

Analysis of the Plan4Pensions options

This is an analysis of the various options in the document “Plan4Pensions: Your guide to the proposed changes to NAPS”. **We stress that nothing in this document should be taken as constituting individual financial advice. It is a summary of results from a mathematical simulation based on the NAPS rules, the proposed DC scheme and Office for National Statistics Life Expectancy tables. The simulation has been prepared to give you a better understanding of the potential impact of the new BARPS options.**

However, your individual circumstances may differ from the results of the simulation as it has understandably been built using certain assumptions which may not be borne out by your experience and circumstances in practice. Further, the simulation results have been averaged to provide the expected net lifetime income under various scenarios. As such, if you would like individual advice as to which of the available new BARPS options would produce the best outcome for you, you should consider taking financial advice. You can find an Independent Financial Advisor in your area by logging on to www.unbiased.co.uk

Summary of findings

The proposed defined contribution (DC) scheme has various options. These are evaluated in a simulation so they can be compared with each other and to a scenario where NAPS accruals continue beyond 1st Apr 2018. These are the main conclusions:

- The DC scheme is a smaller one than NAPS; less money is implicitly paid in by BA and explicitly paid in by the member, resulting in smaller pensions coming out.
- The ratio of member’s benefits to contributions, though much still greater than 1, falls when NAPS is replaced by the DC scheme. Both NAPS and the replacement DC schemes are generous; NAPS is more generous
- It is probably in the member’s interest to pay as much as possible into the new DC scheme; the maximum 5% contributions are therefore the best level.
- Transitional arrangement 3 is usually the best option for the member; sometimes it is Transitional arrangement 2, but probably never Transitional arrangement 1.
- If inflation is below 5% (and probably for some higher rates than 5%), the proposed zero-inflation pension from the DC account gives a better return for the member than the proposed RPI-inflation pension
- The expected loss to the member due to the DC scheme replacing further NAPS accruals is roughly proportional to the expected number of future working years and the member’s salary and can be roughly calibrated

The simulation model structure

We have built a simulation model. It takes as input a NAPS member’s personal characteristics (sex, date of birth, date joined BA and NAPS, salary etc). Then it

simulates that member's life 1,000 times, so we can see what happens to that member's expected net income, which comprises Salary, NAPS pension payments (to the member, spouse and their children), State pension (to the member and spouse), newBARPS pension (to the member and spouse) minus that member's future NAPS and newBARPS contribution. We also subtract National Insurance (NI) contributions (just for the member) and income tax (for the member and spouse) to get to net expected income. The simulation is run 1,000 times and the results averaged to get the expected net lifetime income under various scenarios.

50 scenarios in all are simulated: 10 possible 1st April 2018 salaries (£15,000, £20,000, up to £60,000) and 5 start-work-at-18 dates (1Apr1984, 1989, 1994, 1999, 2003). In each of the 1,000 simulation runs we randomly sample from the ONS "National Life Tables" to get dates of death for the member and their spouse. These will result in one of the following:

- Death in service, no surviving spouse: all NAPS and newBARPS contributions returned; assume NAPS contributions inflate with CPI, assume newBARPS contributions inflate with CPI plus investment returns; assume no tax paid on these returns
- Death in service but there is a surviving spouse who receives a spouse's BA pension (when available) and (tax-free) 3 times the pensionable salary (if in continuing NAPS) or 5 times the total salary (if in newBARPS)
- Member dies after retirement but after death of their spouse: member receives a BA pension (if in continuing NAPS: NAPS pension; if in newBARPS: (a smaller) NAPS pension and a newBARPS pension). No spouse pension is paid.
- Member dies after retirement but before death of spouse: so, member receives a BA pension (if in continuing NAPS: NAPS pension; if in newBARPS: (a smaller) NAPS pension and newBARPS pension). Spouse receives a spouse BA pension (when available)
- For NAPS pension only: Child BA pensions are paid, after the death of the member, to the 2 children until they are 23 years old. We assume this is tax-free and is still paid if Death in Service and contributions are returned (it is unclear if that is the case from the NAPS handbook, but this is a relatively small amount anyway compared to the other pension payments)

