and high incomes.

This appendix provides information on:

- The advantages of distributional modelling.
- Compensating for data deficiencies in distributional modelling.
- The uncertainties inherent in distributional modelling.

The advantages of distributional modelling

Analysis of individual examples can give useful insights into some of the likely impacts of state pension reform. However, to give a full indication of the impact across the whole spectrum of individuals who make up the pensioner population at any one point in time requires a very large number of illustrative cases. Analysis becomes unwieldy and difficult to understand.

Analysis which uses individual examples tends to focus on a few stereotype individual characteristics, the importance of which can become exaggerated by disproportionate prominence. For example, the man who worked and earned median earnings every year to state pension age almost certainly does not exist, but is probably the most frequently analysed model point.

But to capture fully the impact of different proposals on the oldest pensioners, on couples and widows, or people with very little work or caring history as well as different earning and saving experiences would require hundreds of individuals to be modelled for each option at each point in time.

Instead, by looking at the distribution of incomes under alternative policies, it is possible to pick up how the impacts of reform on different types of individuals, from different cohorts and at different points in time during their retirement interact with each other to shape the income distribution as a whole. This gives a more realistic and relevant indication of how progressive alternative reforms may be, and, for example, illustrates the potential for reducing pensioner poverty.

It is important to bear in mind that it is unrealistic for any model to pick up every possible type of change that could happen to the pensioner income distribution in future. The modelling is therefore not intended to be a prediction of what the distribution could be under each option, but to allow comparisons between options on a consistent basis. For example, the analysis shows which reform options are most likely to result in more progressive (i.e. flatter) income distributions.

Some other relevant points are:

- When comparing the income distribution under different options, individuals will change positions in the income distribution. For example, the people with the lowest incomes in the current system may not be in the lowest income group after a reform.
- Distributional estimates cover all pensioners, comparing singles and couples on a comparable basis. This means that a high income couple (towards the top of the income distribution) can receive an increase in income as a result of reform if one of the partners currently has a low individual income, which is increased as a result of the reform.
- Receipt of disability benefits moves individuals up the income distribution. As Pension Credit has more generous income limits for disabled people, it is possible to be in receipt of Pension Credit even though income is relatively high and individuals are in the top part of the income distribution.

Compensating for data deficiencies in distributional modelling

The Distributional Model uses estimates of the current distribution of pensioner incomes as a starting point. But the most appropriate available estimates, from the dataset underlying the Pensioners' Incomes Series (PIS) which in turn is based on the Family Resources Survey, are known to include misreporting. This means that all state pension is reported as one number but Guarantee Credit is sometimes mistakenly reported as state pension. This misreporting will lead to over-estimates of the amounts of BSP and S2P for low income pensioners.

To compensate for this misreporting and improve the projections, the Distributional Model adjusts the estimates of the amounts of BSP and S2P received. For the current system, the adjustment works so that the total amount received across the population in each age and sex group matches the total amount projected by the Aggregate Model. For the White Paper proposals, further adjustments have been made to take into account the reduction in the number of qualifying years for BSP (see Appendix 5) that make misreporting less of an issue. Similar adjustments have been made for the single pension options modelled in the main paper.

The uncertainties inherent in distributional modelling

There is uncertainty as to how the distribution of pensioner incomes will change in future. These uncertainties relate to aggregate future growth in income and to how that income will be distributed in future.

Aggregate growth

Aggregate growth in the total amount of income received by pensioners in future is uncertain. It depends on many unknowns, including:

- How many people qualify for state pension in future.
- How much people contribute to private pensions in future, future investment returns and future annuity rates.
- How much non-pension saving is made in future and how that saving is used.
- How much older people work in future.
- How long people live for in future.
- Future levels of inflation and earnings growth.

Assumptions are necessary on these unknowns. The assumptions used for the base case scenario are described in Appendix 6.

Changes in the distribution

The distribution of pensioner incomes could change in future because of:

- A. **Changes in the relative balance of different types of income:** Different types of income are distributed among the pensioner population in different ways. For example, state pension income has a flatter distribution than private income⁴. So, all other things being equal, changes the balance between different types of income will lead to changes to the pensioner income distribution.
- B. **Pensions policy affecting the distribution of individual types of income:** In addition, both state and private pension reform can lead to changes in how individual types of income are distributed. Examples of state pension reforms that alter the distributions include the introduction of S2P and its maturing, which make the distribution of second-tier state pensions less earnings-related⁵, and the proposed reduction in the number of qualifying years for BSP. Examples of pension reforms that have an impact on the distribution of private pensions include the proposed introduction of Personal Accounts.
- C. **Demographic changes:** Income from pensions usually declines during retirement because state pensions are not fully indexed in line with earnings and income from private pensions tends at best to increase in line with prices⁶. All other things being equal, the expected increase in the number of the 'oldest old' will therefore have an impact on the pensioner income distribution. In addition, the distribution could be affected by changes in how many pensioners are married because, for

