How would removal of the State Pension triple lock affect adequacy?

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Executive Summary

Triple lock indexation (which uprates the new State Pension (nSP) and the basic State Pension (bSP) every year by the greater of the rise in earnings, the rise in the Consumer Price Index (CPI) or 2.5%) has been in place since 2011. The triple lock has increased the value of the State Pension and will continue to increase the value for future pensioners if it remains in place. However, there are concerns about the sustainability of the triple lock. Removal of the triple lock would decrease the cost of providing State Pensions, however it would also have implications for pensioner poverty and the amount spent on other means-tested benefits such as Housing Benefit, caring credits and disability premiums.

The Government is legally required to maintain at least an earnings link for the bSP and the nSP, and therefore, if the triple lock is removed, an earnings link will be one of the potential indexation arrangements. The Conservative Party also mentioned in its most recent election manifesto the possibility of introducing a "double lock", increasing the State Pension by the higher of earnings inflation or prices.[1] The Government has committed to retaining the triple lock for the current Parliament, but bSP and nSP could potentially be linked to earnings or the double lock from 2022.

In order for the implications of potential changes to State Pension indexation to be properly assessed, there needs to be greater clarity about the role of the State Pension.

The role of the State Pension is not clearly defined

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What is the aim of the State Pension?

The aim of the State Pension has migrated from providing a basic level of income, to maintaining living standards, and then back again. The Government intends for the nSP to provide a minimum base of income for people to top up with private pension income, assisted by automatic enrolment, and to reduce means-testing. However, it is not clear whether this minimum base is intended to prevent poverty, allow people to achieve a minimum acceptable standard of living, or contribute some income to an earnings top up.

How much working life income should the State Pension replace?

The full value of the nSP, £159.55 (2017/18), is worth 24% of National Average[2] Earnings[3], and is set just above the Pension Credit level, £159.35 in 2017/18[4]. Under current arrangements, the State Pension will:

- Reduce means-testing among pensioners,
- Assist in preventing poverty but not fully eradicate it; and will not enable people to achieve a minimum acceptable standard of living from the State Pension alone,
- Require some people to save a significant amount of income into a private pension or other savings vehicle in order to achieve adequacy targets in retirement.

In order to determine what proportion of average earnings the State Pension should replace, it is necessary first to determine the ultimate aim of the State Pension.

1. The Conservative and Unionist Party Manifesto 2017; *Forward, Together; Our Plan for a Stronger Britain and a Prosperous Future*
2. Averages are means unless otherwise specified
3. Based on Weekly pay - Gross (£) - For full-time employee jobs: United Kingdom, 2017, ONS, Annual Survey of Hours and Earnings
4. Full Guarantee Credit level

How much should people be expected to save privately?

If the State Pension is intended to provide a platform for saving, there needs to be clarity regarding how much people are expected to save privately. The amount that people need to save in order to meet adequacy targets will vary depending on the level of income they receive from the State Pension. If the level of State Pension income is too low, then the amount some people would need to save privately could be unaffordable. Some assessment is necessary as to how much people from different income groups can afford to save including those not eligible for an employer contribution, such as the self-employed.

Automatic enrolment will enable many more people to save in private pensions and will help more people to meet adequacy targets, though eligibility is not universal and not all those saving through automatic enrolment will make sufficient contributions to meet targets. Changes to automatic enrolment policy which extend eligibility and raise minimum contribution levels could help more people to meet adequacy targets. However, increasing minimum contribution levels or bringing in more people with low incomes could lead to higher opt-out rates or financial hardship for those who struggle to afford contributions.

In order to make an informed decision regarding which indexation arrangement is the most appropriate, the above questions will need to be addressed.

Triple lock indexation provides the most adequate basic level of income, when compared to other indexation scenarios, both in the short-term for those who receive State Pension income under the basic State Pension (bSP) system and in the long-term for those under the new State Pension (nSP) system.

The triple lock is the most effective indexation link for providing a basic level of income and maintaining living standards, but also costs the State more in the long-term

Triple lock indexation provides the most adequate basic level of income, when compared to other indexation scenarios. Assuming that the poverty line grows with earnings, by 2050 the proportion of pensioners in poverty (under 60% of median UK income) under a double lock could be around 1% higher (around 200,000 pensioners more) and under an earnings link could be around 4% higher (around 700,000 pensioners more) when compared to the triple lock.

Box EX1: adequacy targets

This report compares individual outcomes to income adequacy targets in order to measure the impact of different indexation scenarios. The adequacy targets are outlined below:

- The Minimum Income Standard (MIS): allows pensioners to achieve a minimum socially acceptable standard of living – around £10,000pa for a single pensioner in 2017.[5]
- Modest target: allows pensioners to achieve a "modest" standard of living – £17,500pa.[6]
- Comfortable target: allows pensioners to achieve a "comfortable" standard of living – £25,000pa.[7]
- Target replacement rate: a level of income which allows people to replicate their working life living standards when they are in retirement – these vary between individuals.

5. JRF (2017a) table 7, excluding rent and childcare
6. PLSA (2017) p. 26
7. PLSA (2017) p. 26

A triple locked State Pension would make it easier for people to reach adequacy targets

Under a triple locked pension, a low earning woman (30th percentile), contributing from age 22, would need to save 1.3% (£250pa) of salary per year on average to achieve the Minimum Income Standard with £10,000pa:

- Under a double lock, she would need to contribute around 1.8% in total (£100pa extra), and
- Under an earnings link, she would need to double her rate of saving to around 2.6% in total (£270pa extra) of salary per year on average.

In order to save enough to replicate working life living standards in retirement, she would need to save around 4.3% per year (£860pa) on average under a triple lock,

- Around 4.8% total (£110pa extra) under a double lock, and
- Around 5.6% total (£270pa extra) under an earnings link.

The proportion that those with higher incomes need to contribute is less affected by changes in indexation than it is for low earners who are more dependent on State Pensions and benefits.

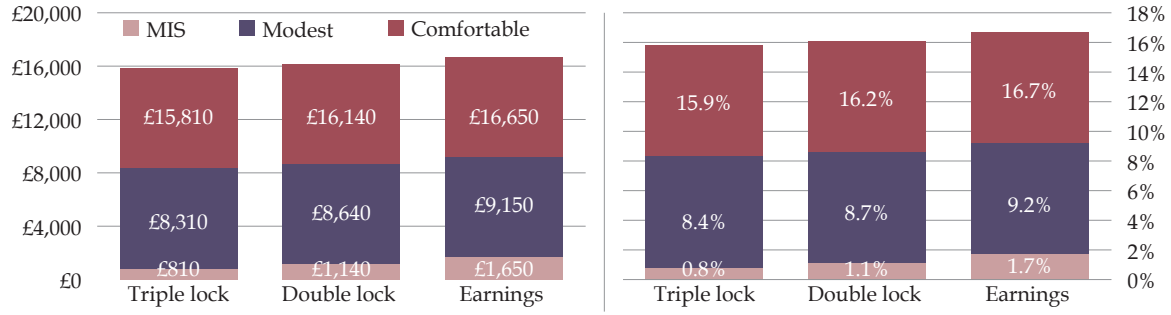
Median and high earners[8] would need to contribute 6.7% and 12.2% of salary on average from age 22 in order to achieve replicate working life living standards in retirement. Under alternative indexation scenarios, they would need to contribute:

- Around 7% total (£110pa extra) and around 12.5% total (£100pa extra) respectively, to replicate living standards under a double lock, and
- Around 7.5% total (£290pa extra) and 12.8% total (£280pa extra) under an earnings link (EX1 & EX2).

Chart EX1[9]

Median earners may need to contribute an extra 0.3% - 0.9% on average per year in order to achieve adequacy targets under different indexation scenarios

Amount needed to top up to different target income levels under different indexation scenarios and average amount needed to contribute from age 22 to reach that amount for a median earner reaching SPa in 2047



Yearly income gap between State Pension income and target rates

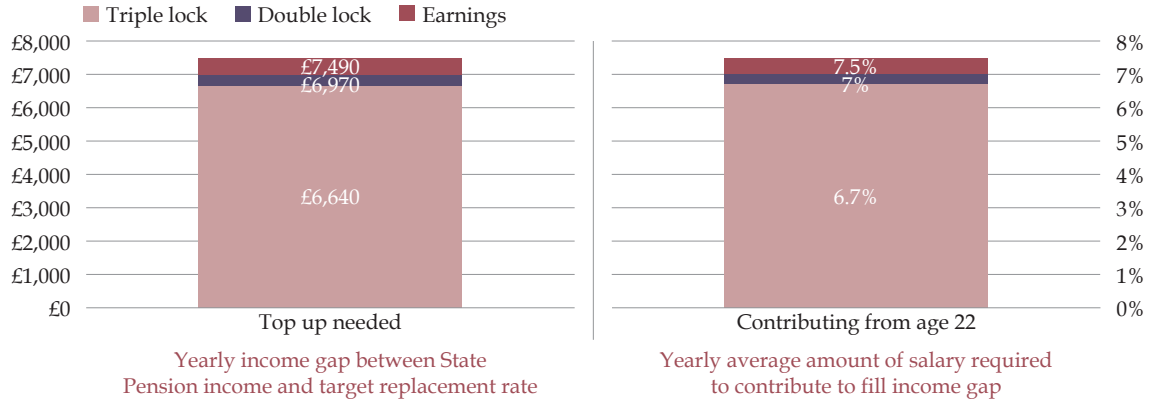
Yearly average amount of salary required to contribute to fill income gap

8. Median earning males and high earning females
9. PPI Individual Model

Chart EX2[10]

Median earners may need to contribute between 6.7% and 7.5% to achieve target replacement rates under an earnings indexation

Amount needed to top up to target replacement rate of £15,800 per year and amount of contributions required to reach that amount for a median earner reaching SPa in 2047 (2017 earnings terms)



Yearly income gap between State Pension income and target replacement rate

Yearly average amount of salary required to contribute to fill income gap

It cannot be assumed that the majority of people will save consistently into a pension from age 22. People are likely to start and stop saving as their income and employment status fluctuates, especially those who take career breaks due to caring or health problems, and those trying to meet competing spending priorities on a limited income. Therefore, required levels of contributions will vary between people, and for some, the contribution amount required to meet adequacy targets could be unaffordable.

A triple locked State Pension would improve adequacy for future as well as current pensioners. Younger people will benefit most from triple lock indexation, which gradually increases the value of the State Pension relative to earnings:

A triple locked State Pension would improve adequacy for future as well as current pensioners

Younger people will benefit most from triple lock indexation, which gradually increases the value of the State Pension relative to earnings:

- A median earning male aged 30 in 2017 would receive around £216,000 total from the triple locked State Pension during his lifetime, compared to
- £190,000 total for a median earning male aged 50 in 2017 (2017 earnings terms).

An increase in the value of State Pension income would reduce the proportion of salary that future workers need to save into private pensions in order to meet adequacy targets.

However, triple locking the State Pension will cost more than other indexation scenarios

Compared to the baseline of the bSP and nSP being triple locked, by 2050:

- An earnings link would save 0.5% per year,
- A double lock would save 0.2% per year,
- A bSP triple lock/nSP earnings link would save 0.5% per year.

An earnings link would cost less than the other three options, though it would increase the gap between State Pension income and adequacy targets.

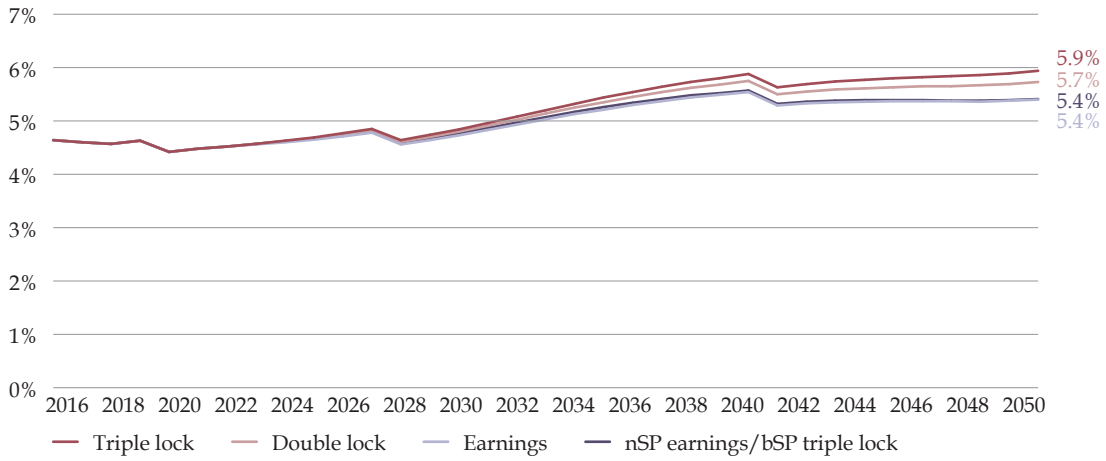
10. PPI Individual Model

While linking nSP to earnings and bSP to the triple lock would originally cost more than an earnings link for both pensions, of around 0.04% of GDP per year, by 2050 it would begin to cost within 0.01% of an earnings link as the proportion of pensioners still in receipt of the bSP would be very low by then (Chart EX3).

Chart EX3[11]

By 2050, a double lock would save around 0.2% per year and an earnings link would save around 0.5% per year

Cost of State Pension under different indexation scenarios by percent of GDP by year



Some of the savings arising from changing the indexation arrangement are reduced by extra expenditure on means-tested benefits. The savings under an earnings indexation compared to the triple lock are reduced by 0.04% when means-tested benefits are taken into account.

One way of compromising between costs and adequacy would be to index the State Pension to a less generous measure than triple lock, but a more generous measure than earnings. This could be achieved through a double lock, saving 0.2% of GDP per year by 2050, or linking bSP to the triple lock and nSP to earnings, saving 0.5% of GDP per year by 2050.

One way of compromising between costs and adequacy would be to index the State Pension to a less generous measure than triple lock, but a more generous measure than an earnings indexation. This could be achieved through a double lock, saving 0.2% of GDP per year by 2050 or linking bSP to the triple lock *and* nSP to earnings, saving 0.5% of GDP per year by 2050.

A double lock in particular would have less of a negative impact on those with lower incomes when compared to an earnings indexation. For example, a pensioner with income at the 10th percentile would experience a 3% (£300pa less) drop in income under the double lock when compared to the triple lock, and a 7% (£700pa less) drop in income under an earnings link, by 2050.

11. PPI Aggregate Model, cost of State Pension and Pension Credit

Under none of the indexation scenarios, does the State Pension provide full protection from poverty, or sufficient support to maintain living standards

Under all of the scenarios, some pensioners still experience poverty in retirement and many will need to save significant amounts into private pensions, or other saving vehicles, in order to achieve adequate retirement incomes.

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Introduction

In 2011, the Coalition Government introduced the "triple lock" mechanism which uprates the new State Pension (nSP) and the basic State Pension (bSP) every year by the greater of the rise in earnings, the rise in the Consumer Price Index (CPI) or 2.5%. There have been concerns about the sustainability of the triple lock and calls for it to be replaced, though the Government has committed to retaining the triple lock during the current Parliament. In its manifesto, the Conservative Party proposed to replace the triple lock with a "double lock" (based on the higher of earnings or CPI) after 2020, although the other major political parties committed to retaining the triple lock until the end of the new Parliament.

Before this, legislation required the State Pension to be uprated at least in line with prices. While the triple lock is not enshrined in legislation, the Government is legally required to uprate the bSP and nSP by a minimum of earnings.

Removal of the triple lock would decrease the cost of providing State Pensions, however it would also have implications for pensioner poverty and the amount spent on other means-tested benefits such as Housing Benefit, caring credits and disability premiums.

This report explores the potential effect of changing State Pension indexation on poverty, adequacy and state spending, and examines the future outlook for State Pension policy as a whole.

