Working Paper

A validation of the methodology used in the Department for Work and Pensions' Ipen model

by John Adams and Chris Curry

DWP Department for Work and Pensions

Department for Work and Pensions

Working Paper No 106

A validation of the methodology used in the Department for Work and Pensions' Ipen model

John Adams and Chris Curry

Contents

List of tables

Acknowledgements

The Authors

John Adams has been the Senior Policy Analyst at the Pensions Policy Institute (PPI) since 2008. He leads the quantitative analysis and modelling research. In his time at the PPI John has worked on a number of PPI modelling projects on public sector pension reform. John has a BSc (Hons) in Actuarial Mathematics and Statistics from Heriot Watt University and a Post Graduate Diploma in Actuarial Management from Cass Business School.

Chris Curry joined the PPI as Research Director in July 2002 and is responsible for the research programme. At the PPI Chris has authored and presented a number of research reports analysing pensions (including state, private and public sector pensions), pension reforms and other provision for retirement income. Chris has a BSc (Hons) in Economics from the University of Warwick and an MSc in Economics from Queen Mary and Westfield College, University of London.

Summary

The Department for Work and Pensions (DWP) has a model called Ipen that produces state and private pension outcomes for hypothetical individuals or couples.

The DWP commissioned the Pensions Policy Institute (PPI) to validate Ipen against the PPI's Individual Model (IM). The PPI's IM is a model developed by the PPI to project incomes in retirement for hypothetical individuals and couples.

The validation process involves comparing the results of the two models under a number of different scenarios and checking whether the results are similar. While no feasible set of scenarios can be exhaustive, a validation process of this type can help to provide confidence in the model's methodology.

In the majority of the scenarios, after allowing for differences in policy assumptions, the results were close (within five per cent) for people of most ages and levels of earnings. This report highlights possible aspects of the modelling that may account for differences that remained after allowing for changes in policy assumptions. The PPI has highlighted areas that the DWP may want to investigate further and consider whether any amendments to Ipen are necessary. These are:

- Difference in the method of calculating private pension fund annuities.

- Cap on National Employment Savings Trust (NEST) contributions.

- Revaluation of Additional State Pensions.

- Basic State Pension (BSP) credits accruing to men earning less than the Lower Earnings Limit (LEL) who are over the age of the women's State Pension Age (SPA).

- Frequency of pension fund contributions.

The greatest difference arises as a result of the method of calculating pension fund annuities.

It is important to distinguish between differences that arise as a result of methodological differences and those that arise as a result of using different assumptions. While a methodology may be technically correct or incorrect, there may be a wide range of different assumptions that are valid. This project concentrates on validation of the methodology of Ipen. No implicit or explicit validation has been undertaken of the assumptions used within Ipen for this exercise or any other DWP analysis that uses Ipen.

The PPI has made available to the DWP the PPI's results of the scenarios tested so that the DWP can assess whether making the recommended changes would be beneficial.

The validation process involved comparing the results of Ipen with the PPI's IM under a number of different scenarios and checking whether the results are similar. The PPI have found that, given the same set of assumptions, and subject to a small number of methodological differences, the results produced by Ipen, are similar to those produced by the PPI IM. The PPI validation extends only to the methodology used in Ipen, and does not validate the underlying assumptions or the use to which those results are put, and does not serve as a check on published figures.

1   Validation of the Ipen Model

1.1   The DWP's Ipen

Ipen is a model developed by the DWP that calculates the outcomes for a hypothetical individual or couple's income in retirement. The model produces estimates of the retirement income from various sources to an individual and, if appropriate, to their spouse. It is similar in purpose to the PPI's IM.

The main sources of retirement income that Ipen models are state pensions, state income-related benefits, individual savings from a pension scheme and individual's savings from an alternative source.

The state pensions modelled include the basic state pension and additional state pension. The additional pension includes the current State Second Pension (S2P), its predecessor the State Earnings Related Pension Scheme (SERPS) and the original additional state pension, the Graduated Retirement Benefit.