We can then work out, for all relevant future years from 1st April 2018, the relevant payments made and taxes paid. These will be for 37 scenarios in total: NAPS continues accruals, NAPS stop accruals and newBARPS arrives with 36 possible options (6 possible contribution rates: 0%, 1%, 2%, 3%, 4%, 5%, times 3 possible transitional arrangements (Trans1, Trans2, Trans3), times 2 possible newBARPS pension choices (zero-inflation pension, RPI pension)).

The average from 1,000 simulations gives us our results.

The proposed replacement Direct Contribution (DC) scheme in Plan4Pensions (which we call newBARPS in this document) provides an amount that can be converted into an RPI-inflation pension or a zero-inflation pension. In both given examples, the multiplier is about 21 for the non-inflation pension and 45 for the RPI inflation pension (e.g. if your DC pot was £100,000, your zero-inflation pension at 65 would be $£100,000/21 =$ roughly £4,800 per annum, or the RPI-inflation pension at 65 would be $£100,000/45 =$ roughly £2,200 per annum.). The model applies these ratios to the

relevant DC amount to calculate the 2 possible pensions considered (all in 1st April 2018 pounds)

Past salaries received, taxes paid etc. (i.e. up to 31Mar18) are regarded as “sunk” payments and costs, so we just consider future payments from 1Apr18 under various scenarios in the document. One additional scenario considered is “current NAPS continues”, to judge the net effect on an individual of the various proposed options. The only past costs/income considered are an estimate of the member’s NAPS contributions up to 31st March 2018, as we need to know the total NAPS contribution when this is repaid to the member’s estate when he or she dies in service with no surviving spouse.

The rules applied are those in the NAPS handbook and it is assumed the member is in the Plan65 scheme.

The simulation needs to know these parameters for the member and the member’s spouse (we simplify some of these later):

- Sex (because women live longer than men)
- Date of Birth (DOB) (we need to forecast how long a pension is paid for)
- Start date in NAPS (in these runs we assume someone joins BA and hence NAPS at 18 and retires from BA at 65)
- Extra months given in NAPS due to leaving APS (if that was the case and the cash offer wasn’t taken; this is needed if we want to extend the runs to people who moved from APS to NAPS, we don’t at present)
- Salary (the member’s annual BA salary on 1st April 2018)
- Average real annual salary rise expected (this will be assumed to be the same rise each year). One could assume 0% if one’s career plateau is reached; the Plan4Pensions document assumes 2.5%
- Retirement date (we assume this is when the member reaches 65).
- State Pension Age (when member and spouse qualify for the State Pension) is calculated according to the latest DWP rules.
- Marital/Civil Partnership status (we won’t complicate the issue by asking for probabilities of marriage, divorce etc; the general model assumes the member either is, or is not, married, and stays that way while the member and spouse are alive)
- Sex of spouse (as this is no longer implied by the member’s sex)
- Spouse DOB (the spouse gets a pension in both NAPS and (depending on the pension option) newBARPS, so we need to be able to work out how long the spouse lives as well)
- Number of children (in these runs we always say 2 children: if any more than 2 children then all the children share that 2-children pension anyway)
- DOBs of children (we won’t bother with their sex, as their death probability at that age is very small, we assume they live beyond 23; we also assume they get a pension, if applicable, until they are 23)
- RPI CPI gap (the difference between the annual rise in RPI and CPI; it’s around 1 percentage point per year at present; we need this, as some benefits are rising by RPI, some by CPI)
- Mortality statistics are taken from the Office of National Statistics document: “National Life Tables, United Kingdom”

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/datasets/nationallifetablesunitedkingdomreferencetables>

In the runs of the model shown here, we use the figures used in Plan4Pensions for real salary annual growth (2.5%) and newBARPS pot real investment return (5.0%). Sensitivity analysis on these assumptions is done at the end of this document.

