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Can't wait to get my pension: the effect of raising the female state pension age on income, poverty and deprivation

Jonathan Cribb* and Carl Emmerson[†]

Abstract

The earliest age at which women can receive a state pension in the UK (the 'state pension age') has been increasing since 2010. We use a difference-in-differences methodology, exploiting the gradual increase from age 60 in 2010 to age 63 in 2016, to estimate the impact of the reform on women's incomes, income poverty rates and measures of material deprivation. We find that, on average, increased earnings partially offset the loss of state pension income, leaving affected women's household incomes on average £32 per week lower due to the reform. Proportionally, the reduction in household income is larger for lower-income women. These reductions in income lead to the absolute income poverty rate of women aged 60–62, who are now under the state pension age, increasing by 6.4 percentage points. However, the increased risk of poverty does not persist after the point at which they reach the state pension age. Moreover, we find no evidence that increasing the state pension age increases the probability of women reporting being deprived of important material items, at least for the items observed in our data. This potentially suggests that they have smoothed their consumption, and avoided increased levels of material deprivation, despite the large reduction in income caused by the reform.

Keywords: public pensions; income distribution; poverty

JEL codes: H55, D31, I38

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1. Introduction

In response to the public finance challenges posed by population ageing, governments across the developed world have been legislating for increases in the ages at which state pensions can be received. The impact of these reforms on the public finances – and on household incomes – will depend not only on the generosity of typical state pension payments but also on how private incomes respond – for example, due to changes in labour supply – and the operation of the rest of the personal tax and benefit system.

The direct impact of delayed state pension income receipt on household incomes may be mitigated if state pension income is taxable, if private incomes – such as earnings – increase in response to a rise in the state pension age, or if other state benefits – perhaps targeted at those with low incomes or those in poor health – are available to replace some of the state pension income forgone. But these potential knock-on effects will also have different consequences for the public finances: if taxable private incomes increase, the public finances would tend to be strengthened further; conversely, if household incomes are cushioned by reduced tax payments or increased benefit income, the gains to the public finances from delayed state pension payments would be offset.

In 1995, the UK government legislated to increase the state pension age (i.e. the earliest age at which a pension can be claimed from the state) for women from 60 to 65. This was legislated to happen between 2010 and 2020. As a result, since April 2010, the female state pension age for women has gradually increased from 60, reaching 63 in March 2016. The women directly affected by this reform are those born after March 1950. Unlike earlier birth cohorts, women who have reached age 60 but not yet reached the state pension age now cannot receive a state pension and will face the less generous 'working-age' tax and benefit system for longer.

Previous work has measured the impact of this rise in the female state pension age on labour market behaviour (Cribb, Emmerson and Tetlow 2016). Specifically, this found that the rise in the state pension age from 60 to 62 between 2010 and 2014 increased employment rates among women aged 60 and 61 by 6.3 percentage points, with the pre-reform employment rate of this group being 41%. Much of this increase in employment was explained by an increase in full-time employment, meaning that for many of those who did respond to the reform there would have been a substantial boost to their earnings, and one that was greater than their lost

state pension income. But this was only true of a small minority of those women whose state pension age was raised.

This paper builds on this previous work by examining the overall impact of the rise in the state pension age on household incomes and the public finances. We consider incomes both gross and net of direct taxes and look separately at private and public sources of income, allowing us to examine the extent to which the reduction in state pension income understates or overstates the impact of the reform on household incomes and on the public finances. We analyse whether the impact differs across the income distribution and, specifically, examine the impact of the reform on measured rates of income poverty. Finally, we consider the impact of the reform on measures of deprivation.

Although the majority of analysis of the social security system looks at incomes or poverty (e.g. Meyer (2010), who studies the effect of the earned income tax credit in the United States on poverty and the income distribution, and Joyce and Sibieta (2013), who look at the effect of the changes to taxes and benefits by the 1997–2010 Labour government on poverty in the UK), there is much less evidence on the impact of social security systems on material deprivation. This is despite an emerging literature that argues that measures of material deprivation may be a better indication of low well-being or living standards than measures of income poverty (Main and Bradshaw 2012; Bossert, Chakravarty and D'Ambrosio 2013) and that, like expenditure, material deprivation is not the lowest for those individuals with the lowest household incomes (Cribb, Joyce and Phillips 2012; Brewer, Etheridge and O'Dea 2017). Thus if a policy increases measures of poverty based on income but does not increase material deprivation, policymakers may be less concerned by this than if the policy also increases material deprivation. It is therefore important to consider the effects of the increase in the state pension age both on income poverty rates and on material deprivation.

Overall, we find that increasing the state pension age from 60 to 63 reduces the net household income of women aged 60–62 by an average of £32 per week, with an increase in earned income partially – but not entirely – offsetting the loss of state pension income. After accounting for behavioural change, we find that the public finances are strengthened by an estimated £5.1 billion per year, of which £4.2 billion comes from lower benefit payments (net of tax, where applicable) and £0.9 billion from higher direct tax payments elsewhere.

Proportionally, we find a larger reduction in household income for lower-income women, with the reform increasing the measured income poverty rate of women aged 60–62, who are

now under the state pension age, by 6.4 percentage points. However, we find no evidence that the increased risk of poverty persists after the point at which they do reach the state pension age. Moreover, we find no evidence that increasing the state pension age increases the probability of women reporting being deprived of important material items, at least for the items observed in our data. This potentially suggests that they have smoothed their consumption, and avoided increased levels of material deprivation, despite the large reduction in income caused by the reform.

The structure of this paper is as follows. Section 2 sets out the policy background and details of the state pension age reform. Section 3 describes the data we use in this study, while Section 4 sets out our empirical methodology. Section 5 presents the results and Section 6 concludes.