Other state benefits are also modelled; these include the Guarantee Credit and Savings Credit, Housing Benefit and Council Tax Benefits (HB/CTB). These are income-related benefits; the amount that an individual receives from these benefits depends on the total amount of income and savings that they receive from other sources.

Ipen also models the amount of income received as a result of saving in a private pension. It uses the contributions paid by an individual and their employer along with an investment return to project the level of pension fund at retirement. That fund is converted into an income stream by projecting the purchase cost of an annuity at retirement.

Ipen also allows for savings from an alternative source. This may be from a past pension scheme or non-pension savings.

Ipen allows users to amend the work profile to model different types of individual based on earnings levels, whether employment is part-time or full-time, time spent in and out of work and the credits that may be received.

1.2   Validation methodology

The DWP commissioned the PPI to validate Ipen against the PPI's IM. The IM is a comparable model which has itself been validated and used extensively in PPI publications[1]. Further details of the IM are in Box 1.

There are some parts of Ipen that cannot be validated directly by the IM because the current version of the IM does not model all of the parts of the benefit system that Ipen does. These include Working Tax Credit, and the possible future Single Tier Pension[2]. These benefits were therefore assumed to not be available for the main purposes of the validation. The IM is used to validate other parts of Ipen, such as the interaction of private pensions with state pensions and Pension Credit.

---

[1]   For example, Curry, C. (2003). The under pensioned, PPI (2004). *Managing Transition* and PPI (2005). *What should be the balance between state and private pensions?*

[2]   DWP (2011). A state pension for the 21st century.
http://www.dwp.gov.uk/docs/state-pension-21st-century.pdf

Validation of the modelling relating to the introduction of a Single Tier Pension was originally part of this exercise, but the details of the correct policy assumptions are not, at the time of writing, publicly available. In order to attempt to replicate the Ipen figures in the PPI IM would mean using the Ipen calculations as a guide to formulating the PPI IM calculations. Such an approach would not constitute validation. Instead, the Single Tier Pension has been considered by a separate validation involving an in depth discussion and presentation of the approach used in Ipen presented by DWP staff.

The validation process used to compare the modelling of the current UK pension system involves comparing the results of the two models under a number of different scenarios and checking whether the results are similar. The purpose of the validation was not to conduct a line-by-line coding check, although this is necessary for any model before it can be used. This validation can only therefore form part of the process of checking Ipen.

The income in retirement from both state pension and private pension were calculated as well as other state benefits for 14 scenarios, selected to cover the main variables available in Ipen[3]. While no set of scenarios can be exhaustive, the scenarios cover the main variables in Ipen.

Scenario 1, the baseline scenario was run for individuals of each year of birth between 1946 (age 65 in 2011) and 1993 (age 18 in 2011). Scenario 1 was run for individuals over the earnings range (2011 terms) £7,000 per annum to £45,000 per annum in £1,000 increments.

The other scenarios were run for three birth cohorts – year of birth 1946, 1970 and 1993 and three earnings profiles (in 2011 terms) – £7,500 per annum, £25,000 per annum and £45,000 per annum. A full list of the scenarios tested is in Appendix A.

The results of the validation were produced by the PPI on both Ipen and the PPI IM and then compared by the PPI. As much as possible, the same assumptions have been used. However, there are differences in a small number of assumptions which have led to some of the differences in outcomes that are observed.

A small number of scenarios were not easily replicated on the PPI Individual model due to the structure of the model. In these cases the scenarios were modelled on Ipen and the calculations were examined by the PPI to test the results[4].

---

[3] For example, different levels of employee and employer contributions, different working life history.

[4] These include the impact of retiring later, individuals having prior savings and the impact of lifestyling the private pension fund.

Box 1   The PPI Individual Model

The Pension Policy Institute's IM is a model of pension income that simulates pension income for individuals and households reaching SPA today and in the future.

For a given set of assumptions about an individual's working and pension contribution histories, the performance of the economy and the conventions used to uprate and accrue payments in the pension system, the IM can project income in retirement from a range of government and private sources.

