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**State Pension eligibility age and retirement behaviour: evidence from the United Kingdom Household Longitudinal Study**

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# State Pension eligibility age and retirement behaviour: evidence from the United Kingdom Household Longitudinal Study

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**Abstract**

We examine individuals' retirement behaviour in response to changes in the State Pension eligibility age introduced in various Pension Acts in the UK. The findings show the probability of retirement increases sharply once individuals become eligible for State Pension, by 40 pp and 34 pp for men and women respectively. We find no empirical support for men or women adjusting their expected retirement age upwards in response to an increase in the SP eligibility age. Our findings suggest that whilst changes in the State Pension eligibility age are important for individual's actual retirement, they do not induce individuals to revise their expected retirement age and this can result in suboptimal retirement planning. The latter can be problematic for those who rely disproportionately on State Pension as their main source of income and, arguably, targeted communication campaigns are needed to improve retirement planning.

JEL classification: J26

Keywords: Retirement, Expectations, United Kingdom Household Longitudinal Study

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## 1. Introduction

Since the 1990s policymakers across OECD countries including the UK have sought to curb the long-term trend of early retirement among older workers (Blundell, Meghir & Smith, 2002; Banks, Emmerson & Tetlow, 2018). Retirement here refers to a gradual reduction or complete cessation of labour supply (Denton & Spencer, 2009). One policy lever which has been used to achieve this goal is increasing the State Pension eligibility age (SP-e age). A key question, then, is to understand how important SP-e age is for retirement behaviour. Due to the timing of the reforms and the cohorts affected, only limited empirical research exists on how men and women have responded or intend to respond in terms of their retirement behaviour to the recent higher SP-e ages in the UK. Notable exceptions include Cribb, Emmerson and Tetlow (2016) and Cribb, Emmerson and O'Brien (2022) who exploit changes in the SP-e age for certain groups of older men and women and find significant labour supply responses among affected cohorts.

Our study adds empirical evidence on retirement behaviour in response to SP-e age reforms in the UK. The reforms are characterised by, first, increasing SP-e age substantially and up to 67, second, speeding up the pace of the equalisation of SP-e age for men and women, and third, being announced and implemented in a relatively short period of time. We address the issues of (actual) retirement when individuals have reached their SP-e age and, separately, how reforms to SP-e age affect individual's expected age of retirement. For this, we use data from the United Kingdom Household Longitudinal Study, a large-scale household panel survey representative of the UK population.

The UK provides an interesting case study to address our two main research questions. First, whilst State Pension (SP) is an important source of income, replacing around 28% of preretirement net income (OECD, 2021), it is the lowest among all OECD countries. However,

this does not imply reforms to SP-e age will not lead to behavioural responses, which could be due to changes in economic incentives, signals, and cultural norms (Kohli, 1991; Cribb et al, 2016; Amin-Smith & Crawford, 2018). Second, the main source of retirement income for UK retirees comes from an occupational pension and individuals can typically receive this from age 55 onwards. However, recent evidence shows 78% of retirement income for the poorest pensioners comes from SP alone (Age UK, 2018).

Separately, research underlines the importance of financial planning for improving living standards in retirement (Lusardi, Michaud and Mitchell, 2017; Gubler and Pierce, 2014). Current labour supply and earnings are a key source of retirement savings, due to pension and formal saving. Therefore, it is of significant policy interest to understand retirement behaviour at older ages and how it is affected by changes to SP-e, in terms of planned age of retirement and actual retirement. From a lifecycle perspective, assuming perfect foresight individuals anticipate changes and adjust their labour supply, consumption and saving behaviour accordingly. However, evidence suggests real life behaviour deviates significantly from this ideal. In the context of retirement, which is typically a one-way process in the UK (Kanabar, 2015), if individuals do not adjust on one or more of these dimensions adequately this could lead to suboptimal outcomes, for example a recent study found women affected by SP-e age reforms were more likely to experience old age poverty compared to a slightly older unaffected cohort (Cribb & Emmerson, 2019).

To address our research questions, we utilise the 2007, 2011 and 2014 reforms to SP-e age in the UK (State Pension Acts) which increased the pace of equalisation of SP-e age between men and women (the latter was historically 5 years lower) and raised the SP-e age of men and women up to 66 or 67, depending on their date of birth. The magnitude of these reforms is non-trivial, women (men) born in certain cohorts saw their SP-e age increase by 2 (1) year(s) over

a relatively short period of time. We also consider whether liquidity constraints proxied by factors such as individual pension membership, household income and housing tenure play a role in current and future retirement decisions. Recent evidence suggests anticipated reforms to SP-e age are important for retirement intentions (see inter alia Ciani et al., 2019, on evidence for Europe), we consider whether reform announcements in the UK prior to individual's survey interview affect retirement age expectations.

The rest of the is paper is set out as follows. Section 2 briefly discusses the academic and policy literature. Section 3 summarises the main features of the UK pension system. Section 4 describes the United Kingdom Household Panel Survey. Section 5 describes the methodology used and Section 6 presents estimation results. Section 7 discusses the implications of our findings and section 8 concludes.

## 2. Literature

SP-e ages have been shown to influence retirement decisions across a range of countries despite differences in the rules defining individual social security and taxes (Ciani et al. 2019). Cribb et al. (2022) analyse how a reform to SP-e age from 65 to 66 in the UK affected male and female labour supply. They find that among treated cohorts the employment rate increases by 7.4 pp for men and by 8.5 pp for women, and that full-time workers, the self-employed, lower educated, and those living in relatively more deprived areas responded more strongly.

Cribb and Emmerson (2019) consider how the reform to women's SP-e age affected living standards. Their findings show find that despite weekly income dropping by £32 per week and the absolute income poverty rate increasing by 6.4 percentage points (pp), affected individuals did not report higher levels of material deprivation and the risk of poverty did not persist once women became eligible for state pension, possibly because individuals smoothed their consumption in response to the reform. The fall in income and rise in poverty even in the short

run suggests individuals do not adjust sufficiently, especially given the policy was announced in 1995 - fifteen years before its introduction. Thus, understanding whether individuals expect to adjust their retirement age given the reforms we consider, which legislate for even higher SP-e ages and with a much shorter period between the announcement and implementation date is an important research question.

Despite the need for policymakers to better understand how individuals respond to state pension age reforms, little empirical evidence is available. Expectation's data has been shown to play an important role in explaining major lifecycle decisions including the decision to retire (see inter-alia Bernheim, 1989 and Manksi, 2004). Disney and Tanner (1999), using the UK Retirement History Survey, compare expected versus actual retirement ages and find that most individuals reported their Expected Retirement Age (ERA) to be the SP-e age at the time. Moreover, these individuals subsequently retired at that age highlighting (i) the accuracy of expectations data in predicting subsequent retirement and (ii) the strong cultural norms associated with reaching SP-e age.