Chapter one sets out historical indexation arrangements and explores their impact on the real value of State Pension income.

Chapter two looks at the role of the State Pension in providing adequacy.

Chapter three explores the costs of the triple lock and how changes to indexation could affect people with different characteristics.

Chapter four analyses the impact of different indexation scenarios on State spending, pensioner poverty and adequacy.

Chapter five discusses the role of the State Pension going forward.

Chapter one: how have State Pensions been uprated historically?

This chapter sets out historical indexation arrangements and explores their impact on the real value of State Pension income.

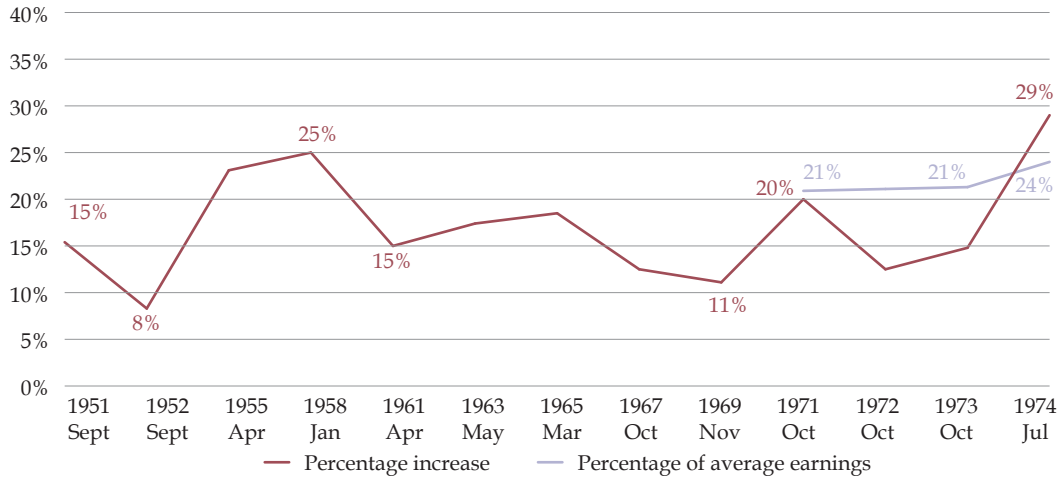
Between 1948 and 1974 the State Pension was uprated on an ad hoc basis, though it generally kept in line with earnings inflation

As part of the birth of Beveridge's Welfare State, the 1948 National Insurance Act introduced a flat rate, contributory State Pension available at age 65 (men) and age 60 (women) at a rate of £1.30pw.[12] Until 1975, State Pension income was uprated on an ad hoc basis,[13] and the value of the State Pension rose more quickly than price inflation, and generally earnings inflation as well.[14] Between 1971 and 1974, the value of a full basic State Pension (BSP) rose from 21% to 24% of average[15] earnings (Chart 1).

Chart 1[16]

Between 1948 and 1974, the State Pension was increased on an ad hoc basis

Basic State Pension as percentage increase from previous year and proportion of average earnings, for an individual under age 80 with own National Insurance contributions, by year



12. Thurley (2010), p.32
13. Through National Insurance Acts
14. Thurley (2010), p.3
15. Averages are means unless otherwise specified
16. DWP (2016) Table 2.1a; average earnings figures prior to 1971 are unavailable

Between 1975 and 1979, State Pension was uprated by the higher of earnings or prices

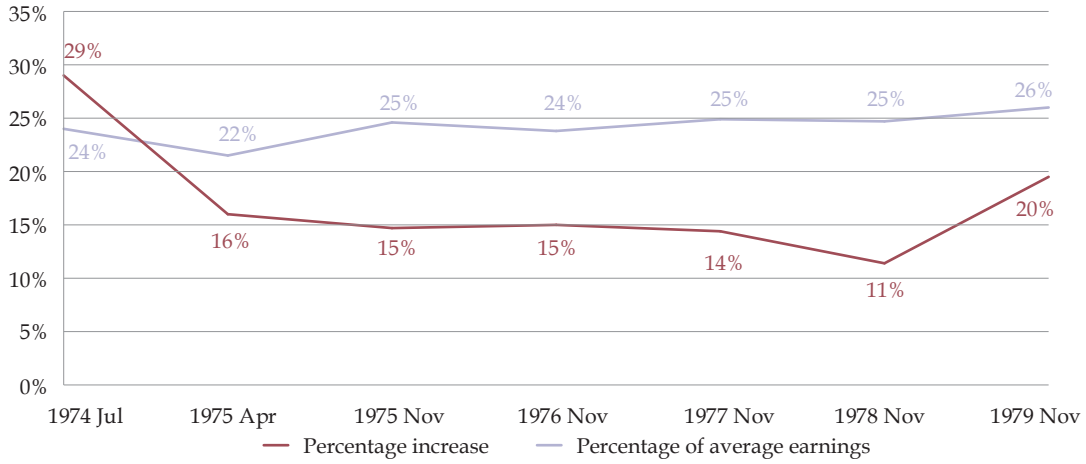
The first earnings related State Pension scheme, Graduated Retirement Benefit (GRB) was introduced in 1961. Income accrued under GRB, and subsequent earnings related State Pension schemes, was uprated in line with the same measures used for the bSP, until 2001.

The Social Security Act 1973 introduced a statutory duty to increase the State Pension in line with inflation (replacing ad hoc rises), and was amended in 1974[17] to provide for yearly increases in line with the higher of prices or earnings. The rationale for this measure was that price inflation was not sufficient on its own to allow pensioners *a continuing share in our increasing national prosperity.*[18] As a consequence, the State Pension was uprated in line with the higher of prices or earnings between 1975 and 1979, and during this time the value of the bSP rose from 22% to 26% of average earnings (Chart 2).

Chart 2[19]

Between 1975 and 1979, the State Pension was increased by the higher of earnings or prices

Basic State Pension as percentage increase from previous year and proportion of average earnings, for an individual under age 80 with own National Insurance contributions, by year



Between 1980 and 2010 State Pensions were uprated by prices

In 1979, as part of a Conservative Government drive to reduce the costs of running the tax and social security system, the link to earnings inflation was broken.[20] The Government claimed that inflating State Pensions by the higher of earnings or prices was unsustainable in the long-term because of the "ratchet effect" which would see State Pensions gradually increase in value relative to earnings.[21] The Social Security Act 1980 amended the 1975 Act to link State Pension increases to prices. From 1980 until 2010, the State Pension was uprated in line with prices, though there were fluctuations in payments due to:

- Switches between basing inflation on historical data and forecasting data,
- Increases and decreases intended to correct errors in projections or prevent State Pension income from rising too slowly.

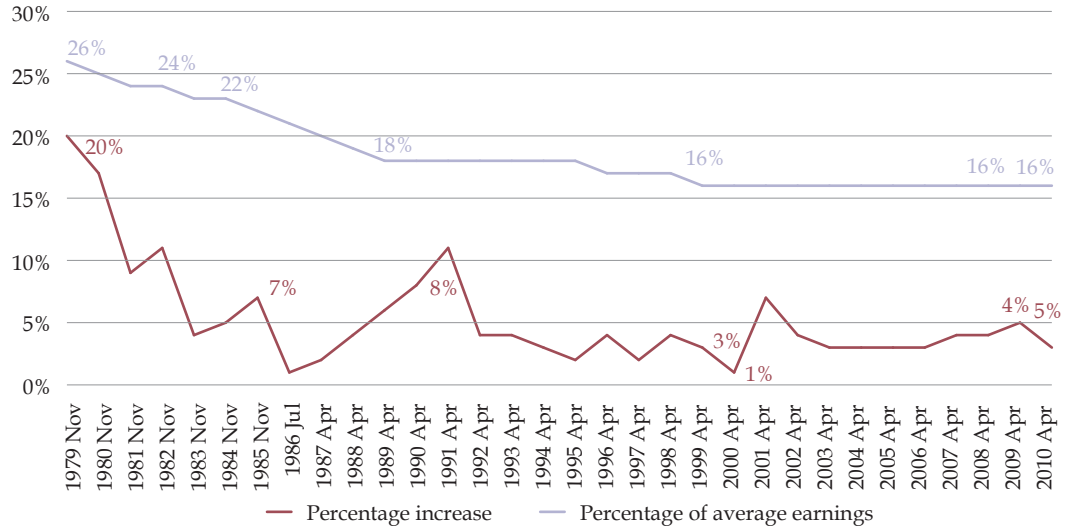
17. In the National Insurance Act 1974
18. HoC Debates 28 March 1974, c 643
19. DWP (2016) Table 2.1a
20. Thurley (2010), p.4
21. HoC Debates 13 June 1979, c 439

In 2001, after a couple of years of very low price inflation, the Government announced that it would introduce a minimum level by which bSP must be uprated of 2.5%. From 2005, the bSP was uprated by the higher of price inflation or 2.5% while additional State Pension income continued to be uprated by price inflation. Between 1980 and 2010, the value of the bSP dropped from 25% to 16% of average earnings as a result of being linked to prices which generally rise more slowly than earnings (Chart 3).

Chart 3[22]

Between 1980 and 2010, the State Pension was increased by prices and dropped from 25% of average earnings to 16%

Basic State Pension percentage increase from previous year and proportion of average earnings, for an individual under age 80 with own National Insurance contributions, by year



In 2011 the measure of price inflation used to uprate pensions and benefits was changed from the Retail Price Index (RPI) to the Consumer Price Index (CPI)

The official measure of inflation was the RPI until 2010 when the Government switched to using the CPI which, it claimed, provided *a more appropriate measure of benefit and pension recipients' inflation experiences than RPI*[23]. The CPI differs from RPI in that it is based on a different formula, which allows for people switching products due to price change or new innovations, and the CPI does not include housing inflation. As a result, CPI tends to increase more slowly than RPI each year, by around 1%.

The opposition Labour Party argued that while uprating benefits by CPI in the short-term would help reduce the UK deficit, it was not an appropriate measure over the long-term, as it would slowly decrease the value of the State Pension.[24]

After 2011, the bSP was uprated in line with the higher of earnings, prices or 2.5%, the "triple lock"

Prior to the switch from RPI to CPI, the Government legislated in 2007 for the bSP to increase with earnings by the end of the 2010 Parliament.[25] The re-linking of bSP to earnings was based on the following arguments:

- People expect that retirement income will reflect earnings and standards of living during working age; therefore the State Pension will better support retirement planning with a foundation amount that is further linked to earnings growth.[26]

22. DWP (2016) Table 2.1a
23. HoC Debates, 3 February 2011, c897W; DWP (2011)
24. Thurley (2017a) p. 13-14
25. The Pensions Act 2007
26. DWP (2006) p. 109 para 3.21

- Indexing the State Pension to an inflationary measure below prices would result in an increase of means-testing among pensioners.[27]
- A reduction in means-testing should increase the incentive to save in a private pension as people would be less likely to lose out on income in retirement through entitlement to benefits.[28]

When the link to earnings for the bSP was re-introduced in 2011, it consisted of a "triple lock", requiring State Pension to be inflated by the higher of the increase in earnings, prices, or 2.5%.

The triple lock was originally intended to compensate for other reductions in the generosity of the State Pension

The idea of a triple lock which would increase the bSP by the higher of earnings, prices or 2.5% was first proposed in the Liberal Democrat 2010 Manifesto.[29] The triple lock was adopted as the measure of inflation for both the bSP (and later the nSP) from 2011, by the then Coalition Government. The effect of the triple lock is that rather than keeping pace with earnings inflation, the State Pension increases in value, over time, above earnings because of years in which price inflation or 2.5% are higher than earnings inflation.

The Government originally intended for the triple lock to be used as a long-term inflationary measure that would ensure that, in return for rises in SPa and the removal of an earnings element, the State Pension would remain "decent" and "properly indexed" as well as affordable.

The Government originally intended for the triple lock to be used as a long-term inflationary measure that would ensure that, in return for rises in SPa and the removal of an earnings element, the State Pension would remain "decent" and "properly indexed" as well as affordable. The former Pensions Minister said that the triple lock was intended to be viewed as part of "a package":

Rising State Pension ages, abolishing earnings related State Pensions and the triple lock are the three elements. You cannot in future build up a State Pension of £170, £180 or £190. That is gone. You cannot retire at 60 or 63 or whatever; that is going. So the deal now is a lousy pension at 60, which is where we started, or a decent, properly indexed pension at 67, 68 or 69, taken as a package. All the costings into the middle of the century are done on the basis of the triple lock running for a long period of time, and it still is a lot cheaper, the reformed system, than the one that would otherwise have been in place.[30]

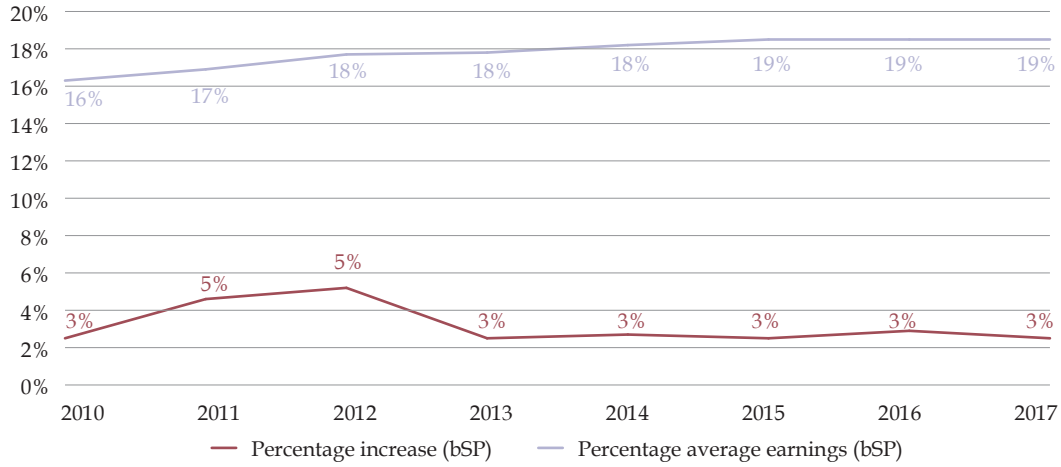
From 2011 on, the bSP was increased by the triple lock and the additional State Pension was increased by CPI. When the nSP was introduced in 2016, it was also increased by the triple lock. Between 2011 and 2017, the value of a full bSP rose from 17% to 19% of average earnings (Chart 4).

27. Thurley, D (2017b) p. 5
28. Thurley, D (2017b) p. 5
29. Liberal Democrat General Election Manifesto 2010
30. Steve Webb (Minister for Pensions), Evidence to the Work and Pensions Committee, 2 March 2016, Q3

Chart 4[31]

Between 2011 and 2017, the basic State Pension was increased by the triple lock

Basic State Pension percentage increase from previous year and proportion of average earnings, for an individual under age 80 with own National Insurance contributions, by year in April



The value of the State Pension dropped in earnings terms when it was linked to prices

In 1971[32] the full rate of bSP[33] was £138.50pw (2017 earnings terms) and grew in value to £172.28pw by 1979 (26% of average earnings) as a result of being uprated in line with earnings.

Between 1980 and 2010, when bSP was linked to prices, the value dropped to £108.07pw. When bSP was linked to the triple lock in 2011, it regained some of the value lost during the price link and is worth £122.30pw in 2017, 19% of average earnings. The full rate of the nSP is worth £159.55pw in 2017, 24% of average earnings. During the period in which the value of the bSP was falling (1980-2010) some people were able to top their income up with additional State Pension, however, the average total pension receipt which includes both basic and additional State Pension did not exceed the full rate of bSP until the year 2000, reaching a difference of around £18 by 2017 (Chart 5).