State and private pension accruals are used to calculate weekly pension income from SPA.

- State pension provision includes BSP, Graduated Retirement Benefit (GRAD), SERPS, S2P, other state benefits such as Winter Fuel Allowance, Pension Credit, HB/CTB.

- Private pension provision includes pension saving and can include other forms of savings (such as housing). Future streams of private pension provision are calculated through annuity purchases.

The IM allows the individual characteristics to be altered in order to make comparisons of income in retirement to be made between individuals with different pre-retirement histories under the same pension system. It also allows for adjustments to be made to the underlying pension and benefit system in order to model the impact on an individual's retirement income of policy changes in the pension system.

Full technical details of the IM have been published by the PPI[5].

1.3   Recommendations

In the majority of the scenarios the results were close for most ages and levels of earnings. Although it is not possible to investigate every possible scenario, the fact that most of the results are so close lends credibility to Ipen.

For other scenarios, the differences in the results were more significant. The rest of this report concentrates on the possible sources of these differences.

The PPI has come up with a list of reasons for the differences in outputs, based on the PPI's understanding of how Ipen works. This list may not be exhaustive and it is possible that, after making the changes to Ipen, differences in the results could still exist. However, the PPI recommends that, as a next step, the DWP investigates the areas identified and determines if any amendments to Ipen are necessary.

The reasons that have been identified for differences in the results between the PPI's IM and Ipen include:

- Assumption differences:

  - the use of phased in contribution rates;

  - Savings Credit uprating difference.

---

[5]   Curry (2003). The under pensioned: Technical paper.

- Methodology differences:
  - difference in the method of calculating annuities;
  - cap on NEST contributions;
  - revaluation of Additional State Pensions;
  - BSP credits accruing to men earning less than the LEL who are over the age of the women's SPA;
  - frequency of pension fund contributions.

The rest of this report describes the above points in more detail. Appendix B contains summary results of the validation scenarios.

1.4   Sources of differences in the results

1.4.1   Assumption differences

The use of phased in contribution rates

The pension fund at retirement is slightly lower in the results obtained by Ipen. This is due to the phasing in of the employee and employer contributions. The PPI's IM currently assumes that the employer and employee pay contributions at the full auto enrolment level starting immediately (a total of eight per cent of band salary), whereas the DWP model assumes that the employer and employee contribute at the minimum level required under the policy as envisaged at the time of modelling, in which contributions are phased in – rising from two per cent to eight per cent of band salary between 2012 and 2017.

Savings Credit uprating difference

The DWP model increases the maximum level of Savings Credit in line with CPI from 2015, following the freezing of the maximum level of Savings Credit in cash terms until 2014. The PPI modelling assumes that, following 2014, the Savings Credit Threshold increases in line with increases in average earnings. This is a difference in policy assumptions rather than a methodological difference. These policy assumptions are regularly revised.

The assumption differences in phasing in contribution rates and Saving Credit uprating have been adjusted for in producing the final comparative results between the models, as shown in Appendix B.

1.4.2   Methodological differences

Difference in the method of calculating annuities

Ipen calculates the annuity rate based on an annuity payable for the period of the life expectancy at retirement. The PPI individual model uses projected annual mortality rates to calculate annuity rates. The DWP method is a simplification, but for consistent underlying mortality tables the results should be largely similar.

However, the DWP calculation allows for an adjustment to the life expectancy when calculating the cost of Retail Price Inflation (RPI) linked annuities. This adjustment implies that people who purchase an inflation linked annuity have a greater life expectancy than in the base projections. The PPI IM does not make such an adjustment. During the regular updating of the PPI IM, the annuity rates produced by the PPI are checked against those currently offered in the annuity market and have been found to be broadly consistent.

This adjustment leads to a substantial discrepancy (of around 11 per cent) in the future levels of private pension income achieved under the PPI IM and Ipen, with Ipen being lower. DWP have informed us they will look again at the basis for their adjustment to life expectancy.

Box 2 sets out the calculation method for annuities in Ipen and how this differs from the standard formula for calculating an annuity for a given life expectancy.