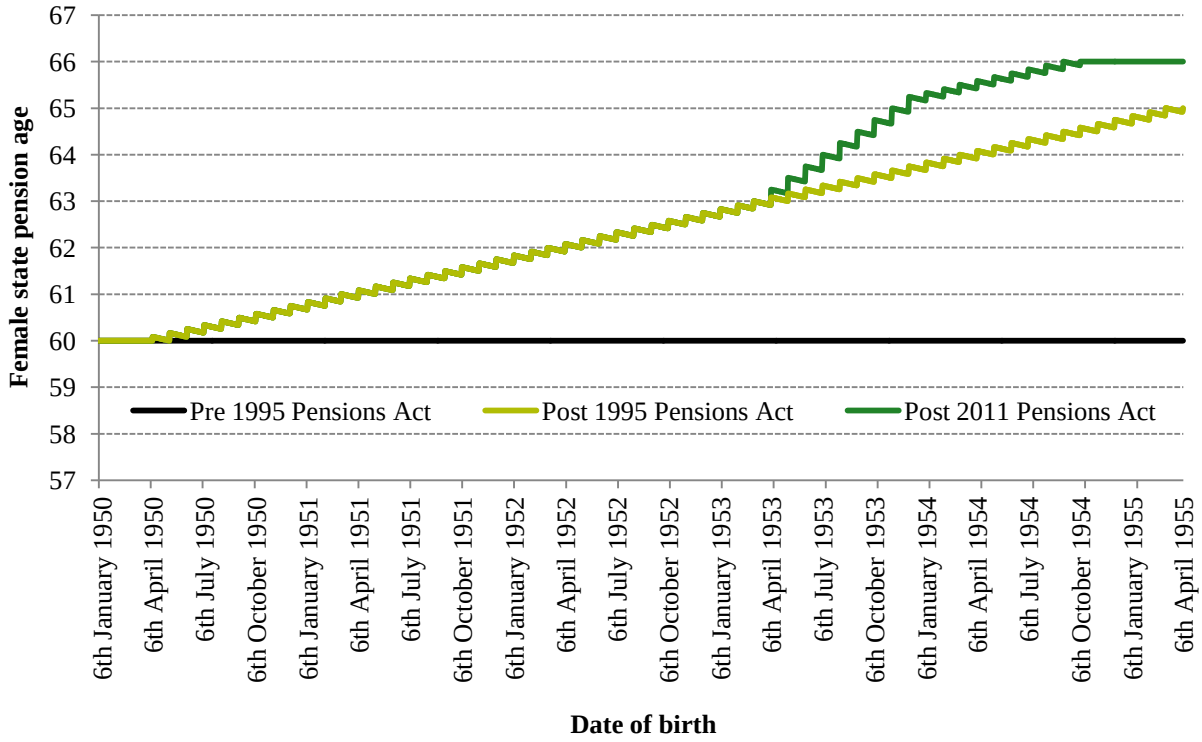
2. Policy background

The state pension age is the earliest age at which a state pension can be claimed in the UK. In 1948, this was set at 60 for women and 65 for men, and this remained unchanged until April 2010. Receipt can be deferred – in return for an increased entitlement – but surprisingly few individuals choose to do this. In 2015–16, a full basic state pension, for which most new claimants qualify, was worth £115.95 per week. Some qualify for an additional pension, which is related to earnings (since 1978) and some formal caring arrangements (since 2002). This can be worth up to around £160 per week in addition to the basic state pension. However, in the past, the majority of employees opted out of this arrangement, choosing instead to build up their own private pension entitlement in return for lower payroll taxes. State pension income is subject to income tax and can reduce entitlement to means-tested benefits, but there is no earnings test.

The 1995 Pensions Act legislated to increase the female state pension age from 60 to 65 over the decade from April 2010. This was to be implemented by raising the state pension age by one month every two months, thereby achieving equalisation with the male state pension age at 65 in April 2020. This reform therefore directly affected all women born after April 1950. The reform is shown in Figure 1, alongside a more recent reform that sped up the increase in the female state pension age to 65 so that it would subsequently be increased (along with the male state pension age) to 66 by October 2020 (the increase from 65 to 66 had previously

been legislated to take place in the middle of the 2020s). The data used in our study cover the period up to and including March 2016, by when the female state pension age had reached 63; therefore the impact of the later legislation shown in Figure 1 is outside our period of interest.

Figure 1. UK state pension age for women under different legislation



Note: The reason the state pension age increases in a 'sawtooth' pattern, rather than a smooth line or a 'step' pattern, is that women born in a given month are allocated a single 'state pension date' at which they are eligible for a state pension. Therefore women born later in the month have a slightly lower state pension age than those born earlier in the month.
Source: Pensions Act 1995, schedule 4 (http://www.legislation.gov.uk/ukpga/1995/26/schedule/4/enacted); Pensions Act 2007, schedule 3 (http://www.legislation.gov.uk/ukpga/2007/22/schedule/3); Pensions Act 2011, schedule 1 (http://www.legislation.gov.uk/ukpga/2011/19/schedule/1/enacted).

Household incomes are also affected by the personal tax and benefit system, some features of which become more generous when an individual reaches the state pension age. On the tax side, employee National Insurance contributions (NICs) are payable on the earnings of those below the state pension age, but not on the earnings of those above the state pension age. On the benefits side, those under the state pension age who are not in paid work may be eligible for certain benefits (such as income support, jobseeker's allowance (JSA) and employment and support allowance (ESA)). When an individual (man or woman) reaches the female state pension age, they are no longer eligible for working-age benefits but instead, if they are on a sufficiently low income, they may receive pension credit. This means-tested benefit is more generous than working-age benefits: not only is the maximum award much higher (in 2015–16, it was worth up to £151.20 per week for a single person, which is more than twice the

maximum £73.10 per week paid to a single JSA recipient aged 25 or over) but it also comes with less 'conditionality' – no requirements for recipients to seek work or to attend work-focused interviews.

Finally, if one individual in a household is over the female state pension age then they become eligible for a winter fuel payment worth £200 per year per household (or £300 per year if at least one person is aged 80 or over).

3. Data

We use data from the UK's Family Resources Survey (FRS). This is an annual cross-sectional household survey which contains around 20,000 households per year across England, Scotland, Wales and Northern Ireland. It is available up to and including the financial year 2015–16. The survey contains a battery of questions about incomes from all sources, of all individuals in the household, alongside background information such as sex, age, education, housing tenure and household structure. Importantly, since 2008–09, it contains the exact date of birth for all individuals, which allows us to calculate their state pension age. Comprehensive and consistent measures of income are derived from the FRS in order to produce the UK's official statistics on income poverty, and the distribution of income, known as the 'Households Below Average Income' (HBAI) statistics.[1] We use these HBAI measures of income in our analysis. We also measure income poverty in the same way as the UK's official absolute poverty measure – defined as having a household net equivalised income that is below 60% of the median in 2010–11, after adjusting for household inflation. We use measures of income poverty based on incomes both before housing costs are deducted ('BHC') and after housing costs are deducted ('AHC'). When incomes are equivalised, they are equivalised using the OECD modified equivalence scale and expressed as equivalent levels of income for a couple with no dependent children (since this is the most common family type among women aged 60–62).

