

**Stung by pension reforms: mental health and life satisfaction of women affected by a change in state pension age**

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**Abstract**

Between 1995 and 2014 several reforms have been enacted to increase the state pension age (SPA) in the United Kingdom and equalise it between women and men. As a result, women born in the 1950s have seen their SPA increase by as much as 6 years, and there are controversies regarding how this information has been communicated to them to allow for planning changes. We conduct a comprehensive analysis of the direct and indirect effects of all the phases of the reforms that led to equalising pension age, investigating mechanisms for indirect effects. We also analyse the heterogeneity of the effect across different women to uncover the effect of longer versus shorter waiting times, and the spill-over effects to their partners. We use longitudinal data and combine a difference-in-difference approach with individual fixed effects, thus allowing a better identification of the causal impact of a transition from being below to being above retirement age. We use all waves available to date and include both women who were not affected by the reform well as those who saw their pension age (gradually) increase from age 60 to 65. Consistent with previous literature, we find a positive impact of the reform on employment and labour market participation, but large negative impacts on various aspects of personal, financial, and mental wellbeing. The effect is larger for women who wait longer, and smaller for women with a partner (compared to those without a partner), partially spilling over to their partner's labour market attachment. Our results provide insights on direct and indirect effects that such pension reforms may have in other contexts and can be generalised to other countries that are seeking to implement equal pension age reforms.

**JEL Codes: I31, J22, J26**

**Keywords: policy reform, retirement, labour supply, care supply, leisure, wellbeing**

## 1. Introduction

The gender effects of pension reforms are very complex: in their report to the European Commission, Bettio et al. (2013) remarked that gender imbalance in pensions is affected by three separate sets of factors. The first is ageing: women have higher life expectancy and their past employment patterns typically differ substantially to those of men both in participation and remuneration (Costa Dias et al., 2016) and the effect of family arrangements are also asymmetrically distributed as evidence on the child wage penalty indicates (Kleven et al., 2019). The second is past pension reforms and particularly the asymmetric effects occurring from the privatisation of risk that has accompanied the shift from public to benefits-based pension. The third is the effect of short term pressures connected to the different responses of women and men to labour market changes and economic crisis.

Bettio et al. (2013) estimated the gross gender pensions gap (the difference in average pensions between women and men over 65 before tax) for 2013 across Europe at an average of 39% (the figure for the UK was 45% in that year), and the corresponding figures when estimated with median pensions were 42% for the EU average and 36% for the UK. When looking at the real values of mean pensions, it becomes evident that only two countries, Bulgaria and Cyprus, had mean pensions that were above the poverty line (the UK was exactly at the poverty line). When compared with pay gaps, pension gaps are generally wider across countries but there is no systematic relationship between the two, since they refer to two different groups of people, with women now retired having probably experienced much wider pay gaps than current women do. The UK belongs to the group of countries in which the pension system reproduces the labour market and amplifies – rather than reducing – gender inequality.

In addition to reduced working lives due to caring responsibilities, pay and career gaps, women also make up the majority of those giving and receiving late life care (McKenna, 2017). The pension gap can thus be seen as the cumulative outcome of gender inequalities accumulated over the life course, and is affected by gender norms of societies (Burkevica et al., 2015) so that an equalisation of still leaves women facing higher risks of poverty and in fact may exacerbate the very gender inequalities it seeks to redress.

Banks and Emmerson (2018), who have analysed the history of state pension policy in the UK since 1948, show that the generosity of the system rose over the period as whole but has fallen in recent years, and in contrast to many countries there were generally never large implicit taxes on work arising from the state pension system. As a result, they found the system

to be now broadly neutral with regard to work incentives for men (for whom the system has been designed). The review by the UK Pensions Commission in 2004 observed that the UK state pensions were the amongst the least generous in the developed world (the basic state pension in 2012 was less than half the minimum wage for a 3 hour week- £107 vs £217) and that women experienced particular disadvantage, making recommendations to include those who had periods out of the labour market for caring responsibilities. As noted by Ginn and MacIntyre (2013), the review failed to account for the caring responsibilities that accrue to women in their 50s and 60s, when they often provide unpaid care for grandchildren, partners and other family members. Thus, even reforms that were intended to redress inequality failed to move from a breadwinner model and are thus not likely to reduce gender inequalities in older age (Foster et al., 2017).

McKenna (2017) observes that the focus of reforms has been on improving financial sustainability of the system and reducing pressure on the working population, but encouraging work into later life can only be responded to by those who are able to do so and have no other constraints. So men retiring in the UK in 2017 UK will be 45% better off than their female peers, leaving women vulnerable to poverty and more reliant on state support.

In this paper, we present the first comprehensive analysis of the direct and indirect effects that the equalisation of the state pension age of women and men in the UK had on cohort of women born in the 1950s, who saw their state pension age (SPA) increasing by as much as 6 years. Cribb et al. (2016) and Cribb and Emmerson (2017) have analysed the impact of this change in the SPA on employment, income, poverty and deprivation using either cross-section or a very short panel of 5 quarters, focussing only on the first part of the reform. In contrast, we analyse the full impact of the reform that equalised the SPA and use an eight-year long panel data, which allows us to better control for various confounding factors. We also contribute to the previous literature by analysing the impact of the reform not only on employment, but also on various other aspects of wellbeing. In addition, we explore heterogeneous effects on non-partnered and partnered women, as well as the spill-over effects on their partners.

Although our case study focuses on the UK, the results can be generalised to other countries who are adopting similar policies.