We need one forecast figure per option, so we can compare the various options: this is the member's (including family's and estate's) net income in today's pounds (where "today" is 1st April 2018) for the rest of the lives of the member, spouse and children. We assume that CPI measures inflation and that all Income Tax, NI thresholds, Lower Earnings Limit etc rise with CPI. State pensions are assumed to rise at just CPI (the currently operating triple lock is only promised until 2020, so we leave it out). NAPS annual pension rises are CPI, capped at 5%, but (at present) the model assumes a constant 3% annual CPI rise. The simulation can therefore work in 1st April 2018 pounds, as everything rises by CPI except:

- newBARPS RPI-inflation pension – which rises by RPI. We will assume RPI annual rises are 3.8% (0.8 percentage points higher than the CPI rise, which was roughly the case over the last few years), so the RPI-inflation pension will rise about 0.8% a year in real terms
- newBARPS zero-inflation pension – which does not rise in actual terms, so the zero-inflation pension will fall by about 3% a year in real terms

We need also to consider other pension income, as we have to deduct income tax (and national insurance for those working). We therefore assume both the member and spouse get the full, state pension when it is due but the spouse has no income apart from BA pension payments and the state pension. At present the level of the *old* state pension is used because most NAPS pensioners were contracted out and this old pension level (about £126 a week) is what they will be paid, rather than the new level (about £160 a week). This assumption can easily be changed; the effect of changing it will be marginal when comparing the differences in net income under the different scenarios.

We assume the member uses "smart pension credit"

We assume no ill-health retirement (as this rarely happens).

There are, and will continue to be, small reductions in future NAPS (and APS) pension rises due to the GMP (Guaranteed Minimum Pension) for some NAPS (and APS) members. This is ignored, because the reduction should be the same when NAPS stops new accruals as it would have been if NAPS had continued accruals beyond 1st April 2018, so there will be no effect on any comparisons.

The model will assume the same newBARPS choice is made each year (all the choices' outcomes will be shown in the outputs), so for example one would keep on, say, 5% contribution even though a member can change this contribution percentage each year under the proposals.

The model will assume the maximum NAPS pension is taken at retirement (i.e. no tax-free lump sum is taken). AVCs won't be considered as they are assumed to be unchanged in the proposals.

The newBARPS pot of money, generated from the member's and BA's contributions plus investment returns, will only be converted to either the zero-inflation or RPI-inflation pensions using the average ratios of pension to pot value inferred from the Plan4Pensions document. The proposed newBARPS pension rules are used (spouse pension of 50% of the member's pension for the RPI-inflation pension, no spouse pension for the zero-inflation pension, no children's pensions in either newBARPS pension)

The model simulates the member's life 1,000 times and hence can calculate the average net return of income to the member (and family) for all the scenarios. The runs for this document assume the following (this can be changed for future runs):

- The member is ground staff (as there were different NAPS contributions in the past for ground and flying staff, so there is a slight difference in returned money when death in service and no surviving spouse)
- The member is male and has a spouse who is female. (The model can easily change these assumptions; in fact, any of the other 3 combinations of sex/gender can be run).
- They have 2 children who were born on the member's 29th and 32nd birthday
- The spouse is exactly 3 years younger than the member
- The model is run for all these combinations:
 - Member is born on 1Apr in one of 1966, 1971, 1976, 1981, 1985. He joins BA, in NAPS, on his 18th birthday on 1st April 1984 or 1989, 1994, 1999, 2003, so on the day NAPS closed to new members (1st April 2003) they would be aged 37, 32, 27, 22, 18 (we'll let that last one join NAPS even though it would be a day after closure to new members). These are 5-year gaps except the last one of 4 years (NAPS started on 1Apr1984 and closed to new members 19 years later on 1st April 2003, so we can't fit in 5-year gaps throughout). This is 5 possible start dates.
 - Member's annual salary on 1st April 2018 starts at £15,000 and, for separate scenarios, goes up in steps of £5,000 to £60,000. This is 10 possible salaries.
- The results show the member's
 - Expenditure (NAPS contributions or newBARPS contributions, income tax, NI payments)
 - and incomes (BA Salary, NAPS pension benefits, new BARPS pension benefits, State pensions)
 - (comprising: adult NAPS member's pension, newBARPS member's pension, contribution refunds, death in service payment, spouse/child pensions)
 - (under the various scenarios:
 - (current NAPS
 - or newBARPS contribution of n% (n=0,1,2,3,4,5)) with
 - transitional arrangements (1,2 or 3 (as defined on page 6 of the Plan4Pensions document)) and
 - RPI-inflation pension or zero-inflation pension