Given the importance of retirement expectations in determining future labour supply on the one hand, and the strong connection between reaching SP-e age and ceasing or reducing paid work on the other few studies have analysed how changes in SP-e age affect retirement expectations. An exception is Botazzi, Jappelli and Padula (2006) who find a series of reforms introduced in Italy during the 1990s to raise SP-e age by five years increased women's (men's) ERA by three (two) years. Similarly, De Grip, Fouarge and Montizaan (2013) find individuals affected by the increased SP-e age from 65 to 66 in the Netherlands adjusted their ERA by 3.6 months while those who faced an increase in SPe-age from 65 to 67 adjusted their ERA by 10.8 months. Such changes in ERA were driven by highly educated females who have higher levels of pension wealth. However, the extent to which individuals adjusted their ERA was

related their work capacity and insurance contribution history, suggestive of an income effect. Coppola and Wilke (2014) analyse a reform similar that evaluated by De Grip, Fouarge and Montizaan (2013), but in this case for Germany and find lower educated individuals did not adjust their expectations given the policy objective.

A recent set of studies investigate the channels which inform individual expectations. Ciani et al. (2019) using survey data spanning 10 European countries finds both official announcements as opposed to implementation and online search are both important for influencing individual beliefs. Alongside how individuals search for information the authors find proximity to the event of interest is important. Specifically, once an announcement has been implemented individuals' do not expect future reforms to SP-e age. In a separate paper using the same dataset Bucher-Koenen et al. (2019) also use the reform announcement date to understand the effect on future expected labour supply. Their findings suggest individuals make a partial adjustment, and, in this case, it is higher educated individuals who are more responsive.

Taken together the existing evidence suggests (i) SP-e ages influence labour supply, (ii) certain groups such as the low educated who have lower pension wealth are likely to be disproportionately affected by such reforms which may lead to suboptimal outcomes such as old-age poverty, in the absence of adjusting on other margins, (iii) individuals do not fully adjust their ERA given the change in the SP-e age instead they make a partial adjustment and (iv) the timing and channels individuals use to learn about reform announcements is important.

## 3. Pension Policy in the UK

The UK pension system consists of three pillars. The first pillar, State Pension was introduced in 1948 and significantly reformed in April 2016. It is now a single tier flat rate scheme based on a Pay as You Go funding structure. Individuals who reached SP-e age prior to this date

remain under the 'old' system which has two tiers: a flat rate basic pension and an additional pension related to earnings.[1] The older individuals in our sample are affected by the pre-2016 system whilst for younger individuals the new system applies. The level of state pension received depends on the number of years of National Insurance Contributions and an individual's date of birth.[2] Further, UK state pension is only available approximately ten years post receipt of occupational pension for members of Defined Contribution Schemes.

In the 2018/19 tax year, the maximum state pension benefit an individual can receive under the new single tier system was £164.35 per week replacing around 28.4% of average pre-retirement earnings (OECD, 2021).[3] This figure is low by European standards, however expenditure on state pensions is non-trivial totalling £93.8 billion or just under 5% of GDP in the tax year 2017/18 (OBR, 2018). Moreover, evidence suggests around 1.1 (out of a total 11.81) million single pensioners aged 65+ rely on their State Pension as their sole source of income (Independent, 2017). Information relating to the second and third pillar of the UK pension system can be found in Online Appendix A.

### 3.1 State Pension and Pension Acts in the UK

The basic structure and features of the UK State Pension system in operation until March 2016 were introduced in the Beveridge Report published in 1948. Between 1948 and 5th April 2010 the SP-e age for women (men) remained fixed at 60 (65). The 1995 Pension Act legislated to increase female SP-e age by one month every month for those individuals born after 6th April

[1] See Bozio et al. (2010) for a comprehensive description of system in place prior to April 2016.
[2] A recent OECD report showed that gaps in employment have limited impact on retirement income in terms of state pension accrual due to welfare policies in operation in the UK (OECD, 2015).
[3] In 2018-2019 the full basic state pension amounted to £125.95 per week under the old system, however the amount calculated is a function of numerous factors such as the 'class' of the contribution and whether an individual was 'contracted out' (see Bozio et al., 2010).

1950, starting from April 2010 and the full reform being rolled out by March 2020 at which point female SP-e age would equal that of males.

The 2007 Pension Act raised the SP-e age for both men and women to 66 between 2024 and 2026 (increasing by one month, every month), to 67 between 2034 and 2036 and to 68 between 2044 and 2046. Policymakers emphasised the reform was required given the rise in life expectancy in the UK among cohorts born post 1950 (ONS, 2015) which had not been matched by an equivalent or proportional increase in SP-e age.

The 2011 Pension Act bought forward the rise & equalisation of female SP-e age legislated in the 1995 Act to November 2018, 18 months earlier than initially planned. The increase in the SP-e age from 65 to 66 for men and women was also brought forward from 2024-2026 to between December 2018 and October 2020. The 2011 reforms were non-trivial in their scope and magnitude: estimates suggest 5 million individuals were affected (Thurley, 2017). The 2014 Pension Act brought forward again planned increases to SP-e age originally legislated in the 2011 Pension Act.[4] In summary, SP-e age in the UK has increased over a relatively short period of time particularly for women.

Figures 1 and 2 visually summarise the 2007, 2011 and 2014 reforms by gender. The increase in SP-e age under each reform is not uniform by or within gender and depends on an individual's exact date of birth and date of survey interview. Online Appendix B details the changes made to SP-e age by gender under successive Acts.

[4] The 2014 Pension Act also legislated that the SPA would be reviewed on a periodic basis. The March 2017 recommendation of the Cridland Review of bringing forward the increase of SPA from 67 to 68 does not affect our sample respondents.