## **2. Background**

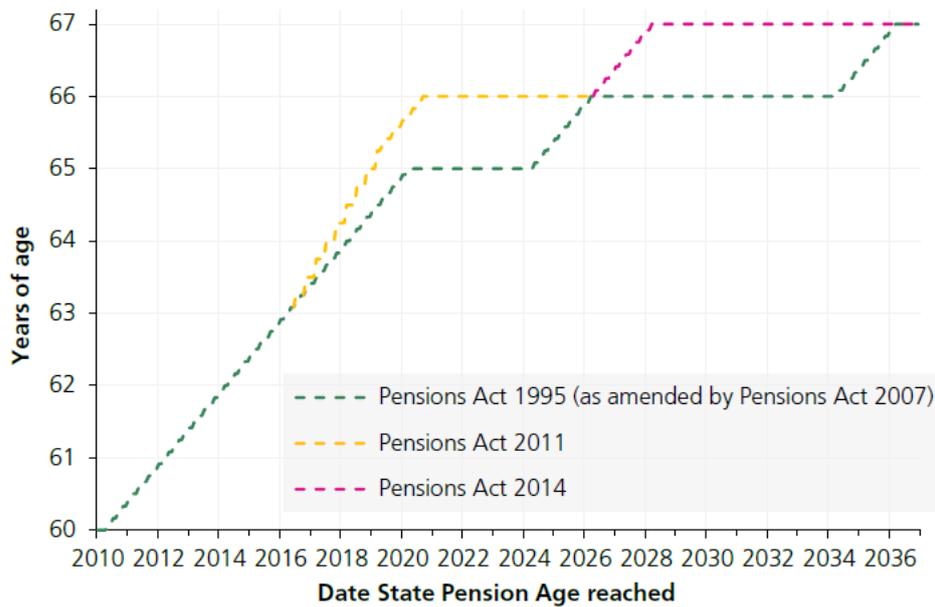
### *2.1. The equalisation of the SPA in the UK*

As already mentioned, in this paper we document the welfare effects of provisions equalising the state pension age of women and men in the UK on the cohort of women born in the 1950s, who saw their state pension age (SPA) increasing by as much as 6 years. This group was affected by several changes (Thurley and Keen, 2018): from the 1940s until April 2010, the SPA was 60 for women and 65 for men. The Pensions Act 1995 was intended to increase the SPA for women from 60 to 65 over the period April 2010 to 2020. However, the Coalition Government legislated a new Pensions Act in 2011 to accelerate the latter part of the increase: starting from April 2016 when women's SPA was 63 the new pension age would be increased to 65 by November 2018 rather than April 2020. The equalised SPA will then rise to 66 by October 2020 (extended from the initial April proposal as concerns were raised about the short notice involved for some women to whom the increase would have been as much as two years). Provision to increase the equalised SPA from 66 to 68 in stages over the period 2024 to 2046 was included in the Pensions Act 2007, while the Pension Act 2014 brought forward the increase in SPA to 67 to the period 2026-2028.

Chart 1 below from Thurley and Keen (2018) illustrates these different changes in women's SPA. The red line shows the timetable for increases to 67 after the Pensions Act 2014. The yellow line shows the timetable after the Pensions Act 2011. The green line shows the timetable in the Pensions Act 1995 and Pensions Act 2007.

**Chart 1**

**State Pension Age for women 2010 to 2036**



Source: Thurley and Keen (2018)

Table 1 below, from the House of Commons Library estimates for the number of women born in the 1950s affected by changes to the State Pension Age (SPA). The document covers all UK-resident women born between 6 April 1950 and 5 April 1960 and incorporates SPA changes legislated for by the Pension Acts 1995, 2007 and 2011.

TABLE 1 ABOUT HERE

A large campaign was formed to protest against the reforms by the group of women who have been most affected, as several of them did not receive proper communication of the changes. WASPI (Women Against State Pension Inequality <https://www.waspi.co.uk/>) was formed in 2015 to argue for the government to provide transitional payments to women born in the 1950s receiving their pension after the age of 60 and women who now receive a state pension but had to wait longer. This campaign, and associated ones, have been growing in strength with a petition with more than 100,000 signatories to Parliament resulting in a Parliamentary debate and legal action to challenge the decisions made and their communication to the women affected by them. Several parliamentary discussions on the issue have since occurred, the Labour Party leader Jeremy Corbyn raised it in a session of Prime Minister's Questions in 2017 and most recently in the context of the General Election 2019 on 23rd November 2019 a pledge

of £58 billion by John McDonnell, the shadow chancellor, to compensate all women born in the 1950s whose pension age was increased.

## *2.2 Effects of the Reforms*

The income and labour market effects of the pension reforms in the UK have been analysed by Cribb et al (2016 and 2017), who have found that increased earnings for those who were able to continue work partially offset the loss of state pension income. This still left affected women's household incomes on average £32 per week lower due to the reform with an effect that was larger for lower-income women (with an increased income poverty rate for women aged 60-62), who are also likely employed in less rewarding jobs. They found the effects not to persist upon reaching SPA and that women managed to smooth consumption over the period. The displacement of caring activities provided by women upon retirement has been investigated by Carrino et al. (2019), who show that an increase in employment substantially reduces the intensity of informal care with those working 30 hours/week reducing care-intensity by 6.6 hours/week, and the probability of providing intensive care (> 20 hours/week) by 4 percentage points, with effects driven by women working in physically and psychologically demanding jobs.