Then the simulation is run 1,000 times and the average net benefits, in 1st April 2018 pounds, are calculated

These are worked out for each year from 2018 (a year is 1Apr to 31March). Past NAPS contributions by a member are also estimated.

Outputs for a simulation run

Here is the result in detail for the best and worst options for a member born in 1966, joining BA in 1984, with an annual salary (in 1st April 2018) of £40,000. (these are our earliest joining date and roughly the middle of our possible salaries).

These amounts show how the member (and family)'s total future net income is comprised.

All are from 1st April 2018 onwards and are in 1st April 2018 pounds.

The member's income comprises

- BA salary (gross), any NAPS pension paid, State pension, the pension from the new DC scheme (called "newBARPS" here)
- Subtracting contributions into NAPS (just from 1st April 2018, not before then), contributions into the newBARPS scheme, Income Tax payments, NI payments

The spouse's income is simpler

- NAPS spouse pension (called Adult Survivor's Pension in the NAPS handbook), State pension, new BARPS spouse pension (spouse only gets this for the proposed zero-inflation pension)
- Subtracting Income tax payments (we are assuming no other spouse income and no hence no spouse NI payments).

We assume these remaining incomes are untaxed (which is not necessarily the case, but is probably the best approximate estimate):

- Death in Service payment (for the current NAPS scheme or the newBARPS scheme)
- any pensions paid for the 2 children (this would only be from NAPS)
- and finally, if the member dies in service and the spouse has already died, both newBARPS and NAPS return the payments that had been paid into the schemes (the figures used will therefore include payments into NAPS before 1st April 2018 as well as after). NAPS pays 3.5% interest but we will assume the 1st April 2018 real value will suffice. newBARPS pays back the contributions plus investment income.

All these figures in the table so far add up to total net income

The final 2 rows of data in the table allow us to compare *future* total contributions with the total BA Pension they provide. This is straightforward for the 3 proposed newBARPS arrangements (Trans1, Trans2, Trans3) but for NAPS we prorate the total NAPS pension paid down to that due for the assumed future years' contributions (from 1Apr 2018), so we are matching like with like.

- "Future" BA pension (i.e. that part of BA pension due to contributions after (*not before*) 1st April 2018)

- Future contribution

Four scenario columns are shown. These are the averages of 1,000 simulations:

- “NAPS cont” assume NAPS continues for accrual beyond 1st April 2018
- “Trans 1” is Transitional Arrangements 1 for newBARPS (as detailed in page 6 of “Plan4Pensions”)
- “Trans 2” is Transitional Arrangements 2 for newBARPS (as detailed in page 6 of “Plan4Pensions”)
- “Trans 3” is Transitional Arrangements 3 for newBARPS (as detailed in page 6 of “Plan4Pensions”)

All amounts shown in these tables are in £1,000s.

The best option (NAPS continuing is not considered to be an option), for a member born in 1966, joining BA in 1984, with an annual salary (in 1st April 2018) of £40,000, was a zero-inflation pension, Transitional Arrangements 3, 5% member contribution.