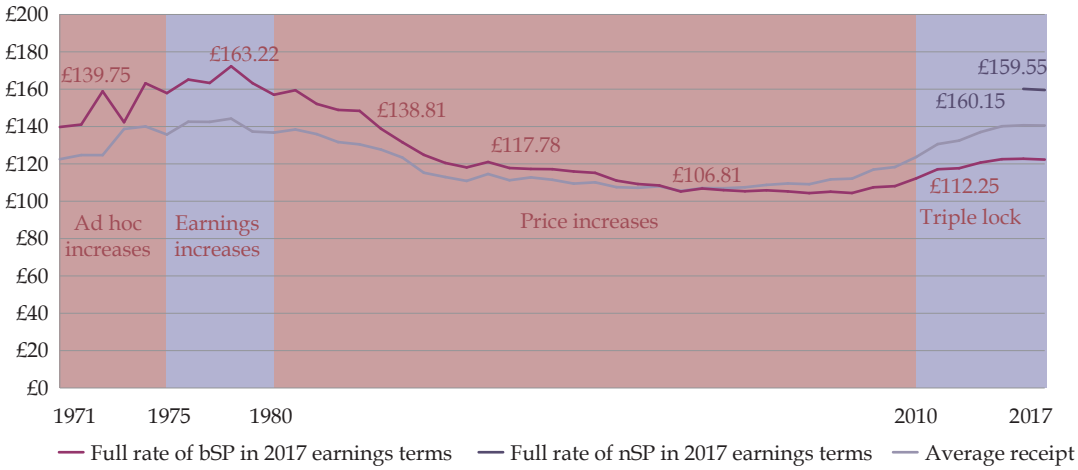
The value of the State Pension dropped in earnings terms when it was linked to prices, from £172.28 per week in 1979 to £108.07 per week in 2010.

31. DWP (2016) Table 2.1a
32. The oldest year for which earnings data is available
33. For a single person under age 80

Chart 5[34]

The value of the bSP reduces during periods of price uprating

BSP and nSP full rates for an individual under age 80 with own National Insurance contributions and average total State Pension receipt in 2017 earnings terms, by year



Most people receive a level of State Pension income higher or lower than the full value of the bSP

While the average receipt of State Pension is currently above the full bSP level because of additional State Pension entitlement, most people receive State Pension income either below or above the full rate of bSP:

- Since 2004, more than 50% of pensioners were receiving State Pension income above the full bSP level.
- By May 2016, 42% of pensioners in receipt of bSP, received State Pension income of £25 or more above the full bSP level, and
- In 2017, around 22% of pensioners received State Pension income of £50 or more above the full bSP rate.

On the other hand,

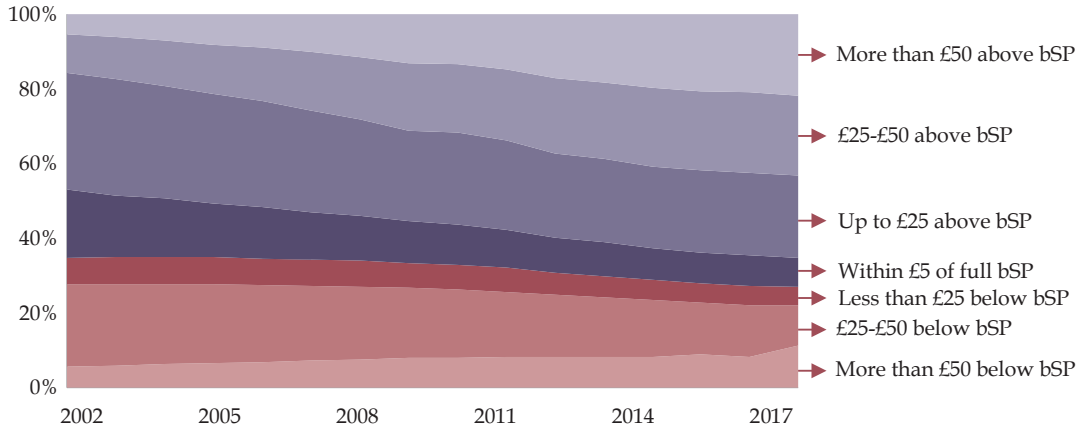
- In 2002, around 35% received an income that was lower than the full bSP by at least £5.
- In 2017, the proportion receiving an income lower than the full bSP by at least £5, was 27% (Chart 6).

34. PPI analysis of DWP (2016) Table 2.1a and ASHE 2017 provisional and ASHE 2016 revised data on gross average weekly pay (Table 1.1a), DWP Spring Budget 2017 expenditure and caseload forecasts, State Pension table

Chart 6[35]

Since 2004, more than 50% of pensioners have received income above the full bSP level

Proportion of people in receipt of basic State Pension income in bands above and below the full level of the bSP, in May of each year, 2002-2017



35. Data sourced from DWP StatXplore tool 12/02/18

Chapter two: what role does the State Pension play in providing adequacy?

This chapter looks at the role of the State Pension in providing adequacy.

There are several ways of measuring adequacy in retirement

Most people want to maintain working life living standards during retirement, though few make sufficient provision to do so. For median earners, around 70% of working life income, net of tax, could allow for similar consumption levels to those experienced during working life while those on lower incomes may need higher replacement rates, of 80% or more. Higher earners can usually maintain living standards on 50% to 60% of working life income.[36]

While working life replacement rates are a useful adequacy measure, they carry potential complications:

- Replacement rates are difficult for people to calculate, understand and plan for, and
- They generally require individuals to maintain a steady income, escalating with earnings, throughout their working life, in order to allow for sufficient contributions and for the estimated target amount to match up with the actual amount required at retirement.

There are other measures of adequacy available:

- Relative poverty: Households with incomes below 60% of yearly median income[37] are considered to be in in relative poverty. Poverty is defined as *having resources well below your minimum needs*.[38]
- The Minimum Income Standard (MIS): The minimum amount required to achieve a socially acceptable standard of living (around £10,000pa for a single pensioner in 2017, excluding rent and childcare).[39]

36. Pensions Commission (2004); The reason that pensioners may not need 100% replacement income in order to maintain similar consumption levels is that for many pensioners, expenses are lower in retirement than they were during working life, due to lower taxes and saving levels
37. UK
38. www.jrf.org.uk/our-work/what-is-poverty
39. JRF (2017a) table 7

- Lifestyle targets: It is possible to calculate target amounts that represent different standards of living. These are easy to understand and allow people a set amount to aim at. Appropriate target amounts are being discussed in the UK, though further work needs to be done on the precise amounts and on creating a national consensus. A current proposal is to use:
  - The MIS as the target for a "minimum" standard of living.
  - Between £15,000pa and £20,000pa for a "modest" standard of living:[40]
  - Between £20,000pa and £30,000pa for a "comfortable" standard of living.[41]

Disabled people and renters will often require higher incomes to achieve adequacy in retirement

Disabled people and renters will often require higher incomes to achieve adequacy

Those who have higher consumption needs might require more than a target level of income in order to achieve a satisfactory standard of living in retirement. Higher consumption needs can arise from many factors such as lack of access to public transport or large discount shops. However, the main indicators which significantly increase consumption in retirement are:

- A household member with a disability: Those with disabilities incur extra expenditure on items and services related to care needs, home adaptions, mobility equipment and transport.[42] Though costs vary, some people may incur costs of up to hundreds of pounds per week.[43]
  - While those with disabilities might be eligible for State benefits, these are not always sufficient to fully cover the costs of disability.[44]
- Renting in retirement: Those who rent in retirement have higher day-to-day living costs than owner occupiers, and pensioners who rent are more likely to be eligible for means-tested benefits.[45] Future pensioners are more likely to be renting than current pensioners:
  - People are buying houses at older ages than they used to and fewer working age people feel they can afford to buy at all. The proportion of 25-34 year olds who are owner occupiers fell from 51.5% in 2008/09 to 38.2% by 2015/16.[46]
  - The number of pensioners renting in the private sector is projected to grow from 370,000 in 2015 to 995,000 by 2035.[47]

40. PLSA (2017) p. 26 One or two short, local breaks a year and infrequent eating out at cheap restaurants; owning an older, less reliable car; affording cask wine, reasonable clothes, discount haircuts, infrequent paid leisure activities; difficulty affording heating and air conditioning; can afford repairs but not redecorating, for example, replacing kitchen or bathroom
41. PLSA (2017) p. 26 One annual holiday in the UK or Europe and frequent eating out; owning a reasonable car; affording bottled wine, good clothes, good haircuts, regular paid leisure activities; can afford to run a range of electronic products and heating/air conditioning; can afford to replace kitchen or bathroom over 20 years
42. Hancock *et. al.,* JRF (2016) p. 8
43. Hancock *et. al.,* JRF (2016) p. 30
44. Hancock *et. al.,* JRF (2016) p. 30
45. PPI (2006) p. 19
46. Department for Housing, Communities and Local Government, Tenure trends and cross tenure analysis, table FA1201
47. Adler & Craw (2017)

Case study: disabilities and/or renting could reduce disposable income

Anna is a 65 year old single woman in receipt of the median income before housing costs of £1,092pm (2015/16).[48]

- If Anna has a disability which requires 14 hours of help per week from a care assistant, costed by the local authority at £24.70 an hour, this would cost £1,498pm. She would need to pay for her own care with any income above £819pm (125% of Guarantee Credit for a single pensioner) so she would need to pay £273pm leaving her with a disposable income (before Council Tax and bills) of £819pm.[49] Some of this care may be subsidised by disability benefit payments.

Beatrice is a 65 year old single woman in receipt of the median income before housing costs of £1,092pm (2015/16).[50]

- If Beatrice pays the median monthly rent of £650pm[51] (2015/16) then her remaining disposable income (before Council Tax and bills) would be £442pm. She may be eligible for Housing Benefit which would subsidise her rent (if she has savings under a certain level).

It is becoming harder to use target rates to define adequacy because retirement is moving from a single event to a transition for some people

It is becoming harder to use target rates to define adequacy because retirement is moving from a single event to a transition for some people

While this report uses several target adequacy rates to illustrate the potential impact of indexation scenarios, single target rates have become less meaningful for some people due to changes in the way people are retiring.

During the last 70 years or so, retirement for many people constituted a single event whereby people left work and received a retirement income for life, either from their State Pension or a combination of State and private pension. For many, retirement remains a cliff-edge event whereby they leave work and take a pension at the same time, however retirement is transitioning towards a staged, flexible, individualised process for some people. This is due to several changes:

- People are healthy for longer and living for longer, on average, then previous generations, which may enable some people to work for longer, though many do not have the opportunity.
- Fewer people are reaching retirement with Defined Benefit (DB) pension entitlement which pays out from a pre-specified age. Retirement ages are correlated with people leaving the labour market, particularly when working for longer does not raise the income that people receive from their pension.
- Members of DB pension schemes are allowed more flexibility than previously and can remain working while starting to take some (or all) of their pension.
- The 2010 removal of the Default Retirement Age[52] means that people can no longer be made redundant solely on the basis of their age, though in some circumstances, people can be made redundant if age factors decrease their ability to perform their job functions.

48. DWP (2017) Table 2.8, median income before housing costs for a single female pensioner under the age of 75, 2015/16 prices terms
49. Case study example figures from Hancock *et. al.* JRF (2016) p. 8, Box 1; monthly rates represent average over the year
50. DWP (2017) Table 2.8, median income before housing costs for a single female pensioner under the age of 75, 2015/16 prices terms
51. Valuation Office Agency, Private Rental Market Statistics, England, 2015-16
52. Age 65

- Rises to the age at which people can take their DB and State Pensions mean that people are incentivised to work for longer to maintain a suitable income, though not all who wish to work longer are able to do so.
- The removal of the requirement to use Defined Contribution (DC) savings to provide a secure retirement income (through an annuity or capped drawdown) means that people can choose to take income in varying amounts rather than withdrawing the same percentage of fund every year.
- Many people, around a quarter of those of working age, feel that they cannot afford to retire, and plan to work beyond SPa, though jobs are not always available for those who need or want them.[53]
- The prevalence of older people working flexibly has increased and the right to request flexible working has been enshrined in legislation alongside an obligation on employers to seriously consider the request. Flexible working at older ages can facilitate people to work for longer despite age related limitations, though not all those who require flexible working are able to access it, particularly those in low skilled and manual jobs.[54]

Because of the above reasons, a single level of income won't necessarily be the best support in retirement for everyone as income needs will vary at older ages when some people are, for example:

- Working full-time,
- Working flexibly,
- Transitioning into retirement, and
- Experiencing changes in health or household circumstances.

There is no consensus about what proportion of retirement income people should receive from the State and what proportion from private pensions

The new State Pension is intended to help reduce means-testing (being set just above Pension Credit) and to provide a foundation for saving into private pensions. However, there is no consensus about whether the State Pension provides a sufficient level of income to achieve its aims, or how much income it is reasonable to expect individuals to generate from private saving.

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In 1998 the Government announced that it intended to move from a position whereby the State provides 60% of people's retirement income (on average) and private sources provides 40%, to a position whereby the State provides 40% and 60% is provided by private sources, though it has not since confirmed whether this is still its goal.[55] Reductions in private sector DB provision are likely to make it harder for people to generate 60% of pension income from private saving, though automatic enrolment will enable more people to save in private pensions in future.

In 2015/16, the average income of pensioner units where the head is aged 75 or over consisted of 55% from State Pensions and benefits, 35% from private pensions, 8% from investments and other sources and 3% from earnings.[56] However, State and private pensions do not offer the same level of efficiency:

- Private pensions have the facility to provide a retirement income which more closely resembles earnings in working life (than State Pension income) and offer greater flexibility, though potentially at a higher cost to the individual.

53. Macleod *et. al.* (2012) p. 98, figure 7.13
54. ILC (2017)
55. Banks, Emmerson, Oldfield (2005) p. 2
56. DWP (2017) table 2.7
57. OECD (2015) Chapter 6, table 6.4

- State Pensions generally provide a more basic level of income though some earnings related income is often included and are more redistributive and less expensive to the individual than private pensions, though cost the State more.

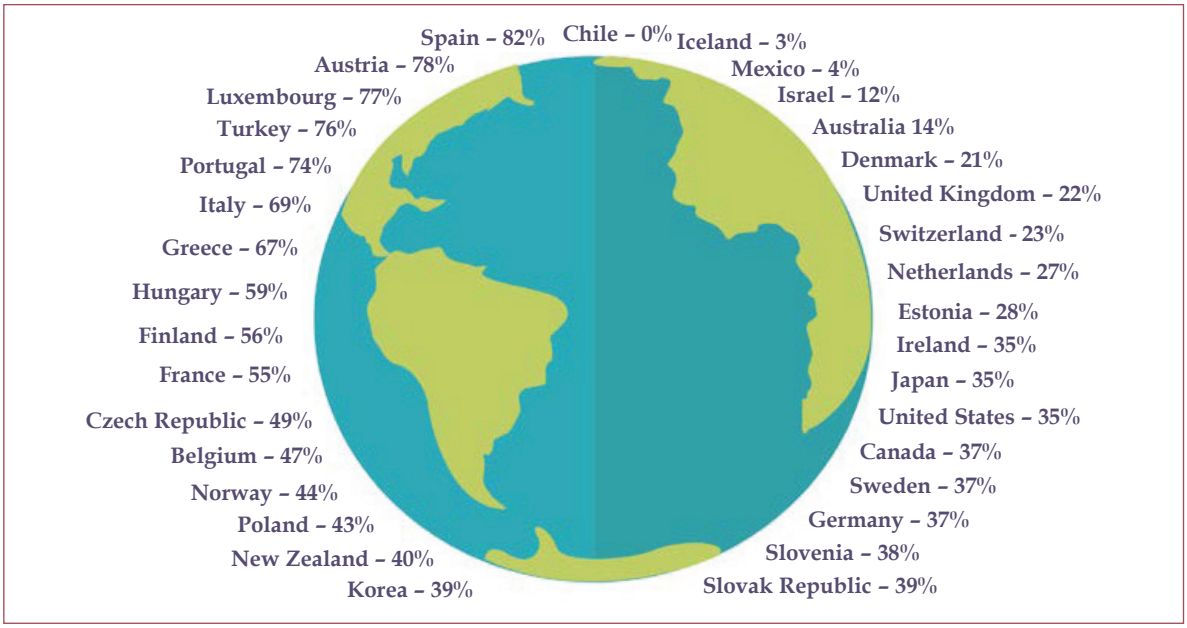
The UK State Pension provides a relatively low replacement rate of average working life income when compared to other OECD countries.