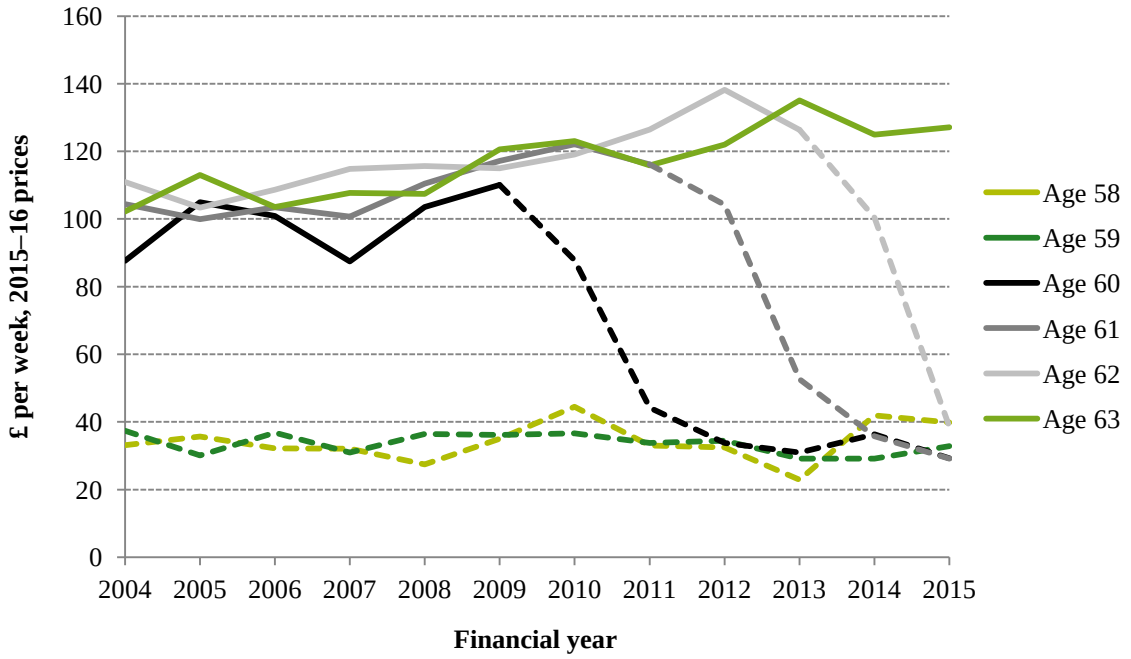
We adjust for inflation using a modified version of the Consumer Prices Index that also incorporates owner-occupied housing costs. All cash figures are expressed in 2015–16 prices. Given that there is known to be considerable measurement error in survey measures of income at the very bottom of the income distribution (Brewer, Etheridge and O'Dea 2017)

[1] More information on the HBAI data sets can be found in Department for Work and Pensions (2017).

and the very top (Burkhauser et al. 2016), in each year of the data we exclude individuals who are in households that have the lowest 1%, and the highest 1%, of household incomes.

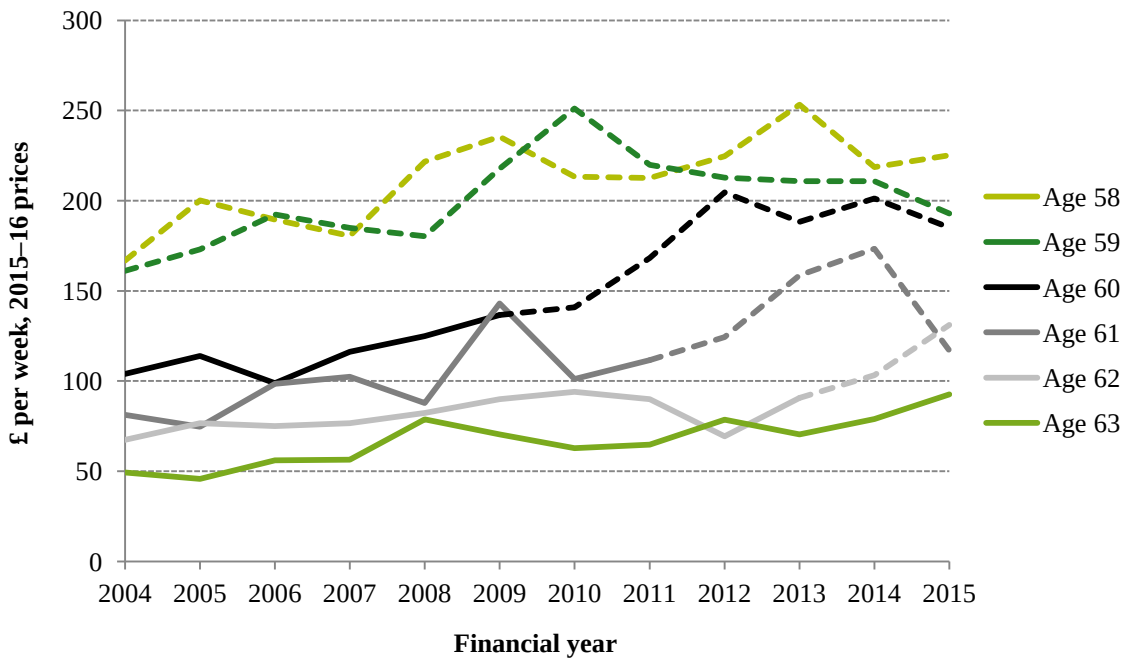
Important drivers of the effect of increasing the state pension age on women's incomes will be the extent to which state benefit incomes and income from employment respond to the reform. Figures 2a and 2b provide graphical evidence of the impact on these outcomes, showing how mean benefit and employment incomes have changed from 2004–05 to 2015–16, for women aged 58–63. The dashed part of each line shows the period in which at least some individuals of the given age were not eligible for the state pension. Figure 2a shows that prior to April 2010 average incomes were much higher among those aged 60 and over than among those aged 58 or 59 (and hence below the state pension age) and that after April 2010 mean benefit incomes fell substantially (but not to zero) when affected age groups could no longer receive the state pension. At the same time, Figure 2b shows there were rises in mean employment income coinciding with women of each age no longer being eligible for the state pension, consistent with the evidence in Cribb, Emmerson and Tetlow (2016) that one effect of the reform is for employment income to increase to offset (at least partially) the fall in benefit income paid to households resulting from the reform.

Figure 2a. Mean state benefit income of women aged 58–63, 2004–05 to 2015–16



Note: Dashed part of each line shows the period in which at least some individuals of the given age were not eligible for the state pension.
Source: Authors' calculations using the Family Resources Survey. Number of observations: 24,493.

Figure 2b. Mean gross income from employment for women aged 58–63, 2004–05 to 2015–16



Note: Dashed part of each line shows the period in which at least some individuals of the given age were not eligible for the state pension.
Source: Authors' calculations using the Family Resources Survey. Number of observations: 24,493.

In addition to the data on incomes, the FRS contains questions regarding families' levels of 'material deprivation'. These questions ask whether families are able to afford certain material items. Given that household incomes will not perfectly reflect the standard of living of a given household, we estimate whether increasing the state pension age affects the probability that families report not being able to afford certain items. This paper looks at the effect on six items that have been reported consistently since 2008–09. The FRS questions are designed explicitly to measure whether individuals are experiencing material deprivation, although it is possible that there might be effects on other indicators of deprivation / other items that are not measured in these data. The FRS survey asks whether families can afford to:

1) keep their home in a good state of decoration;
2) have home contents insurance;
3) put away £10 savings per month for a rainy day;
4) replace worn-out furniture;
5) replace broken electrical items;

6) have a small amount of money to spend on themselves.[2]

These 'material deprivation' questions are only asked to families if all adults are aged 64 or under; there is a separate set of 'pensioner material deprivation' questions for families with an adult aged 65 or over. However, from 2011–12, families are only asked the material deprivation questions listed above if all adults are under the state pension age. We discuss how we estimate the impact on material deprivation in light of this in Section 4.