Box 2 Calculating annuities in Ipen

Ipen calculates the amount of annual pension by calculating a conversion factor as the reciprocal of an annuity which can then be multiplied by the value of the pension fund in order to calculate the retirement income from a private pension.

The standard formula for an annuity, payable at the start of the year for a period of n years is given by $\ddot{a}_{[n]}$

$$\ddot{a}_{[n]} = \left(1 - \left(\frac{1}{(1+i)}\right)^n\right) \div \frac{i}{(1+i)}$$

Where i is the discount rate net of any payment escalation (such as inflation).

Taking the reciprocal of this gives the conversion factor

$$annuity\ factor = \frac{1}{\ddot{a}_{[n]}} = \frac{i}{(1+i)} \times \frac{(1+i)^n}{(1+i)^n - 1}$$

$$= i \times \frac{(1+i)^{n-1}}{(1+i)^n - 1}$$

Ipen calculates the annuity factor using this formula, assuming that the annuity will be paid for a period equal to the life expectancy of the individual being modelled, multiplied by an adjustment factor. In the formula n is replaced by *life expectancy x adjustment*.

$$Ipen\ annuity\ factor = i \times \frac{(1+i)^{(life\ expectancy\ \times\ adjustment - 1)}}{(1+i)^{(life\ expectancy\ \times\ adjustment)} - 1}$$

Cap on NEST contributions

In Ipen, the cap on contributions into NEST is breached for high earners with high contributions in scenarios 3 and 4 (where the private pension contributions are increased). This is because in Ipen the cap is modelled as being split into 5/8 of the cap applying to employee contributions (including tax relief) and 3/8 of the cap applying to employer contributions. In the actual policy, the cap makes no distinction between the source of the contributions, it is concerned with the total level of contributions.

In the scenario of doubling the employer contributions (scenario 4), the cap is breached in cases where the employer contributions are greater than the employer allocated portion of the cap, but where the total contribution would not breach the total cap. A similar situation occurs in the case of doubling the employee contributions (scenario 3). This can lead to contributions being restricted that would not be restricted in real life, leading to a lower pension income in the Ipen modelling results than in real life. DWP have informed us they will be amending their modelling in this area.

Revaluation of Additional State Pension

The Additional State Pension is revalued from the date at which it is accrued up to the date of retirement. The PPI IM and Ipen use slightly different factors to carry out this uprating. In Ipen the same revaluation factor is used for Additional State Pension that accrued in 1978 and 1979. This is different from the Section 148 orders and we believe is simply a minor error in transposing rows. DWP have informed us they will be amending their modelling in this area.

BSP credits accruing to men earning less than the LEL who are over the age of the women's SPA

Men who are over the woman's SPA but earn less than the LEL qualify for credits toward their BSP accrual. This is not programmed into Ipen. Under Ipen the reported BSP income would be lower than the actual amount that would be accrued. Credits awarded in this way to men in this situation will be phased out as the SPAs for men and women are equalised by 2018.

Frequency of pension fund contributions

The calculation of the build-up of the private pension fund is different in the DWP and PPI models. In the PPI model the private pension fund is built up monthly compared with the DWP model which operates annually. The DWP may wish to consider changing to a monthly calculation basis (if computational constraints allow) as this frequency of calculation is more prevalent in reality. However, it does not have a significant impact on the results leading to differences of the order of two per cent in final fund sizes.

Appendix A
Scenarios tested

This appendix describes the scenarios that were tested as part of the validation exercise. The first scenario is described in detail. The remaining scenarios are variations of this first scenario.

A.1 Base case

Personal parameters
- Person is a single man, who retires at relevant SPA therefore no state pension deferral, and dies at their cohort life expectancy, they have a flat earnings profile, i.e. earnings only increase in line with national average earnings.

Working life
- Continuous working life from 18 to SPA, hence full BSP and S2P or relevant equivalent.

