# THE IMPACT OF THE INTRODUCTION OF THE NATIONAL LIVING WAGE ON EMPLOYMENT, HOURS AND WAGES

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Abstract

In 2015 the UK government announced the introduction of a new 'National Living Wage' (NLW) that would apply to those aged 25 and above from April 2016. At a rate of £7.20, this represented a significant increase of 7.5% over the existing National Minimum Wage (NMW) rate. Previous research has generally found, with some exceptions, that the NMW has raised the earnings of low paid workers, without significantly affecting their employment opportunities. The relatively large increase in the wage floor with the introduction of the NLW, and plans to raise the NLW to 60% of median earnings by 2020, raises the possibility of detrimental effects on employment retention and hours worked. We use a difference-in-differences approach and data from the Annual Survey of Hours and Earnings to examine the effects of the NLW introduction and April 2017 uprating on employment retention and hours worked. Overall we find that recent NLW upratings have increased wages for the low paid with generally little adverse effect on employment retention. However, consistent with previous research, we do find some evidence of adverse effects on the employment retention rates of women working part-time. We also find evidence of a reduction in employment retention for some of the lowest paid workers in the retail industries.

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In 2015 the UK government announced the introduction of a new 'National Living Wage' (NLW) that would apply to those aged 25 and above from April 2016. At a rate of £7.20, this represented a significant increase of 7.5% over the existing National Minimum Wage (NMW) rate. Previous research has generally found, with some exceptions, that the NMW has raised the earnings of low paid workers, without significantly affecting their employment opportunities. The relatively large increase in the wage floor with the introduction of the NLW, and plans to raise the NLW to 60% of median earnings by 2020, raise the possibility of detrimental effects on employment retention and hours worked. We use a difference-in-differences approach and data from the Annual Survey of Hours and Earnings to examine the effects of the NLW introduction and April 2017 uprating on employment retention and hours worked. Overall we find that recent NLW upratings have increased wages for the low paid with generally little adverse effect on employment retention. However, consistent with previous research, we do find some evidence of adverse effects on the employment retention rates of women working part-time. We also find evidence of a reduction in employment retention for some of the lowest paid workers in the retail industries.

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1   Introduction

In April 2016, a new statutory 'National Living Wage' (NLW) was introduced in the UK. The NLW was set at £7.20, more than 7% higher than the level of the National Minimum Wage (NMW) which had been in effect since October 2015, and a more than 10% year-on-year increase compared to the April 2015 level of £6.50. Moreover, the NLW applies only to workers aged 25 and over, while the NMW adult rate had applied to workers aged 21 and over since 2010. The objective of this report is to present our findings examining the effects on employment and hours worked of the introduction and first uprating (in April 2017) of the National Living Wage.

We use a standard difference-in-differences (DD) approach similar to that which has been used in a number of previous studies examining the effects of the introduction and upratings of the National Minimum Wage. This approach identifies the impact of a NMW uprating by comparing two groups of workers based on their pre-uprating wages: the treated wage group has initial wages below the incoming minimum wage level, and so are directly affected by the NMW uprating, while the control group were already earning at or somewhat above the incoming NMW uprating, and are not directly affected. We use data from the longitudinal Annual Survey of Hours and Earnings (ASHE).

Given the potential for differences across occupations, industries and regions, we also explore, sample sizes permitting, occupations and industries that have a high proportion of low-paid workers, given that these are much more likely to be affected by the NLW. We also explore the effects on most regions of the UK for some demographic subgroups, as some areas are more likely to be affected by the recent upratings than others.

Because conventional OLS estimates of standard errors may be downward-biased due to the within-group correlation of errors we use the generalised form of the Moulton factor to correct the conventionally estimated standard errors. To make clear the range of effects that we cannot reject at a standard significance level, we also report 95% confidence intervals. We generally find wide confidence intervals for employment retention such that we cannot reject moderate to large positive and negative effects of the NLW. For hours worked the confidence intervals are typically even wider. We also calculate minimum detectable effects (MDEs) to illustrate the power of the difference-in-differences designs that we use. We generally find moderate to high values of the MDE, implying that our estimators are low powered.

We also exploit the fact that the NLW only applies to workers aged 25 and over to identify the effects of the introduction of the NLW. We identify the impact of the NLW by comparing two groups of workers with initial wages below the incoming NLW: the treated group is between age 25 and 30 and so is directly

affected by the introduction of the NLW, while the control group is younger and is therefore not directly affected. We benchmark the usual difference in outcomes between these two groups: first, on outcomes for low paid workers in these same age groups in the past; second, on outcomes for better paid workers in these same age groups at the same time.

The following subsections describe the key results of the analysis, and then in the remainder of the report, we first provide, in Section 2, details of the difference-in-differences approaches we use. In Section 3 we describe the data, and in Section 4 we present the results. Section 5 concludes.

1.1 Key results

In Section 4 we present our estimates of the effect of the April 2016 introduction of the NLW on employment retention, hours and wages using a difference-in-differences approach applied to ASHE data. We also report estimates of the effects of the April 2017 uprating, although identification is less clear cut in this instance, and therefore we put less weight on these results.

Wages

Using the standard DD approach, we find clear evidence of greater real wage growth for treated groups over and above the control groups. The introduction of the NLW resulted in additional wage growth for low paid workers of 4-7pp. The uprating of the NLW in April 2017 by a further 4.2% to £7.5, added a further 0.8-1.4pp to annual wage growth. These effects are evident in the low paying sectors and occupations and regions of the UK that we are able to examine, conditional on sample sizes being large enough.

Using age to identify the impact of the NLW we find much smaller effects on wage growth. The evidence is consistent with a scenario where upon the introduction of the NLW employers increased wages for low paid workers regardless of their age. This suggests that age-based identification methods will underestimate impacts of the NLW on other labour market outcomes.

Employment retention

Using ASHE data, we find no evidence of a negative effect on employment retention for full-time women, full-time men, or part-time men. However, for part-time women we do find evidence of a reduction in employment retention of approximately 2.4-2.6pp in two of our three econometric specifications. We do not find any negative retention effects following the further increase in the NLW in April 2017 for any demographic subgroup. These results suggest an increase in employment retention for the very lowest paid part-time women of 3.8pp. However, these effects are not present in our main specification, which

consider all low paid women working part-time.

We also consider separately, sample sizes permitting, various low paid occupations and industries, and regions of the UK. Because of smaller sample sizes, these low-level estimates may be relatively erratic. We find no evidence of any negative employment retention effects for the occupations we examine, except in the lowest paid retail occupations for part-time women. For those most affected by the introduction of the NLW we find a reduction in employment retention of 6.3pp for part-time women.

We consider various demographic groups in the cleaning, food processing, hospitality, retail and social care industries. Overall there is little evidence of any negative effects on employment retention except in the retail industries. In the retail industry we find a reduction in employment retention following the introduction of the NLW of around 3.8pp for the low-paid part-time women and of 9.3pp for the very lowest paid part-time women in this industry.

Across regions of the UK we generally do not find negative retention effects with the exception of part-time women in the North East, for whom the estimates imply a significant reduction in employment retention of approximately 10pp.

Hours worked

We do not find any evidence of a reduction in hours for treated workers following the introduction of the NLW or the first uprating, in our main estimates. We find some evidence of a reduction in weekly hours for full-time women in the low paid retail occupations of about 2.4 hours. We find weak statistical evidence of a reduction in hours worked for the very lowest paid full-time men in the hospitality sector of just under 2 hours per week following the introduction of the NLW, but statistically significant increases in hours worked following the 2017 uprating for these workers. In London we find a reduction in weekly hours for part-time women of between 1.5-2 hours, following the introduction of the NLW in 2016. In the North West there is some evidence of a reduction in weekly hours for full-time women of approximately 40 minutes at the time of the uprating of the NLW in April 2017.

2 Methodology

2.1 Difference in differences

The difference in differences (DD) approach compares the evolution of the dependent variable for treated and untreated wage groups. The DD approach has become the standard means of evaluating the impact

of NMW upratings on employment retention and hours worked in the UK.[1] This type of difference-in-differences approach was first adopted to examine the impact of minimum wages by Linnerman (1982) in the USA, and is the approach taken by Stewart (2004b,a); Stewart and Swaffield (2008) and Dickens, Riley and Wilkinson (2015) (DRW) to examine the introduction of the UK NMW. We adopt the same approach and apply this to longitudinal ASHE data to examine both the introduction of the NLW and the first uprating in April 2017.

The treated wage group is composed of those workers whose wages lie at or above the level of the minimum wage in period t, but below the level of the incoming minimum wage (NLW) in the next period $t+1$. That is, treated workers are directly affected by an increase in the minimum wage. The control wage group is composed of workers who were already earning at or just above the incoming minimum wage in period t. As a result, the control group is not directly affected by the increase in the minimum wage, although they may be indirectly affected if there are spillovers onto higher wage groups from a minimum wage uprating. These spillovers might, for example, derive from a desire on the part of employers to maintain wage differentials amongst jobs with differing responsibilities or skill requirements.

Throughout our analysis we consider three definitions of the treatment group:

1. All workers earning between the initial and incoming minimum wage

2. Only workers earning at or very close to the initial minimum wage

3. A 'wage gap' definition (defined as the incoming NLW rate divided by the individual wage)

The first definition of the treatment group includes all those affected by the introduction/uprating of the NMW/NLW, while the second definition considers a subset - those who will be most affected, because they are furthest away from the incoming NMW/NLW rate. The third definition includes everyone who is affected by an uprating, but gives more weight to those people who are furthest from the incoming rate, and hence more likely to be affected.

The lack of any recent control time spans complicates the difference-in-differences approach. However, the NLW introduction is associated with a much larger increase in the minimum wage than in the recent past. Between April 2015, when the NMW was set at £6.50, and April 2016, when the NLW was introduced at £7.20, the minimum wage for workers aged 25 and over rose by 10.8% in nominal terms.[2] This increase is more than three times as large as increases in other recent years, as shown in Table 1.

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[1]For example Stewart and Swaffield (2008); Dickens, Riley, and Wilkinson (2015).

[2]Most workers aged 25 and over are covered, with the exception of apprentices in their first year.

Table 1: NMW and NLW rates for April years (ASHE)

	Nominal			
	NMW/NLW (over 25)	NMW/NLW (under 25)	% change over 25	% change under 25
2011	5.93	5.93		
2012	6.08	6.08	2.5	2.5
2013	6.19	6.19	1.8	1.8
2014	6.31	6.31	1.9	1.9
2015	6.50	6.50	3.0	3.0
2016	7.20	6.70	10.8	3.1
2017	7.50	7.05	4.2	5.2

	Real			
	NMW/NLW (over 25)	NMW/NLW (under 25)	% change over 25	% change under 25
2011	6.34	6.34		
2012	6.33	6.33	-0.2	-0.2
2013	6.30	6.30	-0.5	-0.5
2014	6.34	6.34	0.6	0.6
2015	6.50	6.50	2.5	2.5
2016	7.13	6.63	9.7	2.0
2017	7.24	6.81	1.5	2.7

Note: The NMW and NLW rates are those that apply in April of each year. Prior to April 2016 the NMW applied to those aged 21 and over, from April 2016 the NLW applied to those aged 25 and over, while the NMW continued to apply to those aged 21-24 years. Real evaluated at 2015 prices using the CPI.

The treatment group is defined as those paid below the incoming level of the NMW/NLW at time t, and the comparison group is defined as those individuals paid within some range above the new NMW/NLW. For example, in April 2016 the new NLW of £7.20 was introduced for those aged 25 and over. Those workers paid below £7.20 before April 2016, but above the previous level of the NMW in April 2015 of £6.50, have their pay increased to comply with the new rate and are hence allocated to the treatment group. Those workers paid at or above £7.20 before April 2016 are allocated to the control group. Figure 1 illustrates the timings of changes in the NMW/NLW alongside ASHE survey periods. The key is to designate the control group so that it is similar in all other respects to the treatment group. Usual practice in the literature is to take some pay range just above the incoming minimum wage rate. We report results for those up to 10% above the NLW (control group 1), and perform robustness checks using a group that is 10-20% above (control group 2).

Outcomes for the treatment and control group individuals are then compared at time $t+1$ after the new NMW/NLW is in place. The policy effect is then measured as the difference in outcomes between the treatment and control group at time $t+1$ less the difference in outcomes between these groups in some benchmark period that pre-dates the new NMW/NLW. The choice of the base period can be crucial here. We will return to this issue below.

Figure 1: NMW and NLW upratings 2010-2018
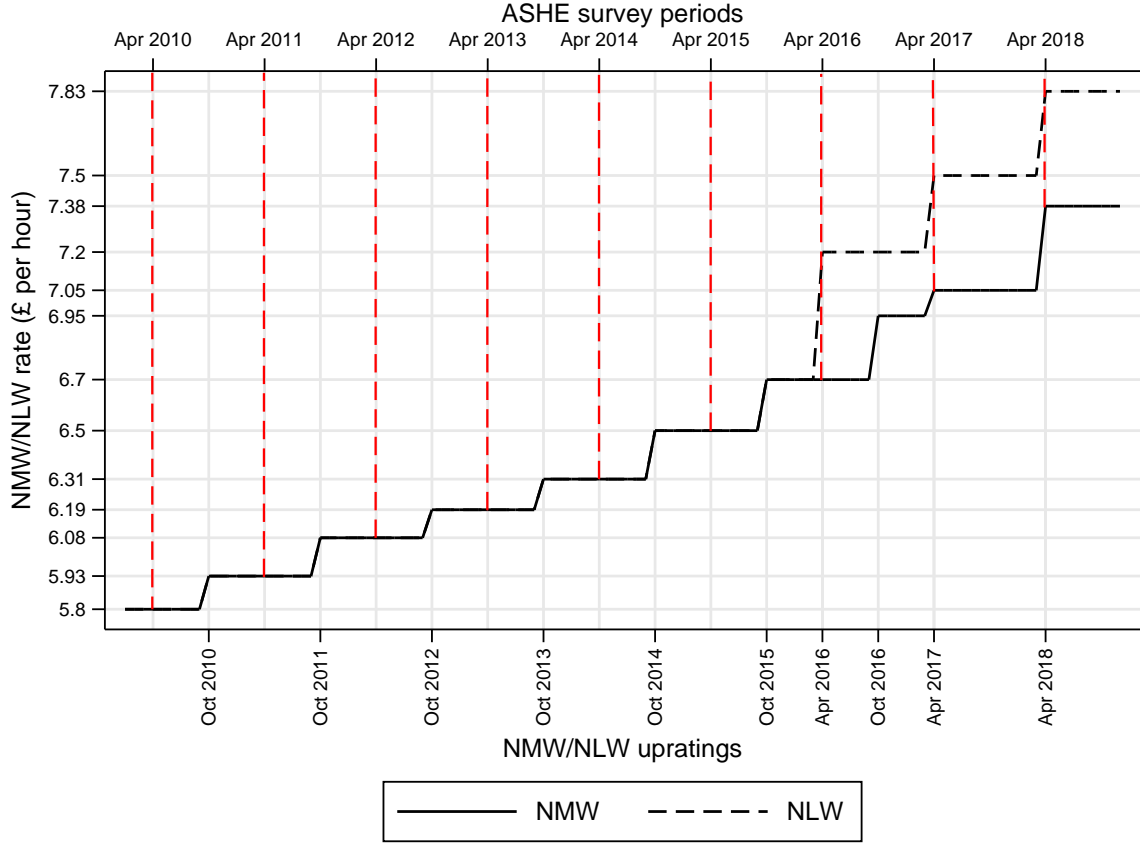
Note: The ASHE survey of employers takes place in April of each year.