4. Empirical methodology

We estimate the impact of increasing the state pension age on different measures of household income, exploiting the fact that we have data on the incomes of otherwise similar women who face different state pension ages. We utilise a difference-in-differences methodology in the same way as Cribb, Emmerson and Tetlow (2016), who estimate the impact of the same reform on labour market behaviour using similarly structured data. This is done by estimating the following model:

$$y_{ict} = \alpha(underSPA)_{ict} + \gamma_t + \lambda_c + \sum_a \delta_a [age_{ict} = a] + X_{ict}\beta + \varepsilon_{ict}, \quad (1)$$

where the outcome of interest (y_{ict}) is allowed to vary by whether the woman is aged below or above the state pension age plus a set of controls. Since both age and calendar time are important determinants of private income (such as earnings and private pension income), we control for these flexibly with dummy variables for age in years and quarters (48 dummies included in the model) and time period (γ_t) in years and quarters (31 dummies included in the model). We also control for the financial year of birth (λ_c) (6 dummies included in the model).

Our identifying assumption here is that any age effects on the outcomes of interest are constant across time and cohort, that any cohort effects are constant across time and age, and that any time effects are constant across cohort and age (which is the standard 'common trends' assumption used in difference-in-differences estimation).

[2] Between 2009–10 and 2010–11, some questions were dropped and others added. We only look at questions asked in each wave since 2008–09. There are two other questions on material deprivation that are consistently asked which we do not use because, rather than referring to what families can afford now, they are likely to be answered in reference to a previous period (when they may or may not have been under or over the state pension age). These questions are whether they can afford to keep their home adequately warm in winter (likely to refer to the previous winter) and whether they can afford to have a holiday away from home for one week a year not staying with friends or family (likely to refer to the previous summer).

We also include controls for a set of individual characteristics (X_{ict}). These include education, relationship status, homeownership, region and – for those with a partner – partner's age and partner's education.[3]

For continuous outcomes – specifically, different measures of income – we estimate equation (1) using ordinary least squares, with standard errors robust to heteroskedasticity. To allow for different effects across the income distribution, we estimate the equation using simultaneous quantile regressions and allow for correlations in the errors across the quantiles. For dichotomous outcomes – such as whether a household is below or above the income poverty line, or different measures of deprivation – we estimate the equation using a probit model with standard errors estimated by bootstrapping with 1,000 replications.

This paper estimates the effect of increasing the female state pension age using data from eight years of FRS data, from 2008–09 to 2015–16 (so two financial years of data prior to the state pension age starting to rise, up to the latest available data by when the female state pension age had reached 63). The sample includes all women born from 1949–50 to 1955–56 (inclusive) so as to include one financial year of birth unaffected by the reform (1949–50) and all other birth cohorts whose state pension age is greater than 60 and where they are observed reaching at least age 60. This gives a sample size of 19,086 women.

As described in Section 3, we cannot estimate the impact of increasing the female state pension age on material deprivation using the same sample as for the income measures since the relevant questions are not asked of women with a partner aged 65 or over or, since 2011–12, of those women who are over the state pension age. However, because we still observe families where the woman is aged 60 or over but also under the state pension age, this means we can still use a difference-in-differences methodology to estimate the impact on material deprivation. Specifically, we take women aged 57–62 who answer the material deprivation questions and contrast how material deprivation rates change among 60- to 62-year-olds between periods when they are over the state pension age and under the state pension age, with how material deprivation changes among 57- to 59-year-olds, who are under the state pension age in all years. To do this, we can simply estimate equation (1) using the sample of women aged 57–62 who do not have a partner aged 65 or over and who answer the material

[3] Specifically, we include: two dummies for education level (leaving education aged 17 or 18, leaving education aged 19 or over, against a baseline of leaving aged 16 or younger); four dummies for relationship status (cohabiting, single, widowed, divorced/separated, against a baseline of married); a dummy for owning the home the individual lives in; eleven dummies for the regions/nations of the UK, with North East as baseline; partner's age (as a quadratic, plus separate dummies for partner being aged 60–64, 65–69, or 70 and over); and two dummies for partner's education (defined in the same way as own education).

deprivation questions. The exact sample used is shown in Appendix Table A1 and has a sample size of 10,947 women.

5. Results

We start by looking at the impact of the state pension age on whether or not women report being in receipt of income from different sources. The estimated impacts on these dichotomous outcomes are all estimated using separate probit models, with a summary of the key results reported in Table 1. As in Cribb, Emmerson and Tetlow (2016), we find statistically significant evidence that being under the state pension age increases employment rates substantially, with our point estimates suggesting even larger effects than they find. Our estimates suggest a 9.8 percentage point (ppt) increase in the proportion in paid work (from a pre-reform base of 38.0%), with a 7.1ppt increase in full-time work and a 3.7ppt increase in part-time work (estimated effects do not sum precisely, since they are estimated from separate models).

Table 1. Effect of increasing female state pension age from 60 to 63 on receipt of different sources of individual income (percentage points)

	Effect of being under state pension age	*Standard error*	*Mean for 60- to 62-year-olds pre-reform*
In paid work	+9.8***	[1.9]	38.0%
In full-time paid work	+7.1***	[1.7]	16.5%
In part-time paid work	+3.7**	[1.5]	21.4%
Receives any state benefits	–72.9***	[0.6]	99.6%
Receives occupational pension	–3.2**	[1.4]	33.2%
Has investment income	–1.5	[1.7]	70.1%

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 19,086 observations in all models. All effects are obtained by estimating equation (1) using a probit model. Standard errors are estimated by bootstrapping with 1,000 replications. Pre-reform means are estimated from FRS data in 2007–08 to 2009–10.

Unsurprisingly, being under the state pension age is found to reduce substantially the likelihood of receiving any state benefits. Pre-reform this was running at 99.6% for 60- to 62-year-old women. Being under the state pension age is found to reduce it by 72.9ppts. Looking at other sources of income, we find that being under the state pension age reduces the likelihood of receiving occupational pension income by 3.2ppts, suggesting that a tendency to

delay receipt of occupational pensions – perhaps until the state pension age or retirement – outweighs any tendency of women to draw their occupational pension income earlier in order to help make up for the loss of state pension income from the rising state pension age. We find no statistically significant effect of being under the state pension age on having investment income.

We now turn to the impact of being under the state pension age on the average (mean) level of income from different sources (with those not receiving any income from a particular source being included in the analysis as getting £0 per week). Since all these outcomes of interest are continuous (in £ per week), we estimate equation (1) using ordinary least squares (OLS). The results are reported in Table 2, with the top panel looking at individual income and the bottom panel looking at household income (i.e. taking into account income from any partner or other household members).

On average, being under the state pension age is found to reduce women's individual incomes by £50 per week (compared with a pre-reform mean of £234), with an £82 per week drop in income from benefits being partially offset by a £43 per week increase in private income. This increase in private income is driven by an increase in gross earnings of £44 per week (compared with a pre-reform mean of £106), with evidence (albeit only statistically significant at the 10% level) that being under the state pension age reduces occupational pension income and increases investment income by, on average, similar amounts.