⁴ DWP (2006 PIS) page 50

⁵ For the calculation of S2P entitlement, anybody earning below the Lower Earnings Threshold (LET) is treated as earning at the level of the LET. Certain types of caring also qualify for credits at the level of the LET. As the LET is currently indexed in line with earnings, but the maximum amount of income that counts for S2P (the Upper Earnings Limit) is indexed in line with prices, S2P will gradually become a flat-rate benefit. In the absence of reform, this would happen gradually, with accruals to S2P becoming flat-rate by around 2050. The distribution of S2P in payment would gradually be affected. Under the White Paper proposals, the transition of S2P into a flat-rate benefit is speeded up, so that accruals become flat-rate around 2030, but S2P benefits received remain partly earnings-related until after 2050.

⁶ Cannon and Tonks (2006), GAD (2005 OPS)

example, different rates of Pension Credit apply for single pensioners and pensioner couples.

- D. Changes in the labour market: The distribution of pensioner incomes could also be affected by other factors, including changes in labour market participation, social mobility and caring.

Like any modelling, the distributional modelling used in the paper cannot reflect everything that will impact on the pensioner income distribution over time. Its aim is to allow comparison of the impact on the shape of the income distribution between different reform options.

Changes in the relative balance of different types of income (effect A) are allowed for automatically in the Distributional Model because aggregate growth in income is modelled separately in the Aggregate Model for different types of income.

The effect of pensions policy on the distribution of individual types of income (effect B), is also allowed for. The approach taken differs for different types of income:

- The way the distributional impact of the introduction of S2P is modelled has been refined for the paper, to make the impact more explicit (see Appendix 5).
- The reduction in the number of qualifying years for BSP under the White Paper reforms has been assumed to flatten the income distribution (see Appendix 5).
- Personal Accounts have been assumed to have a flatter income distribution than other types of private pension income. Appendix 4 contains sensitivity analysis around this assumption.

Demographic changes (effect C) are allowed for automatically. Aggregate growth is modelled separately for different by ages and sexes, and the Distributional Model models singles and couples separately.

Future changes to the labour market (effect D) are more uncertain than the three other factors and would not necessarily alter the differences in outcomes between different policy options. The models assume that employment rates change in future in line with the latest set of Government projections of economic activity rates (see Appendix 6). Otherwise, for simplicity, they assume no future changes to the labour market.

Appendix 3: How many people remain eligible for Pension Credit?

Chapter 4 of the main paper compares the projected proportion of people eligible for Pension Credit under the alternative reform options.

This appendix provides information on:

- The uncertainties around how many people will remain eligible for Pension Credit.
- How the range for the proportion eligible under the White Paper proposals has been derived.
- A comparison of the PPI's projections of Pension Credit for the White Paper reforms with the Government's projections.
- The effect of different scenarios for aggregate private income.

The uncertainties around how many people will remain eligible for Pension Credit

As explained in Chapter 4 of the main paper, future eligibility for Pension Credit under the White Paper proposals is very uncertain. This is because the state pension will not take everybody above the means-tested level (see Box 3 in Chapter 3 of the main paper). Therefore, eligibility for Pension Credit depends on the circumstances at the time of each individual or couple, and in particular the amounts of different types of income that they have then, for example:

- The amount of state pension that individuals have will depend on how many years they qualified for S2P.
- The amount of income from private pensions will depend on how much they contributed, how much employers contributed, how contributions were invested and annuity rates applied.
- The amount of income from other savings will depend on how much they saved, how their savings were invested, and how much of any savings were spent before pension age, and whether they use equity in property.
- The amount of income from earnings will depend on the availability of employment opportunities, and willingness to work.

The future number of pensioner benefit units eligible for Pension Credit has been projected using the Distributional Model. The data limitations and uncertainties of distributional modelling discussed in Appendix 2 therefore also apply to Pension Credit projections.

Because of the uncertainties inherent in projecting the future proportion eligible for Pension Credit, a range of estimates is given.

How the range for the proportion eligible under the White Paper proposals has been derived

For the base case scenario, the Distributional Model projects income growing at different rates for different types of income. For example, average income from BSP grows by 2.2% a year in excess of prices between 2005 and 2050, and income from SERPS/S2P grows by 3.4% a year in excess of prices between 2005 and 2050 (Table A3). As discussed in Appendix 2, these rates of growth are averages over the entire pensioner population, and precise rates of growth vary for different ages, sexes and position in the income distribution.