	All amounts are in £1,000s	NAPS cont	Trans1	Trans2	Trans3
member	BA salary	£581	£581	£581	£581
member	NAPS pension	£511	£306	£306	£337
member	State pension	£98	£98	£98	£98
member	new BARPS pension	£0	£85	£100	£91
member	NAPS Contribution	-£14	£0	£0	£0
member	newBARPS Contribution	£0	-£29	-£35	-£35
member	Income tax	-£174	-£144	-£145	-£150
member	National Insurance	-£66	-£52	-£52	-£52
spouse	NAPS pension	£179	£111	£111	£122
spouse	State pension	£116	£116	£116	£116
spouse	new BARPS pension	£0	£0	£0	£0
spouse	Income tax	-£25	-£11	-£11	-£14
untaxed	Death in Service	£11	£22	£22	£22
untaxed	Child1 pension	£0	£0	£0	£0
untaxed	Child2 pension	£0	£0	£0	£0
untaxed	newBARPS Contribution returned	£0	£0	£0	£0
untaxed	NAPS conts. returned	£0	£0	£0	£0
	Total net income	£1,219	£1,084	£1,092	£1,118
	future BA pension	£88	£107	£122	£114
	future contribution	£14	£29	£35	£35

The member died in service 9.3% of the time, when a spouse pension was paid. The member died after retirement 90.7% of the time. (These percentages are not shown in the table). Once he had died, his spouse was still alive on 57.9% of occasions (not shown in the table) and therefore received a spouse pension. A child pension was paid 1.1% of the time, always after death in service (not shown in the table). On average, the member died in 2047 (aged 81) his spouse died in 2053 (aged 84) (not shown in the table). The member works until aged 65, another 13 years (unless he dies in service). The £581,000 BA salary is around 14 years pay at £40,000 per annum, but we are assuming he gets 2.5% real terms annual pay rises, so taking account of this 2.5% and the probability of death in service takes it down to the expected 13 years of

salary. The total NAPS pension falls from £511,000 to just over £300,000 if NAPS accruals stops. This is due mostly to shorter accrual time and partly to a lower (in real terms) final pensionable salary. Trans3 gives a better NAPS pension than Trans1 and Trans2 because a further 3 years' pay increases (but not those years' pay) count towards the NAPS pension. This Trans3 gain is enough to beat Trans1 and Trans2 benefits such as the initial lump sum. The state pensions payments are the same for the member and (although a higher amount) for the spouse in all options. The new BARPS pension in this scenario is highest in Trans2, though Trans 3 is usually the best option over all the scenarios. Note the 3 possible newBARPS pensions of around £100,000 are smaller than the decrease in NAPS pension (around £200,000). Further NAPS contributions of £14,000 are paid if NAPS continues. (Contributions stop before the BA leaving date because the maximum pension is reached). If NAPS doesn't continue, the newBARPS contributions are £29,000 (Trans1) or £35,000 (Trans2 and Trans3), the latter 2 are higher due to the additional contributions made over the first five years. Member's Income tax is higher when NAPS continues because the member is paid more overall before he dies (due to larger BA pension payments). NI is also higher due to the (in this case) continuing extra 3.1% contributions when NAPS continues.

The spouse NAPS pension is reduced in the same proportions as the member's NAPS pension, when NAPS stops. The spouse state pension is a bit more than the member state pension because women live about 3 years longer than men. In this option, where a zero-inflation pension is purchased, there is no spouse newBARPS pension paid. The spouse income tax is higher when NAPS continues due to the higher total spouse income (due to the higher BA pension paid). Child pensions were paid, but rarely. The average child pension paid here is less than £500, so it rounds down to £0 (to the nearest £1,000) in the table. In the 1,000 simulations, the member never dies in service after the spouse had already died, so no contributions were returned for NAPS continuing or NAPS stopping scenarios.