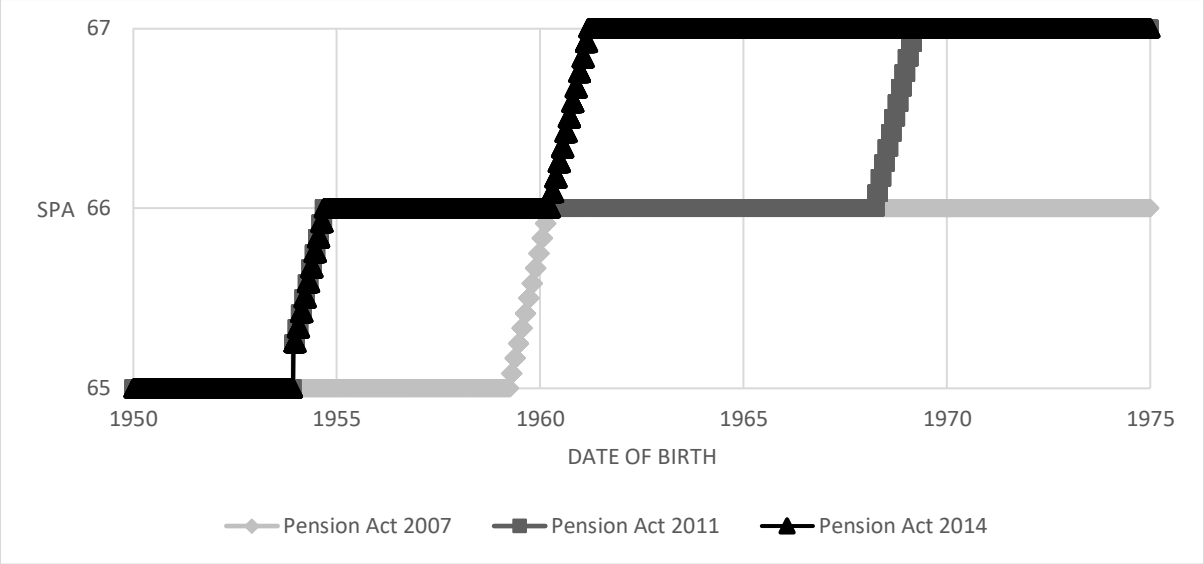


**Figure 1**: **UK State Pension Acts and Men's SPA.** SPA is the official State Pension Age in the UK under the 2007, 2011 and 2014 State Pension Acts conditional on individual's date of birth.

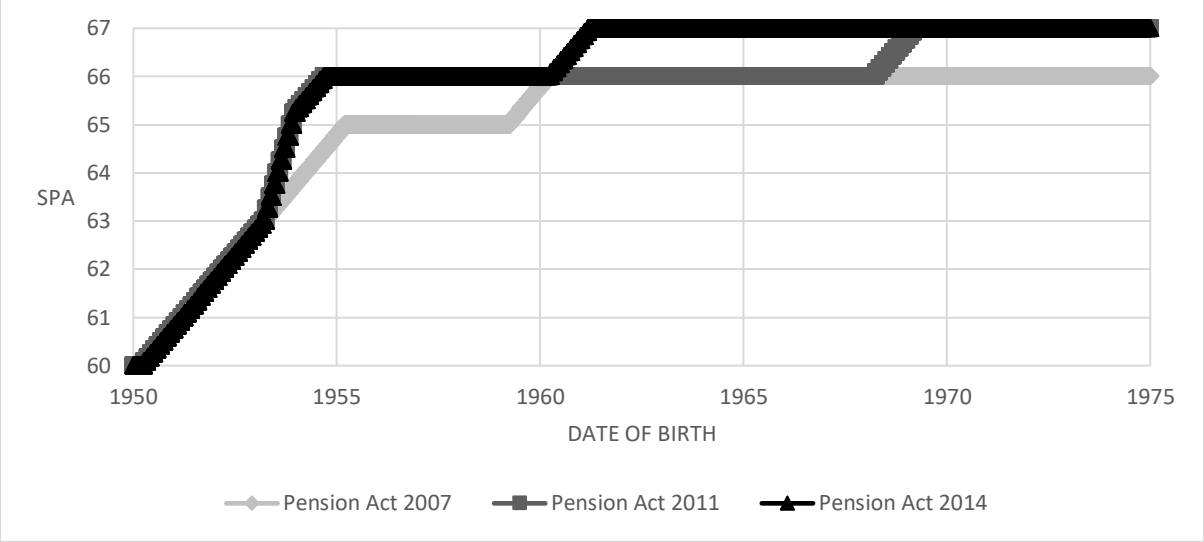


**Figure 2: UK State Pension Acts and Women's SPA.** SPA is the official State Pension Age in the UK under the 2007, 2011 and 2014 State Pension Acts conditional on individual's date of birth.

### 3.2 Abolishment of the mandatory retirement age

Until October 2011 employees were required to request permission to work past age 65 and hence this became the 'default retirement age' (Lain et al., 2017). The Employment Equality Regulations (EER) introduced in 2011 reduced employer powers regarding retirement decisions and improving employee rights including addressing age related discrimination. This did not correspond with a sudden increase in employment rates among older workers, though there has been a general increase in labour force participation among those aged 65+ since the early 2000's (ONS, 2018c). On balance, we do not expect the 2011 EER to affect the impact SP-e age has on ERA in a systematic way, due to strong cultural norms, social security and (lack of) strong tax incentives between reaching SP-e age and reducing work hours or exiting the labour market in the UK (Kohli, 1991; Blundell, Bozio and Laroque, 2013). Moreover, the EER affected labour supply at age 65, which would affect relatively more men than women in our sample given the historic differences in SP-e age by gender. This contrasts with evidence from the US, which found a positive effect on participation rates following the introduction of a similar policy (von Wachter, 2009).

### 3.3 Other state benefits

Individuals may be eligible to receive state benefits depending on their individual and household circumstances. This includes support for living costs, care/disability costs and housing. If such benefits were increased in terms of their generosity this could offset behavioural changes to observed and planned future labour supply, consumption, or savings in response to SP-e age reforms. For this to be true such a change to benefit income would have to be perceived as permanent and similarly for reforms to SP-e age. Over the period covered by our sample data no such benefits have been adjusted upwards (above inflation) to offset the reduction in state pension wealth due to SP-e age reforms.

## 4. Data

The analysis uses the secure version of the United Kingdom Household Panel Study (UKHLS) covering the period 2010-2018 (waves 2-9) (Knies, 2017).[5] UKHLS collects annual data on a range of individual and household economic and sociodemographic characteristics.

Our analysis is based on two samples, one to understand how individual's labour supply responds to reaching SP-e age and the other to analyse how individual's ERA responds to changes in SP-e age. We define a labour force exit as a transition from employment to retirement based on self-reported labour market status across two consecutive survey waves. For analysis purposes we follow individuals aged between 52 and below SP-e age at wave 2 of UKHLS. Individuals are followed over subsequent consecutive waves until the first wave at which they attrit from the sample (if before the final wave). Therefore, the sample used to model retirement transitions is an unbalanced panel of individuals who are retained in the sample even after they retire.

When analysing how ERA responds to changes in SP-e age, we follow previous research and assume that individuals perceive the term 'retirement' to correspond to a significant reduction in labour supply at the intensive or extensive margin (Banks & Smith, 2006; Blundell, Bozio & Laroque, 2013). UKHLS includes a 'retirement planning' module at each wave which contains a range of questions asking individuals for their subjective expectation of events associated with retirement. The question regarding expected retirement age is worded as follows:

"*There is a lot of policy interest in how people are planning for their long term future and retirement. At what age do you expect you will retire or will consider yourself to be retired*?"

[5] An additional robustness checks use waves 2,3,7 and 8 (2010-2017).