Turning to household income, the reduction in net income is found to be smaller, at £32 per week (rather than £50 per week for individual income).[4] This is due to a bigger increase in private income (of £58 per week rather than £43 per week), with some tentative evidence (shown in Appendix Table A2) that the rise in the female state pension age increases the occupational pension income of the husbands of those directly affected by the reform. Appendix Table A2 also shows that we do not see any change in husbands' employment rates as a result of the increase in the state pension age of their wives. In addition, we see a smaller reduction in benefit income at the household level than at the individual level (£74 per week rather than £82 per week). This could be due to a husband's entitlement to benefits increasing as a direct result of his wife being below the state pension age. This could be the case where a

[4] The effect on equivalised income is larger than that on unequivalised income. This is purely because we equivalise to the income needed for a couple with no dependent children (the most common group in our data), which means that equivalisation leads to equivalised incomes being higher than unequivalised incomes for those in smaller households (such as single women with no dependent children, the second most common group in our data).

husband is above the female state pension age, and would therefore be entitled to an entire winter fuel payment rather than the payment being split between them, or where the husband is in receipt of means-tested benefits, such as pension credit which is reduced when his wife receives state pension income.

Table 2. Effect of increasing female state pension age from 60 to 63 on the individual and household incomes of women (£ per week)

	Effect of being under state pension age	*Standard error*	*Mean for 60- to 62-year-olds pre-reform*
Individual income			
Gross earnings (incl. self-emp.)	44.34***	[8.73]	106.32
Net earnings (incl. self-emp.)	32.60***	[6.50]	83.68
Gross occupational pensions	–6.82*	[3.72]	37.82
Net occupational pensions	–4.75	[3.07]	30.99
Gross investment income	4.74*	[2.59]	22.99
Net investment income	3.73*	[2.20]	20.22
Gross private income	43.40***	[9.20]	169.29
Benefit income	–82.46***	[2.61]	108.19
Net income	–49.52***	[6.59]	234.36
Household income			
Total private income	58.10***	[17.00]	533.22
Total benefits	–74.35***	[3.91]	170.34
Total net income	–32.47***	[11.76]	559.59
Total equivalised net income	–40.53***	[10.59]	547.12

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 19,086 observations in all models. All effects are obtained by estimating equation (1) using OLS. Standard errors are robust to heteroskedasticity. Pre-reform means are estimated from FRS data in 2007–08 to 2009–10.

These results also allow us to calculate the public finance implications of raising the state pension age for women, incorporating their own behavioural changes in response to the reform and any behaviour change of their husbands that changes household incomes. By the end of 2015–16, almost 1.1 million women aged 60–62 had not yet reached state pension age (see Appendix Table A3). Looking at the effect of the policy on changes in benefit income, and incomes gross and net of direct taxes, implies that increasing the state pension age for women by three years from 60 to 63 strengthened the public finances by £5.1 billion per year, of which £4.2 billion came from lower benefit payments (net of tax, where applicable) and £0.9 billion from higher direct tax payments elsewhere.

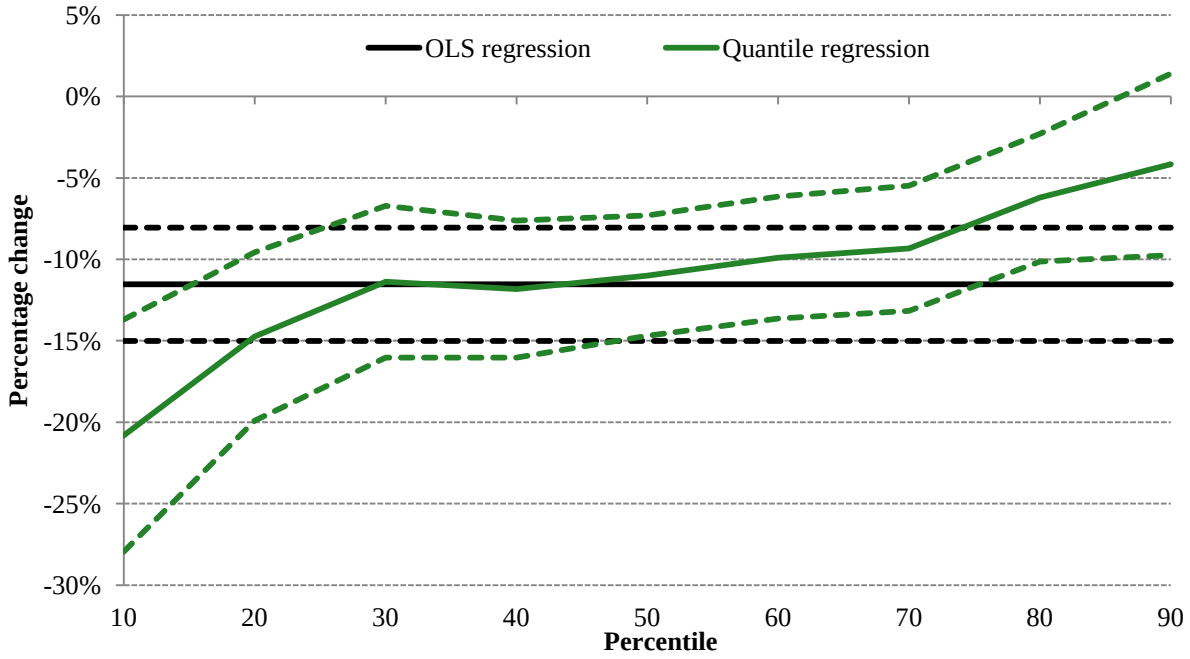
The overall reduction in benefit payments means that the reduction in spending on the state pension is only partially offset by increased spending on other benefits (such as out-of-work working-age benefits). The increase in direct tax receipts comes from the increase in employee NICs on earnings up to the (now higher) state pension age and the boost to tax receipts from behavioural responses that increase private incomes.

We now turn to look at the percentage change in net household income caused by being under, rather than over, the female state pension age at ages 60–62 and, in particular, we examine whether any effect varies across the income distribution. We estimate the effect of being under the state pension age on the net (equivalised) household income distribution using quantile regression. These results show how income at each percentile of the income distribution (conditional on age, cohort and the other variables that we control for as set out in Section 4) varies depending on whether an individual is under or over the state pension age. The effects are presented graphically as a percentage of income in Figure 3 and in £ per week in Figure 4.

In Figure 3, the horizontal solid black line shows that, on average, the rise in the state pension age reduced net household incomes by 11.5% (estimated by OLS), with the horizontal dotted black lines indicating the 95% confidence interval. The green solid line shows the results from quantile regressions. This shows that the increase in the state pension age reduced incomes by a larger percentage among those towards the bottom of the income distribution than among those towards the top. Indeed, at the 90th percentile, the reduction in net household income identified is not statistically different from zero at the 5% level.