More formally, we use the model specified in the equation below

$$y_{it} = \gamma_0 + \gamma_1 D_{it} + \delta(T_t \cdot D_{it}) + \beta X_{it} + Y_t + \epsilon_{it} \tag{1}$$

where y_{it} is the outcome of interest - for example, $\text{Prob}(E_{i,t+1} = 1 | E_{i,t} = 1)$, the probability of being employed at time $t + 1$, conditional on being in work at time t. D_{it} is a dummy variable equal to 1 if an individual belongs to the treatment group for evaluating the NLW change and 0 otherwise. T_t is a dummy that indicates whether the observation is from the period of the NMW/NLW change, or before. Y_t are a set of year dummies that pick up common time effects, and X_{it} are individual, year specific controls. Specifically, we include age, age-squared, a dummy equal to 1 if the job is the same as in the previous period, a set of occupation dummies, a set of industry dummies, and a set of regional dummies. The parameter γ_1 measures the baseline average difference in outcomes between the treatment and control groups (the normal difference), and δ is the estimated treatment effect of the NMW/NLW change.

In addition to employment retention, we also consider the conditional change in hours, and real wage growth conditional on remaining employed.

Previous studies (such as Dickens, Riley, and Wilkinson (2015)) have used the pre-NMW period as a control period. While this is an option for this study, pre-1999 is almost 20 years prior to the introduction of the NLW, and given many changes in labour markets since then, this is arguably not an ideal control period to use. We therefore use more recent years as control periods where the labour market is more similar to what it is when the NLW was introduced. This way our methodology does not rely on similar developments for individuals in different parts of the pay distribution over long periods of time. We report falsification tests, i.e. the estimated effects of an imaginary (placebo) change in the wage floor to check the validity of our approach.

Figure 2 illustrates our DD design. The introduction of the NLW in April 2016 means that our treatment year is defined as 2015, and we use 2010-2013 as control years (only 2012 is shown on the graph for simplicity). In the treatment year, 2015, the treated group are those earning between the NMW of £6.5 and the incoming NLW of £7.2, while the control group in the treated year is defined as being those earning up to 10% above the incoming NLW. In the control years, 2010-2013, we define the treated group as those earning between the current NMW and 10.8% above this, so that we define as treated a similar section of the pay distribution in the past.[3] The control group in the control year is defined as those earning between the upper bound of the treated group and a further 10% above this. When we consider the first uprating of the NLW in April 2017, the treatment year is 2016, and we use 2011-2014 as the control years.[4]

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[3]Alternatively one could deflate the incoming NLW e.g. with average wage growth to define the treatment group in past years, which over the period we consider would lead to a treatment group spanning a wider section of the distribution in control years. Restricting instead the treatment group to workers paid below past NMW upratings would result in a treatment group spanning a relatively narrow section of the distribution in control years, and might underestimate the usual difference in outcomes between the treatment and control groups.

[4]We use the same specification of the baseline when examining the 2017 uprating as in our examination of the introduction of the NLW. An alternative approach would be to define the treatment group in control years to those earning up to 4.2% (rather than 10.8%) above the existing NMW, consistent with the size of the 2017 uprating. However, this is unlikely to be an appropriate benchmarking group following the significant increase in the wage floor with the introduction of the NLW the year before.

Figure 2: Treatment and control groups
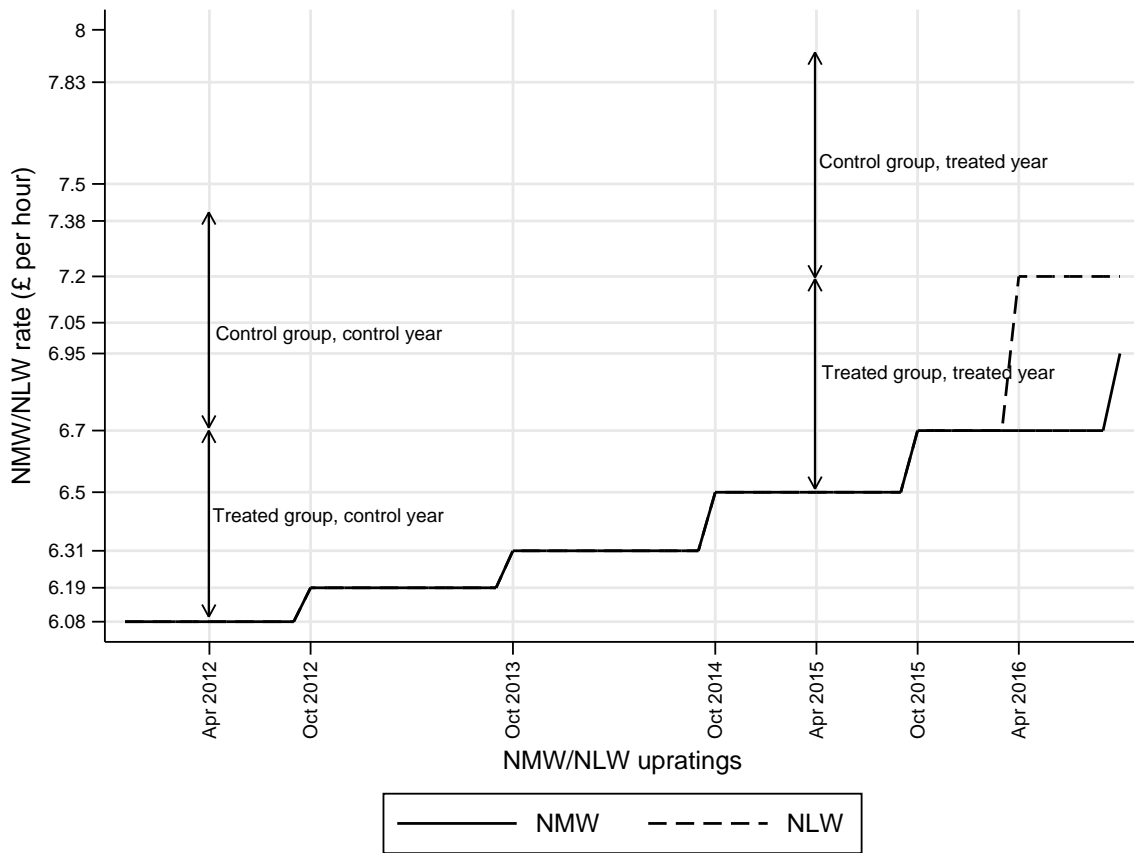
Note: Treatment years are either 2015 (April 2015 to April 2016), or 2016 (April 2016 to April 2017). The figure is illustrative and does not show all of the control years used. The control years are 2010-2013 for the 2015 treatment year, and 2011-2014 for the 2016 treatment year.

2.2 Estimation, inference and interpretation

For some time, it is has been understood that DD regressions such as equation 1 may suffer from within-group correlation of errors (Moulton, 1990) as well as serial correlation of errors (Bertrand, Duflo, and Mullainathan, 2004). Both of these forms of correlation may lead to conventional OLS estimates of standard errors that are downward-biased, so that without appropriate corrections, estimates of standard errors would overstate the precision of ones estimates. Brewer, Crossley, and Zilio (2015) and Brewer, Crossley, and Joyce (2017) discuss these problems, also in the context of UK minimum wage studies, and suggest methods for correcting the standard errors.[5] We use the generalised form of the Moulton factor to correct the conventionally estimated standard errors, and report falsification tests.

Brewer, Crossley, and Zilio (2015) also advocate the reporting of confidence intervals to make clear the range of effects on the variables of interest which are consistent with the results, and to thus guard against over-interpretation of a failure to reject the null hypothesis that any point estimate is equal to zero. We therefore report 95% confidence intervals based on the Moulton corrected standard errors in addition to the point estimates.

Following Bloom (1995) and Brewer, Crossley, and Zilio (2015) we also calculate and present minimum detectable effects (MDEs) to illustrate the power of the difference-in-differences designs used. The MDE is the smallest effect that, if true, has an 80% chance of producing an impact estimate that is statistically significant at the 5% level; where 80% is the statistical power of the experiment and 5% is the level of statistical significance. The significance level (α), is the probability of concluding that there is an impact of the intervention when actually there is no impact. This is generally known as the probability of making a type I error (a false positive). Statistical power (π) is the probability of correctly concluding that an intervention has no statistically significant effect. In other words, it is the probability of not committing a type II error (a false negative). It is commonly set at 80%.

To facilitate interpretation of the estimated coefficients δ from equation 1, we translate our estimated coefficients in our main results into elasticities. We turn our estimates of the impact of the NMW/NLW on 12-month retention rates δ into an estimate of the elasticity of the 12-month job retention rate to the NMW/NLW. This elasticity, η, is defined in the usual way:

$$\eta = \Delta RR/RR/\Delta W/W \tag{2}$$

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[5]Note that the methods suggested there are typically not applicable when considering a single intervention. An alternative is the subcluster wild bootstrap modification of standard errors of MacKinnon and Webb (2018), which may be more suited to the typical difference-in-differences setting.

For the model in which we estimate the average impact of a NMW/NLW uprating, ΔRR is the coefficient δ (i.e. the change in the retention rate for the treatment group as a result of the increase in the NMW/NLW), RR is the counterfactual retention rate (i.e. the proportion of workers who would have remained in employment if the NMW/NLW had not been changed, which we can calculate as the observed retention rate less δ), and $\Delta W/W$ is the average size of the NMW/NLW upratings over the period.

We check the robustness of our results by running a series of placebo tests. Each placebo test substitutes the true treatment year by a counterfactual placebo 'treatment' year. For example, rather than using the time span 2015/16 as the treated period over which the NLW was introduced, we instead use either 2012, 2013, or 2014 as the treatment year, and use respectively 2007-2010, 2008-2011, or 2009-2012 as the control years. Findings of statistically significant estimated treatment effects using a placebo time span can cast doubt on the validity of the results.

3   Data

We use data from the Annual Survey of Hours and Earnings (ASHE) which has much larger sample sizes than the Quarterly Labour Force Survey, the only possible alternative data source for this study.[6] Large samples are especially important when examining potentially differential impacts of minimum wage increases on smaller subgroups such as those working in particular industries or occupations. However, ASHE estimates of employment retention are measured with some error, particularly amongst the lowest paid and those working part-time (see Dickens, Riley, and Wilkinson (2015) for a discussion).

The ASHE is longitudinal and collects detailed data from employers on the wages and hours of a 1% sample of National Insurance numbers. We use data for the period 2007 - 2017. ASHE collects little demographic data apart from gender, age, industry and occupation; limiting the set of controls which can be used. Prior to 2014 employers were only required to submit ASHE data for employees who were earning at or above the PAYE threshold, although larger employers submitted data for all employees. This made it difficult to distinguish between low-wage workers leaving employment, and those that have reduced their hours below the PAYE threshold. However, as of 14, employers are required to submit ASHE data for all employees if any employee is earning at or above the PAYE threshold.

Data are collected progressively for a reference week in April each year. Up to and including 2016, most NMW upratings took place in October, midway between two ASHE data collection reference periods. In April 2016, and again in April 2017, however, the NLW and NMW took effect as of 1 April. As a result, data in 2016 and 2017 was collected shortly after the implementation of a new minimum wage, so that the adjustments recorded are of a shorter term nature than in pre-2016 data.[7]

We drop observations where there are inconsistencies either in the identifier variable, sex or age over time, as well as those affected by periods of absence. We also drop observations with unrealistic observations of 112 or more total weekly hours worked. Our dependent variables take the difference between values at the time of uprating and the previous period. We focus on workers aged 25 or older, who would be eligible for the National Living Wage.[8] Table 2 shows the number of observations of employment retention by treatment year for both the treatment and control groups for each of our four demographic subgroups. For each treatment year, the count includes those in both the treatment year and in the respective control years. The table shows that the prevalence of low paid work is much higher amongst part-time women

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[6]We have examined Labour Force Survey data and we were unable to detect any effects on wage growth.

[7]A similarly short adjustment period also occurred when the NMW was first introduced in 1999.

[8]Workers become eligible for the new minimum wage rate in the first pay period which commences on or after the reference date, which in the case of the NLW introduction is 1 April 2016.

than the three other demographic groups.

Table 2: Sample sizes from the ASHE longitudinal panel

Treatment	FT men		FT women		PT men		PT women	
year	treated	control	treated	control	treated	control	treated	control
2012	10,366	9,935	9,876	8,599	4,937	2,205	20,298	11,634
2013	11,669	10,768	11,048	9,074	5,861	2,415	21,810	12,163
2014	13,144	11,947	11,998	9,923	6,852	2,833	23,598	13,499
2015	13,883	12,498	12,885	10,146	7,576	2,977	24,743	13,844
2016	14,040	13,904	12,732	11,053	7,700	3,497	24,083	14,989

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Each cell shows the number of treated or control observations in both the treatment year and the corresponding control years. For the 2012 treatment year the control years are 2007-2010; for 2013 the control years are 2008-2011; for 2014 the control years are 2009-2012; for 2015 the control years are 2010-2013; and for 2016 the control years are 2011-2014. The controls are defined on the basis of those earning up to 10% above the incoming NLW rate.

Real wage growth is defined as the change in the log real wage, $ln(realwage)_{t+1} - ln(realwage)_t$. Table 3 shows mean wages and hours worked (conditional on being employed) for the treatment group and both control groups in each treatment year. Figure 3 shows wage densities (for wages below £20/hour) in each year with a marker for the relevant NMW/NLW rate. In each year a spike is quite clear suggesting a degree of bunching very near the nominal NMW/NLW rate, giving us confidence that we identify the effects of the NMW/NLW in the wage data we are using. Hours of work in the ASHE is taken from total paid hours, and we define the change in conditional hours worked as being the change in hours for those who are still in employment.

Table 3: Mean wages and hours by treatment and control groups for treatment years only

	Wages				Hours			
	All	Treated	Control 1	Control 2	All	Treated	Control 1	Control 2
2007	13.75	5.58	6.22	6.82	35.43	28.56	31.88	34.12
2008	14.32	5.78	6.42	7.02	35.54	28.56	32.30	34.24
2009	14.52	5.97	6.66	7.30	35.13	28.66	31.76	33.95
2010	14.64	6.04	6.75	7.39	35.19	28.75	32.05	33.97
2011	14.69	6.17	6.91	7.54	35.02	28.94	32.13	34.06
2012	14.70	6.31	7.07	7.74	34.96	28.87	31.71	33.91
2013	14.88	6.42	7.21	7.89	34.94	28.98	32.12	33.84
2014	14.89	6.54	7.34	8.04	34.85	29.02	31.93	33.62
2015	14.90	6.75	7.55	8.27	34.86	29.07	32.28	34.18
2016	15.36	7.27	7.86	8.60	34.97	29.37	32.28	34.03

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Each row shows mean nominal wages and mean hours worked for the treated and control groups in the treatment year only. Control group 1 are defined on the basis of those earning up to 10% above the incoming NLW rate. Control group 2 are defined on the basis of those earning between 10-20% above the incoming NLW rate.