At 22% of average earnings replaced from a combination of basic and additional State Pension, the UK ranks seventh from the bottom in a comparison of OECD countries (Chart 7).

Chart 7[57]

The UK State Pension is relatively low

Gross pension replacement rates from mandatory public pension schemes (State Pensions) in OECD countries in 2015



Whether a working life replacement rate from State Pensions is low or high is subjective and is also affected by the amount of other income and support that people can reasonably expect to receive in addition to State Pension income. For example, if people in a particular country all participate in a private pension scheme from which they are likely to receive at least 46% of National Average Earnings in retirement, it can be assumed that a State Pension supplying 24% of National Average Earnings will be sufficient to allow the average person to replicate working life living standards in retirement from a combination of State and private pension income. Other benefits such as housing and health care, for example, free healthcare through the NHS, will also reduce the amount of income that people will need to support themselves in retirement.

Whether a working life replacement rate from State Pensions is low or high is subjective and is also affected by the amount of other income and support that people can reasonably expect to receive in addition to State Pension income

Chapter three: what are the trade-offs involved in State Pension indexation?

This chapter explores the costs of the triple lock and how changes to indexation could affect people with different characteristics.

While maintaining the triple lock helps people to achieve adequate incomes in retirement, the associated costs are projected to rise over time

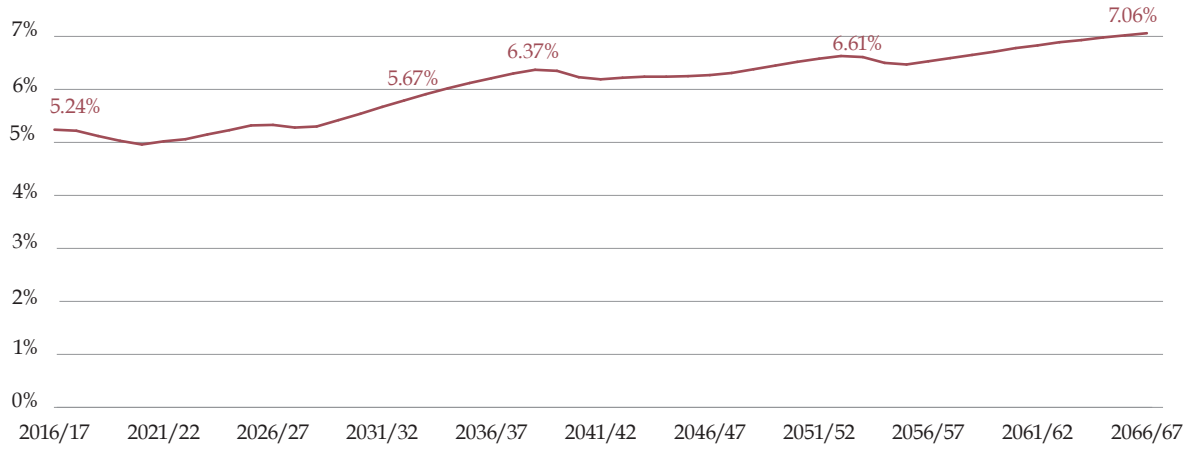
The main driver behind calls for the removal of the triple lock is future costs to the taxpayer.

The triple lock is due to gradually increase above the level of both prices and earnings, and will therefore increase in cost over time. Under current economic assumptions, the Office for Budgetary Responsibility expects State Pension expenditure under the triple lock to cost **7.06% of GDP per year** (Chart 8) by 2066/67, equivalent to around £144bn of today's GDP (£2.04 trillion).[58]

Chart 8[59]

Under the triple lock the State Pension would cost 7.06% of GDP annually by 2066/67

Proportion of GDP spent on State Pensions each year under assumptions of triple lock indexation



While Chart 8 shows the cost of State Pensions increasing over time, the majority of the increase is due to the rising number of pensioners rather than a significant increase in the cost per pensioner. The total cost of State Pensions as a proportion of GDP is projected to increase over time by 31.4% between 2022 and 2050, while the number of pensioners will increase by 37.6%, mainly due to increases in life expectancy.[60]

58. GDP, financial year 2017/18 – £ 2,042,127,000,000 - ONS GDP deflators at market prices, and money GDP, updated 29 September 2017
59. Office for Budgetary Responsibilities Fiscal Sustainability Report, 2017, chart 3.10; does not include SPa rises to age 68 being brought forward, includes many items in addition to the bSP and single tier pension, such as Pension Credit, Winter Fuel Payments and the Christmas Bonus
60. PPI Aggregate Model - These calculations are very sensitive to changes in life expectancy, and projections of future costs could rise or fall as a result of changes to life expectancy projections

People are more dependent on State Pensions as they get older, and will therefore be more sensitive to indexation changes.

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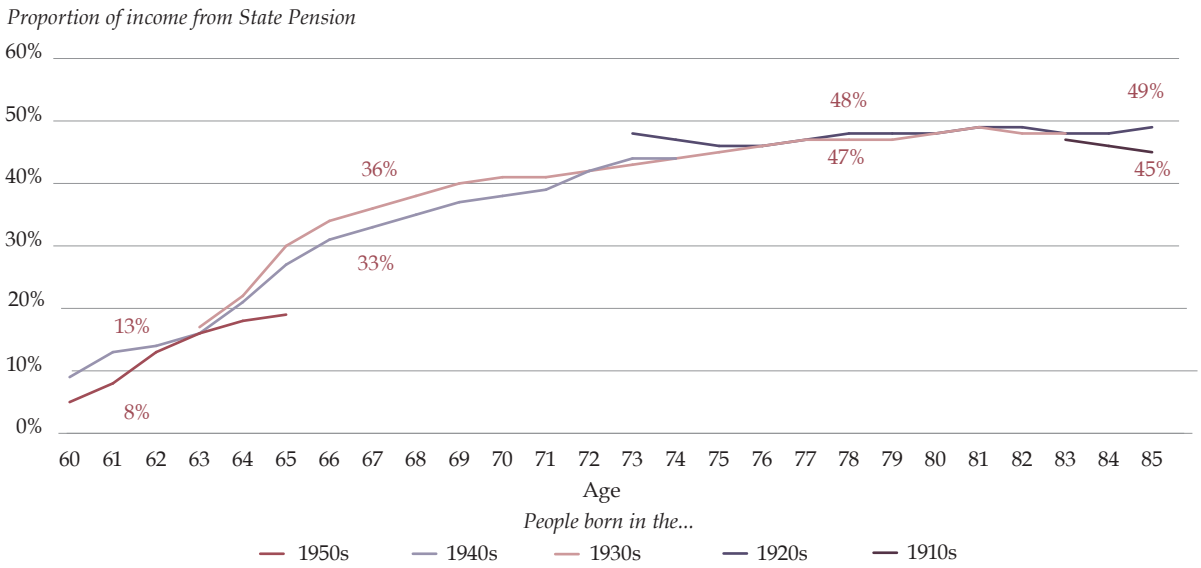
People receive a greater proportion of income from State Pensions as they age, regardless of their year of birth. By the age of 80, the average person is receiving around half of their total income from State Pensions because income from other sources (for example, earnings or private pensions) tends to reduce over time (Chart 9). Therefore, changes to State Pension indexation will have a greater proportional impact on the income of older pensioners.

Chart 9[61]

People experience similar age-based levels of State Pension dependency

Proportion of income from State Pensions by age and cohort: people born in the 1910s, 1920s, 1930, 1940s, and 1950s



Older pensioners are in receipt of lower overall incomes, on average, than younger pensioners. 26% of those aged 65 to 69 are in the top income quintile in 2015/16, compared to 12% of those aged 85 and over. Therefore, changes to the real value of State Pension income will have a greater effect on older pensioners who may be managing on a more limited budget (Table 1).

Table 1: proportion of pensioner households in income quintiles by age, After Housing Costs (2015/16)[62]

	Bottom quintile	Second quintile	Middle quintile	Fourth quintile	Top quintile
Under 65	15%	17%	19%	24%	26%
65 - 69	11%	20%	21%	22%	26%
70 - 74	12%	26%	24%	21%	17%
75 - 79	**14%**	**29%**	**24%**	**19%**	14%
80 - 84	17%	28%	25%	17%	**13%**
85+	19%	24%	24%	20%	12%

61. PPI analysis of ELSA Wave 1-7, average person's income
62. DWP's Households Below Average Income, Table 6.1db

Women will be more sensitive to changes to State Pension indexation on average

Women are more likely than men to have low incomes at older ages. 60% of those in relative poverty over age 65 are women.[63] This is mostly due to women having lower levels of private pension saving than men. Therefore, women at older ages are more likely to be dependent on State Pension income and will be more sensitive to indexation changes.[64]

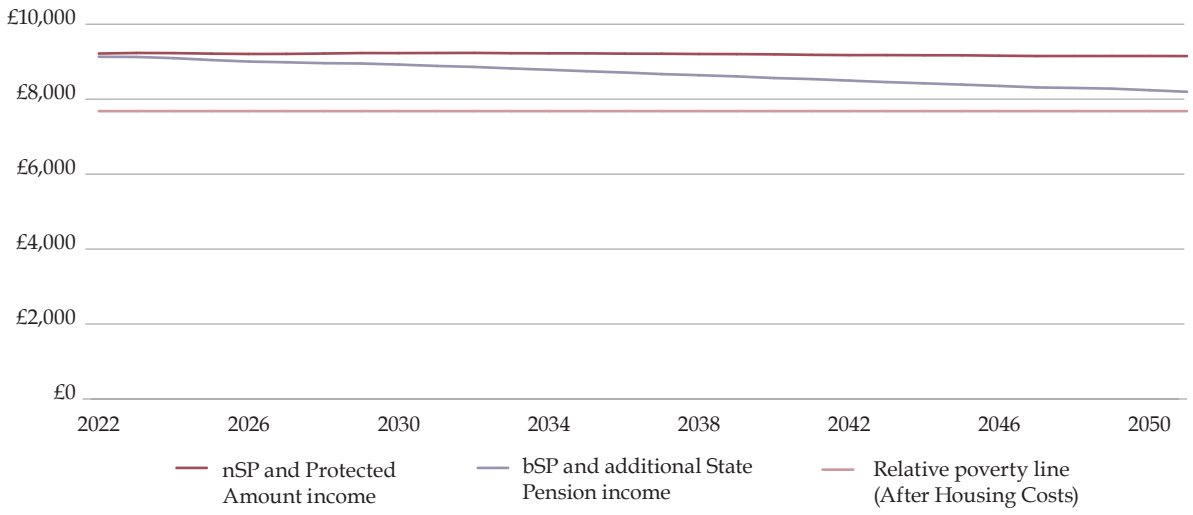
The effects of indexation changes will vary in future according to whether people are receiving income under the bSP or nSP

Those who reached SPa prior to April 6th 2016 will have income that is more sensitive to changes in indexation. Assuming the triple lock remains in place, the average receipt of basic and additional State Pension income will drop closer to the poverty line in every year because a large proportion of the income (additional State Pension) is indexed to prices. The average receipt of basic and additional State Pension could start to fall within less than £1,000 of the poverty line in the mid-2030s, though by this time there will be few pensioners still receiving State Pension under the old system. Those who receive their State Pension from the nSP will not see their income drop so close to the poverty line as a higher proportion will be uprated by the triple lock (Chart 10).

Chart 10[65]

An individual receiving State Pension under the old system experiences income dropping towards the poverty line more quickly despite the triple lock

Triple locked State Pension income for two individuals with identical state pension entitlement, reaching State Pension age on 5th and 6th April 2016 respectively, compared to relative poverty line (2017 earnings terms)



63. DWP's Households Below Average Income, Table 6.3db
64. PPI (2017a)
65. PPI Aggregate Model and Stochastic Scenario Generator, relative poverty line for a single household with no children from DWP's Households Below Average Income, table 2.2.db, uprated to 2017 earnings terms

Some critics argue that the triple lock unduly advantages older people

Some critics of the triple lock have called for its abolition in the name of "intergenerational fairness."[66] The theories behind these calls are that:

- Older adults are currently experiencing higher standards of living than younger people can expect to enjoy when they reach older ages, and that it is unfair to expect younger people to subsidise a higher income for older people through the triple lock.
- Many working age benefits are being frozen or uprated by CPI, and therefore it is not "fair" for only one portion of society to have their benefits uprated by a more generous index.

Not all older people are experiencing a high standard of living and young people have more to gain from the triple lock than older people.

However, not all older people are experiencing a high standard of living and young people have more to gain from the triple lock than older people.

Older pensioners are less likely to be experiencing high standards of living

On average, people over age 60 have seen their income grow more quickly than younger people. Between 2007/08 and 2014/15, the average income for people aged:

- 60 and over grew by 11%,
- 31 to 59 saw virtually no growth at all,
- 22 to 30 fell by 7%.[67]

Most of the growth in the average incomes of those over age 60 arises from changes in labour market behaviour

However, most of the recent growth in the average incomes of those over age 60 arises from changes in labour market behaviour; those who turned 60 after 2007/08 are more likely to be working and have higher pensions on average than those already over age 60. Much of the increase in average incomes derives from earnings and higher pensions for people at and just above age 60.[68] As pensioners age and income from earnings reduces, average overall incomes also decline.

Pensioner poverty has risen from 13% in 2011/12 to 16% in 2015/16

Pensioner poverty has risen from 13% in 2011/12 to 16% in 2015/16

If analysis is restricted to people over State Pension age, then poverty has risen over the last few years. Pensioner poverty was high in 1994/95 at 28%, then fell to 13% by 2011/12. Recently, poverty is rising again for pensioners and was 16% After Housing Costs, in 2015/16.[69]

66. WPSC (2016)
67. IFS (2015)
68. PPI (2017b)
69. DWP (2017b) table 6.3db

In the long-term, the triple lock would benefit younger people more

The triple lock would benefit younger workers more than older workers through higher State Pension levels. As a result of receiving a higher pension and living for longer:

- A median earner aged 30 in 2017 could receive around £216,000 from the triple locked State Pension during his lifetime, compared to
- £190,000 for a man aged 50 in 2017 (2017 earnings terms).

Younger people are also likely to receive a higher proportion from the State Pension relative to the amount they pay through NIcs:

- A 30 year old in 2017 would receive around 179% of what they paid in through NIcs from a triple locked State Pension, in comparison to
- A 50 year old in 2017, who would receive around 166%.[70]

Over time, the proportion of gain for younger people would increase under the triple lock, despite increases in SPa.

Under other indexation scenarios, the generational differences in gain are reduced.

- Under a double lock indexation:
  - A 30 year old man in 2017 would receive around 166% of what he had paid through NIcs from the State Pension.
  - A 50 year old man in 2017 would receive around 159% of what he had paid through NIcs from the State Pension.
- Under an earnings indexation:
  - A 30 year old man in 2017 would receive around 153% of what he had paid through NIcs from the State Pension.
  - A 50 year old man in 2017 would receive around 152% of what he had paid through NIcs from the State Pension.

70. A median earning man, assuming triple lock maintained throughout, assuming average life expectancy at SPa – for underlying data please see Appendix one. NIcs are used to fund not just the State Pension but other areas of the benefits system and the NHS, so the amount paid through NIcs will bring a return in other benefits alongside pensions

Chapter four: how would different indexation scenarios affect individuals and the State?

This chapter analyses the impact of different indexation scenarios on State spending, pensioner poverty and adequacy.