Respondents provide an integer value or can respond 'don't know'. [6] The retirement planning module is age-triggered: only individuals aged 45, 50, 55, 60 and 65 at time of their survey interview and who consider themselves not retired are eligible to answer. We exclude 65-year-old men and 60-year-old women in employment from our sample due to issues related to self-selection. These individuals are likely to be systematically different in an unobservable, and possibly time varying way from the rest of our sample with respect to their taste for work, as they are working at or past SP-e age at the time the survey was administered.[7] The sample used for this part of the analysis is constructed as follows: given the restricted ages covered in the retirement planning module we include all eligible men (women) aged between 45 and 60 (55) at waves 2,3 and 4 (2010-2013) who are also observed for a second time 5 waves later (2015-2018). Identical to approach used for the labour force exit analysis we restrict attention to individuals who report being employees at each respective wave.

Online Appendix C describes the key economic and sociodemographic characteristics used in the analysis. Online Appendix D provides summary statistics of these same characteristics by gender for the sample used in our analysis. After applying relevant sample restrictions there are 1412 men (1386 women) with a complete information set suitable for the labour force exit analysis and 592 men (827 women) eligible to be included in the retirement expectations analysis.

[6] We drop individuals who respond 'don't know' to the ERA question and note such a response is non-random (Kleinjans, K.J. & van Soest, 2014).
[7] An alternative way of eliciting expectations is using subjective probabilities (Manski 2004) such questions are not available in Understanding Society.

# 5. Empirical model

## 5.1 Modelling retirement

Our interest is in understanding how the probability of retirement changes when an individual reaches state pension eligibility age. We estimate the following regression by gender using a fixed effects estimator:

$$(1) \qquad R_{it} = \beta_0 + \beta_1 D_{it} + \boldsymbol{\beta}_2 \boldsymbol{X}_i * D_{it} + \boldsymbol{\beta}_3 \boldsymbol{H}_i * D_{it} + \varphi_t + \theta_i + \epsilon_{it},$$

where $i$ denotes individual and $t$ denotes the year of observation. Equation 1 states the probability an individual is retired or not in a given survey wave, is a function of whether they have reached SP-e age (binary variable $D$), a vector of individual and household level covariates ($\boldsymbol{X}$ and $\boldsymbol{H}$, respectively) interacted with $D$, calendar year fixed effects ($\varphi$) and an individual fixed effects $\theta$. The covariates included in $\boldsymbol{X}$ and $\boldsymbol{H}$ are measured in the first wave an individual is observed to avoid issues of simultaneity and/or reverse causation. Given social norms, income effects and low rates of state pension deferral (see Kanabar and Simmons, 2016), state pension is an important component of total retirement income. Thus, a priori we expect $\beta_1$ to have a positive effect on the probability of retirement. We include individual fixed effects to control for time invariant unobserved heterogeneity which may influence the retirement decision. Standard errors are clustered at the individual level.

We focus on how individual's own SP-e and characteristics, such as whether they are members of an occupational pension plan affect the retirement probability and not their spouse's characteristics (if present). Preliminary analysis found spousal characteristics such as their eligibility for SP did not affect individuals' own retirement expectations. Nonetheless, studies have shown actual retirement is a household level decision and spousal characteristics can affect labour supply (in both directions) including at or around state pension eligibility age (see Cribb et al. 2016; Cribb et al. 2022). We therefore control for household level characteristics

such as income and housing tenure which may affect the retirement decision in vector $\boldsymbol{H}$. To highlight how these characteristics may affect retirement differentially depending on SP-e, we interact covariates with SP-e.

### 5.2 Modelling expected retirement age

Figures 1 and 2 demonstrate the change to SP-e age is gradual and relatively small for some cohorts; whilst for others it is up to two years. The magnitude of the changes differs by date of birth in different calendar years. The complex relationship between SP-e age on the one hand and calendar time and birth cohort on the other, makes it difficult to use standard econometric frameworks typically used to estimate causal effects.[8] Similar to the approach taken to model retirement, we model changes in the expected retirement age ($ERA$) using a fixed effects approach. We estimate the following equation by least squares for each gender:

$$(2) \qquad ERA_{it} = \alpha_0 + \alpha_1 SPA_{it} + \boldsymbol{\alpha_2 X}_i * SPA_{it} + \boldsymbol{\alpha_3 H}_i * SPA_{it} + \gamma_t + \eta_i + \mathfrak{z}_{it}$$

Our dependent variable is $ERA$ and $SPA$ corresponds to SP-e age given individual's date of birth and date of their survey interview. We include an identical set of individual and household level controls (vectors $\boldsymbol{X}$ and $\boldsymbol{H}$, respectively) used to model retirement.[9] For the same reasons discussed in the previous subsection we only include the values recorded at the initial wave an individual is observed and these are interacted with SP-e age. Time fixed effects are denoted by $\gamma$ and individual fixed effects by $\eta$.

The key coefficient of interest is $\alpha_1$ , i.e., the effect of the SP eligibility age ($SPA$) on $ERA$. If $\alpha_1$ is positive (negative) this indicates that the expected retirement age rises (falls) for a given increase in the SP eligibility age. If individuals adjust their expected retirement age with exact

[8] One possibility is to analyse the SPA-ERA relationship around the kink and jump points separately, however the low number of observations around these points, as there are many, makes this impossible.
[9] In preliminary specifications, we controlled for an extensive set of individual and spousal characteristics however these were not statistically significant at conventional levels.

the same number of years as the rise in their SP eligibility age, then $\alpha_1 = 1$. If $\alpha_1 = 0$, this would be consistent with individuals either having perfect foresight or being 'naïve' with respect to announced changes to SP-e age.

## 6. Estimation results

We present our results in two parts, the first focuses on how SP-e age affects the probability of retirement and the second on how SP-e age affects the expected retirement age. These effects are identified from changes in the SP-e age due to the SP reforms discussed in section 3.

Table 1, columns 1 and 3, shows reaching SP-e age significantly increases the probability of transitioning from employment to retirement. For men the magnitude of this effect is 34.4 pp and for women it is 26.4 pp for the base specification. After controlling for individual occupational pension membership, household income and housing tenure, columns 2 and 4 of Table 1 show the probability of retirement increases with 40.2 for men and with 34.4 pp for women who belong to the reference group (low income, have occupational pensions, and are renters).

The results of the extended specifications (columns 2 and 4) provide empirical support for interaction effects of SP-e with income, occupational pension, and housing tenure (bottom row). Nevertheless, the individual estimates of these interaction effects are imprecisely estimated. For men a marginally significant interaction effect of income and SP-e age on the probability of retirement: individuals in the top income tertile are less likely to retire at SP-e age relative to those belonging to the bottom tertile for a given change in SP-e age. For women, no such effect is found, however for this group, relative to women belonging to renter households, the probability of retirement is 11 pp lower among women who report having a

mortgage compared to renters for the same change in SP-e age. We find no joint interaction effect between occupational pension membership and SP-e age on the retirement probability.