Figure 3: Distribution of wages for adults
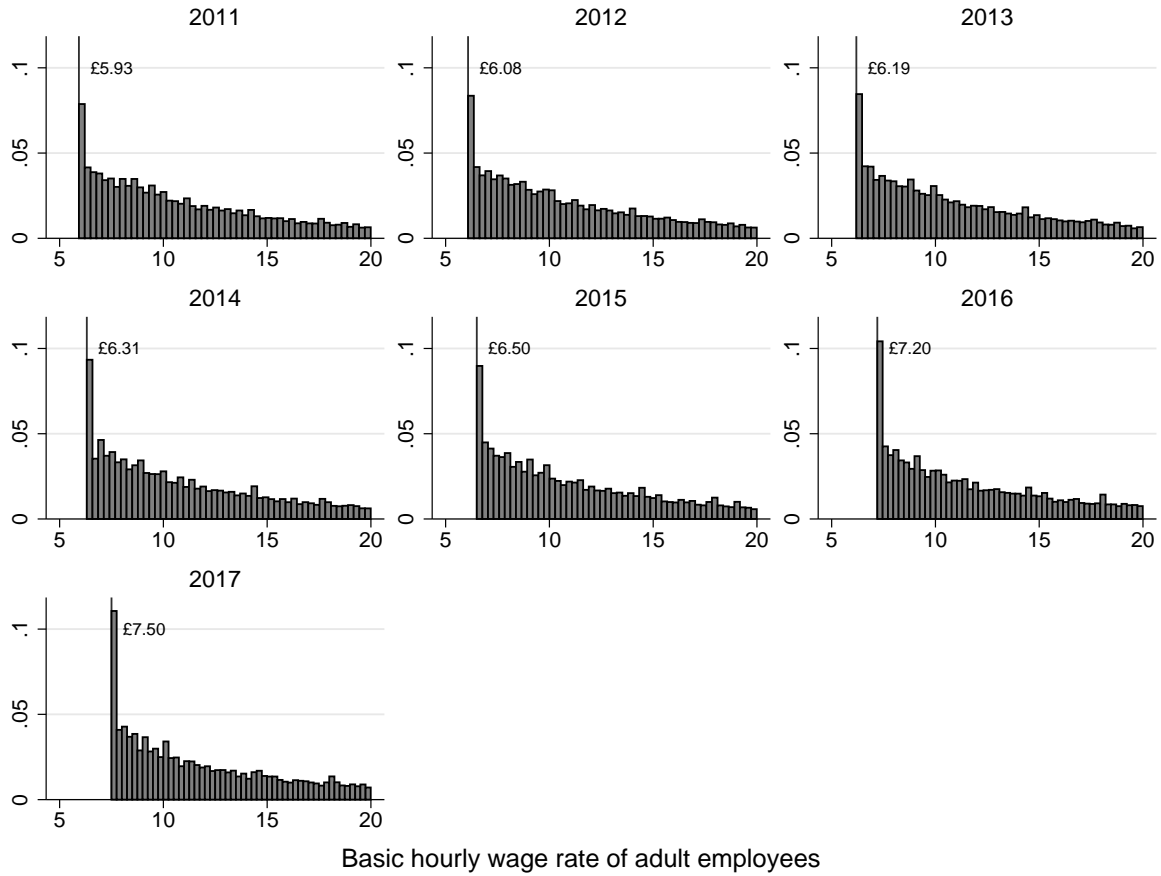
Employment retention is defined as a dummy variable equal to 1 when a person is observed in the ASHE (and therefore in employment) in a subsequent period, and zero otherwise. Table 4 shows mean retention rates for the treated and control groups, but a simple comparison of the retention rates (or hours worked) between treated and control groups is not sufficient to understand how the NLW has differentially affected the treated group, hence the use of difference-in-differences which allows us to control for baseline differences between the two groups. Our regression estimates also include individual time-varying controls, which help to ensure balance in our comparison between treated and control groups.

Table 4: Mean retention rates by treatment and control groups for treatment years only

	All	Treated	Control 1	Control 2
2007	0.79	0.70	0.75	0.76
2008	0.81	0.72	0.76	0.78
2009	0.80	0.72	0.77	0.78
2010	0.81	0.71	0.77	0.80
2011	0.78	0.69	0.76	0.78
2012	0.80	0.70	0.76	0.77
2013	0.80	0.72	0.77	0.79
2014	0.78	0.68	0.74	0.76
2015	0.76	0.67	0.74	0.74
2016	0.76	0.67	0.72	0.73

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Each row shows mean retention rates for the treated and control groups in the treatment year only. Control group 1 are defined on the basis of those earning up to 10% above the incoming NLW rate. Control group 2 are defined on the basis of those earning between 10-20% above the incoming NLW rate.

4 Regression results

We estimate equation 1 separately for five different demographic groups - full-time men, full-time women, part-time men, and part-time women, and for everyone combined. We also estimate three different specifications as outlined in section 2.1. These are our baseline specification (where the coefficient of interest is denoted by δ in the tables), a specification where we restrict the treatment group to those earning between the current NLW and just 0.5% above it (denoted by δ (old) in the tables), and a weighted specification (denoted by δ (wg) in the tables). All of the specifications include age, age squared, a dummy for being in the same job, occupation fixed effects, industry fixed effects, region of work fixed effects, and year fixed effects, these are not reported in the following tables, but are available on request.

As discussed above, we use the Moulton correction for the standard errors which are reported in parentheses below the coefficients. Below the coefficients in square brackets we also report 95% confidence intervals (based on Moulton standard errors). For employment retention and conditional hours worked we also report Minimum Detectable Effects, and these are reported under the confidence intervals. In what follows we consider the introduction of the NLW in April 2016 (treatment year is 2015). We also report estimates of the impacts of the first uprating of the NLW in April 2017 (treatment year is 2016), although this experiment is less clearly defined.

4.1 Main results

Across all of the specifications and demographic groups considered, we find consistent increases in real wage growth associated with the introduction of the NLW in April 2016. When considering all workers directly affected by the introduction of the NLW, the estimated increase in wage growth is between 4.1-6.9 percentage points (pp), as shown in Table 5. The middle row of the table shows that when we restrict attention to those earning between the old minimum wage and 0.5% above, the wage growth is higher, as these are the people who are furthest away from the incoming NLW, and who therefore experience the largest increase in wages. When we consider the uprating of the NLW in April 2017, our estimated increase in wage growth is much smaller, between 0.8-1.4pp, as shown in Table 6.

Tables 7 and 8 show the results for employment retention, for the NLW introduction and the 2017 uprating respectively. Table 7 shows that we do find negative employment retention effects for part-time women using the baseline and weighted specifications. We find a reduction in employment retention for part-time women of about 2.5pp (significant at 5%). However, the 95% confidence intervals shown in Tables 7 and 8 indicate that small positive and larger negative impacts of the NLW on employment would

also not be rejected by this data at a significance level of 5%. For part-time women we cannot reject that the introduction of the NLW reduced the probability of being employed by between 0.5pp and 4.7pp (baseline specification, Table 7). Associated with these large standard errors is that our DD design has relatively low power to detect a plausibly-sized true effect of the NLW. For example, for part-time women, the minimum detectable effect shows that an NLW uprating would need to increase or decrease the job retention rate by 3.1 percentage points to have an 80% chance of being detected (baseline). For full-time women the corresponding MDE is 3.6pp (Table 7). Table 8 shows that we do not find any statistically significant evidence of a decline in employment retention for any demographic group.

The regression results for hours worked, conditional on remaining in employment, are shown in Tables 9 and 10. There is no evidence of a negative effect on hours worked following the introduction or first NLW uprating. The confidence intervals are wide, and the calculated MDEs imply that the estimates are not able to consistently identify small effects.

One way to examine the validity of our quasi-experimental design is to estimate 'placebo' models where we shift our experiment to a different, hypothetical, time period when the intervention under consideration did not take place. If we were to find similar results in our placebo estimates to those in our real estimates this would invalidate our quasi-experimental design. Tables 11 - 19 present placebo estimates for the growth in wages, employment retention, and the change in hours worked. We estimate three placebo models, defining the treatment year as either 2012, 2013, or 2014. For 2012 we use 2007-2010 as control years, for 2013 we use 2008-2011 as control years, and for 2014 we use 2009-2012 as control years. Reassuringly we do not find the robust wage growth that we find in our actual experiment. For 2012 and 2013 the estimates are generally statistically insignificant, while for 2014 they are very small in magnitude and frequently negative, even if statistically significant. In tables 14 - 19 we also find no evidence of any statistically significant effects on employment retention or hours. The exception is a positive effect on employment retention of full-time men paid close to the previous NMW in the 2014 placebo model. Therefore we do not interpret the positive coefficient for this group when the NLW is introduced (Table 7) as an effect of the NLW. However, there are studies, such as Brochu and Green (2013) using Canadian data, that do find increases in employment retention from minimum wages coupled with lower hiring rates.

In Appendix A we report estimates using the comparison group of workers paid between 10% and 20% above the incoming NLW. We find similar wage effects as in our main specification. The negative effect on employment retention for part-time women is no longer present. Placebo tests suggest this group is less suitable as a comparison group for identifying effects on hours.

Table 5: Real wage growth (2015 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.047***	0.042***	0.043***	0.054***	0.051***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
	[0.043,0.051]	[0.035,0.048]	[0.039,0.046]	[0.049,0.059]	[0.045,0.057]
δ (old)	0.064***	0.063***	0.061***	0.069***	0.069***
	(0.003)	(0.008)	(0.002)	(0.002)	(0.003)
	[0.059,0.069]	[0.048,0.078]	[0.056,0.065]	[0.065,0.074]	[0.062,0.075]
δ (wg)	0.045***	0.041***	0.041***	0.051***	0.049***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
	[0.042,0.049]	[0.035,0.046]	[0.038,0.044]	[0.047,0.056]	[0.044,0.055]
N	70,248	18,788	17,257	6,314	27,889
N (old)	40,390	11,554	10,032	3,664	15,140

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 6: Real wage growth (2016 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.011***	0.011**	0.014***	0.012***	0.010***
	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)
	[0.008,0.015]	[0.004,0.017]	[0.011,0.017]	[0.006,0.018]	[0.005,0.015]
δ (old)	0.009***	0.008*	0.010***	0.013***	0.008*
	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)
	[0.004,0.013]	[0.002,0.015]	[0.006,0.015]	[0.008,0.018]	[0.001,0.015]
δ (wg)	0.011***	0.011***	0.013***	0.012***	0.010***
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
	[0.008,0.014]	[0.004,0.017]	[0.010,0.017]	[0.006,0.018]	[0.005,0.015]
N	72,162	19,782	17,593	6,621	28,166
N (old)	44,779	13,021	11,059	4,140	16,559

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Treatment year 2016. Control years 2011-2014.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 7: Employment retention (2015 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.008	0.012	0.000	-0.007	-0.026*
	(0.007)	(0.013)	(0.013)	(0.024)	(0.011)
	[-0.022,0.005]	[-0.013,0.037]	[-0.025,0.026]	[-0.054,0.039]	[-0.047,-0.005]
	±0.020	±0.036	±0.036	±0.067	±0.031
δ (old)	0.001	0.053**	-0.025	0.007	-0.015
	(0.009)	(0.019)	(0.019)	(0.027)	(0.014)
	[-0.017,0.019]	[0.016,0.091]	[-0.063,0.013]	[-0.047,0.061]	[-0.043,0.014]
	±0.025	±0.053	±0.053	±0.076	±0.039
δ (wg)	-0.007	0.013	0.000	-0.006	-0.024*
	(0.006)	(0.012)	(0.012)	(0.022)	(0.010)
	[-0.020,0.005]	[-0.011,0.036]	[-0.024,0.024]	[-0.049,0.037]	[-0.043,-0.004]
	±0.017	±0.034	±0.034	±0.062	±0.028
N	98,552	26,381	23,031	10,553	38,587
N (old)	56,984	16,170	13,332	6,309	21,173

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 8: Employment retention (2016 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.009	0.011	0.004	0.002	0.013
	(0.007)	(0.013)	(0.014)	(0.023)	(0.011)
	[-0.005,0.022]	[-0.014,0.037]	[-0.023,0.030]	[-0.043,0.047]	[-0.009,0.035]
	±0.020	±0.036	±0.039	±0.064	±0.031
δ (old)	0.028***	0.023	-0.002	0.032	0.038**
	(0.008)	(0.017)	(0.017)	(0.026)	(0.014)
	[0.011,0.044]	[-0.010,0.055]	[-0.036,0.032]	[-0.018,0.082]	[0.011,0.064]
	±0.022	±0.048	±0.048	±0.073	±0.039
δ (wg)	0.009	0.011	0.003	0.003	0.014
	(0.007)	(0.013)	(0.013)	(0.022)	(0.011)
	[-0.004,0.022]	[-0.013,0.036]	[-0.023,0.028]	[-0.040,0.046]	[-0.007,0.035]
	±0.020	±0.036	±0.036	±0.062	±0.031
N	101,998	27,944	23,785	11,197	39,072
N (old)	63,937	18,431	14,910	7,213	23,383

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Treatment year 2016. Control years 2011-2014.

[+] $p<0.10$, [*] $p<0.05$, [**] $p<0.01$, [***] $p<0.001$

Table 9: Change in conditional hours (2015 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.046	-0.175	0.081	-0.434	0.029
	(0.106)	(0.312)	(0.293)	(0.618)	(0.129)
	[-0.254,0.162]	[-0.787,0.438]	[-0.493,0.655]	[-1.645,0.778]	[-0.223,0.281]
	±0.297	±0.874	±0.820	±1.730	±0.361
δ (old)	0.013	-0.148	0.231	-0.387	0.033
	(0.362)	(1.409)	(1.309)	(1.027)	(0.525)
	[-0.697,0.723]	[-2.909,2.613]	[-2.334,2.797]	[-2.400,1.627]	[-0.996,1.062]
	±1.014	±3.945	±3.665	±2.876	±1.47
δ (wg)	-0.037	-0.163	0.089	-0.399	0.028
	(0.100)	(0.292)	(0.273)	(0.579)	(0.122)
	[-0.233,0.158]	[-0.736,0.409]	[-0.446,0.624]	[-1.534,0.735]	[-0.211,0.268]
	±0.28	±0.818	±0.764	±1.621	±0.342
N	71,056	18,888	17,608	6,350	28,210
N (old)	40,828	11,613	10,220	3,686	15,309

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, [*] $p<0.05$, [**] $p<0.01$, [***] $p<0.001$

Table 10: Change in conditional hours (2016 as treatment year)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.007	0.070	-0.244	-0.316	0.145
	(0.125)	(0.242)	(0.232)	(0.547)	(0.138)
	[-0.239,0.252]	[-0.405,0.545]	[-0.699,0.211]	[-1.388,0.757]	[-0.126,0.416]
	±0.35	±0.68	±0.65	±1.53	±0.39
δ (old)	-0.029	0.223	-0.391	-0.061	0.104
	(0.410)	(0.832)	(0.776)	(0.886)	(0.458)
	[-0.832,0.774]	[-1.407,1.853]	[-1.912,1.130]	[-1.798,1.675]	[-0.795,1.002]
	±1.15	±2.33	±2.17	±2.48	±1.28
δ (wg)	0.008	0.073	-0.238	-0.288	0.140
	(0.121)	(0.233)	(0.221)	(0.532)	(0.135)
	[-0.229,0.246]	[-0.384,0.529]	[-0.671,0.196]	[-1.331,0.755]	[-0.124,0.404]
	±0.34	±0.65	±0.62	±1.49	±0.38
N	72,921	19,884	17,929	6,654	28,454
N (old)	45,221	13,085	11,247	4,163	16,726

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

4.1.1 Placebo results

Wages

Table 11: Placebo 2012: Growth in real wages

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.002	-0.003	0.004	-0.002	0.003
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
	[-0.002,0.006]	[-0.010,0.003]	[-0.002,0.009]	[-0.008,0.003]	[-0.002,0.008]
δ (old)	0.000	-0.006	0.003	-0.007*	0.003
	(0.004)	(0.010)	(0.003)	(0.003)	(0.006)
	[-0.007,0.008]	[-0.026,0.014]	[-0.003,0.009]	[-0.013,-0.001]	[-0.008,0.014]
δ (wg)	0.002	-0.003	0.004	-0.003	0.003
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
	[-0.002,0.005]	[-0.009,0.003]	[-0.001,0.008]	[-0.007,0.002]	[-0.002,0.008]
N	56,412	14,419	14,060	4,284	23,649
N (old)	31,913	8,884	8,235	2,454	12,340

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2012. Control years 2007-2010.