An alternative to assuming these different rates of growth is to assume a single rate of growth and apply it throughout the entire pensioner population and for all types of income. This is the approach adopted for deriving the range for the future proportion eligible for Pension Credit under the White Paper proposals.

A single rate growth of 2.0% a year in excess of prices would replicate the results in the PPI base case. This factor has been derived from the Distributional Model and seems reasonable:

- The average rate of growth in income over all pensioners is estimated by the Distributional Model is 1.7% a year in excess of prices under the PPI base case scenario for the White Paper (Table A3). The 1.7% seems reasonable. It is the average of rates of growth for individual components of income. The rates of growth for individual components of income are based on aggregate projections of expenditure on state pensions and income from private pensions from the Aggregate Model. These projections are similar to official estimates for state pension expenditure (Table A2) and Pensions Commission estimates (Table A3).
- The single rate of growth is likely to be higher than this 1.7%. The 1.7% is the average rate of growth over all pensioners and not just those who are eligible for Pension Credit. However, state pension income is likely to grow faster in future for lower income pensioners (who are more likely to be eligible for Pension Credit) than for higher income pensioners.

Different assumptions on the single rate of growth can be justified.

Different single rates of growth could result from:

- More or less income in aggregate in future than modelled, so that the rates of future growth shown in Table A3 could be different for some or all types of income.
- Income being distributed differently in future, so that the rates of future growth shown in Table A3 are the same, but that income is skewed to a greater or lesser extent towards lower income pensioners.

Table A3: Projected annual rate of real growth in the average income received by individuals over state pension age between 2005 and 2050 in the base case scenario for the White Paper proposals, by type of income, and Pensions Commission figures for private pension

	Total expenditure/income, £ billion, 2006/7 prices		Average expenditure per head, £ per week, 2006/7 prices		Implied annual rate of real growth
	2005	2050	2005	2050	
BSP	42	150	69	180	2.2%
SERPS/S2P	7	45	12	55	3.4%
Private Pensions (PP)	75	165	122	200	1.1%
Other income	32	90	52	110	1.7%
Total	156	450	255	550	1.7%
PP (Pensions Commission for comparison)	73	180	119	220	1.3%

There is uncertainty about the future distribution of both state and private pension income, as described in Appendix 2. For people potentially eligible to Pension Credit under the White Paper proposals, state benefit income is likely to make up a large part of their income⁸. Both the future distribution of income from BSP and the future distribution of income from S2P are uncertain. The distribution of income from S2P in particular depends on how the labour market changes in future:

- People who are unemployed or self-employed do not accrue S2P, so future amounts of unemployment and self-employment will affect the distribution.
- 75% of people would accrue S2P in each year, even after the White Paper proposals⁹. There is uncertainty around how often people change jobs and therefore to what extent these 75% of people will be the same 75% in each year, which will also affect the distribution.

⁷ PPI estimates are results from the PPI base case scenario for the White Paper proposals. Pensions Commission figures are derived on the estimates of private pension income as a percentage of GDP in Pensions Commission (2005) Figure 1.16, page 57, and converted into £ billion terms using PPI estimates of real GDP. Per head figures use the GAD 2004-based principal population projections. Income from private pensions include all people, whether below or above state pension age. The figures for implied rate of real growth assume no change in the proportion of total private pension income flowing to people over state pension age. 'Other income' includes non-pension saving, earnings and state disability benefits. Figures rounded to the nearest £1 billion for 2005 and to the nearest £5 billion for 2050. Figures have been rounded independently.

⁸ DWP (2006 PIS) page 50

⁹ PPI Briefing Note 32 (2006)

To derive the range of Pension Credit eligibility in the main paper, the single rate of growth is changed from the 2.0% which is equivalent to the base case scenario:

- Assuming a single rate of growth of 2.5% a year in excess of prices, leads to projected Pension Credit eligibility in 2050 being lower, at around one-third. The assumption used by the Government appears to be around 2.5% (see the next section of this Appendix) so this degree of variation is possible. The higher single rate of growth could result from, for example, future saving being made proportionally more by lower earners rather than higher earners than has been the case in the past, or more job changes leading to more S2P being received by lower income pensioners.
- Assuming a single rate of growth of 1.5% a year in excess of prices, leads to projected Pension Credit eligibility in 2050 being higher, at around two-thirds. This could result from, for example, future saving being made proportionally more by higher earners rather than lower earners than has been the case in the past, or fewer job changes leading to less S2P being received by lower income pensioners.

Further work is planned to investigate the specific scenarios that could lead to these levels of growth.

Comparison with the Government's projections

As discussed above, future eligibility for Pension Credit is very uncertain. The outcomes from modelling projections depends on the modelling assumptions used.