Table 2 shows the estimates for equation (2). Like Table 1 we estimate two versions per gender, a basic and extended specification. Column 1 shows suggestive evidence of a one-year increase in SP-e age (SPA) increasing men's ERA by 0.64 years, i.e., a partial adjustment . For women we find no empirical support for such adjustment. After controlling for covariates of interest (column 2 and 4), we find no support for changes to SPA having an independent impact on ERA for those who belong to the reference group of having low income and an occupational pensions, and are renters. There is empirical support for interaction effects of SPA with income, occupational pension, and housing tenure (bottom row) but, as for Table 1, the individual estimates of interaction effects are imprecisely estimated. Among female employees who do not report being active members of their employer's occupational pension scheme, ERA increases by 1.35 years for a one-year increase in SPA relative to those who are.

**Table 1: Retirement and SP eligibility effects**

| | Men (basic) | Men (full) | Women (basic) | Women (full) |
|---|---|---|---|---|
| State Pension eligibility (SP-e) | 0.344*** | 0.402*** | 0.264*** | 0.344*** |
| | [0.0122] | [0.0512] | [0.0131] | [0.0566] |
| Equivalized real monthly household income (interacted with SP-e) | | | | |
| Middle tertile | | -0.0471 | | 0.0307 |
| | | [0.0361] | | [0.0404] |
| Top tertile | | -0.0924* | | 0.0228 |
| | | [0.0380] | | [0.0409] |
| No occupational pension (interacted with SP-e) | | -0.018 | | -0.0378 |
| | | [0.0322] | | [0.0389] |
| Housing tenure (interacted with SP-e) | | | | |
| Own home outright | | 0.00873 | | -0.0587 |
| | | [0.0477] | | [0.0551] |
| Own home with mortgage | | -0.0727 | | -0.112* |
| | | [0.0503] | | [0.0573] |
| Observations | 10,561 | 7,749 | 10,415 | 7,782 |
| (unique individuals) | (1,591) | (1,412) | (1,879) | (1,386) |
| Hausman test (FE vs RE; $H_0$: RE) | Reject $H_0$ | Reject $H_0$ | Reject $H_0$ | Reject $H_0$ |
| $H_0$: No interactions covariates and SP-e | N/A | Reject $H_0$ | N/A | Reject $H_0$ |

Notes: ***,**,*,[1] refers to significance at 0.1%, 1%, 5% and 10% level respectively. Base categories: bottom tertile of income distribution, renter (and other), and individuals who are a member of their current employer pension scheme, all interacted with state pension eligibility (SP-e). Year fixed effects are controlled for.

**Table 2: Determinants of the Expected Retirement Age for men and women**

| | Men (basic) | Men (full) | Women (basic) | Women (full) |
|---|---|---|---|---|
| State Pension eligibility Age (SPA) | 0.643* | 0.795 | 0.152 | 0.486 |
| | [0.261] | [0.508] | [0.230] | [0.413] |
| Equivalized real monthly household income (interacted with SPA) | | | | |
| Middle tertile | | 0.196 | | -0.611 |
| | | [0.414] | | [0.425] |
| Top tertile | | 0.121 | | -0.0915 |
| | | [0.406] | | [0.400] |
| No occupational pension (interacted with SPA) | | -0.115 | | 1.365** |
| | | [0.525] | | [0.472] |
| Housing tenure (interacted with SPA) | | | | |
| Own home outright | | -0.545 | | -0.456 |
| | | [0.461] | | [0.375] |
| Own home with mortgage | | 0.149 | | -1.091 |
| | | [0.652] | | [0.639] |
| Observations | 1,520 | | 2,076 | 1,654 |
| (unique individuals) | (760) | 1,184 (592) | (1038) | (827) |
| Hausman test (FE vs RE; $H_0$: RE) | Reject $H_0$ | Do not reject $H_0$ | Reject $H_0$ | Do not reject $H_0$ |
| $H_0$: No interactions covariates and SPA | | Reject $H_0$ | | Reject $H_0$ |

Notes: ***,**,*,[ı] refers to significance at 0.1%, 1%, 5% and 10% level respectively. Base categories: 45, 2010, bottom tertile of income distribution, renter (and other) and individuals who are a member of their current employer pension scheme interacted with state pension eligibility age (SPA=SP-e age). Year fixed effects are controlled for.

## 7. Discussion

Among male employees we find only suggestive evidence that a partial adjustment is made in the expected age of retirement, and for women there is no evidence of adjustment found. Given empirical support is found for actual retirement for men and women being affected by the SP eligibility age, we next discuss potential reasons which may explain these contrasting results.

Individuals may not adjust their labour supply until closer to the date of retirement. Brucker and Leppel (2013) find individuals exhibit procrastination or inertia in retirement planning, especially among women and those with low financial net wealth. For policymakers this is a concern. Delaying labour supply decisions or not responding at all to future reforms without

adjusting on other margins such as savings or consumption will lead to suboptimal outcomes from a lifecycle perspective. Evidence suggests engagement with retirement planning is correlated with certain characteristics such as financial literacy, those with higher measured levels are more likely to engage in financial planning for retirement, are less likely to experience a sharp fall in living standards later in life and have better health outcomes (Lusardi, Michaud and Mitchell, 2017; Gubler and Pierce, 2014). Whilst UKHLS does not contain measures of financial literacy recorded at the time ERA is measured, we allow for differential adjustment based on, e.g., income and our lack of support for differential adjustment is therefore concerning.

Johnson (2001) analyses female saving behaviour in response to the 1995 State Pension Act and concludes the lack of adjustment observed in household saving rates for women affected by the reform, relative to those unaffected, is suggestive of myopic behaviour. He concludes that women could not have anticipated the reform and the way it was phased in, instead, suggesting the lack of adjustment was due to individuals perceiving the event to be sufficiently 'far off'. In the reforms we consider in this paper, the period between the announcement and implementation date is much shorter compared to the 1995 reform implying that, ceteris paribus, individuals be more likely to adjust on some margin, particularly older age groups who are closer to SP-e age.

**Table 3:** Average ERA for selected state pension eligibility ages.

| **Average ERA in first period observed** (waves 2 and 4, 2010/11-2013/14) | **Men** | **$N_{men}$** | **Women** | **$N_{women}$** |
|---|---|---|---|---|
| SP-e age=65 | 64.33 | 62 | 64.32 | 77 |
| SP-e age=66 | 64.07 | 484 | 63.47 | 644 |
| **Average ERA in second period observed** (waves 6 and 9, 2014/15-2017/18) | **Men** | | **Women** | |
| SP-e age=66 | 64.75 | 169 | 64.70 | 253 |
| SP-e age=67 | 63.60 | 367 | 62.95 | 476 |

Notes: figures correspond to mean expected retirement age (ERA) for two specific SP-e ages in the first and second period an individual is observed in the balanced panel.