$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 12: Placebo 2013: Growth in real wages

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.001	-0.001	0.003+	0.004	-0.000
	(0.002)	(0.005)	(0.002)	(0.003)	(0.003)
	[-0.003,0.005]	[-0.011,0.008]	[-0.000,0.006]	[-0.002,0.010]	[-0.006,0.005]
δ (old)	-0.002	-0.003	-0.001	-0.001	-0.003
	(0.006)	(0.016)	(0.003)	(0.005)	(0.005)
	[-0.014,0.009]	[-0.034,0.027]	[-0.006,0.004]	[-0.010,0.008]	[-0.014,0.007]
δ (wg)	0.001	-0.001	0.003+	0.003	-0.001
	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
	[-0.003,0.005]	[-0.010,0.007]	[-0.000,0.006]	[-0.002,0.009]	[-0.005,0.004]
N	61,448	16,076	15,224	5,024	25,124
N (old)	34,332	9,748	8,800	2,794	12,990

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2013. Control years 2008-2011.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 13: Placebo 2014: Growth in real wages

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.006**	0.005	0.006***	0.006*	0.005+
	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
	[0.002,0.009]	[-0.003,0.013]	[0.003,0.009]	[0.001,0.010]	[-0.000,0.010]
δ (old)	0.005	0.006	0.008**	0.007**	0.004
	(0.003)	(0.010)	(0.003)	(0.002)	(0.004)
	[-0.002,0.012]	[-0.013,0.024]	[0.002,0.013]	[0.003,0.011]	[-0.004,0.012]
δ (wg)	0.005**	0.005	0.006***	0.005*	0.005+
	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)
	[0.002,0.009]	[-0.002,0.012]	[0.003,0.009]	[0.001,0.009]	[-0.000,0.010]
N	67,070	17,851	16,421	5,776	27,022
N (old)	38,308	10,961	9,613	3,280	14,454

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2014. Control years 2009-2012.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Employment retention

Table 14: Placebo 2012: Employment retention

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.003	0.002	-0.006	-0.027	0.004
	(0.007)	(0.014)	(0.014)	(0.027)	(0.012)
	[-0.017,0.011]	[-0.026,0.030]	[-0.034,0.022]	[-0.080,0.026]	[-0.019,0.027]
δ (old)	0.013	0.012	0.016	-0.029	0.032+
	(0.010)	(0.022)	(0.023)	(0.033)	(0.016)
	[-0.007,0.034]	[-0.030,0.055]	[-0.029,0.060]	[-0.093,0.035]	[-0.001,0.064]
δ (wg)	-0.003	0.002	-0.005	-0.024	0.004
	(0.007)	(0.013)	(0.014)	(0.025)	(0.011)
	[-0.016,0.011]	[-0.024,0.028]	[-0.032,0.021]	[-0.073,0.025]	[-0.018,0.025]
N	77,850	20,301	18,475	7,142	31,932
N (old)	44,398	12,488	10,783	4,155	16,972

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2012. Control years 2007-2010.

$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 15: Placebo 2013: Employment retention

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.006	0.016	-0.010	0.006	0.012
	(0.007)	(0.014)	(0.014)	(0.026)	(0.011)
	[-0.007,0.020]	[-0.010,0.043]	[-0.037,0.017]	[-0.045,0.057]	[-0.010,0.034]
δ (old)	0.012	0.028	0.014	-0.015	0.019
	(0.010)	(0.021)	(0.021)	(0.031)	(0.016)
	[-0.008,0.031]	[-0.013,0.068]	[-0.027,0.055]	[-0.075,0.046]	[-0.012,0.050]
δ (wg)	0.006	0.016	-0.008	0.005	0.011
	(0.007)	(0.013)	(0.013)	(0.024)	(0.011)
	[-0.007,0.019]	[-0.009,0.041]	[-0.033,0.018]	[-0.042,0.052]	[-0.010,0.032]
N	84,808	22,437	20,122	8,276	33,973
N	47,715	13,581	11,578	4,731	17,825

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2013. Control years 2008-2011.

[+] p<0.10, [*] p<0.05, [**] p<0.01, [***] p<0.001

Table 16: Placebo 2014: Employment retention

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.010	0.010	0.004	0.037	0.009
	(0.007)	(0.013)	(0.013)	(0.024)	(0.011)
	[-0.004,0.023]	[-0.016,0.035]	[-0.022,0.030]	[-0.009,0.084]	[-0.013,0.030]
δ (old)	0.023*	0.039*	0.003	0.057*	0.014
	(0.009)	(0.019)	(0.020)	(0.028)	(0.015)
	[0.005,0.042]	[0.001,0.076]	[-0.036,0.042]	[0.002,0.113]	[-0.016,0.043]
δ (wg)	0.010	0.010	0.004	0.035	0.009
	(0.006)	(0.012)	(0.012)	(0.022)	(0.010)
	[-0.003,0.022]	[-0.014,0.034]	[-0.020,0.029]	[-0.008,0.078]	[-0.011,0.029]
N	93,794	25,091	21,921	9,685	37,097
N (old)	53,892	15,373	12,786	5,620	20,113

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2014. Control years 2009-2012.

[+] p<0.10, [*] p<0.05, [**] p<0.01, [***] p<0.001

Change in conditional hours

Table 17: Placebo 2012: Change in conditional hours

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.019	-0.211	0.191	0.540	-0.003
	(0.112)	(0.304)	(0.329)	(0.482)	(0.181)
	[-0.200,0.239]	[-0.807,0.386]	[-0.454,0.835]	[-0.404,1.484]	[-0.358,0.352]
δ (old)	0.103	-0.277	0.280	0.744	-0.024
	(0.390)	(1.825)	(1.571)	(0.824)	(0.734)
	[-0.661,0.866]	[-3.854,3.300]	[-2.800,3.359]	[-0.871,2.360]	[-1.462,1.414]
δ (wg)	0.022	-0.202	0.186	0.545	-0.003
	(0.106)	(0.285)	(0.306)	(0.448)	(0.171)
	[-0.186,0.229]	[-0.762,0.357]	[-0.415,0.786]	[-0.333,1.424]	[-0.339,0.333]
N	56,970	14,493	14,302	4,305	23,870
N (old)	32,217	8,927	8,367	2,470	12,453

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2012. Control years 2007-2010.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 18: Placebo 2013: Change in conditional hours

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.064	-0.016	0.030	0.219	-0.082
	(0.135)	(0.270)	(0.258)	(0.512)	(0.159)
	[-0.329,0.202]	[-0.545,0.513]	[-0.475,0.536]	[-0.784,1.221]	[-0.393,0.230]
δ (old)	-0.040	-0.273	0.384	-0.372	-0.044
	(0.442)	(1.601)	(1.268)	(1.081)	(0.700)
	[-0.906,0.827]	[-3.410,2.864]	[-2.100,2.868]	[-2.491,1.747]	[-1.415,1.327]
δ (wg)	-0.062	-0.017	0.027	0.182	-0.077
	(0.128)	(0.252)	(0.239)	(0.484)	(0.151)
	[-0.312,0.189]	[-0.512,0.477]	[-0.441,0.496]	[-0.767,1.130]	[-0.372,0.218]
N	61,448	16,076	15,224	5,024	25,124
N (old)	34,705	9,802	8,959	2,808	13,136

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2013. Control years 2008-2011.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 19: Placebo 2014: Change in conditional hours

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.098	0.173	0.016	-0.013	0.074
	(0.116)	(0.252)	(0.327)	(0.676)	(0.163)
	[-0.129,0.324]	[-0.321,0.666]	[-0.624,0.657]	[-1.338,1.311]	[-0.245,0.393]
δ (old)	0.279	0.462	0.439	-0.447	0.160
	(0.391)	(1.099)	(1.295)	(1.098)	(0.535)
	[-0.488,1.046]	[-1.693,2.617]	[-2.099,2.976]	[-2.598,1.705]	[-0.888,1.208]
δ (wg)	0.094	0.170	0.019	-0.042	0.072
	(0.109)	(0.236)	(0.304)	(0.636)	(0.154)
	[-0.118,0.307]	[-0.293,0.632]	[-0.578,0.615]	[-1.289,1.205]	[-0.229,0.373]
N	67,791	17,946	16,744	5,809	27,292
N (old)	38,694	11,019	9,782	3,307	14,586

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2014. Control years 2009-2012.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

4.2 Occupation, Industry and Region subgroup results

The results presented above in Tables 5 to 10 average across all industries, occupations and regions, however it is possible that the NLW has had a detrimental effect on retention or hours worked in specific occupations or industries such as social care that have a high proportion of low paid workers. There are also regions of the country where the bite of the NLW is likely to be much higher than in say, London. To explore these potential effects further we therefore estimate our models separately for most of the low-paying occupations and industries identified by the LPC (Low Pay Commission, 2017), and for some regions.[9] Industry definitions of low paid jobs will capture many workers, such as managers and supervisors, who will not necessarily be low paid while occupational definitions can be more focused on specific low-paid jobs, we consider both definitions.

We also estimate placebo tests similar to those we estimate for the main results. We use 2012, 2013, and 2014 as alternative 'treatment' years. While we do not report the results of these tests (available on request), we do not generally find any significant effects in the occupation and region results. However, we do find some evidence of small (approximately 1-1.5%) wage growth in the social care sector placebos for part-time and full-time women; these results should therefore be treated with more caution.

The results for occupations are presented in the tables in Appendix C.1, those for industries in Appendix C.2, and those for regions in Appendix C.3.

4.2.1 Low-paying occupations

Across the low paying occupations considered - childcare, food processing, non-food processing, storage, transport, social care, cleaning, retail and hospitality - we generally find consistent wage growth across specifications and demographic groups following the NLW introduction. We find no evidence of an effect on wages of the uprating of the NLW in April 2017 (except for in social care), and therefore do not report results for this change in the NLW. Overall, there is no evidence of any negative employment retention in these generally low paid occupations.

For childcare we examine only part-time women, and do not find any significant effect of the NLW introduction on retention or hours (Table 65).

For food processing, non-food processing, storage, and transport we only consider full-time men. In food

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[9]We are unable to estimate models for some of the low-paying occupations and industries identified by the LPC because of small sample sizes. We also cannot estimate models for all regions because of the small sample sizes of some demographic groups. The tables in Appendix B show the sample sizes for low-paying occupations, low-paying industries and regions.

processing occupations (Table 66), non-food processing occupations (Table 67), transport (Table 69) or storage (Table 68), we do not find any evidence of a statistically significant effect on retention or hours worked.

For social care occupations we examine part-time and full-time women only, and do not find any statistically significant negative effects on employment retention or hours worked for either group (Table 70).

We do not find any statistically significant effects on employment retention or hours for either full-time women, part-time women, full-time men or part-time men in cleaning occupations (Tables 73 - 74), with the exception of a reduction in hours for full-time men, however, this finding is at odds with the fact that we do not find any wage growth for full-time men.

In retail occupations, as shown in Table 76, we find a positive effect on employment retention for full-time men (but this is also present in placebos), and a negative effect for part-time women, but we only find this effect using our specification where the treatment group are those workers at or very close to the initial minimum wage. For part-time women the estimated reduction in employment retention is 6.3pp (significant at 5%). There is also some evidence of a reduction in hours worked for full-time women of just under 2.5 hours per week (Table 77, significant at 5%), but this is only found for the group of full-time women who were being paid closest to the old minimum wage rate.

In hospitality occupations we only find consistent effects on wage growth across our three specifications for part-time women, and in the 'old' specification, for full-time men (Table 78). We do not find any significant effect on employment retention for either group (Table 79). Table 80 shows that we find some evidence of a reduction in hours worked for full-time men of approximately 3 hours per week, but this is only weakly significant at the 10% level, and only for a small sample of full-time men earning close to the old minimum wage rate.

4.2.2   Low-paying industries

In Appendix C.2 we explore the effects of the introduction of the NLW on various industries with a high proportion of low-paid workers: cleaning, food processing, social care, retail, and hospitality. Because of small sample sizes we do not examine all demographic groups in each of these industries. We find generally consistent wage growth across these industries for the demographic groups that we focus on for the 2015 treatment year. With some exceptions, we generally find no effects on wage growth from the uprating of the NLW in April 2017. We only present results for this uprating for those industries in

which we find wage effects.

In the cleaning and food processing industries we consider only part-time women, and full-time men, respectively, and we do not find any significant effects on employment retention or hours worked (Tables 81 and 83).

In the social care industry we examine full-time and part-time women (Table 85) and do not find any evidence of a statistically significant effect on either retention or hours for either the introduction of the NLW in April 2016 or the uprating in April 2017.

In the retail industry we consider all four of our demographic groups. Table 88 shows that when we restrict attention to those most affected by the introduction of the NLW (those paid at the old minimum wage and up to 0.5% above it), we find evidence of a negative effect on employment retention for part-time women of 9.3pp (significant at 1%). From the baseline and weighted specifications we find a much smaller reduction in employment retention of approximately 3.8-3.9pp. We do not find any negative effects of the April 2017 uprating. We do not find any effects on hours worked for any group (Table 89).

In the hospitality industry we also consider all four demographic groups, and do not find any negative effects on employment retention (Table 92). For full-time men there is some evidence of a reduction in hours worked in the hospitality industry of approximately 1 hour, 45 minutes per week, following the introduction of the NLW (Table 94), however this is only from the 'old' specification, and is apparently unwound following the April 2017 uprating, where we find increases of a similar magnitude, across all three specifications (Table 95).

4.2.3 Regions

Finally, we consider the impact of the introduction of the NLW on individual regions of the UK. In London we examine all four demographic groups. In the East, East Midlands, North West, Scotland, the South East, the South West, West Midlands, Yorkshire and the Humber, we consider full-time men, full-time women, and part-time women only. In the North East we consider part-time women only, and in Wales we consider only full-time men and part-time women.[10] These results, for wages, employment retention and hours worked, are presented in Appendix C.3. We find consistent wage effects across all regions from the introduction of the NLW.

We do not find any evidence of statistically significant negative effects on employment retention from the introduction of the NLW for any of the demographic groups in the regions we examine, with the exception

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[10]Sample sizes for all demographics are too small in Northern Ireland.

of part-time women in the North East. For this group we find a reduction in employment retention rates of between 9.4-10.7pp (Table 117; significant at 5%), although this is not statistically significant for the very lowest paid.

With respect to hours worked, we find no evidence of statistically significant negative effects from the introduction of the NLW in any region, with the exception of London and the East Midlands. For London, we find evidence from all three specifications of a reduction of between 1.5 hours and just over 2 hours (Table 98; significant at the 0.1% level). For the East Midlands there is some evidence of a reduction in hours worked for full-time women of just over 2 hours, but we only find this using the 'old' estimator that narrows the treatment group to those earning closest to the old minimum wage rate. For Wales there is evidence of a reduction of about 1 hour per week from the weighted specification (significant at 10%) (Table 115). Following the April 2017 uprating we find evidence of a reduction in hours worked for full-time women of approximately 40 minutes in the North West (Table 104, significant at 10%, baseline and weighted specifications only).

4.3 Comparisons to younger employees

We also consider alternative identification approaches, where we exploit the fact that the NLW does not apply to workers younger than 25. In the first of these approaches we estimate the standard difference-in-differences model from previous sections, comparing the change in outcomes for the treatment group to those for a control group during a period that spans the introduction of the NLW and benchmarking this on differences between the treatment and control groups in past years. We define the treatment group as employees aged 24-30 years paid less than the incoming NLW. This group should receive a wage increase due to the introduction of the NLW. The control group includes employees aged 22-23 years paid less than the incoming NLW. The NLW does not apply to this age group. We exclude individuals aged 21 years from the control group because of significant changes in the NMW for this age group during the benchmarking period (in 2010).

In a second approach we also contrast changes in outcomes between employees aged 24-30 years paid less than the incoming NLW and those for younger employees paid less than the incoming NLW during a period that spans the introduction of the NLW. However, rather than benchmarking on the usual difference in outcomes between these groups from past years, we benchmark on the difference in outcomes between higher paid workers aged 24-30 and higher paid younger workers at the same point in time. Higher pay is defined as workers paid at or up to 10 per cent above the incoming NLW. In this second approach we include 21 year olds in the control group, because we do not rely on earlier time periods for netting off the usual difference in outcomes between the treated and the controls.