Retirement is usually associated with improved mental health: Kodoziej and Garcia Gomez (2019) present a causal analysis using data from the Survey of Health, Ageing and Retirement in Europe and find protective effects of retirement on mental health across all countries, with larger protective gains for those close to the (clinically defined) threshold of being at risk of depression, and larger preserving effects for women and blue collar workers, perhaps suggesting that once more the nature of the job matters. Di Gessa et al. (2016) arrive at similar conclusions considering the association between working beyond SPA and measures of mental health among men aged 65-74 and women aged 60-69 who participate in the English Longitudinal Study of Ageing (waves 2-4) who were in paid work beyond the SPA. They found that it was those who were in good health and more socioeconomically advantaged that were working beyond the SPA to begin with, highlighting again the problem of self-selection and very heterogeneous effects SPA reforms are eliciting.

In this paper we analyse the direct and indirect effects of the change in pension age, focusing on labour force participation and employment (as Cribb et al. 2016), but also on caring activities, on measures of subjective financial wellbeing, mental wellbeing, satisfaction with life overall, with household income, with the amount of leisure time. We particularly want to assess the effect on wellbeing of having to wait for a longer period of time, as this arguably

would affect both the ability to smooth income and the extent of revision of expectations required by the women and their households. We investigate time use changes, income and financial wellbeing as possible mechanisms that affect wellbeing.

### 3. Empirical Strategy

#### 3.1. Data: the UK Household Longitudinal Study<sup>1</sup>

We estimate the impact of the change in women's state pension age using the Special Licence version of Understanding Society, the UK Household Longitudinal Study (UKHLS). UKHLS has various advantages over datasets that have been used in the past to evaluate the impact of changes in the state pension age. First, its longitudinal nature allows us to combine a difference-in-difference approach with individual fixed effects, thus allowing a better identification of the causal impact of a transition from being below to being above retirement age. We use all waves available to date, from 2009-10 (wave 1) to 2016-17 (wave 8) and focus on women aged 50 to 70. Our sample includes both women who were born before 6 April 1950, who were not affected by the reform and reached state pension age 60, as well as those born up to the end of December 1953, who saw their pension age (gradually) increase from age 60 to 65.<sup>2</sup> As the survey includes information on the month but not the day of birth, we assume that the treatment applies to women born from the 1<sup>st</sup> of the month instead of the 6<sup>th</sup>; hence, only a small proportion of women will be misclassified between control and different treatments. This minor issue applies also to previous research (e.g. Cribb et al. 2016; Cribb and Emmerson 2017).

Second, UKHLS includes various individual characteristics, as well as information on attitudes and behaviours, thus allowing a more complete analysis of the socio-economic impact of the reform on various aspects of women's lives. We analyse the impact of the reform on labour force participation and employment (as Cribb et al. 2016), but also on caring activities, on measures of subjective financial wellbeing, mental wellbeing, satisfaction with life overall, with household income, with the amount of leisure time.

Third, the household nature of the data, whereby all adult members of the household are interviewed, allows us to analyse the impact of the reform on women with different living

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<sup>1</sup> University of Essex, Institute for Social and Economic Research. (2019). *Understanding Society: Waves 1-8, 2009-2017 and Harmonised BHPS: Waves 1-18, 1991-2009: Special Licence Access*. [data collection]. 10th Edition. UK Data Service. SN: 6931, <http://doi.org/10.5255/UKDA-SN-6931-9>.

<sup>2</sup> Younger cohorts born until March 1960 will see the state pension age remain at age 65; those born from April 1960 onward will see state pension age gradually increase up to 67 for both men and women.

situations, thus comparing those with and without a partner, and, most importantly, it allows us to analyse the impact that the reform had on male partners' employment and wellbeing.

As already mentioned, our estimation strategy combines the difference-in-difference and the individual fixed effects approaches. Using individual fixed effects means that only women who show changes in the dependent variable and who transition from below to above the state pension age during the course of the survey contribute to the identification of the effect; Table 2 shows the number of women who are observed transitioning in our data: given the timing of the data collection, we observe about 120 women who were not affected by the reform, 168 who saw their state pension age increase by between 1 and 6 months, and 188 who saw an increase between 7 and 12 months. In addition, 319 women saw their pension age increase between one and two years (to 61 and 62), while 376 saw an increase of more than two years (to 63 up to 65). The sample sizes for our analysis refer to the number of person-years.

TABLE 2 ABOUT HERE

### 3.2. Method: Difference-in-Differences with Individual Fixed Effects

The reform allows us to analyse the labour market behaviour and wellbeing of affected women and their partners using a difference-in-difference approach (Angrist and Pischke 2015). Similarly to Cribb et al. (2016) and Cribb and Emmerson (2017), the treatment ( $T_{ict}$ ) is represented by a dummy which is 1 for women who are below the state pension age. This treatment affects women born after (5<sup>th</sup>) April 1950, and younger women are treated for a longer period than older women. Our first set of models is:

$$y_{it} = \alpha T_{it} + \alpha_i + \gamma_t + \lambda_t + \sum_{a=50}^{70} \delta_a (\text{age}_{it} = a) + X_{it}\beta + \varepsilon_{it} \quad (1)$$

Where  $T_{it}$  identifies the treatment; this is one if woman  $i$  is below state pension age at time  $t$ , and zero if she is above it. Since we are using a panel dataset, we observe women reaching state pension age and exiting the treatment (i.e. switching from one to zero). We also include time dummies identifying the survey wave ( $\gamma_t$ ), dummies for survey year ( $\lambda_t$ ), dummies for each year of age ( $\sum_{a=50}^{70} \delta_a (\text{age}_{it} = a)$ ) as well as individual fixed effects ( $\alpha_i$ ). Dummies for cohort or year of birth are unnecessary since they would be perfectly collinear with the individual fixed effects. The inclusion of individual fixed effects implies that only women who

are observed both below and above state pension age during the observation period contribute to the identification of our parameters. Our models also include various additional explanatory variables that may affect the outcome variable; these are: a dummy for married or cohabiting as opposed to single, widowed or divorced; a dummy for homeowners as opposed to renters, a dummy for having a long term health issue, as well as the log of equivalised household income.

