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Abstract

In a previous study we examined the impact on employment of increasing the state pension age for women from age 60 to 61 (Cribb, Emmerson and Tetlow, 2013). This short paper incorporates more recent data, now available up to March 2014, which allows us to study the impact on employment over the period when the female state pension age rose to age 62. Using the same difference-in-differences methodology as before, we find that women's employment rates at ages 60 to 61 were increased by 5.9 percentage points as a result of the state pension age increasing from age 60 to age 62 between April 2010 and March 2014. We find no statistically significant evidence of a different impact on employment between April 2010 and March 2012 (when the state pension age rose from age 60 to 61) and between April 2012 and March 2014 (when it rose from age 61 to 62). The more recent data boost our sample size, allowing us to estimate the impact of the reform with greater precision. However, we continue to find little statistically significant evidence of differences in response among women with different characteristics. The one exception we find is that the rise in the state pension age increases the employment rate of single women by 10.1 percentage points, which is statistically significantly greater (at the 10% level) than the 4.4 percentage point increase we find for women in couples.

Key words: early retirement age; labour supply; policy reform; retirement

JEL classification: H55, J21, J26

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This paper extends the analysis contained in Cribb, Emmerson and Tetlow (2013) to the Labour Force Survey (LFS) data that are now available for a further two years up to March 2014. The LFS and Family Resources Survey (FRS) data are Crown Copyright material and are used with the permission of the Controller of HMSO and the Queen's Printer for Scotland. The LFS and FRS data were supplied by the ESRC Data Archive. Responsibility for interpretation of the data, as well as for any errors, is the authors' alone. The Nuffield Foundation is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at http://www.nuffieldfoundation.org.

1. Introduction

Governments across the developed world have, over recent decades, legislated for increases in the early and normal claiming ages that apply to public pension schemes, often with the explicit intention of strengthening the public finances – not only by reducing payments to pensioners but also by increasing average retirement ages and thus generating additional tax revenues. In 1995, the UK government legislated to increase the state pension age (that is, the earliest age at which a pension can be claimed from the state) for women from 60 to 65. This was legislated to happen between 2010 and 2020.

In a previous study we examined evidence on labour market behaviour in the UK between 2010 and 2012 to examine what impact increasing the state pension age from 60 to 61 had on the economic activity of the affected cohorts of women (Cribb, Emmerson and Tetlow, 2013 – henceforth, CET). The Labour Force Survey (LFS) data utilised in that paper are now available up to March 2014, by the end of which the female state pension age had risen to age 62. Therefore, in this short paper we update our previous analysis, using exactly the same difference-in-differences methodology, to examine the impact of increasing the female state pension age from age 60 to age 62 (between April 2010 and March 2014) on the employment of women aged 60 and 61. CET provide details of the methodology employed and how our work contributes to the existing literature. That paper also contains a detailed discussion of the mechanisms by which an increase in the state pension age in the UK might affect employment and the implications of our findings for which mechanisms might be relatively more important.

In this paper we find that employment rates of women at ages 60 and 61 increased by 5.9 percentage points when the state pension age was increased from age 60 to age 62 over the period from April 2010 to March 2014; this result is statistically significantly different from zero at the 1% level. Between April 2010 and March 2012 (during which time the state pension age rose from age 60 to 61) we find that being aged under (rather than over) the state pension age increased employment rates of women by 6.8 percentage points, all else equal. Between April 2012 and March 2014 (during which time the state pension age rose from age 61 to 62) we find that being aged under the state pension age increased employment rates of women by 4.8 percentage points, all else equal. Both these results are again statistically significantly different from zero at the 1% level, but they are not statistically significantly different from each other.

In this paper, we use a larger sample of data than in CET, which increases the precision of our results. Despite this, we continue to find little statistically significant evidence of differences in response among women with different characteristics. The one exception we find is that the employment rate of single women is increased by 10.1 percentage points which is statistically

significantly greater (at the 10% level) than the 4.4 percentage point increase in employment we find for women in couples.