Savings behaviour
- Saves from 2012 from age 22 (or age above 22 in 2012 for older cohorts) until retirement, without interruption, no previous or additional savings; we also assume all saving is made into a contracted in (i.e. eligibility to S2P is built up and there is no contracted out rebate paid into the pension pot) Defined Contribution pension, which meets minimum criteria to qualify as an automatic enrolment scheme (for convenience we've assumed the scheme used is NEST).

Contributions
- Eight per cent of gross banded earnings – four per cent 'individual' contributions, one per cent from tax relief and three per cent employer contributions.

Charges
- A combination of a 0.3 per cent Annual Management Charge (AMC) and a contribution charge of 1.8 per cent.

Income related benefits
- Pension Credit – both Guarantee and Savings Credit operate with current rules and system rolled forwards.
- CTB – operates with current system rolled forward.
- HB – not operating, i.e. person is not a renter in retirement.

Uprating
The incomes and thresholds are projected forward by uprating in line with economic indicators as follows:
- BSP – Triple lock (long-term earnings assumption for triple lock = +0.2 per cent from 2017).
- SERPS/S2P (in payment) – CPI.
- Graduated Retirement Benefit unit uprating – RPI.

- Lower earnings limit – RPI.

- Upper earnings limit – RPI, then earnings from 2017.

- Lower earnings threshold (underpin) – earnings.

- Guarantee Credit – earnings.

- Savings Credit – Max Savings Credit frozen at £20.52 until 2015, then CPI. Savings Credit starting point from 2011 = GC-MaxSavings Credit/Savings Credit rate.

- CTB – earnings.

- Tax thresholds – RPI then earnings from 2017.

Working age benefits
- Assumed not to be in receipt of working age benefits.

Trivial commutation/lump sum
- Assumed pots below £18,000 in 2011 can be trivially commuted, but this option is not taken in the base case. Assumed earnings uprating from 2012.

- A 25 per cent tax free lump sum is taken and annuitised, i.e. its converted into an income stream on the same terms as the rest of the pension fund, except that the annuitised lump sum is not taxable, but still counts as income brought to account for means tested benefits.

Annuity
- An RPI annuity is purchased at SPA with the rate calculated using an expected value method. Annuity rate = $((IRR*(1+IRR)^{((Life\ expectancy*adjustment\ factor)-1)})/((1+IRR)^{(Life\ expectancy*adjustment\ factor)}-1))$. IRR=0.9 per cent, life expectancy adjustment factor = 1.15.

Economic parameters
- RPI – 3.2 per cent.

- Earnings growth (nominal) – 4.75 per cent.

- Fund growth (nominal) – 5.39 per cent.

A.2 No saving (opts out of auto-enrolment)
The employee opts out of workplace pension saving (and has no other saving).

A.3 Higher individual contributions
The employer contributes three per cent, but the individual contributes the equivalent to ten per cent of banded earnings including tax relief.

A.4 Higher employer contributions
The employer doubles their contribution to six per cent and individual contributions remain at five per cent of banded earnings including tax relief.

A.5 Couple
A married man and woman with the same work and savings profile as each other and the base case. The only difference between them is life expectancy and hence annuity rate and SPA where applicable.

A.6   Retiring later

Retirement is delayed by five years past SPA (though the SPA remains as current policy), so the person benefits from more years of accumulation of private saving, state pension deferral and a higher annuity rate (they are assumed to purchase the annuity at retirement).

A.7   Broken working life

The individual starts work at age 18, ages 25 to 31 (inclusive) are spent caring for children and getting S2P credits, from ages 32 to 43 (inclusive) they work part-time on 50 per cent of their full-time equivalent pay, from ages 44 to 47 (inclusive) they work full-time, from ages 48 to 51 (inclusive) they are unemployed (but get BSP credits), ages 52 to 59 (inclusive) they have a period of inactivity (and don't get any credits), age 60 to retirement they work part-time on 50 per cent of their full-time equivalent pay.

A.8   Period of self-employment

The individual has a period of self-employment from age 56 to SPA. They continue to make pension savings at the same rate but do not receive an employer contribution.