Table 3 shows that the change in ERA observed across our sample period and hence successive State Pension Acts in place is below the SP-e age itself. Given we have a balanced panel we split responses by each point an individual is observed. In the first period the majority of responses were recorded when either the 2007 or 2011 Pension Act was in operation, whereas in the second period the 2014 Pension Act was in operation. Irrespective of time period, those with lower SP-e age refer to older cohorts. Based on these selected common SP-e ages, our sample data highlight the lack of responsiveness in ERA to changes in SP-e age. Irrespective of gender, individuals with a lower SP-e age (and hence older), report a higher ERA compared to younger individuals in both time periods. We also find that the difference in ERA for a given SP-e age is not dissimilar by gender.

These patterns align with the findings reported in Table 2 and suggest those further away from SP-e age in the absence of adjusting on other margins are not making adequate changes in terms of their ERA given changes to SP-e age. Indeed, for many of individuals in our sample the change in SP-e age is approximately one year, for the older cohorts (whose SP-e age increases from say 65 to 66 across the two periods) we do observe a small increase in ERA

across the two periods (0.42 and 0.38 years for men and women respectively). Whereas for younger cohorts whose SP-e age increases from 66 to 67 (so born during 1960s) we observe a decrease in ERA of 0.47 and 0.52 years respectively. We note that given the historic nature of SP-e age difference and the reforms, it is the females with an SP-e age equal to 65 (so born during mid 1950s) who have been affected most recently (compared to men with the same SP-e age), and these individuals report an ERA not dissimilar to their SP-e age (64.32). This is consistent with existing research showing affected cohorts respond to the reform by increasing their labour supply (Ludovico et al. 2020).

We next consider the role of state pension and other income sources in retirement given our findings. State Pension replaces approximately 28% of pre-retirement net earnings (OECD, 2021). Therefore, whilst an important source of income for individuals with lower lifetime earnings and wealth, the bulk of retirement income especially for wealthier households is likely to come from occupational pensions. Private pension wealth holdings are highly unequal in Great Britain**,** aggregate total private pension wealth holdings among the ninth (first) decile is £1288bn (£4bn) or 322 times larger (ONS, 2019). Similarly, from an income perspective, recent figures show median occupational pension income in 2018/19 equalled £181 per week whereas the top 8% of pensioners received at least £750 per week (ONS, 2020).

Table 2 shows that individual's ERA is 1.4 years higher among those who are not active members of their workplace pension scheme, for a one-year increase in SP-e age. Therefore, whilst symbolically important for determining labour force participation, the contribution of State Pension itself to retirement income is relatively low compared to occupational pensions and thus individuals may be slower, especially if the event is sufficiently 'far off' to adjust their expected retirement age upward consistent with the policy objective. The type and level of

occupational pension wealth is then important, in the UK Defined Contribution pensions can be claimed at age 55 whereas more generous Defined Benefit schemes vary in terms of eligibility ages albeit are generally higher. Crawford et al. (2020) finds for a cohort of individuals born in England during the 1950s current DB scheme members report on average an ERA 0.8 years lower than individuals who have no private pension arrangement. Whereas members of DC pensions do not report an ERA which is statistically different from the latter group. Unfortunately, in the UKHLS it is not possible to identify the type of pension an individual has. Conditional on the type of occupational pension held (if any), Crawford et al. (2020) finds individuals in the top household financial wealth quintile report on average an ERA over 2 years lower relative to those in bottom quintile. These findings underline the importance of occupational pension membership and wealth more generally in influencing ERA.

Individuals may adjust on other margins such as increasing their current labour supply and/or savings rate (conversely decreasing consumption) to keep ERA fixed. One reason why such an adjustment may not be needed for a given reduction in state pension wealth is oversaving. Crawford and O'Dea (2014) using the English Longitudinal Study of Ageing show that cohorts born in England in the 1940s (so slightly older than the cohorts analysed in this paper) typically hold levels of wealth far higher than optimal from a lifecycle perspective even after excluding housing wealth. Taken together, given the fact DC pension members can access this income source over 10 years prior to SP-e age and evidence showing individuals typically over-save for retirement suggests state pension income can be thought of as a supplementary rather than primary source of retirement income in the UK. However, whilst this may hold true on average, it is important to note that among the bottom fifth of the pensioner income distribution in Great

Britain approximately 80% of total gross mean income is state benefit income including State Pension (ONS, 2020).

Evidence suggests after a period of decline pensioner poverty is increasing in the UK (DWP, 2021; JRF, 2022). Certain groups such as women, single/widows, those with low lifetime attachment to the labour market, low lifetime earners, disabled, ethnic minorities and divorcees are more likely to experience poverty in old age. Some of these groups have been shown to be more responsive to SP-e age reforms, for example single women adjusted their labour supply more strongly relative to women with a partner (Cribb et al. 2016; Giusta & Longhi, 2021). The fact we do not find evidence of individuals who face liquidity constraints (proxied by housing tenure and income) of adjusting their ERA relatively more for a given change to SP-e age is concerning. Particularly if this is due to suboptimal behaviour such as lack of engagement with financial matters and retirement planning more generally or myopia and this leads to a higher risk of poverty in retirement as has been shown for certain cohorts of women affected by SP-e age reforms (Cribb and Emmerson, 2019). For example, sudden revisions to labour supply close to planned retirement may not be feasible due to health conditions related to main lifetime occupation and sector of work (Chan and Stevens, 2004; Banks and Tetlow, 2008; Round, 2017).[10]

We test for anticipation effects with respect to ERA and its relationship with SP-e age. We estimate an identical regression specification to that estimated in Table 2 but set individuals SP-e age to be equal to the SP-e age (given their date of birth) one years ahead of their survey interview, given the State Pension Act in operation at that time. It is typical for there to be a

[10] We cannot empirically test whether retirement expectations match realisations for a subsample of the data due to the fact reforms take place in quick succession and ERA is only measured every 5 years. However, it may well be that this cohort is not representative of the entire sample and the average effect we estimate is based on individuals who are significantly younger, in some cases by 10-15 years.

period of time when policies are first announced and publicly debated before they become law. For example, reforms to SP-e age (which subsequently became the 2011 State Pension Act) were first announced by UK government in 2010. However, were first discussed in the House of Lords in January 2011 before becoming enshrined in law on 3rd November 2011. Thus, individuals may have revised their ERA by the time their survey interview took place considering this information. In contrast to recent studies using European data (see inter-alia Ciani et al. 2019) however, we find no evidence of such adjustment irrespective of gender and varying the 'announcement period' between 1 and 3 calendar years ahead of the survey interview and the respective State Pension Act in place at the time (see online Appendix E).