The basic State Pension (bSP) and new State Pension (nSP) may be linked to earnings or the double lock from 2022

The Government intends to retain the triple lock until the end of the current Parliament.[71] The Government is legally required to maintain at least an earnings link for the bSP and the nSP, therefore, if the triple lock is removed, an earnings link will be one of the potential indexation arrangements. The Conservative Party also mentioned in their most recent election manifesto, the possibility of introducing a "double lock", which would increase the State Pension by the higher of earnings inflation or prices (CPI).[72] Therefore, the bSP and nSP could potentially be linked to earnings or the double lock from 2022. There are many other potential ways to index State Pension income,[73] however, as these are the two most likely possible scenarios going forward, alongside the triple lock, the scenario analysis in this report is based on a comparison of these options.

Another potential arrangement, which could be introduced as a way of preventing poverty, would be to maintain the triple lock for bSP, while linking nSP to earnings. As shown in Chapter two, pensioners on bSP and additional State Pension income will see the value of their State Pension income declining more quickly, relative to earnings, because a smaller proportion of their income (bSP) is uprated by earnings or above, and a larger proportion (additional State Pension) is uprated by the CPI.

71. House of Commons Debates, 23 November 2016, column 906, Hansard; Conservative and Unionist Party/Democratic Unionist Party Coalition Agreement 2017

72. The Conservative and Unionist Party Manifesto 2017; *Forward, Together; Our Plan for a Stronger Britain and a Prosperous Future*

73. There are other possible arrangements, for example: 1. An earnings track with built in protection for when earnings are very low or prices very high. This system would uprate the State Pension in line with earnings, except for in any year where prices exceeded earnings, when it would increase with prices. This system would continue unless the value of the State Pension exceeded an original fixed proportion of the value of average earnings; if this happened, indexation would return to earnings (even if prices are higher). The purpose of this system would be to allow pensions to maintain real value with earnings. 2. A rolling average of earnings over three or five year periods, this system would aim to maintain the State Pension value at a percentage of average earnings (e.g., 25%).

Maintaining the triple lock for bSP would slow down the degradation in value of State Pension income for pensioners who reached SPa prior to 6 April 2016.

This chapter explores the impact on the State and on individuals of four indexation arrangements:

- Baseline scenario: In the baseline scenario, the nSP and bSP are both triple locked in perpetuity.
- Scenario 1: Reducing the triple lock to earnings inflation from 2022.
- Scenario 2: Reducing the triple lock to a double lock from 2022.
- Scenario 3: Reducing the triple lock to earnings inflation for the nSP but maintaining triple lock for the bSP from 2022.

The triple lock helps to maintain adequacy but increases the cost to the State

One of the key arguments against the triple lock is that it increases the cost to the tax payer over time by increasing in value (though increases in pensioner numbers also contribute to the rise in costs). This report compares the value of potential costs or savings under each indexation scenario against the potential impact on retirement income adequacy in 2050, when the effect of different indexation scenarios will have had time to develop.

By 2050, a double lock would save around 0.2% per year and an earnings link would save around 0.5% per year

Compared to the baseline of the bSP and nSP being triple locked, by 2050:

- An earnings link would save 0.5% per year,
- A double lock would save 0.2% per year,
- A bSP triple lock/nSP earnings link would save 0.5% per year (Chart 11).

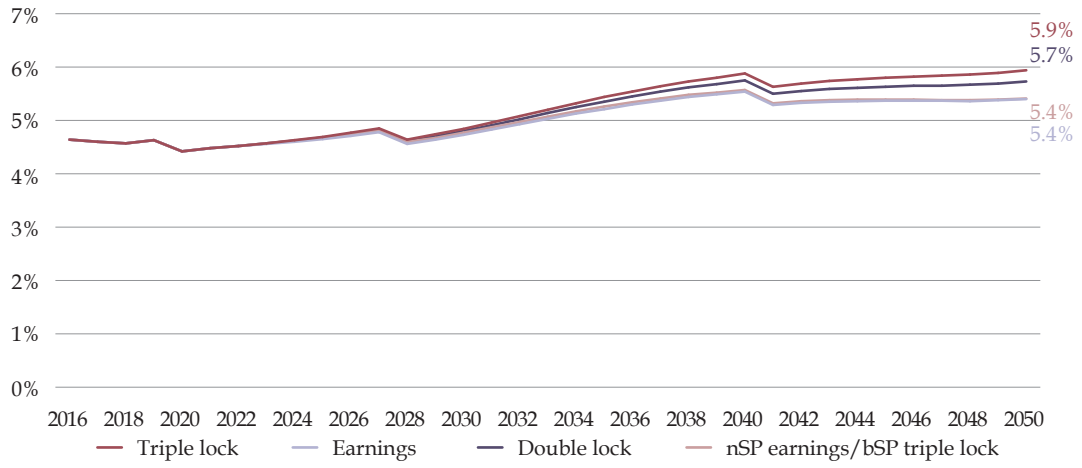
An earnings link would cost less than the other three options, though it would increase the gap between State Pension income and adequacy targets.

While linking nSP to earnings and bSP to the triple lock would originally cost more than an earnings link for both pensions, of around 0.04% of GDP per year, by 2050 it would begin to cost within 0.01% of an earnings link as the proportion of pensioners still in receipt of the bSP would be very low by then (Chart 11).

Chart 11[74]

By 2050, a double lock would save around 0.2% per year and an earnings link would save around 0.5% per year

Cost of State Pension under different indexation scenarios by percent of GDP by year



74. PPI Aggregate Model, cost of State Pension and Pension Credit

While reducing the level of State Pension indexation will save money on expenditure, it could increase spending on means-tested benefits

Alternative indexation scenarios will reduce the expected future incomes of pensioners and increase eligibility for means-tested benefits such as Housing Benefit, Council Tax Reduction, caring benefits and disability premiums on other benefits. Therefore, the real savings to the taxpayer of lower spending on State Pensions will be reduced by the increase in spending on means-tested benefits. Increases in means-tested benefit eligibility may also increase the cost to the State of administering benefits, constituting an additional reduction to savings.

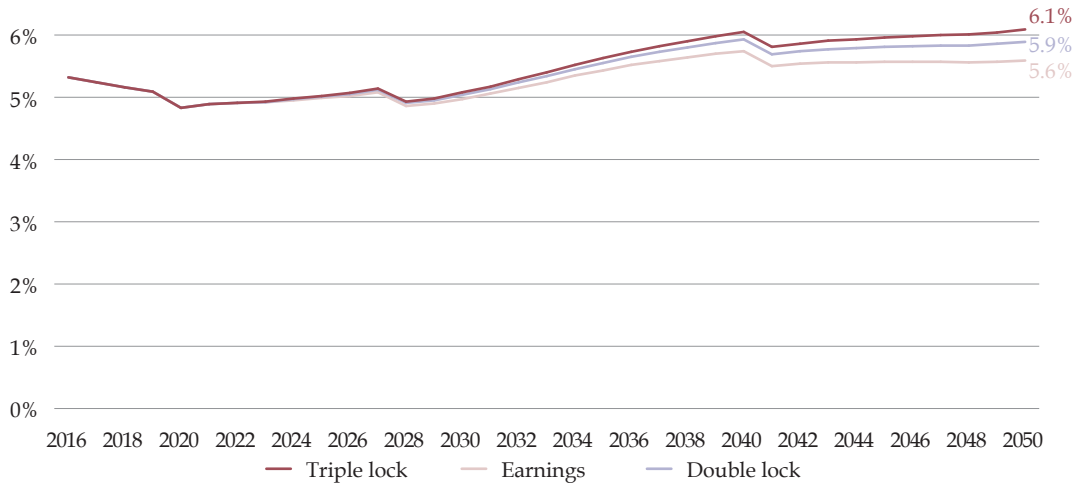
Under State Pension triple lock indexation, the cost of State Pensions, Pension Credit, Winter Fuel Payment, Christmas Bonus, Housing Benefit and Council Tax Reduction would cost 6.1% of GDP per year by 2050.

Under double lock indexation, the annual cost of State Pension and means-tested benefits by 2050 would be 5.9% of GDP and under an earnings indexation, the annual cost would be 5.6%. The savings under an earnings indexation, compared to the triple lock, are reduced by 0.04% when means-tested benefits are taken into account (Chart 12).

Chart 12[75]

An earnings link saves 0.04% less of GDP when means-tested benefits are included in the total costs

Total cost of State Pensions and means-tested benefit spending under different indexation scenarios by percent of GDP by year



Pensioner poverty is projected to be higher under scenarios in which the State Pension is not triple locked, because they will lead to lower growth in the value of base income and fewer pensioners are expected to reach SPa with DB pension entitlement or high levels of DC savings in future which could cushion State Pension income reductions

75. PPI Aggregate Model

Relative poverty among pensioners has increased over the last few years

The proportion of pensioners in relative poverty (on incomes of less than 60% of median UK income) increased from 13% to 16% between 2011/12 and 2015/16.[76] Pensioners with incomes near the poverty line will be more sensitive to indexation changes, especially those whose State Pension income is partly uprated by CPI (those in receipt of additional State Pension or protected payments). Pensioner poverty is projected to be higher under scenarios in which the State Pension is not triple locked, because they will lead to lower growth in the value of base income and fewer pensioners are expected to reach SPa with Defined Benefit (DB) pension entitlement or high levels of Defined Contribution (DC) savings in future which could cushion State Pension income reductions.

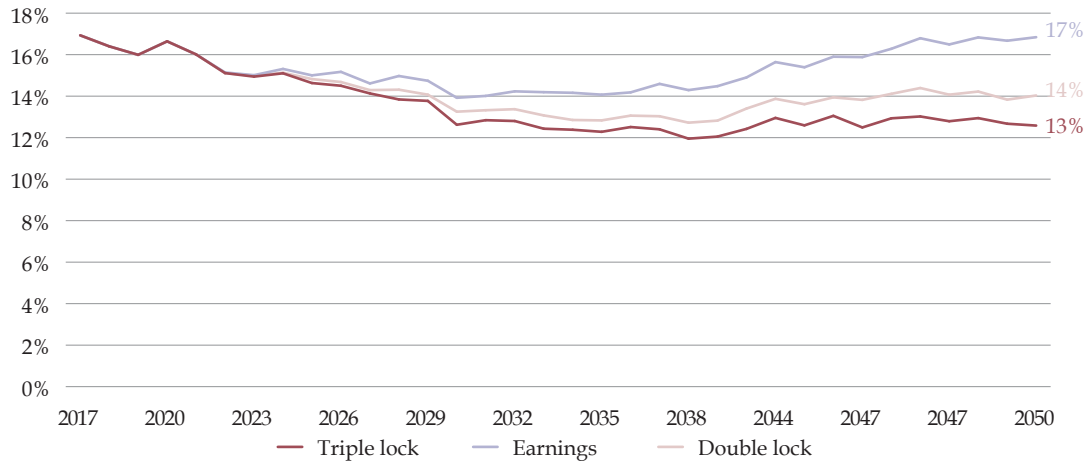
Assuming that the poverty line grows in line with average earnings growth, by 2050, pensioner poverty could be around 1% higher (200,000 pensioners more) under a double lock and around 4% higher (700,000 pensioners more) under an earnings link than under the triple lock (Chart 13).

This analysis does not take account of potential changes to the poverty line between indexation scenarios, and is intended to show the potential difference in impact between indexation scenarios rather than projecting absolute future pensioner poverty rates.

Chart 13[77]

Pensioner poverty is 1% higher under a double lock and 4% higher under an earnings link than under the triple lock, by 2050

Proportion of pensioners in relative poverty After Housing Costs under different indexation scenarios by year



Excluding disability benefits increases poverty by 3% under all indexation scenarios

Disability benefit income is intended to provide for the extra costs associated with having a disability and therefore cannot fairly be considered as disposable income. If disability benefit income is excluded from calculations then poverty among pensioners in 2050 could be around:

- 16% assuming triple lock (around 2.6 million pensioners),
- 1% higher, assuming double lock (around 200,000 pensioners more),
- 4% higher, assuming an earnings link (around 700,000 pensioners more) (Chart 14).

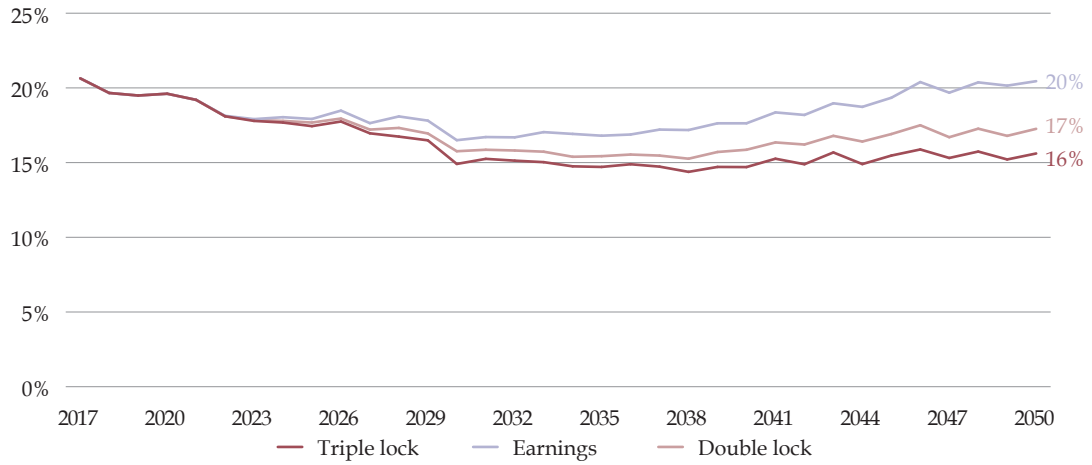
76. JRF (2017c)
77. PPI Aggregate Model

Disability benefit income is intended to provide for the extra costs associated with having a disability and therefore cannot fairly be considered as disposable income

Chart 14[78]

Pensioner poverty could be around 3% higher under all scenarios by 2050 if disability benefits are excluded

Proportion of pensioners in relative poverty After Housing Costs under different indexation scenarios, excluding disability benefits, by year



Those at the lower end of the income distribution will experience greater proportional losses under a double lock or earnings link

Changes to indexation will affect people differently depending on where they are in the income distribution. Those who are at lower levels of the income distribution are likely to be more dependent on State Pension income and therefore will be more sensitive to changes in State Pension indexation.

Under triple lock indexation, median pensioner income in 2050 would be around £20,600pa:

- Median income would fall by £400pa under a double lock and £1,000pa under an earnings link, a 2% and 5% drop in income, respectively.

Under a triple lock, those at the 25th and 10th percentiles of income would receive £14,200 and £10,900pa respectively:

- Under a double lock, income would be reduced by £200pa and £300pa, a drop of 1% and 3%.
- Under an earnings link, income would be reduced by £600pa and £700, a drop of 4% and 7% respectively.

Those at the 10th percentile experience the greatest proportional drop in income as a result of moving to an earnings indexation as they are less able to compensate for State Pension income reductions with other income sources (Chart 15).

78. PPI Aggregate Model

Chart 15[79]

Median pensioner income is £400pa less under a double lock and £1,000pa less under an earnings link than under the triple lock in 2050

Annual income per pensioner units by percentiles under different indexation scenarios in 2050

Indexation scenarios will impact pensioners differently according to their age

Older pensioners are more likely to be dependent on the State Pension and more sensitive to changes in indexation. Under the triple lock in 2050:

- Pensioners aged State Pension age (SPa) to 74 have a median annual income of £21,600pa,
- Those aged 75-79 have a median income of £20,700pa, and
- Those aged 80 and above have a median income of £19,900pa.

Under a double lock, these drop by:

- £400pa for those aged SPa to 75 and aged 75-79, and
- £300pa for those aged over 80.

Under an earnings link, annual incomes drop by:

- £1,000pa for those aged SPa to 75 and aged 75-79, and
- £800[80] for those aged 80 and over (Chart 16).