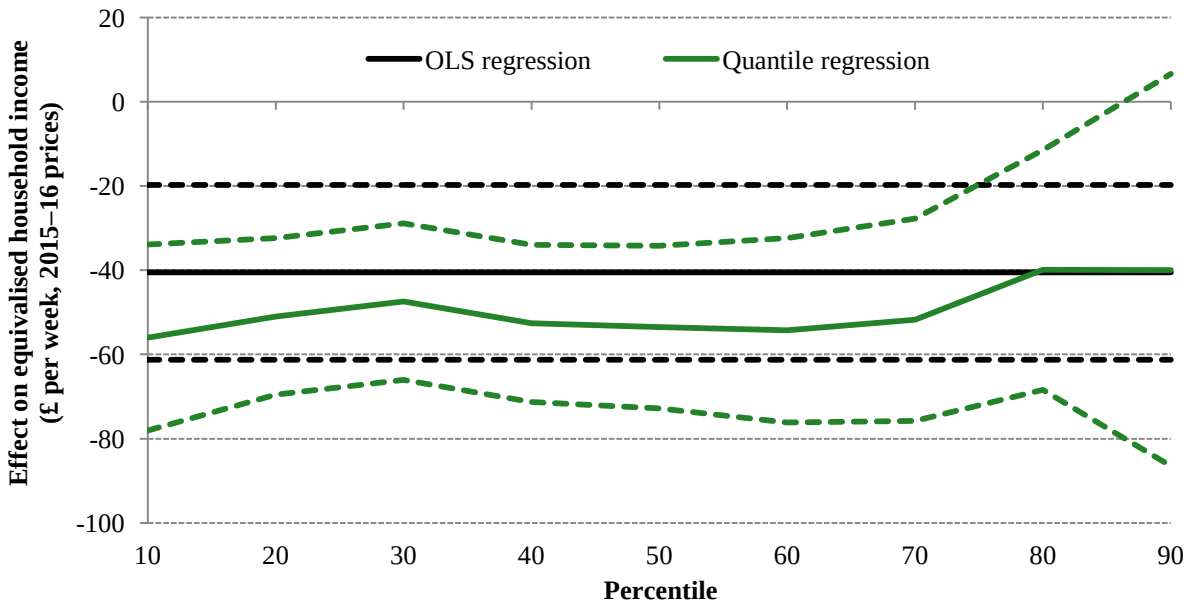
The results in Figure 4 show that this regressive pattern of losses is mainly driven by the fact that the cash reductions in income caused by the reform are similar across the income distribution. Although the point estimates are slightly smaller towards the top of the income distribution, they are not statistically different between the bottom and the top. The patterns seen in Figures 3 and 4 can be explained by the fact that state pension payments are relatively flat in cash terms across the income distribution and therefore represent a smaller share of income for those with higher private incomes.

Figure 3. Effects of increasing female state pension age from 60 to 63 on the net equivalised household incomes of women (in percentage terms)



Note: Results are obtained by estimating equation (1) with log net equivalised household income as the dependent variable. Coefficients are converted to percentages following Halvorsen and Palmquist (1980). Black line shows the estimated mean effect from OLS, the green line from quantile regression. Quantile models are estimated using simultaneous quantile regressions, allowing for correlation in the errors across the quantiles. Standard errors for the quantile regression results are calculated by bootstrapping 1,000 times. The dashed lines provide the 95% confidence intervals. Number of observations: 19,086.

Figure 4. Effects of increasing female state pension age from 60 to 63 on the net equivalised household incomes of women (in £ per week, 2015–16 prices)



Note: Results are obtained by estimating equation (1) with net equivalised household income (expressed in 2015–16 prices) as the dependent variable. Black line shows the estimated mean effect from OLS, the green line from quantile regression. Quantile models are estimated using simultaneous quantile regressions, allowing for correlation in the errors across the quantiles. Standard errors for the quantile regression results are calculated by bootstrapping 1,000 times. The dashed lines provide the 95% confidence intervals. Number of observations: 19,086.

By reducing the household incomes of those towards the bottom of the income distribution, the raising of the state pension age will have pushed up recorded levels of income poverty. The size of this effect can be estimated by using a probit model on whether a household is below or above the poverty line. This is done in Table 3 for two absolute income poverty lines: one measured before housing costs are deducted (BHC) and one measured after housing costs are deducted (AHC).[5] In both cases, we find evidence that the income poverty rate among 60- to 62-year-old women was pushed up substantially as a result of the increase in the state pension age. For AHC poverty our estimate suggests the poverty rate was increased by 6.4ppts (from a pre-reform base of 14.8%), while for BHC poverty the rate was increased by 8.7ppts (from a pre-reform base of 14.7%).

Table 3. Effect of increasing female state pension age from 60 to 63 on the probability of those women being in absolute poverty (percentage points)

	Effect of being under state pension age	*Standard error*	*Mean for 60- to 62-year-olds pre-reform*
In absolute poverty (BHC)	+8.7***	[1.2]	14.7%
In absolute poverty (AHC)	+6.4***	[1.2]	14.8%

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 19,086 observations in all models. All effects are obtained by estimating equation (1) using a probit model. Standard errors are estimated by bootstrapping with 1,000 replications. Pre-reform poverty rates are estimated from FRS data in 2007–08 to 2009–10.

We also explore whether the increase in the measured income poverty rate brought about by the increase in the state pension age varies by different characteristics. For brevity we do this just for the AHC measure of income poverty, and for computational ease in testing the differences between the different effects we use a linear probability model rather than a probit model. This gives an overall impact of 6.9ppts in Table 4 (compared with 6.4ppts when using our preferred probit model, as reported in Table 3). In terms of individual characteristics, we find that the poverty rate is consistently increased by more – in absolute terms – among those groups that had a greater pre-reform rate of poverty: singles rather than couples; renters rather than owner-occupiers; and those with no post-16 education rather than those with some post-16 education. But when we split individuals into whether they reside in an above- or below-average poverty rate region, we find no evidence of any differential impact.

[5] We do not look at the effect on the relative poverty rate (relative poverty being measured as having an income below 60% of contemporaneous median income) as median income (and therefore the poverty line) is itself slightly reduced by the increase in the state pension age. This point notwithstanding, the effect on relative poverty will be very similar to that on absolute poverty.

Table 4. Effect of increasing female state pension age from 60 to 63 on the probability of those women being in absolute poverty (AHC) for different subgroups (percentage points)

	Effect of being under state pension age	*Standard error*	*Number of observations*	*Mean for 60- to 62-year-olds pre-reform*
All	+6.9***	[1.4]	19,086	14.8%
Single	+13.5***	[2.9]†††	5,394	20.3%
In a couple	+4.0***	[1.5]†††	13,692	12.8%
Owner-occupier	+5.3***	[1.4]††	15,136	12.3%
Renter	+13.8***	[4.0]††	3,950	25.6%
Post-16 education	+2.8	[2.0]†††	6,874	9.2%
No post-16 education	+8.8***	[1.8]†††	12,212	16.7%
Lower poverty region	+6.9***	[1.8]	9,604	13.4%
Higher poverty region	+7.1***	[2.0]	9,482	16.3%

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. Lower poverty regions are: East of England, East Midlands, Scotland, South East and South West. Higher poverty regions are: London, North East, Northern Ireland, North West, Wales, West Midlands and Yorkshire and Humberside. All effects are obtained by estimating equation (1) using linear probability models. Standard errors are robust to heteroskedasticity. †††, †† and † denote that the estimated effect for the group is significantly different from that for the other group at the 1%, 5% and 10% level respectively. Pre-reform poverty rates are estimated from FRS data in 2007–08 to 2009–10.