A.9   Spends lump sum

Rather than annuitising the 25 per cent tax free lump sum we assume it is spent at the point of retirement and therefore gives a higher income in the first year of retirement; in practice spending lump sums in order to create or enhance an entitlement to income related benefit may, under notional capital rules, lead to the individual being treated as though they still had the capital, but for the purposes of this analysis we abstract from this.

A.10   Trivial commutation

Those who can trivially commute their pot (i.e. if its value is £18,000 in 2011 terms) do so, if people exceed the trivial commutation threshold they annuitise their pot after taking the 25 per cent lump sum as standard.

A.11   AMC only charge

Assumes that the fund is subject to an AMC of 0.5 per cent and there is no contribution charge.

A.12   Past saving

Individuals starting work before 2012 save from age 25 into a Defined Contribution scheme with an AMC of 1.5 per cent for the first ten years and one per cent thereafter. No employer contribution is assumed. Saving from 2012 uses the same assumptions as in the base case.

A.13   Lifestyling

With 80 per cent in equities and 20 per cent in bonds moving to 100 per cent in bonds for the last ten years before retirement. Returns assumed to be 4.75 per cent (real) for equities and 1.55 per cent (real) for bonds.

A.14   Lower returns

Fund growth assumed to be one per cent real/4.2 per cent nominal.

Appendix B
Summary results

The scenarios in Appendix A were run for individuals of each single year of age from age 16 to age 64, and for a range of salary levels. Rather than show all of the results, this appendix contains a summary of the results after removing the assumption differences as far as possible, but retaining the methodological differences. Scenarios 5, 6, 12 and 13 were compared as a review of the Ipen results rather than as a comparison between Ipen and PPI IM runs.

Key: The cells are shaded depending on the size of the difference between the results of each model: no shading represents that the results are the same to within two per cent, **light grey** signifies that the difference is over two per cent but less than five per cent, **darker grey** signifies a difference of five per cent or greater. A positive difference occurs when the output from Ipen is greater than the output from the PPI IM, and conversely a negative difference occurs when the output from Ipen is less than the output from the PPI IM.

Table B.1   Percentage difference in total pension income from Ipen and PPI IM

Salary		Scenario									
	Year	1	2	3	4	7	8	9	10	11	14
£7,500	2011	-0.4%	0.3%	0.3%	0.3%	0.0%	0.1%	0.3%	0.3%	0.3%	0.3%
	2037	-0.9%	-0.6%	2.0%	1.7%	-4.4%	-0.3%	0.9%	1.0%	1.0%	0.8%
	2061	0.5%	0.5%	5.1%	4.4%	0.5%	3.2%	2.7%	3.3%	3.2%	2.7%
£25,000	2011	2.2%	2.2%	2.2%	2.2%	-0.5%	1.3%	2.2%	2.2%	2.2%	2.2%
	2037	-1.6%	-0.2%	-2.3%	-2.0%	-5.1%	-1.9%	-1.3%	-1.6%	-1.6%	-1.4%
	2061	-3.5%	1.2%	-5.3%	-4.6%	-5.0%	-3.6%	-2.5%	-3.5%	-3.4%	-2.6%
£45,000	2011	2.9%	2.9%	2.9%	2.9%	-1.4%	3.0%	2.9%	2.9%	2.9%	2.9%
	2037	-2.4%	-0.4%	-6.9%	-5.3%	-5.8%	-2.6%	-2.0%	-2.4%	-2.4%	-2.2%
	2061	-5.5%	1.4%	-14.0%	-11.0%	-6.6%	-5.6%	-4.3%	-5.5%	-5.4%	-4.4%

Table B.1 sets out the proportional difference in the retirement income projected from the Ipen model compared with that produced by the PPI IM under each scenario for a given year of retirement. The sources of income total pension income include BSP, Additional State Pension, Private Pension and Pension Credit. The total pension income is deconstructed in Tables B.2 and B.3.