All these add up to the total net income for the member, spouse and member's estate. NAPS continuing gives the best net income because the fall in the total NAPS pensions received is not fully compensated by the newBARPS returns, even though lower newBARPS contributions than NAPS contributions partially addresses this gap. The future BA pension for NAPS is less than that for the 3 newBARPS arrangements, due to the full NAPS pension being reached and contributions stopping before BA leaving date. The ratio of pension to contribution is about 6.3 for NAPS continuing and between 3.3 and 3.7 for the newBARPS arrangements. Trans1, Trans2 and Trans3 have contributions that are 210% 255% of the NAPS contributions, providing about 130% of the NAPS pension. (percentages not shown in table). newBARPS is therefore a generous scheme, but NAPS is more generous, with higher contributions and a higher pension/contribution ratio.

The worst option was an RPI-inflation pension, Transitional Arrangements 1, 0% member contribution:

	All amounts are in £1,000s	NAPS cont	Trans1	Trans2	Trans3
member	BA salary	£581	£581	£581	£581
member	NAPS pension	£511	£306	£306	£337

member	State pension	£98	£98	£98	£98
member	new BARPS pension	£0	£21	£47	£41
member	NAPS Contribution	-£14	£0	£0	£0
member	newBARPS Contribution	£0	£0	-£17	-£17
member	Income tax	-£174	-£140	-£142	-£147
member	National Insurance	-£66	-£54	-£52	-£52
spouse	NAPS pension	£179	£111	£111	£122
spouse	State pension	£116	£116	£116	£116
spouse	new BARPS pension	£0	£6	£12	£11
spouse	Income tax	-£25	-£12	-£14	-£16
untaxed	Death in Service	£11	£22	£22	£22
untaxed	Child1 pension	£0	£0	£0	£0
untaxed	Child2 pension	£0	£0	£0	£0
untaxed	newBARPS Contribution returned	£0	£0	£0	£0
untaxed	NAPS conts. returned	£0	£0	£0	£0
	Total net income	£1,219	£1,056	£1,070	£1,098
	future BA pension	£88	£49	£81	£74
	future contribution	£14	£0	£17	£17

“NAPS continuing” figures of course remain the same, as do both State pensions. The RPI-inflation BARPS pension offered starts off slightly less than half of the zero-inflation pension. Our assumption of 3% CPI inflation is too low an inflation forecast for the RPI-linked pension to improve enough over time, even though this pension also pays a spouse pension. The future BA pension for NAPS is about three to five times that for the 3 newBARPS arrangements. The ratio of pension to contribution is about 6.3 for NAPS continuing and also about 5.1 for Trans2 and Trans3 (there are no member contributions for Trans1). newBARPS is therefore a generous scheme, but NAPS is more generous, with higher contributions and a higher pension/contribution ratio.

Here are the results for someone who joined on 1 Apr 2003, (the day after NAPS closed to new members but we have let them join a day late for this analysis). Their salary is £40,000 by 1st April 2018. The best option, for this member born in 1985, joining BA in 2003, with an annual salary (in 1st April 2018) of £40,000, was (again) a zero-inflation pension, Transitional Arrangements 3, 5% member contribution:

	All amounts are in £1,000s	NAPS cont	Trans1	Trans2	Trans3
member	BA salary	£1,837	£1,837	£1,837	£1,837
member	NAPS pension	£845	£127	£127	£139
member	State pension	£95	£95	£95	£95
member	new BARPS pension	£0	£386	£422	£402
member	NAPS Contribution	-£107	£0	£0	£0
member	newBARPS Contribution	£0	-£92	-£98	-£98
member	Income tax	-£543	-£439	-£446	-£444
member	National Insurance	-£172	-£140	-£140	-£140
spouse	NAPS pension	£320	£53	£53	£58
spouse	State pension	£114	£114	£114	£114
spouse	new BARPS pension	£0	£0	£0	£0

spouse	Income tax	-£50	-£0	-£0	-£1
untaxed	Death in Service	£22	£43	£43	£43
untaxed	Child1 pension	£1	£0	£0	£1
untaxed	Child2 pension	£1	£0	£0	£0
untaxed	newBARPS Contribution returned	£0	£2	£2	£2
untaxed	NAPS conts. returned	£0	£0	£0	£0
	Total net income	£2,362	£1,985	£2,009	£2,007
	future BA pension	£743	£430	£467	£446
	future contribution	£107	£92	£98	£98