The remainder of this paper proceeds as follows. Section 2 shows how employment rates of women of different ages have evolved over the period before and during the increases in the female state pension age. Section 3 presents the updated results. Section 4 concludes.

2. Updated descriptive analysis

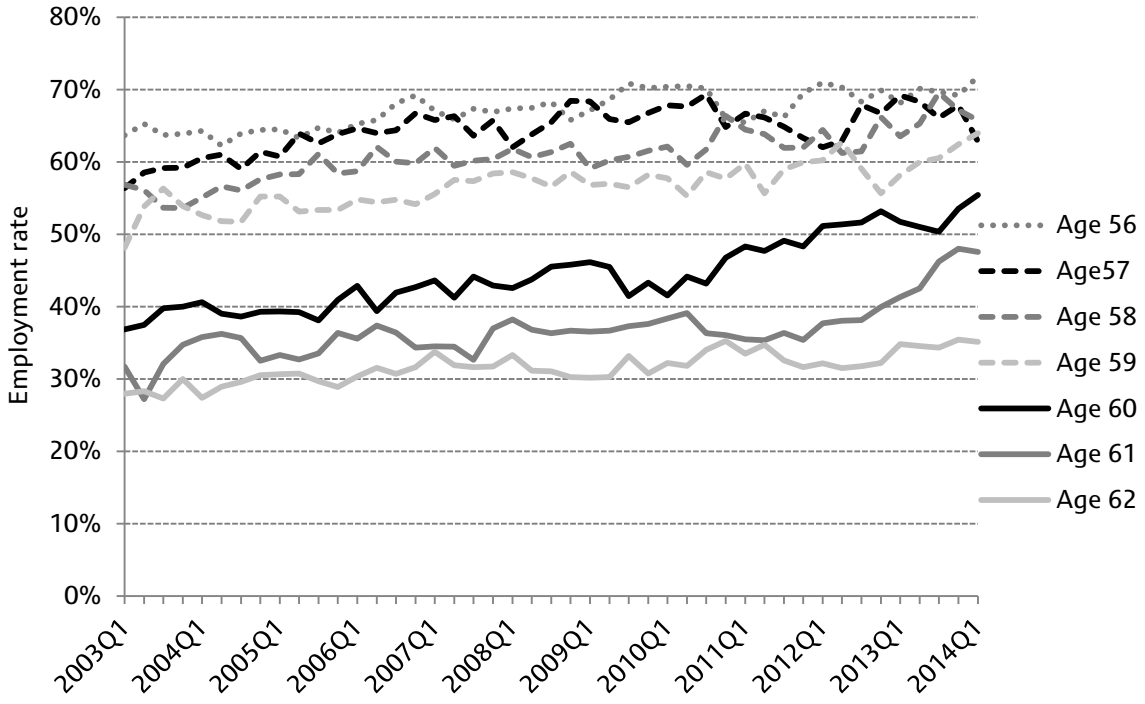
An initial indication of what impact increasing the state pension age has had on employment is provided by Figure 2.1. This shows how employment rates of older women have evolved since 2003 by single year of age. While employment rates at each age have generally been increasing over time (due, at least in part, to later cohorts of women having greater labour force attachment), a particularly large increase was observed for 60-year-old women from April 2010 and March 2012 (when the state pension age rose from age 60 to age 61) and for 61-year-old women from April 2012 and March 2014 (when the state pension age rose from age 61 to age 62). The increases observed among these groups over these periods are the two largest increases seen for any group over any two year period presented in Figure 2.1.

In the first quarter of 2010 (just prior to the increase in female state pension age), the employment rate of 60-year-old women was 41.5%; by the second quarter of 2012 (when, for the first time since 1948, all 60-year-olds were under the state pension age), it had increased to 51.4%. This 9.8 percentage point increase is statistically significant (t-stat = 3.57). During the same period, the employment rate of 61-year-olds fell slightly (by 0.3 percentage points, from 38.4% to 38.1%). This change is not statistically significant at the 10% level. A simple difference-in-differences estimate, comparing the change in employment rate between 2010Q1 and 2012Q2 of 60-year-old women with the change in employment over the same period among 61-year-old women suggests that the increase in the female state pension age from 60 to 61 has increased employment rates among 60-year-olds by 10.1 percentage points.