The projections of eligibility for PC shown in the White Paper are based on the average of results from two different Government models. The first, PENSIM2, models in detail the life histories of a large number of individuals over the next 50 years. Although in theory this should produce a more 'realistic' picture of the future income distribution, in practice results depend on a large number of assumptions concerning, for example, work and earnings histories, and individual savings behaviour. This is a sophisticated approach which does not necessarily mean more reliable figures because of the multiplicity of assumptions and the interactions between them. This model suggests that 27% of pensioners would be eligible for PC in 2050¹⁰.

The second, a version of the Policy Simulation Model (PSM), uses a similar methodology to the PPI Distributional Model, and assumptions derived from PENSIM2. This model suggests that 32% of pensioners would be eligible for PC in 2050¹¹.

¹⁰ DWP estimate

¹¹ DWP estimate

The White Paper shows only the mid-point of these 2 results for future years: 29% in 2050¹².

Government estimates of Pension Credit in the current system are based on income *projected to rise broadly in line with earnings, though this is faster than earnings before about 2030 and more slowly than earnings thereafter*¹³, so broadly 2% per year throughout.

Pensioner incomes after the White Paper reforms appear to be projected by Government to increase by more than average earnings growth between now and 2050: equivalent to a single rate of growth of around 2.5% per year¹⁴.

This is similar to the PPI optimistic scenario. So differences between PPI and Government projections of the future proportion of pensioner benefit units eligible to Pension Credit differ because of modelling assumptions.

The PPI intends to continue to work with Government officials to explore what is a reasonable range of assumptions and the likely uncertainty in the range of outcomes for eligibility for Pension Credit.

To illustrate the possible uncertainties in future Pension Credit eligibility, PPI projections are expressed as a range, with between one-third and two-thirds of pensioner benefit units being eligible in 2050 (Chart A1).

Ultimately, this range reflects the very long-term nature of the projections and the fact that eligibility to Pension Credit depends on a range of factors that cannot be known with certainty.

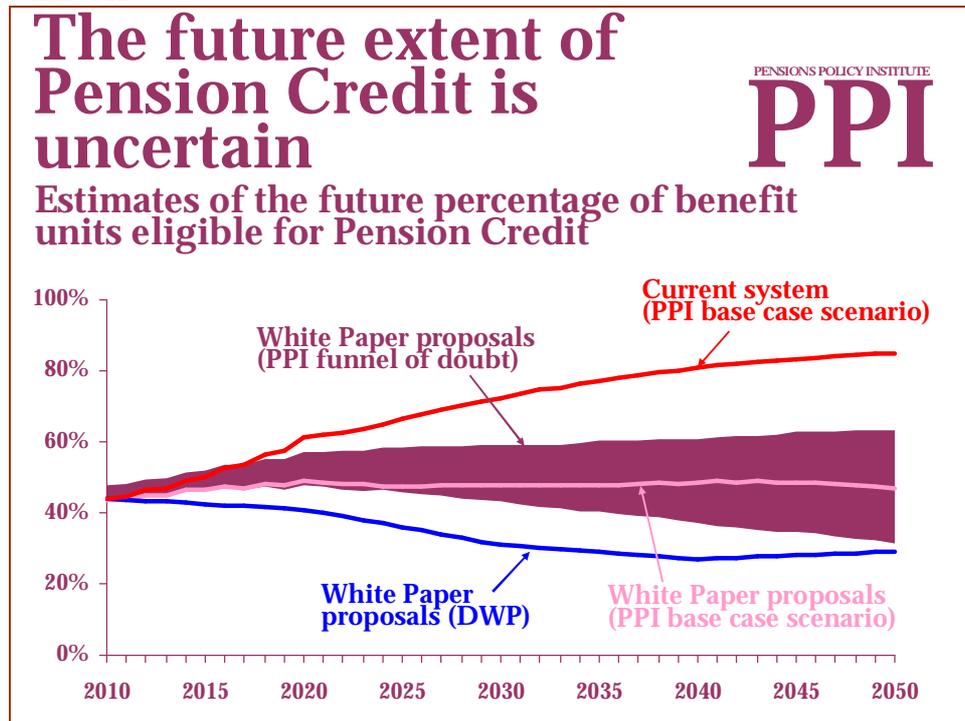
The effect of different scenarios for aggregate private income
This section presents some further sensitivity analysis surrounding Pension Credit. It shows that higher or lower aggregate amounts of income from private pensions, but no change to how that income is distributed, is unlikely to have a large effect on the future proportion of pensioner benefit units eligible for Pension Credit. The main source of uncertainty for Pension Credit eligibility in future is therefore likely to be changes in the distribution of income rather than in the aggregate amount of private pension income.