4.3.1 Age 24-30 compared to Age 22-23 paid less than the incoming NLW, benchmarking on past years

The results of identifying the effects of the NLW off age and time differences for low paid employees are reported in Tables 20 to 25. We report the coefficient on the age 24-30 indicator (the age group that is directly affected by the introduction of the NLW), year effects, and δ is the estimated treatment effect of the NMW/NLW change. As shown in Table 20, this model suggests that the introduction of the NLW led to an increase in real wage growth of 2-3 percentage points for the treatment group. This is much smaller than that estimated using the standard approach in previous sections and reported in Table 5. Looking at the year effects reported in Table 20, we see a positive and statistically significant effect on wage growth at the time of the introduction of the NLW, which is not replicated in earlier years. This suggests that both younger and older workers paid less than the incoming NLW received a significant boost to real wages with the introduction of the NLW. This implies that young workers, for whom the

NLW does not apply, do not obviously provide a good comparison group for identifying the labour market effects of the increase in wages from the introduction of the NLW for low paid workers age 25 and above. This is because it appears that employers have also increased wages for young workers at the time of the introduction of the NLW. Tables 22 to 25 show the results for employment retention and changes in conditional hours worked using this model. Perhaps unsurprisingly, given the relatively small differential in wage growth between age groups, we find no significant effects of the introduction of the NLW or the uprating in April 2017 on either outcome. We find qualitatively similar results when we focus on employees aged 25-26 rather than employees aged 24-30.

We report the results of imaginary changes in the wage floor (placebo tests) in Tables 26 to 34. In many cases these suggest the identification approach is valid in the sense that we find no effects of imaginary policy changes. However, we find negative effects on wage growth for women working full-time in 2012 and 2013, on employment retention for men working part-time in 2012, and on hours growth for women working part-time in 2012 and men working full-time in 2013. Thus, the common trend assumption implicit in this model does not appear to be valid in all instances.

Table 20: Real wage growth (2015 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.001	-0.005	0.001	-0.001	0.001
	(0.019)	(0.005)	(0.010)	(0.020)	(0.029)
	[-0.039,0.037]	[-0.015,0.006]	[-0.018,0.021]	[-0.042,0.039]	[-0.058,0.060]
δ	0.023**	0.019***	0.023**	0.027**	0.030*
	(0.008)	(0.005)	(0.007)	(0.010)	(0.012)
	[0.007,0.040]	[0.008,0.030]	[0.009,0.036]	[0.007,0.046]	[0.005,0.055]
year_2011	-0.018+	-0.003	0.016	0.417***	-0.010
	(0.010)	(0.022)	(0.026)	(0.048)	(0.018)
	[-0.038,0.002]	[-0.047,0.042]	[-0.037,0.068]	[0.320,0.514]	[-0.047,0.027]
year_2012	-0.018+	-0.005	0.018	0.418***	-0.011
	(0.010)	(0.022)	(0.026)	(0.048)	(0.018)
	[-0.039,0.002]	[-0.050,0.040]	[-0.035,0.070]	[0.322,0.514]	[-0.048,0.026]
year_2013	-0.004	0.012	0.027	0.436***	0.003
	(0.010)	(0.022)	(0.026)	(0.048)	(0.018)
	[-0.024,0.016]	[-0.033,0.057]	[-0.026,0.080]	[0.340,0.532]	[-0.034,0.040]
year_2015	0.041***	0.062**	0.074**	0.478***	0.042*
	(0.010)	(0.023)	(0.027)	(0.048)	(0.019)
	[0.021,0.062]	[0.016,0.107]	[0.021,0.127]	[0.382,0.575]	[0.004,0.079]
N	14607	4374	3465	2411	4356

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 21: Real wage growth (2016 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.001	-0.002	0.004	-0.004	0.002
	(0.013)	(0.005)	(0.009)	(0.011)	(0.019)
	[-0.025,0.028]	[-0.012,0.008]	[-0.014,0.022]	[-0.025,0.018]	[-0.037,0.042]
δ	0.002	-0.008	0.004	0.003	0.006
	(0.007)	(0.007)	(0.008)	(0.007)	(0.009)
	[-0.012,0.015]	[-0.022,0.005]	[-0.012,0.020]	[-0.010,0.017]	[-0.013,0.025]
year_2012	0.000	-0.002	0.002	0.003	-0.001
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
	[-0.002,0.003]	[-0.008,0.004]	[-0.005,0.009]	[-0.002,0.008]	[-0.004,0.002]
year_2013	0.014***	0.015***	0.013***	0.019***	0.013***
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
	[0.012,0.017]	[0.009,0.021]	[0.006,0.019]	[0.015,0.024]	[0.009,0.016]
year_2014	0.040***	0.042***	0.038***	0.038***	0.039***
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
	[0.037,0.042]	[0.036,0.048]	[0.031,0.044]	[0.034,0.043]	[0.036,0.042]
year_2016	0.026***	0.037***	0.028***	0.020***	0.019***
	(0.003)	(0.006)	(0.007)	(0.004)	(0.004)
	[0.020,0.033]	[0.024,0.049]	[0.014,0.042]	[0.011,0.029]	[0.010,0.028]
N	14223	4291	3341	2358	4233

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 22: Employment retention (2015 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.017	-0.014	-0.049	0.005	-0.004
	(0.016)	(0.030)	(0.033)	(0.037)	(0.030)
	[-0.048,0.015]	[-0.072,0.044]	[-0.113,0.015]	[-0.068,0.077]	[-0.063,0.055]
δ	0.007	0.040	0.020	-0.029	-0.003
	(0.015)	(0.030)	(0.032)	(0.035)	(0.028)
	[-0.023,0.037]	[-0.018,0.099]	[-0.042,0.082]	[-0.098,0.040]	[-0.058,0.052]
year_2011	0.089	0.359	0.026	-0.068	-0.144
	(0.066)	(0.338)	(0.334)	(0.171)	(0.162)
	[-0.039,0.218]	[-0.304,1.022]	[-0.629,0.681]	[-0.403,0.267]	[-0.462,0.174]
year_2012	0.103	0.381	0.042	-0.086	-0.125
	(0.066)	(0.338)	(0.334)	(0.171)	(0.162)
	[-0.026,0.232]	[-0.282,1.044]	[-0.613,0.697]	[-0.421,0.250]	[-0.443,0.193]
year_2013	0.118+	0.371	0.050	-0.021	-0.116
	(0.066)	(0.338)	(0.334)	(0.171)	(0.162)
	[-0.011,0.247]	[-0.293,1.034]	[-0.605,0.705]	[-0.357,0.314]	[-0.434,0.202]
year_2015	0.086	0.313	0.034	-0.040	-0.141
	(0.067)	(0.339)	(0.335)	(0.173)	(0.163)
	[-0.044,0.217]	[-0.351,0.978]	[-0.623,0.690]	[-0.379,0.298]	[-0.461,0.179]
N	23916	6808	5329	4395	7384

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 23: Employment retention (2016 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.004	0.010	0.029	-0.034	0.010
	(0.016)	(0.030)	(0.033)	(0.037)	(0.031)
	[-0.027,0.036]	[-0.048,0.069]	[-0.036,0.094]	[-0.107,0.038]	[-0.050,0.070]
δ	0.005	0.019	0.039	-0.006	-0.016
	(0.021)	(0.039)	(0.043)	(0.049)	(0.040)
	[-0.037,0.046]	[-0.059,0.096]	[-0.045,0.123]	[-0.101,0.089]	[-0.094,0.062]
year_2012	0.013	0.018	0.018	-0.016	0.021
	(0.010)	(0.018)	(0.020)	(0.023)	(0.018)
	[-0.006,0.032]	[-0.017,0.053]	[-0.022,0.057]	[-0.061,0.029]	[-0.014,0.056]
year_2013	0.028**	0.008	0.023	0.048*	0.031+
	(0.010)	(0.018)	(0.020)	(0.023)	(0.018)
	[0.010,0.047]	[-0.026,0.043]	[-0.016,0.061]	[0.003,0.092]	[-0.003,0.066]
year_2014	0.000	-0.031+	0.013	-0.001	0.022
	(0.009)	(0.017)	(0.020)	(0.022)	(0.017)
	[-0.018,0.018]	[-0.065,0.003]	[-0.025,0.052]	[-0.044,0.041]	[-0.011,0.056]
year_2016	0.003	-0.022	-0.034	0.017	0.031
	(0.019)	(0.037)	(0.040)	(0.044)	(0.037)
	[-0.035,0.041]	[-0.094,0.049]	[-0.112,0.043]	[-0.069,0.102]	[-0.041,0.104]
N	23472	6756	5222	4336	7158

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 24: Change in conditional hours (2015 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.676	0.286	0.115	0.540	1.935
	(1.262)	(0.436)	(0.781)	(1.135)	(1.705)
	[-1.854,3.206]	[-0.587,1.159]	[-1.451,1.680]	[-1.737,2.817]	[-1.485,5.354]
δ	-0.324	-0.403	-0.733	0.528	0.505
	(0.587)	(0.453)	(0.542)	(1.079)	(0.891)
	[-1.500,0.852]	[-1.311,0.505]	[-1.820,0.354]	[-1.638,2.694]	[-1.281,2.292]
year_2011	0.025	-0.977	-0.631	1.283	2.097
	(4.029)	(1.846)	(2.181)	(6.186)	(4.724)
	[-8.050,8.100]	[-4.678,2.724]	[-5.005,3.742]	[-11.130,13.696]	[-7.378,11.573]
year_2012	-0.062	-0.879	-0.319	0.019	2.194
	(4.026)	(1.847)	(2.180)	(6.202)	(4.724)
	[-8.130,8.006]	[-4.583,2.825]	[-4.690,4.052]	[-12.426,12.463]	[-7.281,11.669]
year_2013	-0.118	-0.615	-0.683	0.685	1.520
	(4.026)	(1.849)	(2.179)	(6.189)	(4.722)
	[-8.186,7.950]	[-4.322,3.093]	[-5.052,3.685]	[-11.733,13.103]	[-7.951,10.990]
year_2015	-0.125	-0.744	-0.658	0.367	1.318
	(4.031)	(1.872)	(2.207)	(6.220)	(4.740)
	[-8.204,7.954]	[-4.497,3.010]	[-5.082,3.766]	[-12.115,12.848]	[-8.188,10.824]
N	14909	4386	3620	2422	4481

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 25: Change in conditional hours (2016 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.109	0.104	0.632	-1.105	0.387
	(1.801)	(0.444)	(0.954)	(1.148)	(2.382)
	[-3.515,3.733]	[-0.790,0.997]	[-1.288,2.553]	[-3.419,1.208]	[-4.407,5.181]
δ	-0.379	-0.248	-0.264	-1.050	0.367
	(0.909)	(0.600)	(0.773)	(1.503)	(1.350)
	[-2.207,1.449]	[-1.455,0.960]	[-1.821,1.293]	[-4.079,1.979]	[-2.349,3.084]
year_2012	-0.088	0.120	0.274	-1.247	0.207
	(0.185)	(0.263)	(0.304)	(0.744)	(0.398)
	[-0.459,0.283]	[-0.409,0.649]	[-0.338,0.886]	[-2.747,0.253]	[-0.595,1.008]
year_2013	-0.143	0.381	-0.106	-0.639	-0.463
	(0.183)	(0.263)	(0.295)	(0.705)	(0.389)
	[-0.510,0.225]	[-0.149,0.910]	[-0.699,0.487]	[-2.060,0.781]	[-1.247,0.321]
year_2014	0.394*	0.127	0.233	0.667	0.918*
	(0.178)	(0.265)	(0.296)	(0.692)	(0.389)
	[0.036,0.752]	[-0.406,0.659]	[-0.364,0.829]	[-0.727,2.062]	[0.135,1.701]
year_2016	0.166	0.546	-0.000	-0.203	-0.462
	(0.455)	(0.557)	(0.637)	(1.346)	(0.904)
	[-0.750,1.083]	[-0.575,1.666]	[-1.282,1.281]	[-2.916,2.509]	[-2.282,1.357]
N	14509	4304	3488	2367	4350

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 26: Placebo: Real wage growth (2012 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.001	-0.001	0.011	0.007	-0.001
	(0.015)	(0.006)	(0.007)	(0.009)	(0.030)
	[-0.029,0.031]	[-0.014,0.012]	[-0.003,0.025]	[-0.010,0.024]	[-0.061,0.058]
δ	-0.000	-0.000	-0.013*	0.002	0.002
	(0.007)	(0.006)	(0.006)	(0.006)	(0.013)
	[-0.013,0.013]	[-0.012,0.011]	[-0.026,-0.000]	[-0.009,0.013]	[-0.023,0.028]
year_2008	0.011***	0.003	0.006	0.021***	0.015***
	(0.002)	(0.004)	(0.005)	(0.004)	(0.003)
	[0.007,0.015]	[-0.006,0.012]	[-0.003,0.016]	[0.014,0.029]	[0.010,0.020]
year_2009	-0.024***	-0.033***	-0.028***	-0.013***	-0.020***
	(0.002)	(0.004)	(0.005)	(0.004)	(0.002)
	[-0.028,-0.021]	[-0.041,-0.024]	[-0.037,-0.019]	[-0.020,-0.006]	[-0.025,-0.015]
year_2010	-0.029***	-0.039***	-0.033***	-0.018***	-0.025***
	(0.002)	(0.004)	(0.005)	(0.003)	(0.003)
	[-0.032,-0.025]	[-0.047,-0.030]	[-0.042,-0.024]	[-0.025,-0.011]	[-0.030,-0.020]
year_2012	0.306***	-0.077*	0.033	0.384***	-0.023
	(0.017)	(0.036)	(0.026)	(0.036)	(0.018)
	[0.271,0.341]	[-0.148,-0.005]	[-0.019,0.086]	[0.312,0.457]	[-0.059,0.014]
N	10181	3117	2483	1550	3030

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2012. Control years 2007-2010.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 27: Placebo: Real wage growth (2013 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.000	-0.005	0.011+	0.002	-0.001
	(0.011)	(0.005)	(0.006)	(0.018)	(0.018)
	[-0.023,0.022]	[-0.016,0.006]	[-0.001,0.023]	[-0.033,0.038]	[-0.036,0.034]
δ	-0.003	-0.005	-0.009+	-0.003	0.001
	(0.005)	(0.005)	(0.006)	(0.008)	(0.008)
	[-0.013,0.007]	[-0.015,0.005]	[-0.020,0.002]	[-0.020,0.014]	[-0.014,0.016]
year_2009	-0.035***	-0.035***	-0.032***	-0.035***	-0.034***
	(0.002)	(0.004)	(0.004)	(0.003)	(0.002)
	[-0.038,-0.032]	[-0.043,-0.027]	[-0.040,-0.024]	[-0.042,-0.028]	[-0.039,-0.030]
year_2010	-0.040***	-0.040***	-0.038***	-0.039***	-0.039***
	(0.002)	(0.004)	(0.004)	(0.003)	(0.002)
	[-0.043,-0.037]	[-0.048,-0.033]	[-0.046,-0.030]	[-0.046,-0.033]	[-0.044,-0.035]
year_2011	-0.026+	-0.051**	-0.041*	-0.020	0.010
	(0.014)	(0.016)	(0.020)	(0.016)	(0.025)
	[-0.053,0.002]	[-0.084,-0.018]	[-0.081,-0.001]	[-0.053,0.012]	[-0.039,0.059]
year_2013	-0.010	-0.032+	-0.023	-0.001	0.021
	(0.014)	(0.017)	(0.020)	(0.016)	(0.025)
	[-0.038,0.018]	[-0.066,0.002]	[-0.063,0.017]	[-0.033,0.032]	[-0.028,0.071]
N	11948	3588	2898	1952	3510