A similar exercise can be carried out for 61 year old women over the most recent two years of data. In 2012Q1 (just prior to the increase in female state pension age from age 61), the employment rate of 61-year-old women was 37.7%; by 2014Q1, it had increased to 47.6%. This 9.9 percentage point increase is statistically significant (t-stat = 3.47). During the same two-year period, the employment rate of 62-year-olds increased by 2.9 percentage points (from 32.2% to 35.1%), which is not statistically significantly different from zero. A simple difference-in-differences estimate, comparing the change in employment rate between 2012Q1 and 2014Q1 of 61-year-old women with the change in employment over the same period among 62-year-old

women suggests that the increase in the female state pension age from 61 to 62 increased employment rates among 61-year-olds by 6.9 percentage points.[1]

Figure 2.1 Employment rates of older women, 2003 to 2014, by single year of age



Source: Authors' calculations using the LFS, 2003 to 2014. Based on 219,502 observations

The next section presents the results from a more formal approach to estimating this effect, controlling in a more sophisticated manner for time effects, cohort effects and differences in observed characteristics between the different cohorts of women.

3. Updated results

a. Effect of increasing the state pension age on women's employment rates

All the models are estimated on data from 2009Q2 to 2014Q1, which is from one year before the reform began to the latest available data. Other than the inclusion of more recent data (and thus some additional fixed effects variables to control for time periods and age effects), the specification is identical to CET. The cohorts included are those born from 1949–50 to 1952–53, which includes one cohort unaffected by the reform (1949–50) and three cohorts whose state pension age was changed by the reform. Cohort is controlled for using financial year (e.g. 1950–

[1] Since a small number of 61 year olds will still have been under the state pension age in 2014Q1 (as the state pension age did not reach age 62 until the start of April 2014) this simple estimate might be expected to understate the impact of the rise in state pension age for this group. In the LFS, fewer than 6% of 61 year old women are observed to be under the state pension age in 2014Q1.

51) fixed effects. Time is controlled for using year and quarter fixed effects and there are age fixed effects in years and quarters to control finely for age, which is particularly important in ensuring that the estimate of being under the state pension age is not simply capturing the effect of being younger. We also include a range of other controls including: education, relationship status, housing tenure, ethnicity, geography, as well as partner's age and partner's education for those with a partner.

Table 3.1 reports our main results estimated using OLS (in the top panel) and a probit model (in the bottom panel). For each technique two models are estimated: one that estimates the impact of being under the state pension age over the whole period from April 2010 to March 2014 and one that includes an interaction term allowing for the possibility that the effect on employment is different in the period April 2010 to March 2012 from the period April 2012 to March 2014. In all cases we report standard errors that are clustered at the individual level.

Our preferred specification is the probit model. This shows that being under the state pension age increases the probability of women aged 60 and 61 being in work by 5.9 percentage points (estimate 1, bottom panel), with this impact being statistically different from zero at the 1% level. A similar estimate is found when instead the model is estimated using OLS (6.1 percentage points).

We find that being under the state pension age over the period from April 2010 to March 2012, when the state pension age rose from age 60 to age 61, increases the probability of being in work by 6.8 percentage points. Over the period from April 2012 to March 2014, when the state pension age rose from age 61 to age 62, we find that being under the state pension age increases the probability of being in work by 4.8 percentage points (estimate 2, bottom panel). Again similar estimates are found when the model is estimated using OLS. While it might be tempting to suggest this shows that successive increases in the state pension age have a diminishing impact on employment it should be noted that the estimates relate to different time periods and, in any case, are not statistically significantly different from each other at conventional levels of statistical significance.[2]

The finding that being under the state pension age over the period from April 2010 to March 2012 increases the probability of being in work by 6.8 percentage points is similar to the 7.3 percentage point estimate found in CET. This similarity is unsurprising given that the methodology and most of the data are the same. The slight difference is caused by small

[2] The p-value for the test that the effect over the period April 2010 to March 2012 is the same as the effect over the period from April 2012 to March 2014 is 0.365.

revisions to the data up to 2012Q2 (which actually increase the estimated impact from 7.3 percentage points to 7.4 percentage points) and the inclusion of data from 2012Q3 onwards (which slightly reduces the estimated impact from 7.4 percentage points to 6.8 percentage points).