As discussed in Appendix 2, there are two types of uncertainty about how the distribution of pensioner incomes will change in future. These relate to the aggregate growth in income and to how that income will be distributed in future.

¹² DWP (2006 WP) Figures underlying Figure 3.v, page 123

¹³ DWP (2006 WP RIA) page 154

¹⁴ The PPI has not been able to confirm the assumptions actually used for the White Paper, but 2.5% appears consistent with PPI modelling results replicating the White Paper results. An increase from 2.0% to 2.5% as a result of the White Paper reforms would also be consistent with estimates of the change from PPI models.

Chart A1¹⁵

The aggregate amount received in private income in future seems more uncertain than the aggregate amount received in state pensions¹⁶. The future amount of private income depends on pension saving and investment returns, to what extent older people work in future and how non-pension savings are used.

Therefore, scenarios were tested to investigate the impact of different aggregate amounts of private income. These are the same as the base case scenario, except for the following variations:

- A. All DB schemes in the private sector close for future accrual by 2035.
- B. All DB schemes in the private sector close for future accrual by 2035, investment returns are 1% a year lower than assumed for the base case scenario, and non-pension saving grows with prices rather than earnings.
- C. Contributions to Defined Contribution schemes increase by 2%.
- D. Contributions to Defined Contribution schemes increase by 2%, investment returns are 1% higher than assumed for the base case scenario, and non-pension saving increases by 2% a year in excess of earnings.
- E. All private income grows in line with prices.

¹⁵ PPI estimates using the central scenario for Personal Accounts.

¹⁶ Although the future aggregate amount received in state pensions in future is not certain, it seems less uncertain than the future aggregate amount received in private pension income. Private pension income depends on how much saving is made in future, on future investment returns and future annuity rates.

Different scenarios for Personal Accounts are illustrated separately in Chapter 5 of the main paper and in Appendix 4 below.

The results support findings in Chapter 5 of the main paper that the aggregate amount of private income is unlikely to significantly impact the future proportion of pensioner benefit units eligible for Pension Credit (Table A2).

The only scenario that significantly changes the proportion eligible is Scenario E. However, Scenario E involves a sharp decline in income from private pension, more than halving from around 5.7% of GDP¹⁷ today to around 2.3% of GDP by 2050.

Income from private pensions differ substantially under scenarios A to D, from 3.9% to 6.3% of GDP in 2050, with very little impact on Pension Credit. This suggests that extra income from private pensions is largely flowing to people with incomes that are already high enough to take them above Pension Credit. The main source of uncertainty for Pension Credit eligibility in future is therefore likely to be changes in the distribution of income rather than in the aggregate amount of private pension income.

Table A2¹⁸: Proportion of pensioner benefit units eligible for Pension Credit, and total income from private pensions in 2050 as a proportion of GDP, in different scenarios for the White Paper proposals

	Base case	A	B	C	D	E
2020	50%	50%	50%	50%	50%	60%
2030	50%	50%	50%	50%	45%	70%
2040	50%	50%	50%	50%	45%	75%
2050	45%	45%	50%	45%	45%	75%
Total private pension income in 2050	4.9%	4.8%	3.9%	5.1%	6.3%	2.3%

¹⁷ Estimate from the PPI Aggregate Model, consistent with Pensions Commission (2005) Figure 1.16, page 57

¹⁸ PPI analysis using the Aggregate and Distributional Models. All scenarios assume the base case scenario for Personal Accounts. All figures rounded to the nearest 5%.

Appendix 4: State pension reform and Personal Accounts

Chapter 5 of the main paper considers the interaction between the White Paper proposals for state pension reform and Personal Accounts.

This appendix provides information on:

- The central scenario for Personal Accounts.
- Additional scenarios to test the impact of different distributional impacts of Personal Accounts on the number eligible for Pension Credit.

The central scenario for Personal Accounts

The specific assumptions made for Personal Accounts in the central scenario are similar to those made by the Government in their modelling:

- 10.8 million employees¹⁹, who are not already saving in existing occupational and personal pension policies, are auto-enrolled into a Personal Account or approved alternative.
- Of these 10.8 million employees, 4.6 million²⁰ are assumed to work for an employer who already operates an occupational pension scheme. These employees are assumed to be auto-enrolled into their employer's scheme, which is assumed to be a DC scheme with a higher contribution rate than the default contribution rate for Personal Accounts, in line with the average contribution rate for DC schemes²¹.
- In the central scenario, 62% of the employees who are auto-enrolled into a Personal Account or approved alternative remain opted-in, in line with central Government assumptions²².
- In addition, 0.8 million self-employed people²³ and 0.6 other individuals²⁴ are assumed to voluntarily opt-in to a Personal Account in the central scenario.
- People who join a Personal Account, rather than an existing employer scheme, are assumed to contribute at the default contribution rate and not pay additional contributions. This is to allow comparison with Government projections for the White Paper²⁵.
- Personal Account pensions are taken at state pension age (SPA). For simplicity in the modelling, people who join an existing employer scheme are assumed to take their pension at the same age assumed for other private sector pensions, which for most people is before SPA.