Since our aim is to give an overview of the effect of the change in the state pension age on different aspects of women's lives, we use a variety of dependent variables ( $y_{it}$ ). First, in line with the previous literature, we focus on employment and economic activity to test whether the reform of the state pension age increases the probability of women being in the labour market and/or having a job. Our first dependent variable identifies labour force participation and is one for women who are employed, self-employed, or unemployed, and zero for those who are inactive. Our second dependent variable identifies employment and is one for women who are either employed or self-employed, and is zero for those who are either unemployed or inactive. Whether because of financial needs or because a change in the state pension age represents a signal on the appropriate retirement age (Cribb et al. 2016), we would expect women affected by the reform to be more likely to be active in the labour market and/or employed.

Besides increasing employment, an increase in the state pension age may have an indirect effect on women's wellbeing. While the descriptive literature finds that people who work later in life have higher levels of wellbeing, Kodoziej and Garcia Gomez (2019) causally show that this is driven by selection into working in later life. Our third and fourth dependent variables are GHQ, which we use as a measure of mental health, and satisfaction with life overall. GHQ is a numerical variable which varies from 0 to 36 and for which higher values indicate worse mental health. Life satisfaction is an ordered variable that varies between 1 (completely dissatisfied) to 7 (completely satisfied); higher values indicate higher levels of satisfaction.

All models are estimated using OLS. Although satisfaction is an ordinal variable, it is commonly modelled as continuous to allow for the inclusion of individual fixed effects (Ferreri-Carbonell and Frijters 2004). Similarly, although labour force participation and employment are dummies, non-linear models including fixed effects do not allow the estimation of marginal effects; hence, for simplicity of interpretation we use Linear Probability Models (LPMs).

### *3.3. Mechanisms: Income and Leisure*

We investigate two types of mechanisms that may lead to an indirect effect of the change in the pension age on wellbeing. The first relates to time use: women who have to continue working may have to change the amount of caring they provide to household and non-household members and/or their amount of leisure time. In particular, if the provision of care is related to needs, women may not be able to reduce the amount of care provided even if they remain active in the labour market. In this case it is likely that they will compensate with a reduction in their leisure time. We therefore estimate models similar to those in Equation (1) where the dependent variable is either a dummy for whether women provide any amount of care either to household or non-household member, or a measure of satisfaction with the amount of leisure time, again measured on a scale from 1 to 7.

The second mechanism we investigate is related to income and financial wellbeing. Cross-sectional evidence suggests that, despite increasing employment, the increase in the state pension age also reduces household income and partially increase the risk of poverty (Cribb and Emmerson 2017). Here we focus on three subjective measures of financial wellbeing. The first measure reflects answers to the question “How well would you say you yourself are managing financially these days?” and results in a dummy which is zero for those who say either that they are “living comfortably” or “doing alright”, and one for those who say they are “just about getting by”, “finding it quite difficult”, or “finding it very difficult” (the results are robust to the re-coding of “just about getting by” from one to zero). The second measure is a dummy which is one for those who say they have problems paying either council tax or for housing, or who are behind with some or all bills. Our third and final measure is satisfaction with income, measured on a scale from 1 to 7.

Also in this case all models are estimated using OLS.

### *3.4. Heterogeneous Effects and Spill-over Effects*

We investigate various sources of possible heterogeneous effects of the increase in the state pension age. First, the reform was designed in such a way that women were differently affected by the reform depending on their date of birth. Nevertheless, most analyses of the impact of a change in state pension age only have one treatment. It is possible, however, that women react differently to the treatment depending on how long they are treated for, and that women who had to wait longer to reach state pension age may have been impacted more than those who only had to wait a short time. To analyse heterogeneous effects by length of treatment we re-estimate all models discussed above with a different operationalisation of the treatment variable  $T_{it}$ . Following Beerli et al. (2018) the treatment variable is split into five mutually exclusive

treatments, which distinguish how many additional months women had to wait to reach state pension age:

$$y_{it} = \alpha_0 T_{it} I(d_i = 0) + \alpha_1 T_{it} I(0 < d_i \leq 6) + \alpha_2 T_{it} I(6 < d_i \leq 12) + \alpha_3 T_{it} I(13 < d_i \leq 24) + \alpha_4 T_{it} I(d_i > 24) + \alpha_i + \gamma_t + \lambda_t + \sum_{a=50}^{70} \delta_a (age_{it} = a) + X_{it} \beta + \varepsilon_{it} \quad (2)$$

Where the impact of the treatment is allowed to vary by age and month of birth:  $\alpha_0$  refers to women born before April 1950, and whose state pension age was 60;  $\alpha_1$  is the effect of treatment on those who have to wait between 1 and 6 additional months (above the age of 60) to reach state pension age;  $\alpha_2$  is the effect on those who have to wait between 7 and 12 months, and so on. The results are robust to changes in these cut-off points.

Heterogeneity of the impact of the reform may also depend on the individual situation of each woman. For example, women who are living with a partner may be less affected by the reform if they can rely on additional income and support from their partner, while we may expect the reform to have a larger impact on women who are single, widowed or divorced. We test this by re-estimating our models separately for women with and without a partner.