Table 3.1 Effect of increasing the state pension age from 60 to 62 between April 2010 and March 2014 on women's employment

	Effect of being under SPA	*Standard Error*
OLS		
(1) Estimate across all periods	+0.061***	[0.015]
(2) Estimate split by pre/post April 2012		
Pre 2012	+0.069***	[0.018]
Post 2012	+0.051***	[0.020]
Difference	–0.018	[0.022]
Probit		
(1) Estimate across all periods	+0.059***	[0.015]
(2) Estimate split by pre/post April 2012		
Pre 2012	+0.068***	[0.017]
Post 2012	+0.048**	[0.019]
Difference	–0.019	[0.021]

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level. There are 46,038 observations in all models. All models are estimated on women born in 1949–50 to 1952–53 from 2009Q2 to 2014Q1 with standard errors clustered at the individual level. Estimates allowing for a different effect of being under the SPA before and after April 2012 are from a single regression with an interaction term.

b. Effect of increasing the state pension age on different subgroups

Although our preferred specification is the probit model, the small difference between the estimated impact using OLS and a probit model implies that we can use linear probability models to test whether the effect is the same across all subgroups, which we do to examine whether any particular groups respond more strongly to reaching the state pension age. This is done by estimating the marginal effects of being under the state pension age separately for each subgroup. Table 3.2 shows how responses differed between singles and couples, between home owners and renters, and between those with different levels of educational qualifications.

Although there is substantial variation in the point estimates in Table 3.2 the only statistically significant difference (at the 10% level) is that single women are found to respond more strongly to the state pension age than those in couples (10.1 percentage point change in employment rate compared to 4.4 percentage points). If anything, we find that women who own

their own home rather than those who rent their home, and that those with lower rather than higher levels of education, are more responsive to the rise in the state pension age but these differences are not statistically significant at conventional levels.

Table 3.2 Effect of increasing the state pension age from 60 to 62 between April 2010 and March 2014 on women's employment for different subgroups

	Effect of being under SPA	*Standard error*	*N*
Full sample	+0.061***	[0.015]	46,038
Single women	+0.101***	[0.027]	13,614
Women with a partner	+0.044**	[0.018]	32,424
– *whose partner is older*	+0.045**	[0.021]	23,936
– *whose partner is younger*	+0.044	[0.036]	8,488
Rent house	+0.028	[0.031]	8,781
Own house	+0.071***	[0.017]	37,257
Degree or other HE	+0.023	[0.029]	13,071
Secondary education	+0.070***	[0.022]	22,451
No qualifications	+0.079***	[0.028]	10,516

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level. All models are estimated using OLS estimated on women born in 1949–50 to 1952–53 from 2009Q2 to 2014Q1 with standard errors clustered at the individual level.

The increase in the state pension age led to a change in the financial incentive to work at ages 60 and 61 for many women, not only because of the loss of state pension income but also because of other differences in the treatment of people aged under and over the female state pension age within the UK tax and benefit system. To examine whether these changes in the financial incentive to work were an important driver of women's responses, we estimate how the participation tax rate (PTR) for all members of our sample is likely to change at the point that the individual reaches the state pension age. The PTR is defined as the percentage of earnings lost in taxes and withdrawn benefits when an individual moves into paid work. Based on the estimated PTRs, we divide our sample into three broad groups: those who are likely to face an increase in their PTR when the state pension age is increased, those who are likely to face essentially no change, and those who are likely to face a decrease in their PTR. If marginal financial incentives are an important driver of women's responses to this policy reform, other things being equal, we would expect the employment rate of the last group to increase most significantly as a result of the policy reform. Full details of how we estimated the change in PTR from the rise in the state pension age for each individual are provided in CET.