79. PPI Aggregate Model
80. Numbers may not total due to rounding

Chart 16[81]

Those at higher ages may be more dependent on State Pension income and more sensitive to indexation changes

Annual median income by age under different indexation scenarios in 2017 earnings terms, 2050

Women are more likely to be dependent on the State Pension and will experience a greater proportional loss under a double lock or earnings link than men

Indexation scenarios will impact pensioners differently according to their gender

Women are more likely to be dependent on the State Pension and will experience a greater proportional loss under a double lock or earnings link than men. Men at the 25th percentile experience losses in weekly income of 2% from a double lock and 5% from an earnings indexation, when compared to the triple lock. For men at the 10th percentile, indexation changes result in losses of 3% (double lock) and 6% (earnings).

Women at the 25th percentile experience losses in income of 3% from a double lock and 7% from an earnings indexation, when compared to the triple lock. For women at the 10th percentile, indexation changes result in losses of 3% (double lock) and 7% (earnings) (Chart 17).

81. PPI Distributional Model

Chart 17[82]

Women on lower incomes experience greater drops in income as a result of changes to State Pension indexation

Annual income per head of single men and women by percentiles under different indexation scenarios in 2050

The rest of this chapter considers the potential impact of different indexation scenarios on the income of individuals and how much they might need to save to top their State Pension income up to adequacy targets. Please see the Appendix for details of the modelling and underlying assumptions.

The adequacy target rates are those discussed in previous chapters:

- The Minimum Income Standard (MIS): around £10,000 per annum for a single pensioner in 2017[83]
- Modest standard of living: £17,500 per annum (halfway between the range)[84]
- Comfortable standard of living: £25,000 per annum (halfway between the range)[85]
- Target replacement rate: a level of income which allows people to replicate their working life living standards when they are in retirement (these vary between individuals).

While these scenarios project the proportion of earnings that people would need to save in order to achieve adequacy targets, the scenarios rely on people using their savings to purchase an annuity. In reality, many people will withdraw their savings in lump sums and/or purchase drawdown products as well as or instead of buying an annuity. Some people might spend down their savings after age 55, meaning that even if they have saved a sufficient amount to provide themselves with an adequate income in retirement, they might not use the savings in a way which would realise that income.

The scenarios also assume that people contribute in every year until SPa from age 22 or age 40. In reality, many people take employment or contribution breaks during working life as a result of the need to provide care, health problems, unemployment or financial pressures.

Women in particular, are more likely to spend time out of the labour market or work flexibly in order to provide care for children or other family members:

- Only 25% of women born between 1920 and 1949 worked mostly full-time from age 16 to age 54, and
- 64% either spent most of their life out of the labour market or had working histories characterised by combinations of paid employment and family care.[86]

82. PPI Distributional Model
83. JRF (2017a) table 7, excluding rent and childcare
84. PLSA (2017) p. 26
85. PLSA (2017) p. 26
86. PPI *et. al.* (2017)

Gender differences in the labour market have resulted in women having lower private pension savings on average than men.[87] Female pensioners are less likely to meet adequacy targets and are more likely to be in poverty.

Younger women are spending more time in the labour market than previous generations though their private pension savings are still likely to be impacted by lower than average wages, time out for care and gendered approaches to saving.

The hypothetical low, median and high earning individuals are assumed to:

- Work from age 22 to SPa and earn at the same level throughout their working lives,
- Accrue a full new State Pension,
- Reach SPa in 2047, around 20 years from today.

Under an earnings indexation, low earners might need to contribute an average of 1.3% of salary more in order to achieve adequacy targets, when compared to the triple lock

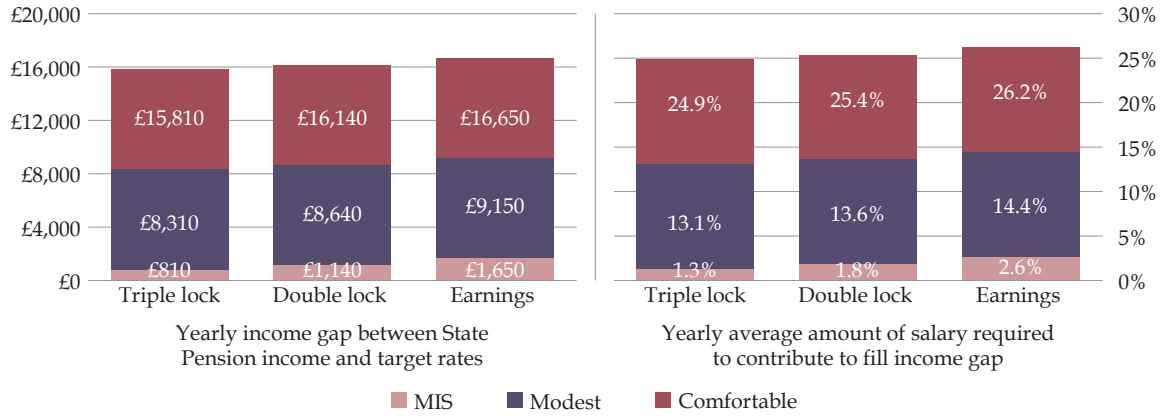
Under an earnings indexation, low earners would need to contribute around 1.3% more of their salary per year on average from age 22 to achieve an income at the Minimum Income Standard, modest or comfortable levels, when compared to the triple lock.

- Those who spend less time contributing or start contributing later would need to contribute at higher amounts in order to achieve adequacy targets. A low earner contributing from age 40 would need to contribute 2.7% a year on average, around £540pa.
- Under a double lock, a 22 year old would need to contribute around 0.5% more on average, around £100pa extra, and a 40 year old would need to contribute around 1.1% more per year, around £220pa extra (Chart 18 & Table 2).

Chart 18[88]

Low earners may need to contribute around an extra 1.3% of salary to achieve adequacy targets under an earnings indexation than under the triple lock

Required average yearly contribution of salary needed when contributing from age 22 to top up to different target income levels under different indexation scenarios for a low earner reaching SPa in 2047



87. PPI *et. al.* (2017) p. 1
88. PPI Individual Model

Table 2: required average yearly contribution of salary needed when contributing from age 40, to top up to different target income levels under different indexation scenarios for a low earner reaching SPa in 2047

	Minimum	Modest	Comfortable
Triple lock	2.7%	27.6%	52.4%
Double lock	3.8%	28.7%	53.5%
Earnings	5.5%	30.4%	55.2%

A low earner might need to contribute an average of 4.3% of salary each year to achieve her target replacement rate income under a triple locked State Pension

A low earner (earning at the 30th percentile) reaching SPa in 2047 would need to contribute an average of 4.3% of salary per year to achieve a replacement rate of £11,900 if contributing from age 22 under triple lock indexation. From age 40, she would need to contribute an average of 9.1% per year.

- Under a double lock, a low earner would need to contribute an extra 0.5% (from age 22) and an extra 1.1% per year (from age 40), an increase of around £100 to £220pa extra.
- Under an earnings link, she would need to contribute an extra 1.3% (from age 22) to 2.8% (from age 40) more per year, an increase of around £270pa extra to £560pa extra (Chart 19 & Table 3).

Chart 19[89]

A low earner might need to contribute an average of between 4.3% and 5.6% of salary from age 22 to achieve their target replacement rate, under different scenarios of indexation

Amount needed to top up to target replacement rate of £11,900 per year and average contributions from age 22 required to reach that amount for a low earner reaching SPa in 2047 (2017 earnings terms)

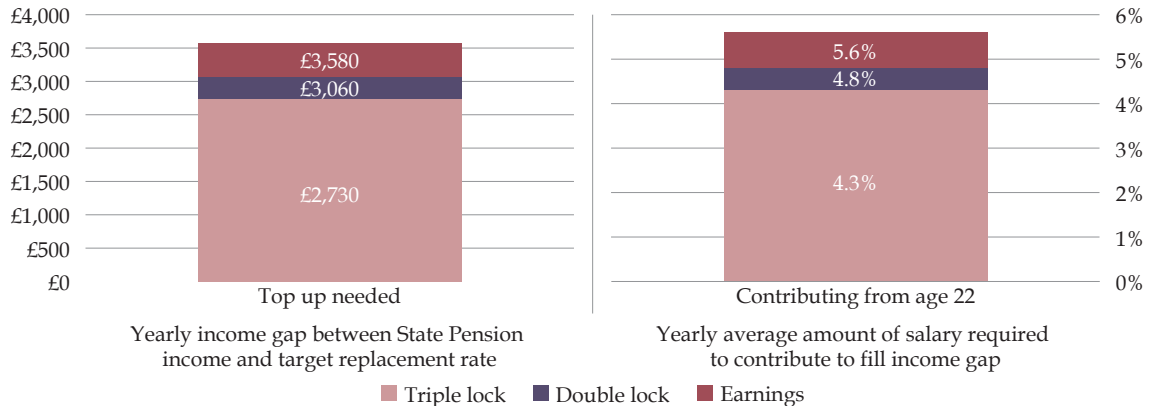


Table 3: required average yearly contribution of salary needed when contributing from age 40, to maintain living standards in retirement under different indexation scenarios for a low earner reaching SPa in 2047

	Target working life replacement rate
Triple lock	9.1%
Double lock	10.2%
Earnings	11.9%

89 PPI Individual Model

Median earners might need to contribute between 0.3% and 0.9% extra per year, on average to achieve adequacy targets under a State Pension which is not triple locked

Median earners will not need to increase contributions in order to meet pre-set adequacy targets as much as low earners because a lower proportional increase is needed to achieve the same savings amount.

- Under a double locked State Pension, a median earner (reaching SPa in 2047) would need to contribute an average of 0.3% more per year if contributing from age 22 and 0.7% per year if contributing from age 40, in order to meet adequacy targets. This represents an increased annual contribution of between £110pa extra and £220pa extra.
- Under an earnings linked State Pension, a median earner would need to contribute an average of 0.9% more per year if contributing from age 22 and 1.7% more per year if contributing from age 40, in order to meet adequacy targets. This represents an increased annual contribution of between £290pa extra and £570pa extra (Chart 20 & Table 4).

Chart 20[90]

Median earners may need to contribute an extra 0.3% - 0.9% on average per year in order to achieve adequacy targets under different indexation scenarios

Amount needed to top up to different target income levels under different indexation scenarios and average amount needed to contribute from age 22 to reach that amount for a median earner reaching SPa in 2047

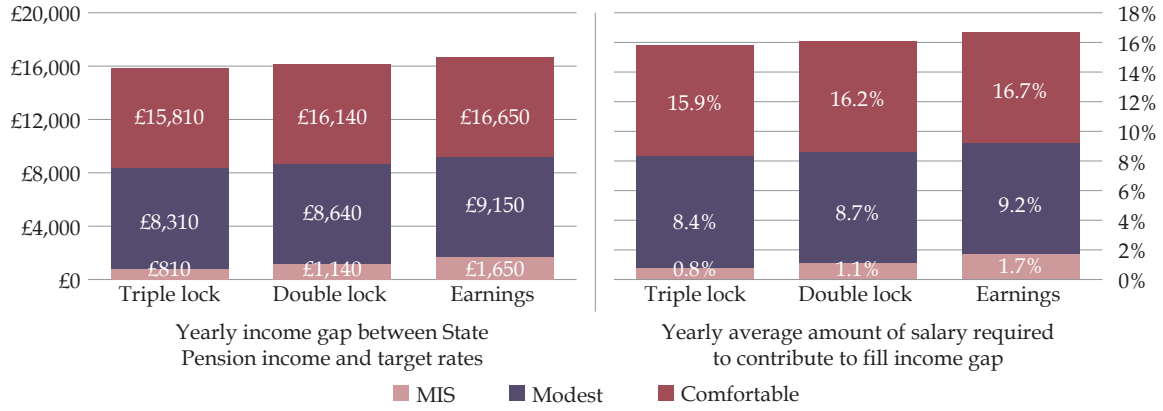


Table 4: required average yearly contribution of salary needed when contributing from age 40, to top up to different target income levels under different indexation scenarios for a median earner reaching SPa in 2047

	Minimum	Modest	Comfortable
Triple lock	1.6%	16.5%	31.5%
Double lock	2.3%	17.2%	32.1%
Earnings	3.3%	18.2%	33.2%

90 PPI Individual Model

A median earner might need to contribute an average of 6.7% of salary each year to achieve his target replacement rate income under a triple locked State Pension

Median earners will have higher target replacement rates than low earners and the State Pension will provide a lower proportion of this income. Therefore, median earners will need to save a higher proportion of salary in order to achieve their target replacement rates.

- A median earner reaching SPa in 2047 would need to contribute an average of 6.7% of salary per year to achieve a replacement rate of £15,800 if contributing from age 22. From age 40, he would need to contribute an average of 13.2% per year.
- Under a double lock, he would need to contribute an average of 0.3% and 0.7% more per year, an increase of around £110pa extra to £220pa extra.
- Under an earnings link, he would need to contribute an average of 0.9% to 1.7% more per year, an increase of around £290pa extra to £570pa extra (Chart 21 & Table 5).

Chart 21[91]

Median earners may need to contribute between 6.7% and 7.5% to achieve target replacement rates under an earnings indexation

Amount needed to top up to target replacement rate of £15,800 per year and amount of contributions required to reach that amount for a median earner reaching SPa in 2047 (2017 earnings terms)

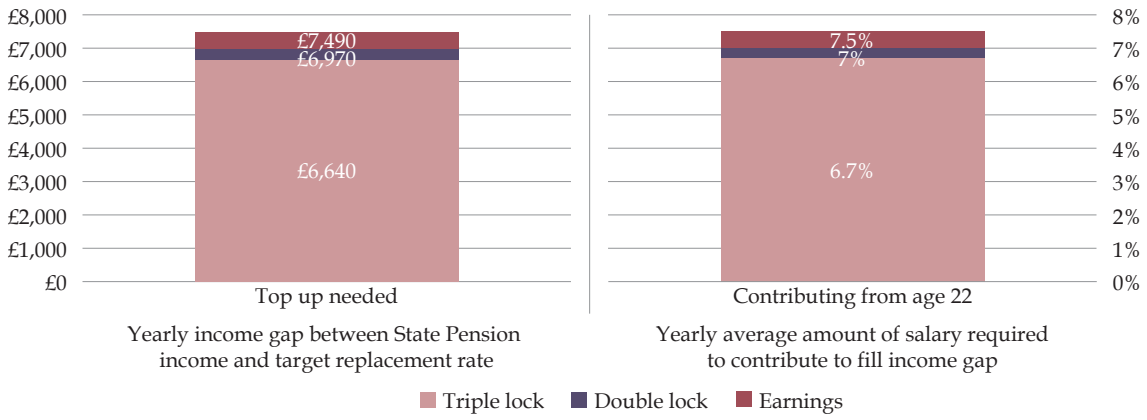


Table 5: required average yearly contribution of salary needed when contributing from age 40, to maintain living standards in retirement under different indexation scenarios for a median earner reaching SPa in 2047

	Target working life replacement rate
Triple lock	13.2%
Double lock	13.9%
Earnings	14.9%

91 PPI Individual Model

Higher earners might need to contribute between 0.2% to 0.6% more in order to achieve adequacy targets under a State Pension which is not triple locked

Higher earners will not need to increase the proportion of salary contributed in order to meet pre-set adequacy targets as much as low and median earners under different indexation scenarios because a lower proportional increase is needed to achieve the same savings amount.

- Under a double locked State Pension, a high earner (earning at the 90th percentile and reaching SPa in 2047) would need to contribute an average of 0.2% more per year (than under the triple lock) if contributing from age 22 and 0.4% per year if contributing from age 40, in order to meet adequacy targets. This represents an increased annual contribution of between £110pa extra and £210pa extra.
- Under an earnings linked State Pension, a high earner (reaching SPa in 2047) would need to contribute an average of 0.6% more per year if contributing from age 22 and 1.1% per year if contributing from age 40, in order to meet adequacy targets. This represents an increased annual contribution of between £280pa extra and £540pa extra (Chart 22 & Table 6).