¹⁹ DWP (2006 WP RIA) page 49, Figure 2.1

²⁰ DWP (2004)

²¹ 8.9% of gross salary. GAD (2006) page 94, paragraph 8.9

²² DWP (2006 WP RIA) page 49, Figure 2.1

²³ DWP (2006 WP RIA) page 49, paragraph 2.56

²⁴ Midpoint of range in DWP (2006 WP RIA) page 49, paragraph 2.58

²⁵ DWP (2006 WP RIA) page 56, paragraph 2.76

- Annual charges in Personal Accounts are 0.3% of assets under management. This is the target for Personal Accounts and so reflects an optimistic scenario for charges. It is lower than the 0.5% assumed by the Government²⁶.
- For simplicity and consistency with the other modelling in the paper, investment returns in Personal Accounts are assumed to be the same as for other pensions (see Appendix 6).
- In payment, the distribution of Personal Accounts is assumed to be distributed more towards the lower end of the income distribution than other types of private pension (see sensitivity analysis below).

In addition, different scenarios for Personal Accounts have been modelled. Two scenarios have higher and lower rates of opt-out and numbers of people voluntarily opting-in, while a third scenario has some levelling-down of existing pension provision. These scenarios are described in Chapter 5 of the main paper.

Additional scenarios to test the impact of different distributional impacts of Personal Accounts on the number eligible for Pension Credit
As described in Appendix 2, there are uncertainties about how income from Personal Accounts is distributed over the pensioner population in future.

New savers in Personal Accounts could have lower incomes than existing savers while in work. This may mean that income from new saving in Personal Accounts will be distributed more towards lower income people than income from other types of private pension.

The future distribution of income from new saving in Personal Accounts is very uncertain. It depends on many factors, including rates of opt-out which can only be estimated with a wide range of uncertainty (see Chapter 5 of the main paper). However, an assumption concerning the distribution has to be made if the impact of Personal Accounts on Pension Credit is to be modelled.

²⁶ DWP (2006 WP RIA) page 165, paragraph D7

One reasonable assumption is that income resulting from new saving in Personal Accounts will resemble the current distribution of SERPS in payment. This seems reasonable because:

- Income from Personal Accounts and SERPS both depend on contributions made over working life.
- People who stay opted-in to Personal Accounts will contribute on approximately the same band of earnings as that on which SERPS entitlements are based²⁷.
- Employees in Personal Accounts who were not previously saving are more likely to have previously have been contracted-in. The distribution of SERPS in payment is, broadly, also for people who were contracted-in²⁸.

The assumption is not perfect because, for example, the self-employed could opt-in to join Personal Accounts but were not allowed to join SERPS. However, sensitivity analysis suggests that the precise assumption adopted does not have a large impact on the results presented in Chapter 5 of the main paper.

For example, if income is distributed in the same way as BSP currently is (flatter than the current distribution of SERPS), then the results for the proportion of pensioner benefit units eligible for Pension Credit are the same, within rounding (Table A4).

Table A4²⁹: Estimates of the future proportion of pensioner benefit units eligible for Pension Credit under different scenarios for how income from Personal Accounts is distributed in future, assuming the optimistic opt-out scenario for the White Paper reforms

	Income distributed in same way as SERPS currently is	Income distributed in same way as BSP currently is
2020	50%	50%
2030	50%	50%
2040	50%	50%
2050	45%	45%

²⁷ Although bands for Personal Accounts are proposed to increase in line with earnings while the band for SERPS, which is between the Lower Earnings Limit and the Upper Earnings Limit, has in the past been indexed in different ways. DWP (2005 AS) page 30.

²⁸ In some circumstances, SERPS can be payable by the state in respect of periods of contracted-out accrual, for example if inflation is high. See PPI (2006 PP).

²⁹ PPI analysis using the Aggregate and Distributional Models. All figures rounded to the nearest 5%.

Appendix 5: Changes from modelling in previous PPI papers

The projections in the paper have been produced using the PPI Aggregate Model, Distributional Model and Individual Model. These models have been developed by the PPI to assess the impact of long-term policy options. The Nuffield Foundation has funded the development of the models.