Finally, we analyse spill-over effects by focusing on the male partners of those women who were affected by the reform. By affecting income, labour force participation and wellbeing of women, the reform may also have had an indirect effect on those who live with them. Therefore, we re-estimate the previous models where the treatment still refers to the female partner, but the dependent and other explanatory variables refer to the male partner.

## 4. Empirical Results

### 4.1. Effect of the Increase in State Pension Age

Table 3 shows the impact that the reform had on women's labour market and wellbeing outcomes. Columns (1) and (2) suggest, in line with the previous literature, that being below the state pension age increases women's probability of being in the labour market by 11.6 percentage points, and increases their probability of having a job by about 9.3 percentage points. These effects are only marginally larger than what found by Cribb et al. (2016) using the Labour Force Survey and focusing on the first part of the reform.

Although Table 3 confirms that the increase in the state pension age had the desired effect of keeping women in employment, the last two columns also suggest some negative impact on wellbeing: women below the state pension age have worse mental health (GHQ) as well as lower levels of life satisfaction.

#### TABLE 3 ABOUT HERE

Does the increase in women employment have a negative impact on other activities typically performed by women of this age such as caring activities? The first column of Table 4 suggests that this is not the case and there is no statistically significant difference in the probability of providing care. This result is robust to changes in the definition of caring: besides a dummy for providing any care (Table 4), we also experimented with dummies separating caring provided to household members vs. non-household members, as well as with dummies separating those who spend a significant amount of time in caring activities (we experimented with more than 5, 10 and 20 hours per week), including and excluding those who provide no care at all. This is in contrast with Carrino et al. (2019) who also use the UKHLS but do not exploit the panel nature of the data. Our results are consistent with the nature of caring activities, which are generally provided on the basis of need, and irrespectively on the working situation of the person who provides the informal care.

Column (2) of Table 4 suggests that women who are below the pension age experience a lower level of satisfaction with the amount of leisure time. This is consistent with the previous results: women below the state pension age are more likely to work, but having the same probability of providing informal care to household and non-household members, is likely to result in a decrease in the amount of leisure time compared to what desired, and consequent decrease in satisfaction with it.

#### TABLE 4 ABOUT HERE

Besides time use, the increase in the state pension age also had a negative financial impact. Table 4 suggests that women who are below the pension age are more likely to say that they are finding difficult to manage on their income (Column (3)), they are slightly more likely to be behind with bills (Column (4)) and, as a consequence, are less satisfied with their household income (Column (5)).

In summary, although the reform in the state pension age had the desired effect of increasing women's employment and participation in the labour market, our results show that it also had a negative impact of various aspects of wellbeing.

#### *4.2. Heterogeneity and Spill-over Effects*

An increase in the state pension age may not have a large impact on women if the increase is only a few months compared to their original expectation (i.e. 60 years): while some women may decide to work the few additional months until they reach their (new) state pension age, others may have enough financial resources to retire at 60 even when their state pension age has been increased. Women who have to wait one or more additional years, on the other hand, may be more badly affected by the change. Tables 4 and 5 analyse the heterogeneity of the response to the increase in the state pension age as a function of the number of additional months or years women had to wait to reach their new state pension age, as discussed in Equation (2). Table 5 shows that the increase in the probability of being in the labour market and of having a job is relatively stable across groups, suggesting that the reform has the desired effect of increasing employment and labour market participation for any additional year the woman has to wait to reach state pension age. Although all groups seem to show a worsening in mental health, this is statistically significant only for those who have to wait two or more additional years. Life satisfaction, on the other hand, seem to be worse for all women who have to wait more than six months to reach their new state pension age.

In line with the previous results, Table 6 suggests that there is no difference in the probability of providing care across groups, while all those who experience an increase in the state pension age show a lower level of satisfaction with their leisure time and seem to be more likely to say they struggle financially. Satisfaction with income is also lower for those who experience an increase in their pension age, although the difference is statistically significant only for those who have to wait more than six months.

TABLES 5 AND 6 ABOUT HERE

Table 7 compares women with and without a partner: the effect on those without a partner is in the top panel, while the effect on those with a partner is in the bottom panel. We might expect the increase in the state pension age to have a smaller effect on women with a partner since they may have additional savings, income and support to stop working at age 60 and before reaching their new state pension age. As expected, for all outcomes analysed, the

regression coefficients are consistently larger for women without a partner, thus suggesting that this group of women is particularly negatively affected by the reform.

TABLE 7 ABOUT HERE

Finally, Table 8 focuses on spill-over effects and analyses whether there has been a change in behaviour and wellbeing of male partners of those women who have been affected by the reform. While the sample is now different (men instead of women), the model estimated is very similar to the one in Equation (1): dependent and explanatory variables refer to men with the only exception of the variable “under state pension age”, which refer to the female partner. The results suggest that the reform of women’s pension age partially spilled-over to their partners, who are now slightly more likely to be active in the labour market and to have a job if she is still below pension age. As one would expect, the magnitude of the effect, however, is smaller than for women. Despite the change in employment behaviour, the reform had no impact on the male partners’ mental health or wellbeing.