Chart 22[92]

Indexation arrangements have a lesser effect on adequacy targets for higher earners than for low and median earners

Required average contribution of salary needed, when contributing from age 22, to top up to different target income levels under different indexation scenarios for a high earner reaching SPa in 2047

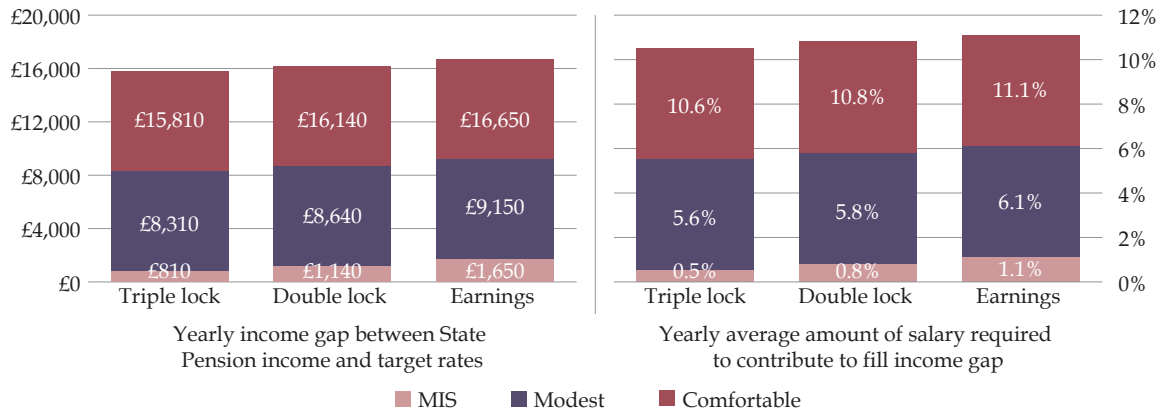


Table 6: required average yearly contribution of salary needed when contributing from age 40, to top up to different target income levels under different indexation scenarios for a high earner reaching SPa in 2047

	Minimum	Modest	Comfortable
Triple lock	1%	10.8%	20.5%
Double lock	1.5%	11.2%	21%
Earnings	2.1%	11.9%	21.6%

92 PPI Individual Model

A higher earner might need to contribute around 12.2% in order to achieve her target replacement rate income under a triple locked State Pension

Higher earners will have higher target replacement rates than median and low earners and the State Pension will provide a lower proportion of this income. Therefore, higher earners will need to save a higher proportion of salary in order to achieve their target replacement rates.

- Under a triple locked State Pension, a high earner reaching SPa in 2047 would need to contribute an average of 12.2% of salary per year to achieve a replacement rate of £27,500 if contributing from age 22. From age 40, she would need to contribute an average of 23.8% per year.
- Under a double lock, she would need to contribute an average of 0.2% and 0.4% more per year, an increase of around £110pa extra to £210pa extra.
- Under an earnings link, she would need to contribute an average of 0.6% to 1.1% more per year, an increase of around £280pa extra to £540pa extra (Chart 23 & Table 7).

Chart 23[93]

Indexation arrangements have a lesser effect on adequacy targets for higher earners than for low and median earners

Required average contribution of salary needed, when contributing from age 22, to top up to different target income levels under different indexation scenarios for a high earner reaching SPa in 2047

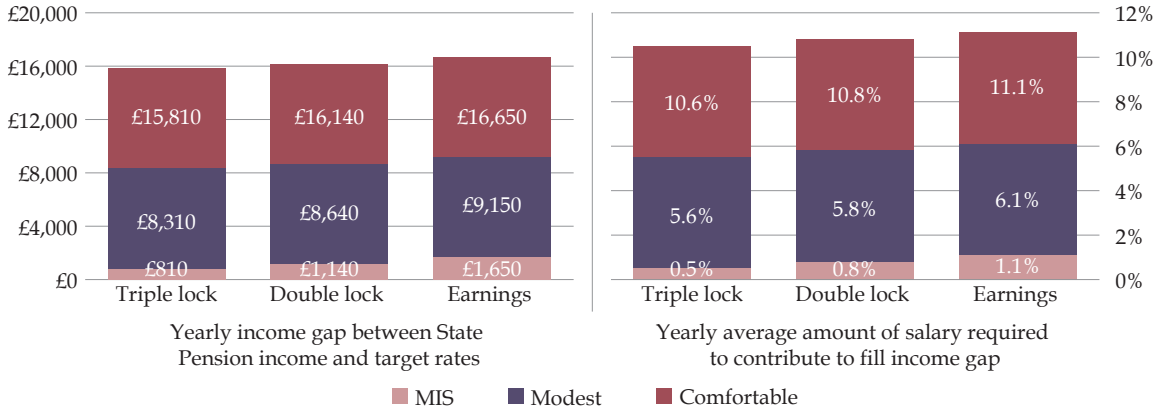


Table 7: required average yearly contribution of salary needed when contributing from age 40, to maintain living standards in retirement under different indexation scenarios for a median earner reaching SPa in 2047

	Target working life replacement rate
Triple lock	23.8%
Double lock	24.2%
Earnings	24.9%

93 PPI Individual Model

Automatic enrolment will enable many more people to save in private pensions and will help more people to meet adequacy targets, though eligibility is not universal and not all those saving through automatic enrolment will make sufficient contributions to meet targets. Changes to automatic enrolment policy which extend eligibility and raise minimum contribution levels could help more people to meet adequacy targets. However, increasing minimum contribution levels or bringing in more people with low incomes could lead to higher opt-out rates or financial hardship for those who struggle to afford contributions.

Automatic enrolment will enable many more people to save in private pensions and will help more people to meet adequacy targets, though eligibility is not universal and not all those saving through automatic enrolment will make sufficient contributions to meet targets

Chapter five: what is the role of the State Pension?

This chapter discusses the role of the State Pension to date and going forward.

In order to measure the real impact of different policy options it is important to define the role of the State Pension

There are two main aims for a State Pension

In order to measure the real impact of different policy options it is important to define the role of the State Pension. However, there is no clear consensus on what that role should be and its stated aims have fluctuated. Over time the State Pension has played both a basic income role and a role of maintaining living standards. Under the two main potential aims of a State Pension, different policy approaches are appropriate:

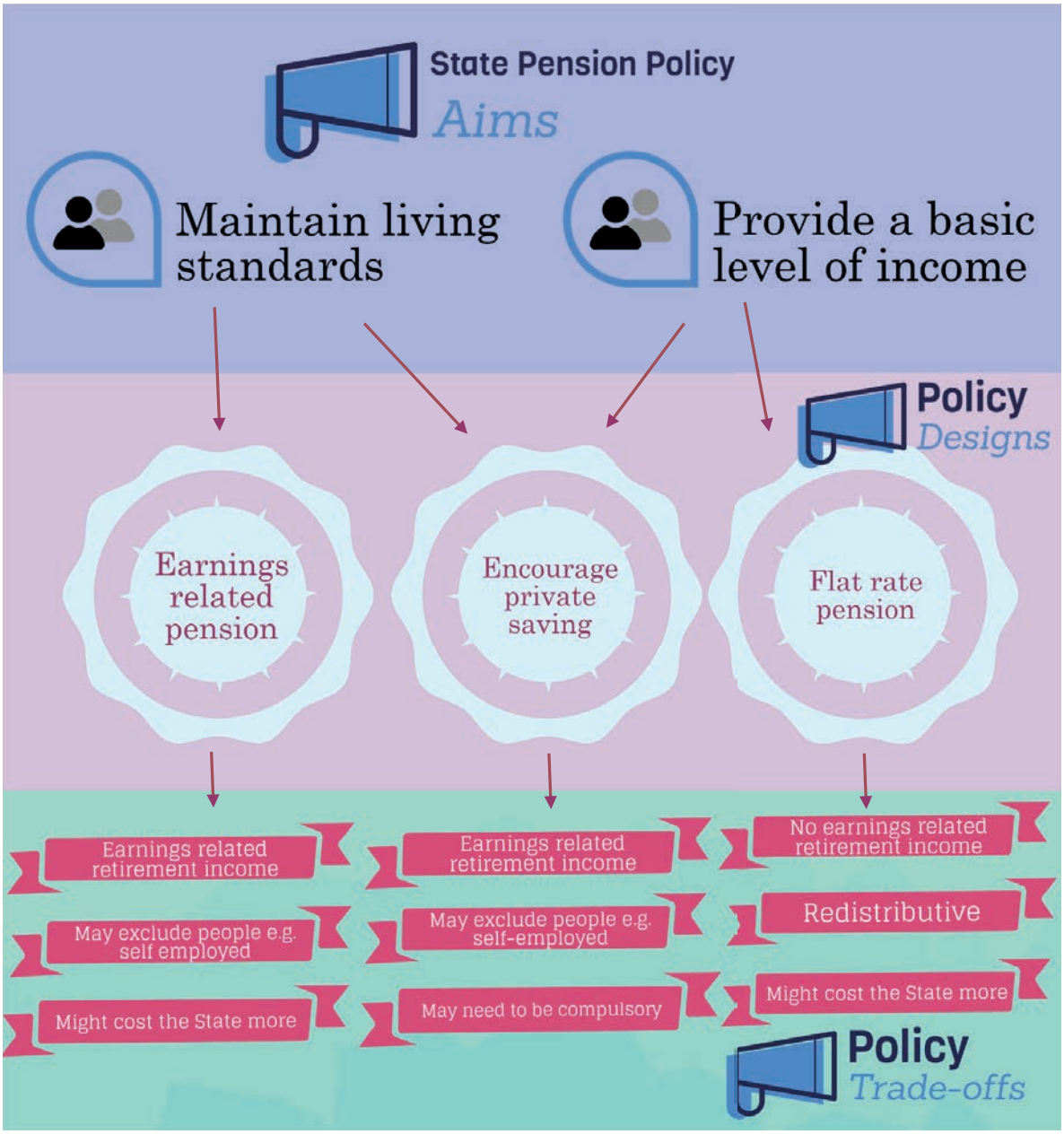
- **Avoidance of poverty**
  - If it is determined that pensioner poverty is due to poor decision making during people's working lives, then policymakers are likely to explore ways to facilitate more saving during working life and better use of savings during retirement, backed up by a basic level of State Pension.
- If it is determined that pensioner poverty is due to circumstances beyond people's control, then means-tested or flat rate benefits (including State Pension), correctly applied, will be a more effective way of preventing poverty.[94]
- **Maintaining living standards**
  - This could be defined as ensuring that people have either a specific target rate of income or a proportion of their working life income that lets them maintain working life living standards in retirement. Policy approaches could include one, or a combination of, flat rate State Pension, earnings related State Pension and policies encouraging saving.[95]

There are trade-offs involved in the different policy approaches:

- A system encouraging saving:
  - Could help people to better achieve target rates which relate to their own earnings levels during working life.
  - May not extend coverage to people who are unable to save due to unemployment or low earnings.
  - Might need to be compulsory to ensure comprehensive coverage.
- A system of benefits:
  - Would be redistributive across the earnings distribution, ensuring that those on lower incomes are able to achieve a suitable income in retirement.
  - Might represent a greater costs to the State, though some of the cost could be supplemented through higher National Insurance contributions (NIcs).
  - May complicate the system.
  - Could discourage private saving (Figure 1).

94. IFS (2010) p. 6
95. IFS (2010) p. 6

Figure 1



The State Pension was originally designed to prevent poverty in older age

The basic State Pension (bSP) was introduced as a flat rate, non means-tested, contributory benefit in 1948. It had the aim of preventing poverty among older people by providing them with a subsistence level of income just above a measure of absolute poverty.[96]

The rise of private pension schemes encouraged the development of an earnings related pension

By the late 1950s, employer run Defined Benefit (DB) schemes had become more common, though around two thirds of employees remained without a scheme, and depended on the bSP in retirement. The development of DB schemes encouraged calls for an earnings related element of State Pension and were the genesis of the earnings related Graduated Retirement Benefit (GRB) scheme, introduced in 1961.[97]

96. IFS (2010) p. 8

97. Introduced as Graduated Retirement Benefit, then State Earnings Related Pension, the State Second Pension

From 1961, the State Pension aimed to both alleviate poverty and help people maintain living standards

The more comprehensive State Earnings Related Pension (SERPS) was introduced in 1975,[98] and aimed to provide an earnings related pension for those not covered by employer schemes alongside the flat rate bSP.[99] SERPS aimed to pay people an income of around 25% of working life income (within a band of earnings) in addition to their bSP income.

The introduction of earnings related schemes changed the purpose of the State Pension from providing a basic level of income to both basic income and maintaining living standards in retirement.

There were concerns about the cost of providing the earnings related State Pensions

During the 1980s, due to rapid increases in the number of people reaching SPa and living for longer, the Government began to become concerned about the cost of paying SERPS in future. The Government also wanted to ensure that the State Pension did not act as a disincentive to save in the growing number of private Defined Contribution (DC) pension schemes offered by employers.[100]

The Government initially considered abolishing SERPS, however this move was opposed by the opposition party of the time and other groups representing older people. Instead, the Government put in place legislation to reduce the proportion of working life income that people could accrue from 25% to 20%, over a phased process. The reform also extended the right to contract out to people who were members of a private pension scheme that was not employer run.

Over time the additional State Pension became more redistributive, diluting the earnings related elements and rebalancing towards basic income

In 2002, SERPS was replaced by the State Second Pension (S2P), though people could still receive income from entitlements built up under GRB and SERPs. The aim of S2P was to provide a more redistributive Second Tier pension through providing a flat rate element which would benefit lower earners (when compared to SERPs). S2P also aimed to increase incentives for people to save in private pensions. S2P was scheduled to become a wholly flat rate benefit by around 2030.[101]

The introduction of the nSP brought the aim of the State Pension back to providing a basic level of income

In 2016, the new State Pension (nSP) replaced both the bSP and S2P with a single tier, flat rate benefit pension (though previous entitlements are honoured). The full level of nSP is worth around the same, in earnings terms, as the flat rate, single tier bSP was in its 1948 introduction. Therefore, the nSP can be seen as a return to the policy aims of 1948, when the State Pension was intended to alleviate poverty. The Government now aims, through automatic enrolment and other private pension policies, for people to rely on private pensions for an earnings related income in retirement, which the State Pension will provide a minimum base for.

The role of the State Pension is not widely understood by those contributing to it

98. Because GRB was unable to prevent enough pensioners falling back on means-tested benefits, Thurley (2013) p. 7
99. Those who were members of company schemes could contract out of paying NIcs towards SERPS on the understanding that they would receive an earnings related pension from their private pension scheme.
100. Thurley (2013) p. 8
101. DSS (1998) pp. 5 & 49

The role of the State Pension is poorly understood though the nSP aims to help increase knowledge

The role of the State Pension is not widely understood by those contributing to it. In 2012, only 26% of 18-69 year olds had at least a "basic knowledge" of the State Pension.[102] Many working age people expect the State Pension to provide sufficient income for a comfortable retirement, while others believe that the State Pension might not exist by the time that they retire.[103] Without a comprehensive understanding of how the State Pension works and the role that it is intended to fulfil, it can be difficult for people to know how much income they might need from private pensions or other sources to top up their income in retirement.

One of the purposes of the simpler nSP system is to raise levels of trust and understanding of the State Pension among people of working age.[104]

The aim of the State Pension has migrated from providing a basic level of income to maintaining living standards and then back again

Under none of the indexation scenarios, does the State Pension provide full protection from poverty, or sufficient support to maintain living standards

The aim of the State Pension has migrated from providing a basic level of income to maintaining living standards and then back again. The Government intends the nSP to provide a minimum base of income for people to top up with private pension. However, it is not clear whether this minimum base is intended to prevent poverty, allow people to achieve a minimum acceptable standard of living or contribute some income to an earnings top up.