The PPI updates its modelling data and assumptions annually to allow different pieces of modelling work to be compared during the year. For the paper, modelling data and assumptions have been updated, so that results in the paper are not directly comparable to previous PPI work.

The new data reflected in the models includes:

- The latest, 2004-based, set of population projections from the Government Actuary's Department³⁰.
- Estimates from the latest Lifetime Labour Market Database (LLMDB) for 2003/4 for the breakdown of the employed population by age, sex, earnings, whether contracted-out of S2P and, for those people who are contracted-out, the type of pension into which they are contracted-out. The LLMDB is a 1% sample of National Insurance records supplied by DWP.
- Estimates from the Family Resources Survey 2003/4 for the number of self-employed workers and their breakdown by age, sex and earnings³¹.
- New projections of economic activity rates from the Office for National Statistics³².
- The dataset underlying the latest Pensioners Income Series publication, for the 2004/5 year, which is used as the starting point for the Distributional Model.
- New legislated contracted-out rebate rates for 2007/8 to 2011/2³³.
- Estimates of the aggregate amount of private pension contributions from the Office for National Statistics³⁴.
- New estimates of Pension Credit take-up³⁵.
- Official benefit rates and tax thresholds for 2006/7.
- New estimates of the amount of money in private pension funds, from the Association of British Insurers³⁶.

³⁰ GAD (2005 PP)

³¹ The 2003/4 FRS rather than the more recent 2004/5 FRS has been used to estimate the earnings distribution of self-employed individuals, for consistency with the most recent data on employees from the LLMDB

³² ONS (2006)

³³ Social Security (Reduced Rates of Class 1 Contributions, Rebates and Minimum Contributions) Order 2006

³⁴ Penneck and Tily (2005)

³⁵ Midpoints of ranges of take-up estimates by caseload in DWP (2006 TU)

³⁶ ABI (2005)

- **New estimates of the amount of private pensions in payment from the Family Resources Survey 2004/5.**

In addition, some refinements have been made to the models to improve on the modelling methodology in the Distributional Model:

- **The distributional impact of S2P has been allowed for more explicitly. Income from S2P is divided into a flat-rate part and an earnings-related part. The relative balance between the two is assumed to change gradually over time in line with Aggregate Model estimates. The result is that the projected distribution of total income from S2P becomes gradually flatter over time.**
- **The model has been extended to allow for distributional impact of the reduction in qualifying years in the White Paper proposals. This would mean people reaching State Pension Age (SPA) from 2010 are more likely to have full BSP. The Distributional Model allows for the impact of the 2010 change to slowly filter through the pensioner population, so that it affects everybody at SPA in 2010, everybody within 1 year of SPA in 2011, everybody within 2 years of SPA in 2012, and so on.**

Appendix 6: The PPI base case scenario

This appendix describes the common set of assumptions used in the base case modelling presented in the paper.

Assumptions have been made in the paper on future pensions policy, on the UK economy as a whole and on Personal Accounts.

Future pensions policy

Details of the alternative reform options tested are in Chapter 1 of the main paper.

The projections for the current system in the paper assume that the current state pension system continues, with the same uprating conventions as are used today³⁷:

- The Basic State Pension (BSP) and State Second Pension when in payment are increased in line with prices. The BSP remains the minimum level of entitlement to Savings Credit.
- The Guarantee Credit continues to be increased in line with average earnings.
- The Lower and Upper earnings limits for State Second Pension increase in line with prices. The Lower Earnings Threshold (the LET – the ‘flat-rate’ part of State Second Pension) continues to be increased in line with average earnings. The Upper Earnings Threshold continues to increase to reflect the changes in the LET, ensuring that higher earners receive the same in State Second Pension as they would have received in SERPS. However, when the Upper Earnings Threshold overtakes the Upper Earnings Limit, it is assumed to be uprated in line with prices.
- The base case scenario assumes that Pension Credit take-up³⁸:
 - Remains at current levels for people who are entitled to both the Guarantee Credit and Savings Credit components. This is just over 80% for single pensioners and around 66% for couples.
 - Remains at around 80% for pensioner benefit units who are only entitled to the Guarantee Credit component.
 - Increases from the current level of around 50% to 80% for pensioner benefit units who are only entitled to the Savings Credit component. This is consistent with the Government’s long-term assumption that take-up of Pension Credit will increase to 80% under the current system³⁹.

³⁷ For more details, see PPI (2006)

³⁸ Midpoints of ranges of take-up estimates by caseload in DWP (2006 TU)

³⁹ DWP (2006 WP RIA) page 155, paragraph A17. The Government assumes that take-up of Pension Credit will reach 80% in 2007/8.