## 8. Conclusion

Our results confirm SP-e age strongly affects actual retirement, despite the absence of an earnings test for SP eligibility or significant financial incentives to remain in work. Hence, SP-e age remains closely aligned with social or cultural norms regarding the timing of retirement. However, our results also show that individuals do not upwardly adjust their expected age of retirement given the legislated increase in SP-e age.

We provide suggestive evidence that active membership to a workplace pension can be important for such adjustments in the ERA for women; non-members increase their ERA by more than 1.3 years for each year SP-e age is increased. Furthermore, we find individuals who are likely to be liquidity constrained are no more likely to adjust their ERA for a given increase in eligibility age. However, for most households whilst an important source of *supplementary* retirement income, state pension only replaces on average 28% of preretirement income and whilst SP-e age has been increased successively in recent years, defined contribution pensions, the most common type of scheme in the UK and relatively more important for determining total retirement income can be claimed from age 55 (increasing to 57 in 2028).

The finding of no adjustment made to the expected retirement age in response to the increase in state pension eligibility age may well reflect rational behaviour, for example such individuals have perfect foresight. However, existing evidence suggests cohorts of women affected by the 1995 State Pension Act exhibit myopic behaviour when the policy was *implemented* and that men and women from recently affected cohorts do respond by raising their *actual* labour supply much closer to the event itself (Johnson, 2001; Cribb et al. 2016; Cribb et al. 2022). Therefore, from a policy perspective our findings suggest policymakers in the UK may need to improve communication to raise awareness of SP-e ages for cohorts approaching retirement years and among younger prime age workers. Recent developments such as the midlife MOT and forthcoming Pensions Dashboard Programme aim to address some these issues, however a key concern here is engaging individuals to use such tools and improving financial education in the context of retirement planning in the UK, especially among younger cohorts.

## Conflict of interest statement/declaration of competing interests

The authors declare that they have no conflict/declarations of interest. No funding was sought for this project.

We confirm this article is not being considered for publication elsewhere.

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**Online Appendix A: Occupational and personal pensions in the UK (Second and Third Pillars).**

## Occupational pensions.

Occupational pensions are a voluntary form of retirement saving and make up the second pillar of the UK pension system. These have traditionally been Defined Contribution (DC) or Direct Benefit (DB) type pension schemes; individuals are taxed on receipt of income from their occupational pension not at time of contribution. Occupational pensions (and personal pensions) play an important role in providing income in retirement, given that the level of state pension is relatively low in the UK (OECD, 2021). For example, average net replacement rates increase from 28 percent (state pension alone) to 62.2 percent after accounting for the presence of an occupational pension (OECD, 2017). Since April 2002 individuals have been able to claim their occupational pension from the age of 55 (up from 50); highlighting the significant age gap between claiming occupational and state pension in the UK for both men and women. A recent DWP report highlights that 62 percent of pensioners expect to receive income from an occupational pension (DWP, 2015).

To increase occupational pension coverage and retirement saving (but not retirement age *per se*), the UK government in April 2012 introduced Auto Enrolment (AE) a policy whereby employees were automatically enrolled into a workplace pension. Evidence shows that such 'nudge' behaviour has been effective in terms of changing individuals behaviour in a particular way (in this case minimising opt out) given the policy objective (Cribb and Emmerson, 2016).[11] Early evidence from the introduction of AE suggests it has been largely successful in terms of

[11] Auto enrollment was gradually phased in starting with larger employers before moving on to smaller employers, note that it does not cover the self-employed and we do not include such individuals in our sample for analysis purposes due to the way the UK pension system has historically treated self-employed versus employees, in addition to issues such as selection and unobserved heterogeneity.

coverage but issues such as increasing contribution rates conditional on participation still remain (Cribb et al. 2016; DWP 2017).

The UK government has also made significant changes to the way in which contributions to DC pensions can be drawn and used. Until March 2015 individuals could draw down up to 25 percent (tax free) as a lump sum and annuitize the remainder, following the introduction of the Pensions Schemes Act 2015; individuals are free to use their retirement savings as desired. A priori it is not clear how this policy change may influence retirement expectations. One possibility is that given it came into effect soon after the 2014 state pension act, which introduced further increases to SP-e age, the 2015 Pensions Schemes Act (PSA) could have mitigated upward revisions to ERA. For example, if individuals were likely to be liquidity constrained, the policy reform meant this would no longer be the case and *ceteris paribus* induce individuals to retire earlier or at the same age as initially planned.

Thurley (2017) summarises the impact of the 2015 PSA on individuals and shows that the introduction of the reform led to significantly more individuals drawing down their pension pot early (before age 65), that most of these early withdrawers had relatively small pension pots (<£30,000) and the number of annuities being taken out falling sharply, drawdown becoming the norm. Evidence suggests most individuals did not consider their DC pension as their main source of retirement income (the majority reported DB and State Pension) and that it was common for individuals to access their pension pots whilst still in employment (FCA, 2018). The research also suggested the reforms did not lead individuals 'squandering' their retirement savings and instead choosing to invest in alternative forms of saving (Thurley, 2017).

### Personal pensions.

Personal pensions are another type of voluntary retirement saving, between an individual and a provider (usually an insurance firm); and make up the third tier of the UK state pension

system. Personal pensions are usually a DC type scheme and are treated in the same way as occupational pensions from a taxation perspective.[12] Individuals must be aged at least 55 before they are eligible to claim their personal pension; the 'Pension Freedom' reforms introduced in 2015 affected personal pensions in the same way they did occupational pensions.

The widespread availability and uptake of occupational pensions since the 1950s and the fact that the UK labour market has historically been made up of employees means the proportion of individuals who have a personal pension is higher among the self-employed, a group of individuals who we do not consider in this study.[13] This also means that when analysing retirement age expectations among employees it is relatively more important to control for the presence of an occupational pension rather than a personal pension.

[12]An individual can have an occupational and personal pension although certain limits exist in terms of total contributions made within a tax year. a tax year runs from 6th April each year to 5th April the following year. The annual pension contribution allowance on a personal pension is set by government; in the 2018-19 tax year it is £40,000.

[13] Self-employment rates have increased in the period after the Financial Crisis; nonetheless the self-employed still only make up 15% of the labour force in the UK (ONS, 2018a).