The analysis so far has shown that for 60- to 62-year-old women, being below the state pension age rather than above reduces overall incomes, leads to a bigger percentage reduction in the incomes of women in lower- rather than higher-income households and substantially pushes up the income poverty rate. An important additional issue is whether this is a persistent effect or whether it is only temporary.

To examine whether there is evidence of any persistent effect of being under the state pension age for a longer time (which results from the increase in the state pension age) on income and poverty, we estimate equation (1) but also add a dummy variable indicating whether or not the individual is one year past their state pension age. The results are presented in Table 5 and show that there is some evidence that the increase in employment, and the reduction in receipt of state benefits, caused by the increase in the state pension age persist. This could suggest that some women who reach age 60 but cannot receive a state pension, and who remain in paid work as a result, then remain in paid work and do not claim their state pension when they do reach the state pension age. However, these estimates are only statistically significant at the 10% significance level. Overall, the estimated impact on net income (measured at the individual or household level) one year after reaching state pension age is

negative, but it is much smaller than the effect on being under the state pension age, and the estimated effects are not statistically significant. In terms of the poverty rate, while this is found to increase significantly when women aged 60–62 are not able to receive the state pension, there is no evidence that this increased poverty rate persists once they do reach the state pension age. We therefore find that increasing the state pension age increases income poverty rates temporarily, rather than permanently. In other words, increasing the state pension age above 60 increases poverty rates between age 60 and the new state pension age, but has no impact on income poverty once the women have reached the higher state pension age.

Table 5. Testing for a persistent effect of raising state pension age: effect of increasing female state pension age from 60 to 63 on economic activity, income and poverty rate

	Effect of being under state pension age		*Effect of being one year past state pension age*	
	Coefficient	Standard error	Coefficient	Standard error
Economic activity (percentage points)				
In paid work	+9.2***	[1.9]	+3.7*	[2.0]
In full-time paid work	+6.7***	[1.7]	+1.7	[1.9]
In part-time paid work	+3.1**	[1.5]	+2.8*	[1.7]
Receives any state benefits	–70.4***	[1.8]	–6.8*	[4.2]
Receives occupational pension	–3.0**	[1.5]	–1.2	[1.6]
Has investment income	–1.4	[1.7]	–0.1	[2.0]
Income (£ per week)				
Net individual income	–48.39***	[6.75]	–5.69	[6.96]
Net equivalised household income	–37.07***	[10.77]	–17.43	[11.70]
Income poverty (percentage points)				
In absolute poverty (BHC)	+8.5***	[1.2]	+0.8	[1.5]
In absolute poverty (AHC)	+6.2***	[1.3]	+1.1	[1.6]

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 19,086 observations in all models. All effects are obtained by estimating equation (1) with the addition of a dummy variable signifying whether the individual has reached one year past her state pension age. All effects are estimated using a probit model. Standard errors are estimated by bootstrapping with 1,000 replications.

Both men and women can be eligible for pension credit and winter fuel payment when they reach the female state pension age (rather than their respective state pension ages). This means that single men are no longer able to claim pension credit at 60 (subject to the means test), but must wait until they reach the female state pension age determined by their date of

birth. To examine the impact this change has on single men, we take single men from the same survey years and birth cohorts as our main analysis of women and look to see what effect the rising state pension age has on their incomes. The results are presented in Appendix Table A4 and show that the increase in the female state pension age reduces their state benefit income significantly (by £21 per week), leading to an increase in the income poverty rate among this group that is similar in magnitude to that found for women (7.2ppts and 6.1ppts for BHC and AHC poverty for single men, compared with 8.7ppts and 6.4ppts for women).

The results so far have shown that increasing the state pension age increases rates of income poverty for women, although only temporarily. To help gauge the extent to which the reform increases hardship for the affected women, we also investigate its effect on material deprivation. Table 6 shows the impact of increasing the female state pension age on measures of material deprivation. The first two rows show that using the slightly different sample from the results shown previously makes very little difference to the estimated results of the impact of the reform on income poverty. The table also shows that, despite the increases in income poverty as a result of the reform, there is no increase in the average number of items that families are deprived of, at least using the items that we observe in our data. Nor are there any significant impacts on the probability of being deprived of at least one item, or indeed any of the individual items that we examine. Not only are the effects not significantly different from zero, but the point estimates are also very close to zero. These results suggest that households may have been able to smooth their consumption against falls in income, and therefore avoided higher levels of deprivation despite the falls in household incomes caused by the policy.

Table 6. Effect of increasing female state pension age from 60 to 63 on material deprivation rates of women (percentage points unless otherwise stated)

	Effect of being under state pension age	*Standard error*	*Mean for 60- to 62-year-olds pre-reform*
Absolute AHC poverty (whole sample)	*+6.4****	*[1.2]*	*14.8%*
Absolute AHC poverty	+5.6**	[2.3]	14.2%
Mean number of items deprived of	+0.025	[0.094]	1.13
Deprived of at least one item	+1.2	[2.9]	38.2%
Deprived of two or more items	+0.7	[2.6]	26.6%
Deprived of: good decoration	+0.1	[2.1]	10.4%
Deprived of: contents insurance	+0.7	[1.6]	6.4%
Deprived of: £10 savings per month	+0.7	[2.8]	25.4%
Deprived of: replace furniture	–1.1	[2.5]	18.0%
Deprived of: replace electrical goods	+1.6	[2.1]	12.6%
Deprived of: spending money on self	+3.1	[2.2]	11.9%

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 10,947 observations in all models. Effects on all outcomes except 'Mean number of items deprived of' (which is estimated by OLS) are obtained by estimating equation (1) using a probit model. Their standard errors are estimated by bootstrapping with 1,000 replications (except for 'Mean number of items deprived of', where the standard errors are robust to heteroskedasticity). Pre-reform means are estimated from FRS data in 2007–08 to 2009–10.

One concern might be that, although many individuals are able to adjust relatively easily to the loss of benefit income by using savings to help smooth their consumption or by retiring later, some groups might be credit constrained or have already left the labour force and so find it harder to adjust. In Table 7, we look at the effects on material deprivation for three groups of women with higher-than-average poverty rates (as shown in Table 4), who might find it harder to smooth their consumption: renters, singles and those with low education. The results show that despite significant increases in the poverty rates for these groups, there are no significant effects on deprivation for any of them. Although the standard errors on these effects are relatively high due to the small sample sizes, the point estimates are also small, particularly given the large increases in measured income poverty. This suggests that, on these measures of deprivation, even among groups that might be expected to find it harder to adjust to the loss of state pension income, we do not find evidence of increases in rates of material deprivation.