The BA salary is much bigger than the previous results shown because this member was 18 when they joined in 2003 and is planned to retire at 65 in 2050 (unless death in service intervenes), so the BA salary is for an expected 32 years from 2018. This example best shows the maximum difference between NAPS and newBARPS because the further NAPS contributions (i.e. after 1st April 2018) continue for the longest time (up to 32 years: 2018 to 2050). The NAPS pension, when NAPS continues, is about 46% of the BA future salary payments. The spouse pension tops this up to about 63%. This shows how relatively generous NAPS is compared to the proposed DC scheme: the member is currently paying in nearly 13% of future salary for NAPS Plan65 membership, so BA plus investment returns is paying the 50% of salary to bring the 13% up to the expected 63% to be paid out. The future BA pension for NAPS continuing is around 1.7 that for the 3 newBARPS arrangements. The ratio of pension to contribution is about 6.9 for NAPS continuing and between 4.5 and 4.8 for the newBARPS arrangements. Trans1, Trans2 and Trans3 have contributions that are about 90% NAPS contributions, providing about 60% of the NAPS pension. (percentages not shown in table). newBARPS is therefore again a generous scheme, but NAPS is more generous, with higher contributions and a higher pension/contribution ratio.

These figures are based on the Plan4Pensions document's figures of annual real terms salary rises of 2.5% per annum and investment return on the growing newBARPS pot (which eventually becomes a pension) of 5% per annum. As a crude sensitivity check on the effect of these growth forecasts, here are the results for that same 18-year-old joining on 1Apr2003, but this time with 0% real terms salary rises (i.e. just inflation rises) and 0% annual real terms investment return (i.e. the newBARPS pot just grows with inflation and its additional contributions).

	All amounts are in £1,000s	NAPS cont	Trans1	Trans2	Trans3
member	BA salary	£1,230	£1,230	£1,230	£1,230
member	NAPS pension	£337	£129	£129	£129
member	State pension	£95	£95	£95	£95
member	new BARPS pension	£0	£112	£120	£116
member	NAPS Contribution	-£73	£0	£0	£0
member	newBARPS Contribution	£0	-£62	-£68	-£68
member	Income tax	-£209	-£192	-£193	-£192
member	National Insurance	-£141	-£110	-£109	-£109
spouse	NAPS pension	£142	£54	£54	£54

spouse	State pension	£114	£114	£114	£114
spouse	new BARPS pension	£0	£0	£0	£0
spouse	Income tax	-£15	-£1	-£1	-£1
untaxed	Death in Service	£12	£25	£25	£25
untaxed	Child1 pension	£1	£1	£1	£1
untaxed	Child2 pension	£1	£0	£0	£0
untaxed	newBARPS Contribution returned	£0	£1	£1	£1
untaxed	NAPS conts. returned	£0	£0	£0	£0
	Total net income	£1,492	£1,396	£1,398	£1,395
	future BA pension	£308	£138	£146	£141
	future contribution	£73	£62	£68	£68

The salary is 67% of the previous one (due to 0%, not 2.5%, annual real growth). However, because of the NAPS final salary rules, the NAPS-continues pension falls further and is now 42% of the previous one. The 2.5% per annum real salary increase inflates the value of NAPS-continuing more than it inflates the value of the newBARPS pension, which (not shown here) will also be 67% of the previous one if the 5% investment return had stayed, because the newBARPS pension is just proportional to the average BA salary, not the “final” salary (which is in fact the average of the highest 2 of the last 5 years). The investment return of 0% understandably has a big effect on the newBARPS pension: the combined effect of 0% salary rises and 0% investment returns reduce the newBARPS pension to about 29% of the previous one (that had 2.5% salary rises and 5% investment growth per annum. The future BA pension for NAPS is about 2.8 times that for the 3 newBARPS arrangements. The ratio of pension to contribution is about 4.2 for NAPS continuing and between 2.1 and 2.2 for the newBARPS arrangements. Trans1, Trans2 and Trans3 have contributions that about 90% of the NAPS contributions, providing about 45% of the NAPS pension. (percentages not shown in table). newBARPS is still therefore a generous scheme, but NAPS is more generous, with higher contributions and a higher pension/contribution ratio.