Table 3.3 shows the effect of increasing the female state pension age on women's employment rates, estimated separately for those likely to face a higher/same/lower PTR as a result of the increase in the state pension age. We do this separately for singles and couples, although in our data there are very few singles likely to face a higher PTR as a result of the reform.

Among couples, the largest point estimate of the increase in employment from the rise in the state pension age is for those who face an *increase* in their PTR as a result of the reform (4.9 percentage points). However, we cannot reject that the coefficients are the same at standard significance levels.

For singles, the rise in employment is found to be largest among those who experienced no change in their PTR rather than among those who saw their PTR fall, although these effects are not statistically significantly different from one another. Although the effect of increasing the state pension age for single women who face an increase in their PTR is to reduce employment, the sample size is very low for this group, the effect is not significant, and is imprecisely estimated.

Overall, therefore, we find no significant evidence that changes in marginal financial incentives have been an important factor in driving the response to the policy.

Table 3.3 Effect of increasing the state pension age from 60 to 62 between April 2010 and March 2014 on women's employment for different subgroups based on change in participation tax rate

	Effect of being under SPA	*Standard error*	*N*
Singles	+0.101***	[0.027]	13,614
–PTR reduced	+0.077*	[0.044]	4,394
– no change in PTR	+0.128***	[0.034]	8,911
–PTR increased	–0.243	[0.160]	309
Couples	+0.044**	[0.018]	32,424
–PTR reduced	+0.046	[0.036]	7,265
– no change in PTR	+0.038	[0.045]	4,989
–PTR increased	+0.049*	[0.023]	20,170

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level. All models are estimated using OLS estimated on women born in 1949–50 to 1952–53 from 2009Q2 to 2014Q1 with standard errors clustered at the individual level.

c. Effect of increasing the female state pension age on broader measures of women's economic status

The effect of increasing the state pension age on employment is important in determining how raising the state pension age will affect the public finances (by generating additional tax revenues) and how it will affect individuals' earned income. However, the larger public finance

picture and individuals' welfare will also be affected if individuals work full-time rather than part-time or if increasing the state pension age increases the number of individuals claiming unemployment or disability benefits. Therefore, we have also examined how increasing the state pension age affects the propensity to work full- or part-time or to engage in other economic activities.

We first use a multinomial probit model to estimate the impact of being above the state pension age on whether a woman is in full-time work, in part-time work or not in paid employment. These results are presented in the top panel of Table 3.4. While both full-time and part-time employment is found to have increased as a result of increasing the state pension age, the impact on full-time employment is slightly larger (at +3.7 percentage points) than the impact on part-time employment (+2.3 percentage points). However, these results are not statistically significantly different from one another.

Table 3.4 Effect of increasing the state pension age from 60 to 62 between April 2010 and March 2014 on women's economic status

	Effect of being under SPA	*Standard error*	*Prevalence when aged 60-61 prior to increase in SPA (2009–10)*
Multinomial probit model			
Full-time work	+0.037***	[0.013]	17.7%
Part-time work	+0.023*	[0.013]	22.5%
Out of work	–0.060***	[0.015]	59.9%
Multinomial probit model			
In work	+0.054***	[0.015]	40.2%
Retired	–0.114***	[0.014]	43.9%
Sick or disabled	+0.042***	[0.009]	9.4%
Unemployed	+0.011***	[0.003]	0.8%
Other	+0.007	[0.008]	5.8%

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level. There are 46,038 observations in both models. Standard errors are clustered at the individual level and estimated by bootstrapping with 1,000 replications. Estimates were successfully produced on all replications for the multinomial probit with three outcomes and on 995 of these replications for the multinomial probit with five outcomes. Prevalence of economic states prior to increase in SPA may not sum to 10% due to rounding.

We also use a multinomial probit model to estimate simultaneously the impact of increasing the state pension age on the prevalence of five different economic states. As the bottom panel of Table 3.4 shows, the estimated impact on being 'retired' (–11.4 percentage points) is larger in absolute terms than the impact on being in paid work (+5.4 percentage points).[3] This model also suggests that there was a significant increase in the proportion of women reporting being sick or disabled (+4.2 percentage point), a large increase relative to the proportion (9.4%) of 60 and

[3] The increase in employment derived from this specification is different from that quoted above because of the different methodology used to estimate the answer.