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2013. Control years 2008-2011.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 28: Placebo: Real wage growth (2014 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.000	-0.003	-0.001	0.003	-0.000
	(0.013)	(0.005)	(0.005)	(0.010)	(0.021)
	[-0.026,0.025]	[-0.013,0.007]	[-0.012,0.010]	[-0.018,0.024]	[-0.042,0.041]
δ	0.002	0.003	0.003	0.001	-0.001
	(0.006)	(0.005)	(0.005)	(0.006)	(0.009)
	[-0.009,0.013]	[-0.007,0.013]	[-0.008,0.013]	[-0.011,0.012]	[-0.018,0.017]
year_2010	-0.005**	-0.005	-0.005	-0.005+	-0.005*
	(0.001)	(0.003)	(0.004)	(0.003)	(0.002)
	[-0.008,-0.002]	[-0.012,0.001]	[-0.012,0.003]	[-0.010,0.001]	[-0.009,-0.001]
year_2011	0.006	-0.027+	-0.055	0.390***	-0.540***
	(0.007)	(0.016)	(0.038)	(0.028)	(0.024)
	[-0.008,0.020]	[-0.058,0.004]	[-0.132,0.021]	[0.334,0.446]	[-0.588,-0.493]
year_2012	0.006	-0.027+	-0.053	0.393***	-0.542***
	(0.007)	(0.016)	(0.038)	(0.028)	(0.024)
	[-0.008,0.020]	[-0.059,0.004]	[-0.130,0.023]	[0.336,0.449]	[-0.589,-0.494]
year_2014	0.045***	0.014	-0.021	0.427***	-0.501***
	(0.007)	(0.016)	(0.038)	(0.028)	(0.024)
	[0.031,0.059]	[-0.018,0.046]	[-0.097,0.056]	[0.371,0.483]	[-0.549,-0.453]
N	13370	4045	3137	2181	4007

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2014. Control years 2009-2012.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 29: Placebo: Employment retention (2012 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.013	0.009	0.011	0.068	-0.012
	(0.019)	(0.036)	(0.038)	(0.046)	(0.036)
	[-0.024,0.051]	[-0.061,0.078]	[-0.063,0.085]	[-0.023,0.159]	[-0.083,0.059]
δ	-0.018	-0.036	-0.011	-0.078+	0.027
	(0.017)	(0.033)	(0.035)	(0.042)	(0.032)
	[-0.052,0.016]	[-0.101,0.030]	[-0.080,0.058]	[-0.160,0.004]	[-0.037,0.090]
year_2008	0.017	0.018	0.030	0.029	-0.008
	(0.013)	(0.024)	(0.027)	(0.035)	(0.024)
	[-0.009,0.043]	[-0.029,0.066]	[-0.022,0.082]	[-0.038,0.097]	[-0.055,0.040]
year_2009	0.022+	0.031	0.018	0.028	0.016
	(0.013)	(0.023)	(0.025)	(0.033)	(0.023)
	[-0.003,0.047]	[-0.014,0.076]	[-0.031,0.068]	[-0.037,0.093]	[-0.029,0.061]
year_2010	0.048***	0.055*	0.057*	0.042	0.044+
	(0.013)	(0.023)	(0.025)	(0.032)	(0.023)
	[0.023,0.072]	[0.010,0.100]	[0.007,0.106]	[-0.021,0.106]	[-0.000,0.088]
year_2012	0.239+	0.101	0.189	0.747*	0.308+
	(0.128)	(0.117)	(0.257)	(0.343)	(0.185)
	[-0.011,0.490]	[-0.129,0.331]	[-0.316,0.694]	[0.075,1.419]	[-0.056,0.671]
N	16784	4913	3805	2892	5174

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2012. Control years 2007-2010.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 30: Placebo: Employment retention (2013 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.008	-0.004	0.018	0.020	0.009
	(0.018)	(0.033)	(0.035)	(0.042)	(0.033)
	[-0.026,0.043]	[-0.068,0.061]	[-0.051,0.087]	[-0.061,0.102]	[-0.057,0.074]
δ	0.002	0.041	-0.049	-0.007	0.005
	(0.016)	(0.031)	(0.033)	(0.038)	(0.031)
	[-0.030,0.034]	[-0.021,0.103]	[-0.114,0.016]	[-0.082,0.068]	[-0.056,0.065]
year_2009	0.004	0.013	-0.012	-0.008	0.023
	(0.012)	(0.022)	(0.024)	(0.031)	(0.023)
	[-0.020,0.028]	[-0.031,0.057]	[-0.060,0.036]	[-0.068,0.052]	[-0.022,0.067]
year_2010	0.032**	0.035	0.033	0.009	0.049*
	(0.012)	(0.022)	(0.025)	(0.029)	(0.022)
	[0.008,0.055]	[-0.009,0.079]	[-0.015,0.082]	[-0.048,0.067]	[0.005,0.092]
year_2011	0.033	0.189*	0.048	0.106	0.071
	(0.059)	(0.093)	(0.190)	(0.273)	(0.243)
	[-0.082,0.148]	[0.007,0.371]	[-0.324,0.420]	[-0.429,0.641]	[-0.404,0.547]
year_2013	0.060	0.170+	0.107	0.155	0.098
	(0.060)	(0.096)	(0.191)	(0.275)	(0.244)
	[-0.058,0.178]	[-0.018,0.358]	[-0.267,0.481]	[-0.385,0.694]	[-0.380,0.576]
N	19532	5622	4442	3516	5952

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2013. Control years 2008-2011.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 31: Placebo: Employment retention (2014 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.003	-0.018	0.016	-0.017	-0.002
	(0.017)	(0.031)	(0.034)	(0.039)	(0.031)
	[-0.036,0.030]	[-0.079,0.043]	[-0.050,0.083]	[-0.093,0.060]	[-0.064,0.059]
δ	0.010	0.044	-0.025	0.042	-0.013
	(0.016)	(0.031)	(0.033)	(0.036)	(0.029)
	[-0.021,0.041]	[-0.017,0.105]	[-0.089,0.039]	[-0.028,0.112]	[-0.069,0.043]
year_2010	0.026*	0.022	0.043+	0.012	0.025
	(0.011)	(0.021)	(0.023)	(0.028)	(0.021)
	[0.004,0.048]	[-0.019,0.064]	[-0.002,0.089]	[-0.043,0.067]	[-0.015,0.065]
year_2011	0.081	0.037	0.170	-0.034	0.308
	(0.053)	(0.194)	(0.212)	(0.143)	(0.229)
	[-0.021,0.184]	[-0.342,0.417]	[-0.247,0.586]	[-0.314,0.246]	[-0.141,0.756]
year_2012	0.095+	0.055	0.186	-0.051	0.329
	(0.053)	(0.194)	(0.213)	(0.144)	(0.229)
	[-0.009,0.198]	[-0.325,0.434]	[-0.230,0.603]	[-0.333,0.230]	[-0.120,0.777]
year_2014	0.075	-0.026	0.202	-0.061	0.338
	(0.054)	(0.195)	(0.214)	(0.145)	(0.230)
	[-0.030,0.180]	[-0.409,0.356]	[-0.217,0.621]	[-0.345,0.223]	[-0.112,0.788]
N	22066	6355	4860	4078	6773

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2014. Control years 2009-2012.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 32: Placebo: Change in conditional hours (2012 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.154	-0.042	0.118	1.206	-0.159
	(1.445)	(0.806)	(0.691)	(1.522)	(1.836)
	[-2.742,3.050]	[-1.658,1.575]	[-1.267,1.504]	[-1.847,4.259]	[-3.842,3.523]
δ	-0.301	-0.234	-0.395	-0.623	-2.188*
	(0.673)	(0.529)	(0.533)	(1.393)	(0.970)
	[-1.649,1.047]	[-1.296,0.827]	[-1.465,0.674]	[-3.417,2.170]	[-4.134,-0.243]
year_2008	-0.645**	-0.441	-1.075**	0.237	-0.766
	(0.236)	(0.347)	(0.381)	(1.144)	(0.516)
	[-1.118,-0.172]	[-1.137,0.255]	[-1.838,-0.311]	[-2.058,2.531]	[-1.801,0.269]
year_2009	-0.356	-0.076	-0.379	-2.852*	-0.918+
	(0.225)	(0.329)	(0.363)	(1.103)	(0.485)
	[-0.807,0.094]	[-0.735,0.583]	[-1.107,0.349]	[-5.065,-0.640]	[-1.892,0.056]
year_2010	-0.177	0.234	-0.567	-0.605	-0.904+
	(0.219)	(0.321)	(0.358)	(1.071)	(0.475)
	[-0.615,0.262]	[-0.411,0.878]	[-1.284,0.150]	[-2.753,1.542]	[-1.857,0.049]
year_2012	2.096	0.102	4.504	14.573	13.840*
	(1.262)	(2.781)	(3.911)	(11.103)	(6.471)
	[-0.433,4.624]	[-5.473,5.677]	[-3.337,12.345]	[-7.697,36.843]	[0.862,26.819]
N	10385	3123	2585	1561	3116

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2012. Control years 2007-2010.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 33: Placebo: Change in conditional hours (2013 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.248	0.133	0.003	1.277	0.729
	(1.175)	(0.472)	(0.529)	(1.304)	(1.860)
	[-2.108,2.603]	[-0.812,1.079]	[-1.058,1.064]	[-1.341,3.894]	[-3.000,4.458]
δ	-0.490	-0.882+	-0.327	0.502	-0.372
	(0.556)	(0.448)	(0.493)	(1.180)	(0.934)
	[-1.604,0.625]	[-1.780,0.016]	[-1.316,0.662]	[-1.865,2.870]	[-2.244,1.500]
year_2009	0.280	0.430	0.691+	-3.327**	-0.139
	(0.219)	(0.328)	(0.367)	(0.968)	(0.456)
	[-0.158,0.719]	[-0.228,1.088]	[-0.045,1.426]	[-5.268,-1.385]	[-1.055,0.776]
year_2010	0.486*	0.699*	0.516	-1.071	-0.025
	(0.213)	(0.322)	(0.362)	(0.929)	(0.443)
	[0.059,0.912]	[0.054,1.344]	[-0.210,1.242]	[-2.934,0.793]	[-0.913,0.863]
year_2011	0.220	-1.455	0.164	-3.222	-7.968**
	(1.923)	(1.416)	(1.794)	(10.617)	(2.479)
	[-3.634,4.073]	[-4.294,1.383]	[-3.432,3.760]	[-24.527,18.083]	[-12.939,-2.998]
year_2013	0.424	-0.455	0.383	-4.106	-8.316**
	(1.934)	(1.457)	(1.824)	(10.674)	(2.531)
	[-3.451,4.299]	[-3.377,2.467]	[-3.273,4.040]	[-25.524,17.313]	[-13.391,-3.241]
N	12194	3602	3012	1964	3616

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2013. Control years 2008-2011.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 34: Placebo: Change in conditional hours (2014 as treatment year), Age 22-23 controls

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.094	0.133	0.848	0.039	-0.869
	(1.359)	(0.477)	(0.862)	(1.228)	(1.734)
	[-2.629,2.816]	[-0.824,1.089]	[-0.880,2.576]	[-2.425,2.504]	[-4.345,2.606]
δ	-0.619	-0.183	-0.385	-1.107	-0.695
	(0.624)	(0.455)	(0.562)	(1.136)	(0.872)
	[-1.869,0.631]	[-1.095,0.729]	[-1.511,0.740]	[-3.387,1.173]	[-2.443,1.053]
year_2010	0.191	0.255	-0.215	2.244*	0.123
	(0.200)	(0.297)	(0.334)	(0.881)	(0.420)
	[-0.211,0.592]	[-0.340,0.851]	[-0.885,0.454]	[0.477,4.011]	[-0.719,0.966]
year_2011	-0.613	0.027	-0.215	2.094	-0.001
	(0.988)	(1.373)	(3.520)	(5.753)	(2.708)
	[-2.593,1.367]	[-2.726,2.781]	[-7.273,6.843]	[-9.451,13.639]	[-5.430,5.428]
year_2012	-0.688	0.154	0.102	0.963	0.028
	(0.991)	(1.377)	(3.519)	(5.776)	(2.710)
	[-2.673,1.298]	[-2.607,2.914]	[-6.953,7.156]	[-10.627,12.552]	[-5.404,5.461]
year_2014	0.203	0.301	0.268	3.614	1.311
	(1.008)	(1.413)	(3.537)	(5.802)	(2.749)
	[-1.817,2.224]	[-2.533,3.134]	[-6.824,7.359]	[-8.028,15.255]	[-4.200,6.822]
N	13639	4052	3282	2192	4113

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group age 22-23 paid less than the incoming NLW. Treatment year 2014. Control years 2009-2012.

$^+$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

4.3.2 Age 24-30 compared to Age 21-23 paid less than the incoming NLW, benchmarking on higher paid employees

The results of identifying the effects of the NLW off age and the pay distribution are reported in Tables 35 to 40. We report the coefficient on the age 24-30 indicator (the age group that is directly affected by the introduction of the NLW), being low paid (i.e. paid less than the incoming NLW), and δ is the estimated treatment effect of the NMW/NLW change. As shown in Table 35, this model suggests that the introduction of the NLW led to an increase in real wage growth of 1-1.7 percentage points for the treatment group. This effect is statistically different from zero only when estimated on All groups simultaneously and when estimated for women working full-time. The coefficient on being low paid suggests that at the time of the introduction of the NLW, wage growth increased by 3-5 percentage points more for those paid less than the incoming NLW than those already paid the NLW rate, or up to 10 per cent above it, regardless of age. These results are consistent with the idea that employers may have increased wages for low paid younger workers in response to the introduction of the NLW for workers age 25 and above, corroborating the findings using age and time to identify the effects of the introduction of the NLW, reported in Table 20. Thus, the model is not suitable for identifying the effects on other outcomes of the increase in wages for low paid workers age 25 and above. We report these results nonetheless and, as expected based on the wage results from this model, find no effects of the introduction of the NLW on employment retention and hours.

We report the results of imaginary changes in the wage floor (placebo tests) in Tables 41 to 49. These generally suggest the identification approach is valid in the sense that we find no effects of imaginary policy changes. Negative effects on employment retention for men working full-time in 2012 and positive effects on hours growth for women working part-time in 2014 are the exceptions.

Table 35: Real wage growth (2015 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.006	0.013	-0.005	0.003	0.014
	(0.005)	(0.010)	(0.011)	(0.013)	(0.010)
	[-0.005,0.017]	[-0.008,0.033]	[-0.028,0.018]	[-0.022,0.029]	[-0.007,0.034]
low wage	0.038***	0.040***	0.033***	0.049***	0.037***
	(0.004)	(0.007)	(0.008)	(0.008)	(0.007)
	[0.031,0.046]	[0.026,0.054]	[0.018,0.048]	[0.034,0.064]	[0.023,0.050]
δ	0.010*	0.011	0.017+	0.016	0.010
	(0.004)	(0.008)	(0.010)	(0.010)	(0.008)
	[0.001,0.019]	[-0.006,0.027]	[-0.002,0.037]	[-0.004,0.037]	[-0.007,0.026]
N	6381	1950	1688	998	1745

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2015. Control group age 21-23.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 36: Real wage growth (2016 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.000	-0.003	0.012	-0.008	0.001
	(0.005)	(0.011)	(0.012)	(0.009)	(0.008)
	[-0.011,0.011]	[-0.025,0.019]	[-0.013,0.037]	[-0.026,0.010]	[-0.016,0.018]
low wage	0.018***	0.023**	0.019*	0.019**	0.016**
	(0.004)	(0.008)	(0.009)	(0.006)	(0.005)
	[0.010,0.025]	[0.007,0.039]	[0.000,0.038]	[0.007,0.031]	[0.006,0.027]
δ	-0.001	-0.008	-0.005	0.000	0.008
	(0.004)	(0.009)	(0.011)	(0.007)	(0.006)
	[-0.010,0.008]	[-0.027,0.010]	[-0.027,0.017]	[-0.015,0.015]	[-0.005,0.020]
N	4895	1682	1299	651	1261

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2016. Control group age 21-23.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 37: Employment retention (2015 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.013	0.010	-0.046	-0.001	-0.024
	(0.025)	(0.045)	(0.046)	(0.065)	(0.052)
	[-0.062,0.035]	[-0.078,0.097]	[-0.136,0.044]	[-0.128,0.126]	[-0.125,0.078]
low wage	-0.038*	-0.022	-0.028	-0.014	-0.065*
	(0.016)	(0.030)	(0.030)	(0.039)	(0.033)
	[-0.069,-0.007]	[-0.080,0.037]	[-0.086,0.031]	[-0.091,0.062]	[-0.129,-0.000]
δ	-0.006	-0.005	0.012	-0.042	0.017
	(0.020)	(0.036)	(0.038)	(0.052)	(0.041)
	[-0.045,0.033]	[-0.076,0.066]	[-0.063,0.086]	[-0.145,0.061]	[-0.063,0.097]
N	10385	3097	2559	1762	2967