Macroeconomic assumptions

Macroeconomic assumptions have been updated since previous PPI work:

- Prices are assumed to grow by 2.5% each year.
- Earnings are assumed to grow by 2.0% each year in excess of prices.
- The age, sex and marital structure of the population is assumed to follow the Government Actuary's Department's (GAD's) 2004-based population projections⁴⁰.
- Employment rates are based on the most recent activity rate projections from the Office for National Statistics (ONS)⁴¹. After the end of the ONS projections in 2020/1, employment rates are assumed to remain constant.
- Contracting-out in the private sector is assumed to halve between now and 2035 as defined benefit schemes are closed down but to remain at current levels in the public sector⁴².
- Contracted-out rebate rates are assumed to follow rates currently laid down in legislation, which covers years up to and including 2011/2⁴³. Thereafter, contracted-out rebate rates are calculated within the Aggregate Model as being actuarially neutral assuming the assumptions made for the previous set of rebates, for 2002/3 to 2006/7.
- Private pension funds earn nominal investment returns of 7% a year for equities and 4% a year for bonds, before expenses.
- For the calculation of Pension Credit eligibility in the base case scenario, non-pension income is assumed to increase in line with average earnings.

Personal Accounts

All of the reform options modelled in the paper include Personal Accounts from 2012. The assumptions for the different scenarios for Personal Accounts are described in Appendix 4.

⁴⁰ GAD (2005 PP)

⁴¹ ONS (2006)

⁴² This is the most recent published assumption used by GAD to project the cost of SERPS/S2P and contracted-out rebates. GAD (2004). Other organisations have suggested that Defined Benefit schemes might close more quickly, including the Pensions Commission, which would increase the costs of S2P in the long term and reduce the costs of contracted-out rebates in the short term Pensions Commission (2005) page 57.

⁴³ Social Security (Reduced Rates of Class 1 Contributions, Rebates and Minimum Contributions) Order 2006

Acknowledgements and Contact Details

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Contact:

Chris Curry, Research Director

Telephone: 020 7848 3731

Email: chris@pensionspolicyinstitute.org.uk

or

Adam Steventon, Pensions Modeller

Telephone: 020 7848 3675

Email: adam@pensionspolicyinstitute.org.uk

Pensions Policy Institute

King's College

Waterloo Bridge Wing, Franklin-Wilkins Building

Waterloo Road

London

SE1 9NN

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References

- Association of British Insurers (ABI) (2005) *Research Update: Money in funded pensions*
- Cannon, E and Tonks, I (2006) *Survey of annuity pricing* Department for Work and Pensions Research Report No 318
- Department for Work and Pensions (2006 WP) *Security in retirement: towards a new pension system*
- Department for Work and Pension (2006 WP RIA) *Security in retirement: towards a new pension system Regulatory impact assessment and technical appendices*
- Department for Work and Pensions (DWP) (2006 TU) *Income Related Benefits Estimates of Take-up in 2004/2005*
- Department for Work and Pensions (DWP) (2006 PIS) *The Pensioners' Incomes Series 2004/5*
- Department for Work and Pensions (DWP) (2005 AS) *The Abstract of Statistics for Benefits, Contributions and Indices of Prices and Earnings: 2004 Edition*
- Department for Work and Pensions (DWP) (2004) *Simplicity, Security and Choice: Working and saving for retirement*, TSO
- Government Actuary's Department (GAD) (2006) *Occupational pension schemes 2005: Thirteenth survey by the Government Actuary*
- Government Actuary's Department (GAD) (2005 PP) *2004-based principal population projections for the UK*
- Government Actuary's Department (GAD) (2005 OPS) *Occupational Pension Schemes 2004: The twelfth survey by the Government Actuary*
- Government Actuary's Department (GAD) (2004) *Update of the Quinquennial Review of the National Insurance Fund as at April 2000*
- Office for National Statistics (ONS) (2006) *Labour Force Projections 2006-2020*
- Penneck, P and Tily, G (2005) *Private pension estimates and the National Accounts in Economic Trends 622* Office for National Statistics
- Pensions Commission (2005) *A New Pension Settlement for the Twenty-First Century*
- PPI Briefing Note Number 32 (2006) *The new 'contributory' test: principle or practicality?*
- Pensions Policy Institute (PPI) (2006) *The Pensions Primer*
- Steventon (2005) *What will pensions cost in future?* Pensions Policy Institute
- The Family Resources Survey 2003/4 and 2004/5 were supplied by the UK Data Archive, University of Essex, and are funded by the Department for Work and Pensions (DWP). The Pensioners' Income Series dataset 2004/5 and extracts from the Lifetime Labour Market Database 2003/4 were supplied by the DWP. The UK Data Archive and the DWP bear no responsibility for further analysis and interpretation.
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