Under all of the scenarios, some pensioners still experience poverty in retirement and many will need to save in private pensions in order to achieve a minimum acceptable standard of living or higher. In order for the implications of potential changes to State Pension indexation to be properly assessed, there needs to be greater clarity on the purpose, role and aim of the State Pension.

Under all of the scenarios, some pensioners still experience poverty in retirement and many will need to save in private pensions in order to achieve a minimum acceptable standard of living or higher. In order for the implications of potential changes to State Pension indexation to be properly assessed, there needs to be greater clarity on the purpose, role and aim of the State Pension.

102. MacLeod et. al. (2012) p. 82, para 6.6.1
103. MacLeod et. al. (2012) p. 36, para 3.3.1; Vickerstaff et. al. (DWP) (2012); Telegraph 02.12.14 *State Pension 'extinct in 30 years', warn one in six MPs;* Telegraph 27.12.12 *Pensions will not exist by 2050, expert warns*
104. DWP (2013)

Appendix one: assumptions and modelling

This report contains projections of individual and aggregate outcomes from the PPI's Suite of pension models. The models used are detailed below. Results are presented in 2017-18 earnings terms and rounded to reflect uncertainty (components may not sum to totals because of rounding).

Summary of modelling approach

Outcomes for illustrative individuals have been modelled using the PPI's Individual Model. This has been used to deterministically project outcomes for a representative individual, reflecting working patters, earnings levels, the pensions and benefits system and their individual saving.

The cost to the Government of supporting the State Pension has been modelled using the PPI's Aggregate Model. This has been used to deterministically project the labour market and pensioner populations to calculate private pension saving and State Pension entitlement.

Means-tested benefits and poverty levels have been modelled using the PPI's Distributional Model. This integrates with the Aggregate Model's average pensioner impacts to project changes to the distribution of pensioner incomes. This identifies the portion of the pensioner population who are projected to be entitled to means-tested benefits or to meet particular income thresholds.

Modelling assumptions

The pension and benefits system

The pension system modelled is as currently legislated and as has historically operated. The triple lock is assumed to be maintained indefinitely unless an alternative uprating system is explicitly applied from the end of the current Parliamentary term in 2022. The taxation and benefits system modelled is as currently legislated and as has historically operated. The decentralisation of means-tested Council Tax and Housing Benefits is assumed to be neutral as well as the introduction of Universal Credit to these items.

Economic assumptions

Historical assumptions

Historical economic figures, including earnings levels and inflation are taken from ONS statistics.

Historical pension fund returns have been derived from equity and bond performance since 1960 published in the Barclay's equity gilt study.

Future economic assumptions

Future economic assumptions used in projection are taken from the Office for Budget Responsibility's (OBR) Economic and Fiscal Outlook (EFO) (for short-term assumptions) and Fiscal Sustainability Report (for long-term assumptions).

To assess the premium of State Pension uprating above earnings Monte Carlo simulation has been used to assess the ratcheting effect of both the triple and double lock using the PPI's Economic Scenario Generator. This has been benchmarked against the OBR's calculated triple lock premium of 0.36% above earnings.

Fund charges are assumed to be 0.5% for DC/master trust schemes set up for automatic enrolment.[105]

Long-term earnings growth is assumed to be 4.2%, and other economic assumptions are taken in line with OBR assumptions, derived from their 2017 Fiscal Sustainability Report, 2017 Economic and Fiscal Outlook and 2018 update to long-term assumptions. The earnings band for automatic enrolment contributions and minimum salary assumption are assumed to grow with average earnings.

The PPI's Economic Scenario Generator

The PPI's Economic Scenario Generator (ESG) is used to produce randomly generated future economic scenarios based upon historical returns and an assumption of the median long-term rates of return. It was developed by the financial mathematics department at King's College London. It is used to test how the distribution of outcomes is influenced by the uncertainty of future economic assumptions.

Key results

The model generates projected future inflation rates, and earnings growth

- Inflation rates
  - Future CPI increases and earnings inflation rates
- Investment returns
  - Returns are produced for the major asset classes of equity, cash and gilts

This produces nominal returns which can be combined to produce investment returns for a more complex portfolio.

Application of output

The output of the ESG is a number of economic scenarios which are employed by the PPI's other models to analyse the distribution of impacts on a stochastic economic basis.

Key data sources

The specification of the model is based upon historical information to determine a base volatility and future assumptions to determine a median future return:

- Historical returns: Historical yields and returns as well as inflation measures are used to determine the key attributes for the projected rates
- Future returns: Future returns are generally taken from the Office for Budget Responsibility Economic and Fiscal Outlook to ensure consistency with other assumptions used in the model for which the economic scenarios are being generated. Volatility can also be scaled against historical levels.

Summary of modelling approach

The six identified risk factors modelled are:

G	Nominal GDP
P	CPI
W	Average weekly earnings
Y^l	Long-term yields
Y^s	Money market yields
S	Stock returns

Using these variables, a six dimensional process, x_t is defined.

$$x_t = \begin{bmatrix} \ln G_t - \ln G_{t-12} \\ \ln(P_t - \ln P_{t-12} + 0.02) \\ \ln W_t - \ln W_{t-12} \\ \ln\left(e^{Y_t^l} - 1\right) \\ \ln\left(e^{Y_t^s} - 1\right) \\ \ln S_t \end{bmatrix}$$

Where t denotes time in months.

The development of the vector x_t is modelled by the first order stochastic difference equation:

$$\Delta x_t = A x_{t-1} + a + \varepsilon_t$$

Where A is a 6 by 6 matrix, a is a six dimensional vector and ε_t are independent multivariate Gaussian random variables with zero mean. The matrix A and the covariance matrix of the ε_t were determined by calibrating against the historical data. The coefficients of a were then selected to match the long-term economic assumptions.

105. Equivalent Annual Management Charge for multi-employer/Master trust schemes such as Legal and General's Worksave, NEST and The People's Pension.

It follows that the values of x_t will have a multivariate normal distribution. Simulated investment returns will, however, be non-Gaussian partly because of the nonlinear transformations above. Moreover, the yields are nonlinearly related to bond investments.

The first component and third components of x_t give the annual growth rates of GDP and wages, respectively. The fourth and fifth components are transformed yields. The transformation applied ensures that the yields are always positive in simulations. Similarly the second component gives a transformed growth rate of CPI. In this case, the transformation applied ensures that inflation never drops below -2% in the simulations. This figure was selected to be twice the maximum rate of deflation ever found in the historical data.

The PPI's Individual Model

The Individual Model is the PPI's tool for modelling illustrative individual's income during retirement. It can model income for different individuals under current policy, or look at how an individual's income would be affected by policy changes. This income includes benefits from the State Pension system and private pension arrangements, and can also include income from earnings and equity release. It is useful to see how changes in policy can affect individuals' incomes in the future.

This model can be used in conjunction with economic stochastic scenarios derived from the PPI's economic scenario generator to produce stochastic output.

Key results

The key output from the model is the built-up pension wealth and entitlement over the course of the individual's work history and the post-retirement income that results from this.

The post-retirement income is presented as projected cashflows from retirement over the future lifespan of the individual. These are annual cashflows which include the following key items:

- State Pension
  - Reflects entitlement and the projected benefit level of State Pension components.
- Private pension
  - Derived from the decumulation of the pension pot, allowing for tax-free cash lump sum and the chosen decumulation style (e.g. annuity or drawdown).
- Other State benefits
  - Other benefits contributing to post-retirement income such as pension credit.
- Tax
  - Tax payable on the post-retirement income, to understand the net income available to the individual.

These cashflows are calculated as nominal amounts and restated in current earnings terms.

Outcomes are expressed in current earnings terms for two reasons; it improves the comprehension of the results and reduces the liability of either overly optimistic or cautious economic assumptions.

Application of output

The model is best used to compare outcomes between different individuals, policy options, or other scenarios. The results are best used in conjunction with an appropriate counterfactual to illustrate the variables under test.

Key data sources

The specification of a model run is based upon three areas:

The individual

The individuals modelled are specified based upon an earnings and career profile. Saving behaviour for private pension accumulation is considered, as well as the behaviour at retirement.

These are generally parameterised according to the project in question, designed to create vignettes to highlight representative individuals of the groups under investigation.

Earnings levels used are age and gender specific rates taken from Office for National Statistics (ONS) Annual Survey of Hours and Earnings (ASHE) data.

The lifecourses modelled are either working and making pension contributions throughout a complete working lifetime or starting to make pension contributions from age 40, representing a later start to pension saving.

The policy options

The policy option maps the pension framework in which the individual exists. It can accommodate the current system and alternatives derived through parameterisation. This allows flexing of the current system to consider potential policy options to assess their impact upon individuals under investigation.

This area has the scope to consider the build-up of pensions in their framework such as the auto-enrolment regulations for private pensions and the qualification for entitlement to State benefits.

The framework in retirement allows for the tax treatment and decumulation options taken by the individual as well as other sources of State benefits which influence the post-retirement outcomes for individuals.

Economic assumptions and scenarios

The model is capable of running with either deterministic or stochastic economic assumptions.

The deterministic assumptions used are generally taken from the Office of Budget Responsibility (OBR) Economic and Fiscal Outlook (EFO) to ensure consistency. They cover both historical data and future projected values. Alternatively the model can be used in conjunction with the PPI's Economic Scenario Generator (ESG) to produce a distribution of outputs based upon potential future economic conditions.

Summary of individual modelling approach

The model projects the pension features of the individual, both in accumulation (pre-retirement) and decumulation (post retirement) phases.

It projects the pre-retirement features of the individual through the accumulation of pension entitlement, both State benefits and occupational Defined Benefit schemes.

This is done through the modelling of the career history of the individual, deriving pension contributions and entitlement from the projected earnings profile.

The entitlement to and the level of State benefits are projected such that from retirement their contribution to the income of the individual can be calculated. Private pension income is modelled and assumes a decision about the behaviour of the individual at retirement. This allows for the chosen decumulation path of any accrued private pension wealth.

Limitations of analysis

Care should be taken when interpreting the modelling results used in this report. In particular, individuals are not considered to change their behaviour in response to investment performance. For example, if investments are performing poorly, an individual may choose to decrease their withdrawal rate and vice versa.

Monte Carlo simulation can be a powerful tool when trying to gain an understanding of the distribution of possible future outcomes. However, in common with other projection techniques, it is highly dependent on the assumptions made about the future. In this case, the choice of distribution and parameters of the underlying variables, the investment returns of equities, gilts and cash are important to the results.

The PPI's Aggregate Model

Overview of Aggregate Modelling of Private Pensions

The PPI Aggregate Model links changes in the UK population, the labour market and economic assumptions to project forward private and State Pension savings. Population projections are taken from 2014-based figures published by the ONS. Current distributions of individuals across pension scheme types are taken from the Lifetime Labour Market Database (LLMDB)[106] a panel dataset of 1% of UK National Insurance records. The workforce data includes numbers of individuals and average earnings split by age, gender and earnings band. The data are further split

106. Data from LLMDB 2010-11

between public and private sector contracted-out schemes and those who are contracted-in to the State Second Pension (S2P).

Initial Conditions

In the base year of projection, individuals with private sector pension arrangements are split between public and private Defined Benefit (DB) schemes and workplace Defined Contribution (DC) schemes. 17.5% of working individuals are assumed to be members of DC workplace pensions and 32.1% of individuals are assumed to be members of DB workplace schemes.[107] 73.2% of those in DB schemes are assumed to work within the public sector,[108] leaving 8.6% of the workforce in private sector workplace DB schemes.

The workforce not initially enrolled in public sector DB, private sector DB or private sector workplace DC, are considered as the eligible population for automatic enrolment. This includes individuals not in workplace pension schemes who contribute to personal pensions.

Stocks of existing assets for DB schemes and workplace DC schemes are split across cohorts by contribution levels. Initial stocks of workplace DB assets were assumed to be £890 billion in the base year.[109] It was assumed that the stocks of DC assets in 2010 were £275 billion.[110]

Movement of individuals between schemes due to decline in DB schemes

The proportion of individuals in each scheme is not stable over time: the proportion of the total workforce who are enrolled in a private sector DB scheme is assumed to decline by 80% between 2010 and 2030 and these individuals are moved into the existing DC workplace schemes.

Movement of individuals between schemes post automatic enrolment

From 2012, employees in the private sector without workplace DC provision are placed in a scheme to represent automatic enrolment, which is split further into master trust schemes and other DC schemes, assuming 63% are automatically enrolled into master trusts and the remaining into other DC schemes. Individuals are enrolled in proportion to the likely number of employees becoming eligible each year due to staging of their employers. Similarly, during the staging period, employees in existing DC schemes who become eligible for automatic enrolment either remain in the existing scheme or are moved to a new automatic enrolment workplace DC scheme (again split into master trusts and other DC schemes in the same proportions as mentioned above). It is assumed that 80% of existing members remain in their current scheme, and 20% are expected to move to the new automatic enrolment scheme. New members to DC schemes who have an employer with an existing scheme either join the new automatic enrolment scheme (80%) or join an existing DC scheme (20%).

Overall, after 2012 the private sector workforce is assumed to contribute to either private sector DB pension schemes, DC schemes which were existing prior to automatic enrolment, DC which were set up for automatic enrolment, or schemes set up for those that are eligible for automatic enrolment that did not contribute before the implementation of automatic enrolment. It is assumed that 14%[111] of the workforce change jobs from year to year, which causes individuals to shift from existing DC schemes into new DC automatic enrolment schemes over time.

Contributions

Contributions are taken as a percentage of total earnings for employer provided schemes (both existing schemes and those set up after automatic enrolment) and are taken across band earnings for individuals automatically enrolled who previously were not saving. The earning band is taken to be £5,876 to £45,000 with an earnings trigger of £10,000 (all in 2017/18 terms).

When automatically enrolled, individuals and their employers are assumed to contribute at the minimum levels required under automatic enrolment legislation (phased in from a

107. ONS (2013a)
108. Average proportion of males and females employed in public sector COSR schemes according to LLMDB 2010-11
109. TPR (2012) The Purple Book Chapter 4 Table 4.1 Assets discounted to the base year.
110. Workplace DC assets taken from ONS (2012) Table 3, adjusted for decumulated assets.
111. Average annual workforce churn. DWP (2010) p49

combined contribution of 2% of band earnings in 2012, rising to 8% of band earnings in 2018 in accordance with existing regulations) unless otherwise stated.

The PPI's Distributional Model

Overview of Distributional Modelling of pensioner incomes

The PPI Distributional Model links the current distribution of pensioner incomes to projected changes in the level of income components projected within the Aggregate Model. Entitlement to means-tested benefits is calculated throughout the distribution and claims are included within incomes.

The current distribution of pensioner incomes

In the base year of projection, a weighted distribution of pensioner incomes is derived from ONS Family Resource Survey (FRS) data. This distribution is split by age, gender and household status. The distribution and interaction of income components is mapped to the distribution.

The projection of the pensioner distribution

The pensioner distribution is projected allowing for demographic changes including mortality based upon ONS forecasts. The aggregate level of income components is trued to the changing averages projected within the Aggregate Model. This allows for evolving levels of private pension saving as well as State Pension changes to work their way through the pension landscape while maintaining the correlations between income sources.

The projection of the pensioner distribution

The pensioner distribution is projected allowing for demographic changes including mortality based upon ONS forecasts. The aggregate level of income components is trued to the changing averages projected within the Aggregate Model. This allows for evolving levels of private pension saving as well as State Pension changes to work their way through.

The calculation of means-tested benefits

The income of pensioner units is used to assess eligibility for means-tested benefits. The decentralisation of means-tested Council Tax and Housing Benefits is assumed to be neutral as well as the introduction of Universal Credit to these items. The amount of benefit a pensioner unit would be eligible for is calculated based upon current eligibility criteria. Claims rates are derived from DWP caseload data to allow for eligible individuals not claiming.

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