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2015. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 38: Employment retention (2016 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.005	0.078	-0.023	-0.012	-0.066
	(0.028)	(0.048)	(0.052)	(0.075)	(0.061)
	[-0.060,0.051]	[-0.017,0.173]	[-0.126,0.080]	[-0.158,0.135]	[-0.185,0.053]
low wage	-0.024	0.022	-0.038	-0.042	-0.035
	(0.019)	(0.035)	(0.038)	(0.047)	(0.038)
	[-0.062,0.013]	[-0.048,0.091]	[-0.114,0.037]	[-0.134,0.049]	[-0.110,0.039]
δ	0.000	-0.040	0.022	-0.026	0.035
	(0.023)	(0.042)	(0.046)	(0.060)	(0.046)
	[-0.045,0.046]	[-0.122,0.041]	[-0.068,0.112]	[-0.143,0.092]	[-0.055,0.124]
N	7917	2646	2017	1159	2095

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2016. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 39: Change in conditional hours (2015 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.642	-0.120	-0.264	0.678	2.265+
	(0.422)	(0.568)	(0.600)	(1.917)	(1.195)
	[-0.209,1.492]	[-1.267,1.028]	[-1.475,0.947]	[-3.196,4.552]	[-0.144,4.675]
low wage	0.218	-0.735	0.173	-0.363	0.138
	(0.820)	(0.605)	(0.398)	(1.137)	(1.091)
	[-1.436,1.872]	[-1.957,0.487]	[-0.631,0.977]	[-2.662,1.935]	[-2.062,2.339]
δ	-0.475	0.324	-0.843	1.651	-0.492
	(0.788)	(0.646)	(0.503)	(1.532)	(1.164)
	[-2.063,1.114]	[-0.979,1.627]	[-1.858,0.172]	[-1.445,4.748]	[-2.840,1.856]
N	6460	1950	1732	1002	1776

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2015. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 40: Change in conditional hours (2016 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.011	-0.295	0.293	-3.426	1.192
	(0.459)	(0.619)	(0.712)	(2.149)	(1.310)
	[-0.936,0.914]	[-1.546,0.956]	[-1.144,1.730]	[-7.770,0.917]	[-1.451,3.836]
low wage	0.321	0.571	-0.652	1.023	-0.810
	(0.319)	(0.706)	(0.537)	(1.385)	(0.816)
	[-0.322,0.963]	[-0.854,1.995]	[-1.735,0.432]	[-1.776,3.822]	[-2.456,0.837]
δ	-0.466	-0.325	0.217	-0.742	-0.182
	(0.379)	(0.768)	(0.634)	(1.780)	(0.973)
	[-1.229,0.298]	[-1.876,1.226]	[-1.062,1.496]	[-4.339,2.856]	[-2.146,1.783]
N	4957	1685	1336	652	1282

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2016. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 41: Placebo: Real wage growth (2012 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.003	0.009	-0.013	0.013	-0.002
	(0.005)	(0.009)	(0.010)	(0.010)	(0.007)
	[-0.007,0.012]	[-0.009,0.026]	[-0.034,0.009]	[-0.007,0.034]	[-0.016,0.011]
low wage	0.015	0.009	0.015	0.027***	0.017
	(0.011)	(0.008)	(0.012)	(0.006)	(0.018)
	[-0.007,0.036]	[-0.007,0.024]	[-0.009,0.038]	[0.016,0.038]	[-0.019,0.054]
δ	-0.004	-0.003	-0.002	-0.005	-0.000
	(0.010)	(0.008)	(0.012)	(0.008)	(0.017)
	[-0.024,0.017]	[-0.020,0.014]	[-0.027,0.023]	[-0.022,0.011]	[-0.034,0.034]
N	5602	1869	1407	842	1484

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2012. Control group age 21-23.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 42: Placebo: Real wage growth (2013 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.003	-0.017+	-0.003	-0.007	0.012+
	(0.004)	(0.009)	(0.010)	(0.010)	(0.007)
	[-0.012,0.005]	[-0.036,0.002]	[-0.024,0.017]	[-0.027,0.014]	[-0.001,0.026]
low wage	0.013+	0.011	0.007	0.033***	0.022*
	(0.007)	(0.008)	(0.006)	(0.007)	(0.010)
	[-0.001,0.027]	[-0.006,0.028]	[-0.006,0.020]	[0.019,0.047]	[0.001,0.043]
δ	-0.002	0.001	0.003	-0.004	-0.016
	(0.007)	(0.009)	(0.008)	(0.009)	(0.010)
	[-0.016,0.011]	[-0.018,0.020]	[-0.013,0.020]	[-0.022,0.014]	[-0.036,0.004]
N	6083	1958	1522	956	1647

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2013. Control group age 21-23.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 43: Placebo: Real wage growth (2014 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.009+	0.008	0.027*	0.007	-0.008
	(0.005)	(0.010)	(0.011)	(0.009)	(0.009)
	[-0.001,0.019]	[-0.013,0.029]	[0.005,0.050]	[-0.012,0.026]	[-0.025,0.009]
low wage	0.017**	0.017	0.012	0.025**	0.023***
	(0.006)	(0.011)	(0.008)	(0.008)	(0.005)
	[0.005,0.030]	[-0.005,0.039]	[-0.004,0.027]	[0.009,0.042]	[0.012,0.033]
δ	-0.007	-0.005	-0.012	-0.005	0.002
	(0.006)	(0.012)	(0.009)	(0.009)	(0.007)
	[-0.020,0.006]	[-0.029,0.019]	[-0.031,0.007]	[-0.024,0.014]	[-0.012,0.015]
N	6431	1994	1568	1094	1775

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2014. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 44: Placebo: Employment retention (2012 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.012	0.070	0.000	-0.105	-0.066
	(0.027)	(0.046)	(0.050)	(0.069)	(0.056)
	[-0.065,0.040]	[-0.020,0.160]	[-0.099,0.099]	[-0.241,0.030]	[-0.175,0.043]
low wage	-0.062***	0.003	-0.065*	-0.097*	-0.081*
	(0.017)	(0.031)	(0.033)	(0.040)	(0.034)
	[-0.095,-0.029]	[-0.059,0.064]	[-0.129,-0.000]	[-0.175,-0.019]	[-0.148,-0.015]
δ	-0.006	-0.077*	0.019	-0.012	0.064
	(0.021)	(0.038)	(0.041)	(0.055)	(0.044)
	[-0.048,0.036]	[-0.151,-0.002]	[-0.062,0.100]	[-0.120,0.096]	[-0.022,0.149]
N	8820	2726	2084	1524	2486

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2012. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 45: Placebo: Employment retention (2013 as treatment year), Age model)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.038	0.066	0.032	-0.091	0.116*
	(0.025)	(0.044)	(0.048)	(0.065)	(0.054)
	[-0.012,0.088]	[-0.021,0.154]	[-0.063,0.126]	[-0.219,0.037]	[0.011,0.221]
low wage	-0.043**	-0.016	-0.023	-0.088*	-0.038
	(0.016)	(0.030)	(0.031)	(0.038)	(0.033)
	[-0.075,-0.011]	[-0.074,0.042]	[-0.084,0.038]	[-0.163,-0.013]	[-0.103,0.027]
δ	-0.004	-0.035	-0.006	0.046	-0.012
	(0.020)	(0.036)	(0.039)	(0.053)	(0.042)
	[-0.044,0.036]	[-0.105,0.036]	[-0.083,0.071]	[-0.059,0.150]	[-0.093,0.070]
N	9344	2896	2247	1562	2639

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2013. Control group age 21-23.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 46: Placebo: Employment retention (2014 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.027	0.035	0.027	0.028	-0.004
	(0.025)	(0.045)	(0.047)	(0.060)	(0.052)
	[-0.021,0.076]	[-0.053,0.124]	[-0.066,0.120]	[-0.089,0.145]	[-0.105,0.098]
low wage	-0.023	-0.040	0.003	-0.048	0.014
	(0.016)	(0.029)	(0.032)	(0.036)	(0.032)
	[-0.054,0.007]	[-0.098,0.017]	[-0.059,0.065]	[-0.118,0.022]	[-0.048,0.076]
δ	-0.008	-0.012	-0.004	0.019	-0.000
	(0.020)	(0.036)	(0.040)	(0.049)	(0.040)
	[-0.047,0.031]	[-0.082,0.058]	[-0.082,0.073]	[-0.077,0.115]	[-0.079,0.079]
N	10353	3131	2399	1898	2925

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2014. Control group age 21-23.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 47: Placebo: Change in conditional hours (2012 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.301	-0.125	0.719	-0.228	-1.099
	(0.422)	(0.525)	(0.571)	(1.986)	(1.418)
	[-0.550,1.151]	[-1.184,0.933]	[-0.432,1.870]	[-4.240,3.783]	[-3.957,1.760]
low wage	-0.010	-0.244	0.502	-0.571	0.954
	(0.266)	(0.663)	(0.672)	(1.094)	(0.851)
	[-0.546,0.527]	[-1.582,1.094]	[-0.853,1.857]	[-2.780,1.639]	[-0.763,2.670]
δ	0.118	0.349	-0.509	-1.376	-1.300
	(0.337)	(0.679)	(0.689)	(1.582)	(1.093)
	[-0.561,0.797]	[-1.021,1.718]	[-1.899,0.881]	[-4.571,1.820]	[-3.504,0.903]
N	5725	1877	1473	846	1529

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.
Control group 1. Treatment year 2012. Control group age 21-23.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 48: Placebo: Change in conditional hours (2013 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	0.306	0.354	-0.200	-2.908	2.181
	(0.433)	(0.573)	(0.617)	(1.806)	(1.357)
	[-0.566,1.178]	[-0.802,1.509]	[-1.445,1.046]	[-6.556,0.740]	[-0.555,4.917]
low wage	0.498	0.585	-0.024	-0.388	-0.073
	(0.495)	(0.735)	(0.396)	(1.051)	(0.827)
	[-0.501,1.496]	[-0.897,2.067]	[-0.823,0.775]	[-2.511,1.735]	[-1.742,1.595]
δ	-0.602	-0.578	-0.426	2.144	-1.153
	(0.512)	(0.754)	(0.507)	(1.492)	(1.040)
	[-1.633,0.430]	[-2.099,0.943]	[-1.449,0.596]	[-0.870,5.158]	[-3.250,0.943]
N	6204	1968	1580	961	1695

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.
Control group 1. Treatment year 2013. Control group age 21-23.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 49: Placebo: Change in conditional hours (2014 as treatment year), Age model

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
age 24-30	-0.483	-0.203	0.384	0.214	-3.724**
	(0.438)	(0.580)	(0.574)	(1.894)	(1.267)
	[-1.367,0.401]	[-1.374,0.968]	[-0.775,1.543]	[-3.610,4.039]	[-6.280,-1.169]
low wage	0.755	0.078	0.226	1.700	-1.191
	(0.591)	(0.558)	(0.667)	(1.117)	(0.775)
	[-0.437,1.948]	[-1.048,1.204]	[-1.120,1.571]	[-0.556,3.957]	[-2.754,0.373]
δ	-0.274	-0.037	-0.069	-0.116	2.007*
	(0.591)	(0.606)	(0.696)	(1.572)	(0.982)
	[-1.467,0.919]	[-1.259,1.186]	[-1.473,1.336]	[-3.290,3.059]	[0.027,3.988]
N	6496	1997	1608	1096	1795

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 1. Treatment year 2014. Control group age 21-23.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

5 Conclusion

In July 2015 the UK government announced the introduction of a new 'National Living Wage' that would apply to those aged 25 and over from April 2016. At a rate of £7.20, this represented a significant increase of 7.5% over the existing National Minimum Wage rate (and a 10.8% increase on the rate prevailing a year previously - in April 2015). Previous research has generally found, with some exceptions for particular groups in the labour market, see Dickens, Riley, and Wilkinson (2015), that the NMW has raised the earnings of low paid workers, without significantly affecting their employment opportunities. The large increase in the NLW for those aged 25 and above, and plans to raise the NLW to 60% of median earnings by 2020, raise the possibility of detrimental effects on employment retention and hours worked.

This report has presented the results of our research into the effect of the introduction of the National Living Wage on wage growth, employment retention and weekly hours worked. We use a difference-in-differences approach applied to ASHE data. We also examine the effects for various demographic subgroups in low-paying occupations, low-paying industries, and most regions of the UK, where we expect that the bite of the minimum wage might be more significant. Overall we find that the introduction of the NLW has had little adverse effect on employment retention while raising the wages of the lowest paid.

Consistent with previous research we do find some evidence of adverse effects on the employment opportunities of part-time women. Our main results using the control group of workers paid up to 10% above the NLW suggest an own-wage elasticity of employment retention for low paid part-time women of between -0.3 and -0.7. This is calculated from the estimated effects of the NLW on wage growth and employment retention. If instead we calculate the elasticity of employment retention for this group with respect to the actual change in the wage floor, then the estimated minimum wage elasticity of employment retention for low paid part-time women from our main results lies between -0.2 and -0.35.[11] Using the control group of workers paid between 10% and 20% above the NLW we find no adverse effects of the NLW on the employment retention of part-time women. We also find some evidence of negative effects on employment retention for part-time women in low-paid retail occupations. When we consider low-paid sectors we also find negative employment retention effects for part-time women in the retail sector. The only negative employment retention effects we find at a regional level are for part-time women in the North East of England.

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[11]Note that the implied labour demand elasticity associated with these estimates of the elasticity of employment retention are smaller in magnitude; between -0.2 and -0.5 calculated using the estimated change in wages and between -0.15 and -0.25 using the actual change in the NLW. These estimates lie within the bounds for the own-wage elasticity of labour demand suggested by previous meta-studies (see Hamermesh (1993); Lichter, Peichl, and Siegloch (2015)).

To test the robustness of our results we also estimate placebo models where we substitute the true treated year by a counterfactual 'treated' year. These falsification tests give some reassurance that our real quasi-experimental results are not spurious. However, it is important to note that identification in a difference-in-differences framework relies on the assumption of common trends between the treated and control groups, and this assumption does not always hold in some of the data we use. A further issue concerning estimation of difference-in-differences models relates to the accuracy of inference when using the naive estimates of the standard errors produced by OLS. Because an individual may have unobservable characteristics that are correlated with other individuals of the same group, or may be affected by common shocks, this gives rise to a grouped error structure. This results in standard errors that are downward biased, leading to t-statistics that are too large and, accordingly, leads a researcher to over-reject the null hypothesis of no treatment effect. To mitigate this possibility we use a parametric adjustment using intra-class correlations as proposed by Moulton (1990).

As recommended by Brewer, Crossley, and Zilio (2015) we also report 95% confidence intervals based on these Moulton corrected standard errors. While we fairly consistently (apart from the exceptions discussed above) cannot reject the null hypothesis that recent NLW upratings have had no impact on employment retention based on the point estimates reported, we also cannot rule out the possibility of negative or positive effects, given the generally wide confidence intervals. Our calculations of the MDEs show that a NLW uprating would need to decrease (increase) the job retention rate by between 2.8 - 3.9 percentage points for part-time women to have an 80% chance of being detected; by 3.4 to 5.3 percentage points for full-time women, and by 3.4 to 5.3 percentage points for full-time men (main results).

Our exploration of age-based models to identify the impacts of the NLW suggest that employers may have increased the wages of younger workers, for whom the NLW does not apply, in response to the introduction of the NLW.

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A Main results using alternative control group

Where control group is defined as those earning between 10-20% above the incoming NLW.