Table B.2   Percentage difference in state pension income from Ipen and PPI IM

Salary		Scenario									
		1	2	3	4	7	8	9	10	11	14
£7,500	Year										
	2011	-0.4%	0.3%	0.3%	0.3%	0.0%	0.1%	0.3%	0.3%	0.3%	0.3%
	2037	-0.9%	-0.6%	-0.6%	-0.6%	-4.5%	-2.1%	-0.6%	-0.6%	-0.6%	-0.6%
	2061	0.5%	0.5%	0.5%	0.5%	0.0%	0.3%	0.5%	0.5%	0.5%	0.5%
£25,000	Year	1	2	3	4	7	8	9	10	11	14
	2011	2.2%	2.2%	2.2%	2.2%	-0.5%	1.3%	2.2%	2.2%	2.2%	2.2%
	2037	-0.2%	-0.2%	-0.2%	-0.2%	-0.7%	-0.6%	-0.2%	-0.2%	-0.2%	-0.2%
	2061	1.2%	1.2%	1.2%	1.2%	0.5%	1.1%	1.2%	1.2%	1.2%	1.2%
£45,000	Year	1	2	3	4	7	8	9	10	11	14
	2011	2.9%	2.9%	2.9%	2.9%	-1.4%	3.0%	2.9%	2.9%	2.9%	2.9%
	2037	-0.4%	-0.4%	-0.4%	-0.4%	-0.6%	-0.8%	-0.4%	-0.4%	-0.4%	-0.4%
	2061	1.4%	1.4%	1.4%	1.4%	0.9%	1.3%	1.4%	1.4%	1.4%	1.4%

Table B.2 sets out sets out the proportional difference in the retirement income projected from the Ipen model compared with that produced by the PPI IM arising from state pension income. The income included consists of BSP, Additional State Pension and Pension Credit. State pension differences principally reflect revaluation of Additional State Pension and BSP credits accruing to men earning less than the LEL who are over the age of the women's SPA.

Table B.3   Percentage difference in private pension income from Ipen and PPI IM

Salary		Scenario									
		1	2	3	4	7	8	9	10	11	14
£25,000	Year	1	2	3	4	7	8	9	10	11	14
	2011	-	N/A	-	-	-	-	-	-	-	-
	2037	-10.1%	N/A	-10.1%	-10.1%	-14.1%	-10.6%	-10.1%	-10.1%	-10.2%	-9.8%
	2061	-16.9%	N/A	-16.9%	-16.8%	-16.9%	-16.9%	-16.9%	-16.9%	-16.9%	-16.6%
£45,000	Year	1	2	3	4	7	8	9	10	11	14
	2011	-	N/A	-	-	-	-	-	-	-	-
	2037	-10.9%	N/A	-23.9%	-20.1%	-14.7%	-11.4%	-10.9%	-10.9%	-10.9%	-10.6%
	2061	-17.6%	N/A	-30.5%	-26.7%	-18.2%	-17.7%	-17.6%	-17.6%	-17.7%	-17.4%

Table B.3 sets out sets out the proportional difference in the retirement income projected from the Ipen model compared with that produced by the PPI Individual arising from private pension income. Private pension differences principally reflect differences in the method of calculating annuities (where Ipen has a lower annuity rate as a result of the life expectancy adjustment applied) and, in scenarios 3 and 4 at the higher income levels, the cap on NEST contributions.

The Department for Work and Pensions (DWP) has a model called Ipen that produces state and private pension outcomes for hypothetical individuals or couples.

The DWP commissioned the Pensions Policy Institute (PPI) to validate Ipen against the PPI's Individual Model (IM). The PPI's IM is a model developed by the PPI to project incomes in retirement for hypothetical individuals and couples.

The validation process involves comparing the results of the two models under a number of different scenarios and checking whether the results are similar. While no feasible set of scenarios can be exhaustive, a validation process of this type can help to provide confidence in the model's methodology.

If you would like to know more about DWP research, please contact:
Carol Beattie, Central Analysis Division, Department for Work and Pensions,
Upper Ground Floor, Steel City House, West Street, Sheffield, S1 2GQ.
http://research.dwp.gov.uk/asd/asd5/rrs-index.asp

DWP Department for
Work and Pensions