61 year olds who self reported being sick or disabled prior to the increase in the state pension age. This increase suggests that some who are sick or disabled have a tendency to report themselves as "retired" once they reach the state pension age – potentially because they will no longer be able to receive Employment and Support Allowance (ESA, which is for working age individuals unable to work due to health problems). The proportion reporting being unemployed also increased (+1.1 percentage points) when the state pension age was increased. This is a particularly large increase given that only 0.8% of 60-61 year old women in 2009–10 reported being unemployed. This increase could arise because individuals continue actively seeking work until they reach state pension age, when they qualify for non-employment income sources (such as state pensions), which do not have the same job search requirements as working-age out-of-work benefits.[4]

These results are similar to the results of a similar regression presented in Table 4.4 of CET using data up to March 2012. One difference is that, including more recent data, Table 3.4 reports a larger and more precisely estimated increase in the proportion of women reporting themselves to be sick or disabled (an increase of 4.2 percentage points, rather than 1.3 percentage points). However, we cannot reject that the effects in the two periods are the same.

4. Conclusion

Many countries have legislated to increase early or normal pension claiming ages over the last few decades, partly but not exclusively motivated by a desire to reduce the future cost of public pension promises. In 1995, the UK government legislated to increase the earliest age at which women could claim a state pension from 60 to 65 between April 2010 and March 2020.

Cribb, Emmerson and Tetlow (2013) provided the first (ex post) examination of the impact of this policy on women's economic activity at older ages, using data covering the period up to June 2012 during which the state pension age rose from age 60 to age 61. This short paper updates these results by using data up to March 2014 by when the state pension age for women had risen to age 62.

Our results, which allow for a flexible specification of cohort effects, suggest that employment rates did increase significantly as a result of the change in state pension age from age 60 to age

[4] By November 2013, (the latest month for which the Department for Work and Pensions have currently released data on the number of benefit recipients) 1.2% of 60 and 61 year old women who were under the SPA were receiving jobseeker's allowance. This figure is consistent with our estimate of a 1.1ppt increase in the proportion of women who are unemployed due to the increase in the state pension age. 11.1% of the same group were claiming disability benefits (incapacity benefit or employment support allowance). Offsetting this to a large extent, there will have been a reduction in the numbers able to claim pension credit. However, published administrative data sources do not allow us to observe this.

62 – by 5.9 percentage points using our preferred specification. We find statistically significant rises in both full-time and part-time female employment as a result of the reform.

Between April 2010 and March 2012 (during which time the state pension age rose from age 60 to 61) we find that being aged under (rather than over) the state pension age increased employment rates of women by 6.8 percentage points, all other things being equal. This is similar to the 7.3 percentage point effect found by Cribb, Emmerson and Tetlow (2013). Between April 2012 and March 2014 (during which time the state pension age rose from age 61 to 62) we find that being aged under (rather than over) the state pension age increased employment rates of women by 4.8 percentage points, all other things being equal. While it might be tempting to infer from this that successive increases in the state pension age have a diminishing impact on employment it should be noted that these estimates relate to slightly different time periods and, in any case, are not statistically significantly different from each other at conventional levels of statistical significance.

In addition to the impact on employment rates, we find the policy has also led to a 4.2 percentage point increase in the proportion of women reporting themselves as sick or disabled and a 1.1 percentage point increase in the fraction of women who are unemployed and actively seeking work at ages 60 and 61. These increases in employment, poor health and unemployment are offset by a 11.4 percentage point reduction in the proportion reporting themselves to be retired.

We find that the employment rate of single women is increased by more than the employment rate of women in couples (10.1 percentage points compared to 4.4 percentage points), with this difference being statistically significant at the 10% level. No statistically significant differences in the estimated impacts are found between home owners and renters, those with different levels of education or those likely to face different changes in marginal financial incentives to work from the tax and benefit system as a result of the reform.

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