Leaving the salary rise at 2.5% but having a 0% investment return reduces the newBARPS pension to about 42% of the previous one (not shown here).

Summary of all the results

There are 36 newBARPS options for each of our 50 income/starting-date options. We have above identified the best and worst newBARPS option above for just 2 of these 50 income/starting-date options. There is a net income loss in moving to newBARPS for all 50 of these options. This loss roughly depends on the number of future working years under newBARPS, i.e. the time from 1st April 2018 to retirement date. We can divide the net income loss by the future working years to get a loss per future working year. We can then divide that by the 1st April 2018 salary to get a loss per future working year per 1st April 2018 salary. For the best option highlighted above, this loss ratio ranges from 18% to 29% over the 50 salary/starting-date combinations. For the worst option, this loss ratio ranges from 29% to 43% over the 50 salary/starting date combinations. For one of these 50 salary/starting date combinations, our member born in 1985, joining BA in 2003 at 18, with a salary (in 1st April 2018) £40,000, the best-option loss ratio is 28%, the worst-option loss ratio is 43%. This member has 32 future working years from 1st April 2018 to retirement. His best-option loss is

therefore $28\% \times 32 \times \pounds 40,000 = \pounds 353,000$. His worst-option loss is $43\% \times 32 \times \pounds 40,000 = \pounds 546,000$.

As reasoned above, NAPS-continuing gives the best net income. Assuming NAPS does not continue, which of the 36 newBARPS options is best? The results say that the best option, over the 50 salary/starting-date combinations, is 5% contribution, Trans3 (but sometimes Trans2), zero-inflation newBARPS pension. The worst option is always 0% contribution, Trans1, RPI-inflation newBARPS pension.

This is saying:

- It is best to pay the highest contributions possible (5%) into newBARPS. This makes sense as BA also then pays in more. Also, the contributions reduce the tax burden when employed, as they are not taxed, and the pension eventually paid will have a lower tax percentage paid on it than would be the case when working. Finally, the contribution pot (from Member's plus BA's contributions) is assumed to grow at 5% in real terms. Even though BA won't pay any further matching contributions, the tax-reduction and investment-return reasons argue for even higher member contributions (if affordable)
- Transitional Arrangement 3 is usually best, sometimes Transitional Arrangement 2. This is mainly because of the higher member and BA contributions paid for the first 5 years. These always (in our examples) give a better return than the Transitional Arrangement 1 with its £10,000 lump sum. Sometimes Trans2 wins for the lower salaries of the younger members: the tax paid probably swings the balance here.
- In the newBARPS pension choice, the zero-inflation pension always beats RPI-inflation pension. Caution is needed here, as the calculations of these 2 pensions are based on just the 2 examples shown in Plan4Pensions. It would appear that the RPI-pension loses out because it starts too low compared to the zero-inflation pension (the ratio of RPI-inflation pension to zero-inflation pension starts at 47% and it only multiplies by a fraction of 1.04 a year, so it would take about 20 years for the RPI-inflation pension to become the bigger pension)). The proposed RPI-pension *does* pay a spouse pension whereas the zero-inflation pension *does not* pay a spouse pension, but even this is not big enough to compensate for the lower RPI-inflation starting point. The RPI-inflation pension would look much better if we had higher inflation. For example, if CPI inflation was 6% per annum (not our assumed 3%), the RPI-inflation pension would catch up in about 10 years, not 20.