Table 7. Effect of increasing state pension age from 60 to 63 on poverty and material deprivation rates for subgroups of women

	In absolute AHC poverty (ppts)	*Mean number of items deprived of*	*Deprived of any items (ppts)*	*N*
Renters	+13.6**	+0.047	+2.0	2,369
	[6.7]	[0.300]	[6.3]	
Singles	+12.6***	+0.127	+3.0	3,656
	[4.3]	[0.205]	[5.4]	
No post-16 education	+7.1**	+0.147	+3.1	7,027
	[3.1]	[0.126]	[3.7]	

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. Effects on outcomes except 'Mean number of items deprived of' (which is estimated by OLS) are obtained by estimating equation (1) using a probit model. Their standard errors, shown in square brackets, are estimated by bootstrapping with 1,000 replications (except for 'Mean number of items deprived of', where the standard errors are robust to heteroskedasticity).

6. Conclusion

One potential way to deal with the public finance costs of rising longevity is to increase the age at which unreduced public pensions can be received. The impact such a reform has on household incomes – and on the public finances – will depend on how households respond to the reform, and the operation of the rest of the tax and benefit system. The impact on household incomes and on the public finances might be muted if state pensions are taxable and if many individuals move onto other state benefits. If in contrast individuals respond by increasing their earnings, this would not only boost household incomes – thereby making up for at least some of the lost state pension income – but also strengthen the public finances further. If household incomes are significantly reduced then the gains to the public finances from such a reform should possibly be weighed against whether particular types of households experience large losses and the hardship this causes.

This paper has estimated the impact of increasing the female state pension age in the UK from 60 to 63, between April 2010 and March 2016, on the incomes of women aged 60–62. We find that, on average, household incomes were reduced by £32 per week, with an increase in employment income partially offsetting a larger fall in income from state benefits. After accounting for behavioural change, we estimate that the public finances were strengthened by £5.1 billion, of which £4.2 billion came from reduced benefit spending (net of tax, where applicable) and £0.9 billion from increased direct tax receipts elsewhere. This implies that the

reduction in benefit spending from the cut to state pension spending is only partially offset by higher benefit spending elsewhere, while on the tax side the reduction in income tax from state pension income is more than offset through increased taxes on private incomes.

Women from lower-income households are found to experience a relatively greater cut to their net incomes, and the poverty rate among women aged 60–62 is found to increase by 6.4ppts as a result of the state pension age rising from 60 to 63. The increases in poverty rates are greater among groups for whom income poverty is more prevalent: singles rather than those in couples; renters rather than owner-occupiers; and those with fewer, rather than more, years of formal education. But we find no evidence that this increase in income poverty persists once these women do reach the state pension age. It should also be noted that, because the state pension is a relatively similar cash amount across the pensioner income distribution, increasing the earliest age at which it is claimed has a much smaller impact on poverty than would a similar-sized (in public finance terms) cut in a benefit that is targeted towards low-income families, such as working-age tax credits. We also find no evidence of any increase in the likelihood of women reporting being deprived of important material items, potentially suggesting that many affected families have smoothed their consumption, and avoided increased levels of deprivation, despite the large reduction in income caused by the reform.

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Appendix

Appendix Table A1. Number of observations by age and financial year for estimation sample for material deprivation results

Financial year	*Age*					
	57	58	59	60	61	62
2008–09	346	303	309	335	365	294
2009–10	287	325	313	308	325	340
2010–11	321	306	312	309	298	269
2011–12	226	249	301	186	0	0
2012–13	262	230	256	227	53	0
2013–14	277	223	228	223	179	0
2014–15	227	267	225	228	211	39
2015–16	199	171	179	135	158	123

Note: Dark shaded cells indicate women in this sample who are all over their state pension age. Light shaded cells where some women in this sample are above and some women are below the state pension age. Unshaded cells show where women in this sample are below their state pension age.

Appendix Table A2. Effect of increasing female state pension age from 60 to 63 on the incomes and economic activity of husbands

Outcome	*Effect of wife being under state pension age*	*Standard error*
Individual income (£ per week)		
Gross employment income (incl. self-emp.)	+2.39	[18.69]
Gross occupational pension income	+15.35*	[9.25]
Gross investment income	+3.20	[4.43]
Gross private income	+21.12	[18.65]
Benefit income	+6.72**	[3.06]
Net income	+22.03*	[12.55]
Economic activity (ppts)		
In paid work	–0.1	[2.1]
In full-time paid work	–1.4	[2.0]
In part-time paid work	+1.1	[1.3]
Receives any state benefits	+0.3	[0.9]
Receives occupational pension	+1.9	[2.0]

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 12,342 observations in all models. Effects on economic activity are obtained using a probit model; their standard errors are estimated by bootstrapping with 1,000 replications. Effects on income components are estimated using OLS; their standard errors are robust to heteroskedasticity.

Appendix Table A3. Estimated number of women over 60 but under state pension age, by March 2016 and November 2018: UK and nations and regions of UK

	By March 2016: women aged 60–62	*By November 2018: women aged 60–64*
United Kingdom	1,084,600	1,787,100
North East	48,100	79,200
North West	120,800	199,400
Yorkshire and the Humber	90,100	148,800
East Midlands	81,000	134,100
West Midlands	94,800	156,000
East of England	103,800	171,600
London	110,400	178,500
South East	149,200	246,200
South West	100,800	168,200
Scotland	99,500	162,800
Northern Ireland	29,200	47,700
Wales	57,000	94,700

Note: Figures rounded to the nearest 100.
Source: Office for National Statistics (ONS) mid-year population tables, 2015.

Appendix Table A4. Effect of increasing pension credit age from 60 to 63 on economic activity, incomes and poverty of single men

Outcome	*Effect of being under pension credit age*	*Standard error*	*Mean for 60- to 62-year-old single men pre-reform*
Economic activity (ppts)			
In paid work	+2.4	[3.8]	44.4%
Receives any state benefits	–53.3***	[2.8]	100.0%
Receives occupational pension	–2.3	[3.3]	32.3%
Has investment income	–1.9	[3.7]	61.0%
Individual income (£ per week)			
Gross earnings (incl. self-emp.)	+4.95	[27.51]	193.60
Gross occupational pensions	–4.61	[10.52]	75.87
Gross investment income	+0.11	[5.37]	28.65
Gross private income	+1.97	[27.12]	300.03
Benefit income	–20.78**	[8.11]	88.81
Net income	–16.05	[15.98]	300.03
Household income (£ per week)			
Total private income	–16.35	[30.26]	364.26
Total benefits	–30.29***	[9.47]	115.26
Total net income	–38.14*	[19.51]	372.80
Total equivalised net income	–29.85	[22.22]	468.37
Absolute poverty rates (ppts)			
In absolute poverty (BHC)	+7.2**	[3.3]	20.5%
In absolute poverty (AHC)	+6.1*	[3.3]	23.4%

Note: ***, ** and * denote that the effect is significantly different from zero at the 1%, 5% and 10% level respectively. There are 3,984 observations in all models. Effects on economic activity and poverty are obtained by estimating equation (1) using a probit model; their standard errors are estimated by bootstrapping with 1,000 replications. Effects on income components are estimated using OLS; their standard errors are robust to heteroskedasticity. Pre-reform means are estimated from FRS data in 2007–08 to 2009–10.