TABLE 8 ABOUT HERE

## **5. Conclusions**

We have analysed the direct and indirect effects of the reforms enacted in the UK between 1995 and 2014 to increase the state pension age (SPA) and equalise it between women and men, combining a difference-in-difference approach with individual fixed effects, thus allowing a better identification of the causal impact of a transition from being below to being above retirement age and using waves available of the UK USS, so all women aged 50 to 70 from 2009-10 (wave 1) to 2016-17 (wave 8). In line with Cribb et al. (2016) we find that Being below the state pension age increases women’s probability of being in the labour market by 11.6 percentage points, and increases their probability of having a job by about 9.3 percentage points. The increase in the state pension age also had a negative financial impact: women who are below the pension age are more likely to say that they are finding difficult to manage on their income, they are slightly more likely to be behind with bills and, as a consequence, are less satisfied with their household income and this holds over the years suggesting that consumption smoothing may not in fact be taking place (or not to satisfactory levels). We also investigate time use effects and find no statistically significant difference in the probability of

providing care, but a lower level of satisfaction with the amount of leisure time. The presence of a partner helps to mitigate some of these effects: for all outcomes analysed, the regression coefficients are consistently larger for women without a partner, thus suggesting that this group of women is particularly negatively affected by the reform.

In addition, we also find that women below the state pension age have worse mental health (GHQ) as well as lower levels of life satisfaction, and this effect is stronger for those who have to wait for longer. Although all groups seem to show a worsening in mental health, this is statistically significant only for those who must wait two or more additional years. Life satisfaction, on the other hand, seem to be worse for all women who must wait more than six months to reach their new state pension age. This effect we believe provides evidence of the damage caused by changes in women's expectations, as well as the direct effect of leisure displacement and financial impacts. This is an important aspect of the effects of the reforms that has not been formally considered at all.

Finally, we also investigate changes in behaviour and wellbeing of male partners of those women who have been affected by the reform and find that the reform of women's pension age partially spilled-over to their partners, who are now slightly more likely to be active in the labour market and to have a job if she is still below pension age. As one would expect, the magnitude of the effect, however, is smaller than for women. Despite the change in employment behaviour, the reform had no impact on the male partners' mental health or wellbeing.

Our results provide insights on direct and indirect effects that such pension reforms may have in other contexts and can be generalised to other countries that are seeking to implement equal pension age reforms.

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## Tables

**Table 1: Women affected by changes in the state pension age**

**'WASPI' women: women born in the 1950s affected by changes to the State Pension Age by the 1995, 2007 and 2011 Pension Acts**

The **sum impact** row shows the aggregate increase in SPA compared to an SPA of 60. The **maximum increase** experienced by any woman born in the 1950s is **6 years** in total.

House of Commons Library calculations based on ONS/NRS/NISRA mid-year 2017 population estimates. Rounded to nearest hundred or thousand. See footnotes for full details.

Women born...	Between the 6th... ...and the 5th...	Apr-50	Apr-51	Apr-52	Apr-53	Oct-53	Dec-53	Apr-54	Oct-54	Apr-55	Apr-59	Total affected by each act:				<i>of whom: total already reaching SPA by the end of 2018 (all those born before 6 Dec 1953)</i>			
Impact of the...		Apr-51	Apr-52	Apr-53	Oct-53	Dec-53	Apr-54	Oct-54	Apr-55	Apr-59									
<b>1995 Act</b> compared to an SPA of 60	From	1 day	1y 1d	2y 1d	3y 1d	3y 6m 1d	3y 8m 1d	4y 1d	4y 6m 1d	5 years exactly									
	To (inclusive)	1 year	2 years	3 years	3y 6m	3y 8m	4 years	4y 6m	5 years										
<b>2007 Act</b> compared to <b>1995 Act</b>	From	No impact										1 day							
	To (inclusive)											1 year							
<b>2011 Act</b> compared to <b>1995 &amp; 2007 Acts</b>	From	No impact			2 months	1y 2m	1y 6m exactly	1y 6m exactly	1 year	1 year	0 days								
	To (inclusive)				1 year	1y 4m	1y 6m exactly	1y 6m exactly	1y 6m exactly	1 year	1 year								
<b>Sum impact</b> of 1995, 2007 & 2011 Acts compared to SPA of 60	From	1 day	1y 1d	2y 1d	3y 2m 1d	4y 8m 1d	5y 2m 1d	5y 6m 1d	6 years exactly										
	To (inclusive)	1 year	2 years	3 years	4y 6m	5 years	5y 6m	6 years											
Code	Country/region	Constituency	Number of women affected										1995 Act	2007 Act	2011 Act	Total	2011 Act	Total	
<b>K02000001</b>	<b>United Kingdom</b>		<b>349,600</b>	<b>346,600</b>	<b>353,000</b>	<b>180,200</b>	<b>60,100</b>	<b>119,200</b>	<b>180,500</b>	<b>179,500</b>	<b>1,559,300</b>	<b>417,600</b>	<b>3,745,500</b>	<b>417,600</b>	<b>2,696,300</b>	<b>3,745,500</b>	<b>240,300</b>	<b>1,289,500</b>	
<b>K03000001</b>	<b>Great Britain</b>		<b>340,400</b>	<b>337,500</b>	<b>343,600</b>	<b>175,500</b>	<b>58,500</b>	<b>116,000</b>	<b>175,600</b>	<b>174,600</b>	<b>1,515,300</b>	<b>405,700</b>	<b>3,642,600</b>	<b>405,700</b>	<b>2,621,100</b>	<b>3,642,600</b>	<b>233,900</b>	<b>1,255,500</b>	
<b>E92000001</b>	<b>England</b>		<b>290,400</b>	<b>287,900</b>	<b>292,800</b>	<b>149,500</b>	<b>49,800</b>	<b>98,900</b>	<b>149,500</b>	<b>148,700</b>	<b>1,290,500</b>	<b>346,300</b>	<b>3,104,300</b>	<b>346,300</b>	<b>2,233,200</b>	<b>3,104,300</b>	<b>199,300</b>	<b>1,070,400</b>	
E12000001	North East		15,500	15,300	15,600	8,000	2,700	5,300	8,000	8,000	70,300	18,300	167,000	18,300	120,500	167,000	10,600	57,100	
E12000002	North West		39,300	38,400	39,100	19,900	6,600	13,200	20,000	19,900	174,500	46,700	417,700	46,700	300,900	417,700	26,500	143,400	
E12000003	Yorkshire and The Humber		29,300	28,900	29,300	15,000	5,000	9,900	14,900	14,800	130,300	34,700	312,100	34,700	224,600	312,100	20,000	107,400	
E12000004	East Midlands		26,500	26,500	26,800	13,700	4,600	9,000	13,400	13,300	114,700	30,900	279,400	30,900	199,600	279,400	18,200	98,000	
E12000005	West Midlands		30,400	30,200	31,000	15,800	5,300	10,400	15,600	15,500	132,500	35,300	322,100	35,300	230,500	322,100	21,100	112,700	
E12000006	East		33,900	33,600	33,800	17,400	5,800	11,500	17,300	17,200	146,300	38,700	355,400	38,700	254,100	355,400	23,100	124,500	
E12000007	London		32,500	33,400	34,500	18,000	6,000	11,900	18,500	18,400	165,800	46,700	385,800	46,700	285,400	385,800	24,000	124,400	
E12000008	South East		48,700	47,900	48,500	24,700	8,200	16,300	24,900	24,800	214,500	57,800	516,300	57,800	371,200	516,300	32,900	178,000	
E12000009	South West		34,200	33,700	34,000	17,200	5,700	11,400	16,800	16,700	141,500	37,100	348,500	37,100	246,500	348,500	23,000	124,900	
<b>W92000004</b>	<b>Wales</b>		<b>18,900</b>	<b>18,600</b>	<b>19,000</b>	<b>9,600</b>	<b>3,200</b>	<b>6,300</b>	<b>9,400</b>	<b>9,300</b>	<b>79,700</b>	<b>21,000</b>	<b>195,000</b>	<b>21,000</b>	<b>138,600</b>	<b>195,000</b>	<b>12,800</b>	<b>69,200</b>	