**Online Appendix B: Summary of the UK State Pension Acts.**

Men

***Period 1: 2007 Pension Act.***

Law from beginning of sample period until November 2, 2011

Main changes made to SPA:

- If a man is born before 6th April 1959: SPA=65
- If a man is born after 6th April 1959: SPA=65+1 month (1 month if born on 6th April, less if born after 6th April), born between 6th May and 5th June 1959: SPA=65+2 months (if born on 6th May less if born after). Born between 6th February and 6th March 1960: SPA=65+11 (11 months if born on 6th February 1960, less if born after)
- If a man is born after 6th March 1960 but before 6th April 1968: SPA=66

***Period 2: 2011 Pension Act.***

Law between November 3, 2011 and May 13, 2014

Main changes made to SPA:

- If a man is born before 6th December 1953: SPA=65
- If a man is born after 6th December 1953 and before 5th January 1954: SPA=65+3 months, born between 6th January and 5th February 1954: SPA=65+3+1, …., born between 6th September 1954 and 5th October 1954: SPA=65+3+8 (for the youngest i.e. born 5th October 1954, it will be 66 for those born on 6th September 1954).
- If a man is born October 1954 – March 1968: SPA=66
- If a man is born between 6th April-5th May 1968: SPA=66+1, …, between 6th February 1969 and 5th March 1969: SPA=66+11 (if born on 6th February 1969)
- If a man is born from 6th March 1969 onwards: SPA=67
- If a man is born after 5th April 1969 but before 6th April 1977 attains pensionable age when the person attains the age of 67. Born 6th April 1977 to 5th May 1977 then SPA is 67+1 month (if born on 6th April 1977)
- If a man is born 6th May 1977 to 5th June 1977 then SPA is 67+2 month (if born on 6th May 1977) until 6th March 1978 to 5th April 1978 after which SPA: 68
- A man born after 5th April 1978 attains pensionable age when the person attains the age of 68.

***Period 3: 2014 Pension Act.***

Law between May 14, 2014 –and end of sample period

- Cohorts up to and including 5th April 1960: as in period 2.
- If a man is born on or after 6th April 1960-5th May 1960: SPA=66+1 month, …,6th February 1961-5th March 1961: SPA+66+11
- If a man is born in March 1961 or later: SPA=67
- The increase in SPA going from 67 to 68 is identical to that described in period 2.

## Women

***Period 1: 2007 Pension Act***

Law from beginning of sample period until November 2, 2011

- A woman born before 6th April 1950 attains pensionable age when she attains the age of 60.
- -A women born between 6th April 1950 and 5th May 1950 reaches SPA when she is 60+1 month (at most if she is born on 6th April 1950), If 6th May1950≤born<5th June 1950 then SPA: 60+2 months... and so on...until 6th March 1955≤born<5th April 1955: SPA is 64 years and 11 months.
- A woman born after 5th April 1955 but before 6th April 1959 she attains pensionable age when she is 65
- -A woman after 6th April 1959- same rules as detailed for men above.

***Period 2: 2011 Pension Act.***

Law between November 3, 2011 and May 13, 2014

- -A woman who is born 6th April 1953 -5th May 1953: SPA is 63 years + 3 months…… (note that under the 1995/2007 act her SPA would have been 63 years+1 months), so an increase of two months.
- -A woman born 6th May 1953-5th June 1953: SPA is 63 years + 6 months (note that under the 1995/2007 act her SPA would have been 63 years+2 months), so an increase of four months.
- …and so… until:
- A woman born 6th November 1953-5th December 1953: SPA is 65.
- Then for those born after 6th December 1953 the spa for females is same as that for males above, note however that the increase in state pension age is larger for those individuals born between December 1953 and March 1955, compared to individuals born after 1955.

***Period 3: 2014 Pension Act.***

Law between May 14, 2014 –and end of sample period

- Same rules as for men.

## Online Appendix C

### Table C1:Variable definitions.

| Variable | Definition & Categories |
|---|---|
| Dependent variable | |
| ERA | Individuals expected age of retirement |
| Retired | Individual self-reports their economic status as retired |
| Covariates | |
| *Individual level covariates* | |
| SP-e age | Age at which individual is eligible to claim their state pension according to State Pension Act in operation at time of respondent's survey interview and his or her date of birth. |
| Member of an employer's pension scheme | Yes=0; No=1 |
| *Household level covariates* | |
| Housing tenure | Housing tenure of household individual resides in at the time of survey interview: Owned outright, owned with mortgage, rent and other |
| Household income tertile | Total post –tax equivalized household net income (of all household members) which has been adjusted for inflation (2015 prices) and household size using the OECD scale. |

## Online Appendix D

## Table D1: Descriptive characteristics by gender

| | ERA sample | | Retirement sample | |
|---|---|---|---|---|
| Variable | Men | Women | Men | Women |
| Dependent variable | | | | |
| ERA (in full years) | 63.92 | 63.50 | | |
| Proportion retired | | | 0.15 | 0.12 |
| Covariates | % | % | % | % |
| *Individual level covariates* | | | | |
| SP-e age | 66.26 | 66.23 | 65.39 | 64.86 |
| Member of an employer's pension scheme | | | | |
| Yes | 0.84 | 0.83 | 0.79 | 0.78 |
| No | 0.16 | 0.17 | 0.21 | 0.22 |
| Other/ don't know | | | | |
| *Household level covariates* | | | | |
| Housing tenure | | | | |
| Owned outright | 0.17 | 0.23 | 0.40 | 0.39 |
| Owned with mortgage | 0.69 | 0.65 | 0.49 | 0.48 |
| Rented | 0.14 | 0.12 | 0.11 | 0.13 |
| Household income tertile | | | | |
| Top income tertile | 0.31 | 0.36 | 0.42 | 0.42 |
| Middle income tertile | 0.38 | 0.31 | 0.35 | 0.34 |
| Bottom income tertile | 0.31 | 0.33 | 0.23 | 0.24 |
| N*T (N unique) | 1184 (592) | 1654 (827) | 7749 (1412) | 7782 (1386) |

Sample descriptives refer to data used to estimate expected retirement age equation. Sample descriptives used to compute labour force exit analysis available upon request. Proportions may sum over 1 due to rounding.

**Online Appendix E**

**Table E1: Expected Retirement Age (ERA)and SP eligibility anticipation effects**

| | **Coefficient [Std.Err.]** | **Coefficient [Std.Err.]** |
|---|---|---|
| SPA one year following survey interview | 0.114 | 0.215 |
| | [0.351] | [0.271] |
| 2011 | 0.352 | -0.165 |
| | [0.321] | [0.275] |
| 2012 | 0.229 | 0.520 |
| | [0.364] | [0.332] |
| 2013/14 | 0.493 | 0.0744 |
| | [0.472] | [0.437] |
| Constant | 56.46* | 49.58** |
| | [23.26] | [17.97] |
| Observations (unique individuals) | 1184 (592) | 1654 (827) |

Notes: base categories for age (45), year (2010). ***,**,* refers to significance at 0.1%, 1% and 5% level respectively. Sample refers to two period balanced panel controlling for individual fixed effects.

Table E1 refers to regressions of ERA on SPA one year ahead of the survey interview to detect the presence of anticipation effects. No empirical support for such effects is found.