Source: House of Commons Library.

Table 2: Number of women observed both below and above state pension age in our data

Increase in pension age (months above 60 years of age)	Number of women observed below pension age at t-1 and above pension age at t
0 months – retirement age: 60	120
1-6 months	168
7-12 months	188
1-2 years	319
More than 2 years	376
Total	1,171

Table 3: Effect of being below state pension age on employment and subjective financial situation

	(1)	(2)	(3)	(4)
	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction
Under state pension age	0.116*** (0.008)	0.093*** (0.008)	0.429*** (0.139)	-0.116*** (0.042)
Observations (person/year)	62,916	62,916	55,691	55,462

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income. Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table 4: Effect of being below state pension age on subjective wellbeing

	(1)	(2)	(3)	(4)	(5)
	Caring	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
Under state pension age	-0.011 (0.012)	-0.184*** (0.049)	0.066*** (0.011)	0.034* (0.017)	-0.156*** (0.046)
Observations (person/year)	51,485	55,428	60,874	29,346	55,440

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income. Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table 5: Effect of being below state pension age on employment and subjective financial situation, by state pension age

	(1)	(2)	(3)	(4)
Under state pension age and individual State pension age is:	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction
60 years	0.139*** (0.025)	0.138*** (0.024)	0.238 (0.432)	-0.073 (0.132)
60 years + 1-6 months	0.130*** (0.019)	0.084*** (0.018)	0.242 (0.318)	-0.050 (0.096)
60 years + 7-12 months	0.079*** (0.016)	0.073*** (0.015)	0.521* (0.277)	-0.207** (0.085)
60 years + 1-2 years	0.113*** (0.012)	0.093*** (0.011)	0.296 (0.200)	-0.113* (0.061)
60 years + at least 2 more years	0.128*** (0.012)	0.098*** (0.012)	0.627*** (0.207)	-0.108* (0.063)
Observations (person/year)	62,916	62,916	55,691	55,462

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income. Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table 6: Effect of being below state pension age on subjective wellbeing, by state pension age

	(1)	(2)	(3)	(4)	(5)
Under state pension age and individual State pension age is:	Caring	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
60 years	0.046 (0.038)	-0.142 (0.152)	0.062* (0.032)	-0.022 (0.056)	-0.027 (0.143)
60 years + 1-6 months	-0.046* (0.028)	-0.278** (0.111)	0.058** (0.024)	0.045 (0.041)	-0.138 (0.104)
60 years + 7-12 months	-0.026 (0.024)	-0.155 (0.097)	0.062*** (0.021)	0.083** (0.035)	-0.207** (0.091)
60 years + 1-2 years	-0.011 (0.018)	-0.185*** (0.070)	0.046*** (0.015)	0.035 (0.026)	-0.130** (0.066)
60 years + at least 2 more years	-0.002 (0.019)	-0.171** (0.072)	0.093*** (0.016)	0.015 (0.026)	-0.188*** (0.068)
Observations (person/year)	51,485	55,428	60,874	29,346	55,440

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income. Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table 7: Effect of being below state pension age by marital status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Women without a partner	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
Under state pension age	0.157*** (0.015)	0.115*** (0.014)	0.706** (0.284)	-0.142* (0.079)	-0.230** (0.091)	0.140*** (0.021)	0.054* (0.030)	-0.323*** (0.084)
Observations (person/year)	19,001	19,001	16,901	16,790	16,772	18,670	10,899	16,788
Women married or cohabiting								
Under state pension age	0.097*** (0.010)	0.085*** (0.009)	0.260* (0.157)	-0.095* (0.050)	-0.163*** (0.058)	0.031*** (0.012)	0.029 (0.022)	-0.072 (0.055)
Observations (person/year)	43,915	43,915	38,790	38,672	38,656	42,204	18,447	38,652

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income.

Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table 8: Effect of being below state pension age on their (male) partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female partner's retirement age	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
Under state pension age	0.031*** (0.008)	0.033*** (0.008)	-0.115 (0.122)	-0.056 (0.043)	0.014 (0.051)	0.020* (0.011)	0.019 (0.019)	-0.062 (0.047)
Observations (person/year)	38,940	38,940	32,176	32,056	32,048	34,962	16,055	32,043

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income.

Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

## Appendix

Table A1: Effect of being below state pension age by marital status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Women without a partner	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
60 years	0.157*** (0.044)	0.160*** (0.041)	0.151 (0.878)	0.049 (0.247)	0.089 (0.286)	0.119* (0.063)	-0.027 (0.099)	-0.289 (0.262)
60 years + 1-6 months	0.223*** (0.034)	0.148*** (0.032)	0.133 (0.659)	0.054 (0.180)	-0.397* (0.208)	0.138*** (0.049)	0.055 (0.066)	-0.332* (0.192)
60 years + 7-12 months	0.071** (0.030)	0.057** (0.028)	0.740 (0.582)	-0.284* (0.160)	-0.148 (0.184)	0.208*** (0.043)	0.143** (0.063)	-0.465*** (0.170)
60 years + 1-2 years	0.174*** (0.021)	0.144*** (0.020)	0.763* (0.414)	-0.139 (0.114)	-0.332** (0.132)	0.085*** (0.031)	0.075 (0.046)	-0.137 (0.121)
60 years + at least 2 more years	0.158*** (0.022)	0.092*** (0.020)	0.922** (0.412)	-0.183 (0.114)	-0.167 (0.131)	0.168*** (0.031)	0.015 (0.043)	-0.444*** (0.121)
Observations (person/year)	19,001	19,001	16,901	16,790	16,772	18,670	10,899	16,788
<b>Women married or cohabiting</b>								
60 years	0.131*** (0.031)	0.134*** (0.030)	-0.009 (0.494)	-0.022 (0.159)	-0.167 (0.183)	0.031 (0.037)	-0.016 (0.068)	0.069 (0.173)
60 years + 1-6 months	0.083*** (0.022)	0.051** (0.022)	0.111 (0.363)	-0.044 (0.116)	-0.287** (0.134)	0.024 (0.028)	0.043 (0.054)	-0.031 (0.127)
60 years + 7-12 months	0.086*** (0.019)	0.084*** (0.018)	0.382 (0.310)	-0.179* (0.100)	-0.118 (0.115)	0.000 (0.023)	0.051 (0.042)	-0.098 (0.109)
60 years + 1-2 years	0.084*** (0.014)	0.073*** (0.014)	0.101 (0.227)	-0.098 (0.073)	-0.124 (0.084)	0.027 (0.017)	0.020 (0.032)	-0.100 (0.079)
60 years + at least 2 more years	0.116*** (0.015)	0.101*** (0.015)	0.477** (0.238)	-0.084 (0.077)	-0.181** (0.088)	0.055*** (0.018)	0.033 (0.034)	-0.072 (0.083)
Observations (person/year)	43,915	43,915	38,790	38,672	38,656	42,204	18,447	38,652

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income.

Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%

Table A2: Effect of being below state pension age on their partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female partner's retirement age	Active in the labour market	Has a job	Mental health (GHQ)	Life satisfaction	Satisfaction with amount of leisure time	Struggles financially	Problems paying bills	Satisfaction with income
60 years	-0.053*	-0.041	-0.080	0.153	0.369*	-0.050	0.015	0.126
	(0.031)	(0.031)	(0.482)	(0.170)	(0.199)	(0.042)	(0.071)	(0.185)
60 years + 1-6 months	-0.033	-0.029	0.541	-0.046	0.043	0.006	0.048	-0.076
	(0.022)	(0.022)	(0.337)	(0.120)	(0.141)	(0.030)	(0.060)	(0.131)
60 years + 7-12 months	0.058***	0.042**	-0.137	-0.019	-0.003	0.034	0.021	0.225**
	(0.018)	(0.018)	(0.287)	(0.101)	(0.119)	(0.025)	(0.043)	(0.110)
60 years + 1-2 years	0.035***	0.041***	-0.056	-0.094	0.011	0.023	0.029	-0.149*
	(0.013)	(0.013)	(0.199)	(0.070)	(0.083)	(0.018)	(0.031)	(0.077)
60 years + at least 2 more years	0.051***	0.054***	-0.385*	-0.091	-0.066	0.027	-0.003	-0.159**
	(0.014)	(0.014)	(0.206)	(0.073)	(0.086)	(0.019)	(0.033)	(0.080)
Observations (person/year)	38,940	38,940	32,176	32,056	32,048	34,962	16,055	32,043

All models are estimated using linear models with individual fixed effects. Other covariates included: a full set of dummies for wave of data, for year of the survey, for each year of age. A dummy for those who are married or cohabiting (as opposed to single, divorced, widowed), one for homeowners (as opposed to renters), and one for having a long term illness. All models also include the log of equivalised household income.

Standard errors in parenthesis. \* Statistically significant at 10%, \*\* Statistically significant at 5%, \*\*\* Statistically significant at 1%