Table 50: Real wage growth (2015 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.055***	0.052***	0.053***	0.065***	0.056***
	(0.005)	(0.006)	(0.005)	(0.010)	(0.008)
	[0.044,0.065]	[0.040,0.064]	[0.042,0.063]	[0.045,0.085]	[0.041,0.070]
δ (old)	0.072***	0.073***	0.071***	0.080***	0.073***
	(0.008)	(0.015)	(0.010)	(0.005)	(0.007)
	[0.057,0.087]	[0.043,0.104]	[0.050,0.091]	[0.071,0.090]	[0.060,0.087]
δ (wg)	0.053***	0.050***	0.051***	0.062***	0.054***
	(0.005)	(0.006)	(0.005)	(0.009)	(0.007)
	[0.043,0.062]	[0.039,0.061]	[0.041,0.060]	[0.044,0.079]	[0.041,0.067]
N	68,857	20,189	17,640	5,664	25,364
N (old)	38,999	12,955	10,415	3,014	12,615

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, [*] $p<0.05$, [**] $p<0.01$, [***] $p<0.001$

Table 51: Employment retention (2015 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.006	0.006	0.013	0.012	0.014
	(0.007)	(0.012)	(0.013)	(0.028)	(0.012)
	[-0.007,0.020]	[-0.019,0.030]	[-0.012,0.039]	[-0.043,0.066]	[-0.010,0.038]
δ (old)	0.016+	0.045*	-0.013	0.027	0.025
	(0.009)	(0.019)	(0.019)	(0.031)	(0.016)
	[-0.002,0.034]	[0.009,0.081]	[-0.050,0.025]	[-0.035,0.088]	[-0.005,0.056]
δ (wg)	0.006	0.006	0.012	0.012	0.013
	(0.006)	(0.012)	(0.012)	(0.026)	(0.011)
	[-0.006,0.019]	[-0.016,0.029]	[-0.011,0.036]	[-0.039,0.062]	[-0.009,0.036]
N	96,140	28,017	23,349	9,600	35,174
N (old)	54,572	17,806	13,650	5,356	17,760

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Control group 2. Treatment year 2015. Control years 2010-2013.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 52: Change in conditional hours (2015 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.082	-0.076	-0.061	-1.419+	-0.096
	(0.135)	(0.354)	(0.391)	(0.748)	(0.122)
	[-0.346,0.182]	[-0.770,0.619]	[-0.828,0.706]	[-2.885,0.047]	[-0.335,0.144]
δ (old)	0.008	-0.026	0.077	-1.322	-0.083
	(0.374)	(1.564)	(1.225)	(1.066)	(0.422)
	[-0.726,0.741]	[-3.091,3.039]	[-2.324,2.479]	[-3.412,0.768]	[-0.911,0.744]
δ (wg)	-0.071	-0.069	-0.045	-1.305+	-0.089
	(0.127)	(0.331)	(0.366)	(0.698)	(0.116)
	[-0.320,0.178]	[-0.719,0.580]	[-0.763,0.673]	[-2.672,0.063]	[-0.316,0.139]
N	69,676	20,304	17,998	5,695	25,679
N (old)	39,448	13,029	10,610	3,031	12,778

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Minimum detectable effects below the confidence intervals.

Control group 2. Treatment year 2015. Control years 2010-2013.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

A.1 Placebo results

Wages

Table 53: Growth in real wages (2012 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.002	-0.002	0.002	0.011	0.004
	(0.005)	(0.009)	(0.006)	(0.010)	(0.006)
	[-0.009,0.013]	[-0.020,0.016]	[-0.009,0.013]	[-0.008,0.030]	[-0.008,0.016]
δ (old)	0.001	-0.004	0.002	0.004	0.004
	(0.011)	(0.027)	(0.010)	(0.006)	(0.010)
	[-0.021,0.023]	[-0.057,0.050]	[-0.018,0.022]	[-0.009,0.017]	[-0.015,0.023]
δ (wg)	0.002	-0.002	0.002	0.009	0.003
	(0.005)	(0.009)	(0.005)	(0.009)	(0.006)
	[-0.008,0.012]	[-0.018,0.015]	[-0.008,0.012]	[-0.008,0.027]	[-0.008,0.014]
N	55,857	16,015	14,233	3,825	21,784
N (old)	31,358	10,480	8,408	1,995	10,475

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2012. Control years 2007-2010.

$^+$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 54: Growth in real wages (2013 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.003	0.000	0.004	0.006	0.003
	(0.005)	(0.007)	(0.006)	(0.010)	(0.006)
	[-0.008,0.013]	[-0.014,0.015]	[-0.007,0.015]	[-0.014,0.027]	[-0.010,0.015]
δ (old)	-0.001	-0.002	-0.001	0.000	-0.000
	(0.012)	(0.024)	(0.014)	(0.008)	(0.010)
	[-0.024,0.023]	[-0.048,0.045]	[-0.028,0.027]	[-0.016,0.016]	[-0.019,0.019]
δ (wg)	0.002	0.000	0.003	0.005	0.002
	(0.005)	(0.007)	(0.005)	(0.009)	(0.006)
	[-0.008,0.012]	[-0.014,0.014]	[-0.007,0.014]	[-0.013,0.024]	[-0.009,0.014]
N	60,931	17,552	15,651	4,475	23,253
N (old)	33,815	11,224	9,227	2,245	11,119

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2013. Control years 2008-2011.

$^+$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 55: Growth in real wages (2014 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.006	0.006	0.005	0.010	0.004
	(0.006)	(0.009)	(0.006)	(0.010)	(0.006)
	[-0.006,0.017]	[-0.011,0.023]	[-0.006,0.016]	[-0.009,0.030]	[-0.008,0.016]
δ (old)	0.005	0.006	0.006	0.006	0.003
	(0.010)	(0.023)	(0.014)	(0.005)	(0.008)
	[-0.015,0.025]	[-0.038,0.051]	[-0.022,0.034]	[-0.003,0.016]	[-0.012,0.018]
δ (wg)	0.005	0.006	0.005	0.010	0.004
	(0.005)	(0.008)	(0.005)	(0.009)	(0.006)
	[-0.005,0.016]	[-0.010,0.022]	[-0.005,0.015]	[-0.008,0.027]	[-0.008,0.015]
N	65,838	19,260	16,727	5,137	24,714
N (old)	37,076	12,370	9,919	2,641	12,146

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2014. Control years 2009-2012.

$^+$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Employment retention

Table 56: Employment retention (2012 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.009	0.023+	0.002	-0.042	0.017
	(0.008)	(0.014)	(0.015)	(0.032)	(0.013)
	[-0.006,0.024]	[-0.003,0.050]	[-0.027,0.030]	[-0.104,0.020]	[-0.009,0.043]
δ (old)	0.031**	0.039+	0.029	-0.029	0.050**
	(0.011)	(0.021)	(0.023)	(0.037)	(0.018)
	[0.010,0.052]	[-0.002,0.080]	[-0.016,0.074]	[-0.101,0.044]	[0.014,0.085]
δ (wg)	0.009	0.022+	0.002	-0.037	0.015
	(0.007)	(0.013)	(0.014)	(0.029)	(0.012)
	[-0.005,0.023]	[-0.003,0.047]	[-0.025,0.029]	[-0.094,0.021]	[-0.009,0.040]
N	76,574	22,202	18,622	6,455	29,295
N (old)	43,122	14,389	10,930	3,468	14,335

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2012. Control years 2007-2010.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 57: Employment retention (2013 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.008	0.012	0.001	-0.012	0.017
	(0.007)	(0.013)	(0.014)	(0.031)	(0.013)
	[-0.006,0.022]	[-0.014,0.038]	[-0.025,0.028]	[-0.073,0.048]	[-0.008,0.042]
δ (old)	0.014	0.022	0.025	-0.031	0.027
	(0.010)	(0.020)	(0.021)	(0.036)	(0.017)
	[-0.006,0.034]	[-0.017,0.062]	[-0.015,0.066]	[-0.101,0.039]	[-0.006,0.060]
δ (wg)	0.007	0.012	0.003	-0.013	0.016
	(0.007)	(0.012)	(0.013)	(0.029)	(0.012)
	[-0.006,0.021]	[-0.013,0.036]	[-0.022,0.028]	[-0.069,0.043]	[-0.008,0.039]
N	83,401	24,119	20,487	7,505	31,290
N (old)	46,308	15,263	11,943	3,960	15,142

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2013. Control years 2008-2011.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 58: Employment retention (2014 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.005	-0.001	-0.006	0.060*	0.013
	(0.007)	(0.013)	(0.013)	(0.029)	(0.012)
	[-0.009,0.019]	[-0.026,0.024]	[-0.032,0.021]	[0.004,0.116]	[-0.012,0.037]
δ (old)	0.019+	0.029	-0.006	0.082*	0.017
	(0.010)	(0.019)	(0.020)	(0.033)	(0.016)
	[-0.000,0.037]	[-0.008,0.066]	[-0.045,0.033]	[0.017,0.147]	[-0.014,0.048]
δ (wg)	0.005	-0.000	-0.004	0.055*	0.012
	(0.007)	(0.012)	(0.013)	(0.026)	(0.011)
	[-0.008,0.018]	[-0.024,0.023]	[-0.029,0.020]	[0.004,0.107]	[-0.010,0.034]
N	91,412	26,688	22,124	8,754	33,846
N (old)	51,510	16,970	12,989	4,689	16,862

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2014. Control years 2009-2012.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Change in conditional hours

Table 59: Change in conditional hours (2012 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.140	-0.114	0.233	1.888*	0.153
	(0.142)	(0.382)	(0.409)	(0.744)	(0.175)
	[-0.139,0.419]	[-0.863,0.636]	[-0.568,1.034]	[0.429,3.347]	[-0.189,0.496]
δ (old)	0.221	-0.173	0.262	2.018	0.100
	(0.427)	(2.278)	(1.331)	(1.251)	(0.616)
	[-0.615,1.057]	[-4.638,4.292]	[-2.346,2.871]	[-0.433,4.469]	[-1.107,1.306]
δ (wg)	0.136	-0.110	0.223	1.808*	0.143
	(0.134)	(0.359)	(0.382)	(0.704)	(0.166)
	[-0.128,0.399]	[-0.813,0.594]	[-0.526,0.972]	[0.428,3.187]	[-0.182,0.468]
N	56,432	16,092	14,494	3,841	22,005
N (old)	31,679	10,526	8,559	2,006	10,588

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2012. Control years 2007-2010.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 60: Change in conditional hours (2013 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.110	0.122	0.071	0.840	0.094
	(0.140)	(0.331)	(0.396)	(0.651)	(0.134)
	[-0.165,0.385]	[-0.526,0.771]	[-0.706,0.847]	[-0.435,2.115]	[-0.169,0.356]
δ (old)	0.147	-0.146	0.374	-0.087	0.124
	(0.411)	(1.877)	(1.270)	(1.219)	(0.566)
	[-0.658,0.953]	[-3.826,3.533]	[-2.115,2.863]	[-2.477,2.302]	[-0.985,1.233]
δ (wg)	0.102	0.114	0.067	0.747	0.087
	(0.133)	(0.310)	(0.370)	(0.618)	(0.127)
	[-0.158,0.362]	[-0.493,0.721]	[-0.658,0.791]	[-0.464,1.957]	[-0.163,0.336]
N	61,626	17,659	15,932	4,496	23,539
N (old)	34,189	11,291	9,383	2,255	11,260

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2013. Control years 2008-2011.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 61: Change in conditional hours (2014 as treatment year, control group 2)

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.005	0.092	-0.106	-0.826	0.069
	(0.153)	(0.325)	(0.396)	(1.041)	(0.158)
	[-0.304,0.295]	[-0.545,0.729]	[-0.883,0.671]	[-2.866,1.214]	[-0.241,0.379]
δ (old)	0.173	0.346	0.339	-1.214	0.149
	(0.428)	(1.331)	(1.163)	(1.360)	(0.426)
	[-0.666,1.012]	[-2.262,2.955]	[-1.941,2.620]	[-3.880,1.453]	[-0.686,0.983]
δ (wg)	-0.001	0.093	-0.095	-0.814	0.068
	(0.144)	(0.305)	(0.370)	(0.979)	(0.149)
	[-0.283,0.280]	[-0.504,0.690]	[-0.820,0.630]	[-2.733,1.106]	[-0.225,0.360]
N	66,590	19,368	17,067	5,162	24,993
N (old)	37,493	12,441	10,105	2,660	12,287

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses. 95% confidence intervals in square brackets.

Control group 2. Treatment year 2014. Control years 2009-2012.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

B Appendix: Occupation, Industry and Region sample sizes

Table 62: Sample sizes from the ASHE longitudinal panel (occupation)

	FT men	FT women	PT men	PT women
Agriculture	560	76	106	72
Call centres	159	148	30	93
Childcare	20	620	43	1,931
Cleaning	1,356	1,411	1,091	4,170
Food processing	1,754	1,160	220	324
Hospitality	2,098	1,736	1,607	3,877
Leisure	264	296	169	328
Non-food processing	1,644	656	222	159
Retail	2,654	3,752	2,263	9,997
Security	810	83	119	39
Social care	599	2,442	230	2,341
Storage	2,738	631	515	247
Transport	1,514	100	472	65

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Samples are for employment retention and the years 2010-2013 and 2015, and include both the treatment and control groups.

Table 63: Sample sizes from the ASHE longitudinal panel (industry)

	FT men	FT women	PT men	PT women
Agriculture	438	179	69	134
Child care	19	612	24	854
Cleaning	908	564	793	1,880
Food processing	1,657	1,076	149	361
Hairdressing	30	207	47	545
Hospitality	3,232	2,703	2,221	4,499
Leisure	517	420	304	702
Retail	5,465	5,430	3,329	13,302
Security	621	50	95	40
Social care	1,183	4,127	519	4,361

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Samples are for employment retention and the years 2010-2013 and 2015, and include both the treatment and control groups.

Table 64: Sample sizes from the ASHE longitudinal panel (region)

	FT men	FT women	PT men	PT women
East of England	2,332	1,918	865	3,693
East Midlands	2,425	2,134	839	3,100
London	2,188	1,798	1,517	2,773
North East	1,178	1,124	457	2,015
North West	3,388	2,972	1,254	4,696
Northern Ireland	1,084	816	366	1,148
Scotland	2,082	2,059	854	3,366
South East	2,617	2,456	1,128	4,677
South West	2,081	1,839	844	3,463
Wales	1,591	1,200	540	2,127
West Midlands	2,850	2,496	977	3,718
Yorkshire	2,565	2,219	912	3,811

Note: Authors' calculations from ASHE data (Office for National Statistics, 2018). Samples are for employment retention and the years 2010-2013 and 2015, and include both the treatment and control groups.

C   Appendix: Occupation, Industry and Region regression results

C.1   Low-paying occupations

Table 65: Low pay occupation: childcare (PT women) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.065***	-0.049	0.221
	(0.009)	(0.048)	(0.237)
	[0.047,0.084]	[-0.143,0.045]	[-0.243,0.685]
δ (old)	0.076***	-0.057	0.663
	(0.014)	(0.082)	(0.655)
	[0.048,0.104]	[-0.217,0.103]	[-0.621,1.947]
δ (wg)	0.063***	-0.045	0.223
	(0.009)	(0.045)	(0.221)
	[0.047,0.080]	[-0.134,0.043]	[-0.211,0.657]
N	1,306	1,931	1,322
N (old)	655	970	665

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 66: Low pay occupation: food processing (FT men) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.048***	0.030	-0.864
	(0.005)	(0.046)	(0.681)
	[0.037,0.058]	[-0.061,0.121]	[-2.198,0.471]
δ (old)	0.067***	0.097	-1.570
	(0.006)	(0.063)	(1.078)
	[0.055,0.078]	[-0.027,0.220]	[-3.682,0.542]
δ (wg)	0.046***	0.030	-0.833
	(0.005)	(0.043)	(0.629)
	[0.036,0.055]	[-0.055,0.115]	[-2.066,0.400]
N	1,249	1,754	1,256
N (old)	746	1,058	749

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2009-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 67: Low pay occupation: non-food processing (FT men) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.049***	0.057	-0.122
	(0.008)	(0.049)	(0.564)
	[0.033,0.064]	[-0.039,0.152]	[-1.227,0.983]
δ (old)	0.076***	0.067	0.098
	(0.013)	(0.068)	(0.947)
	[0.051,0.102]	[-0.067,0.200]	[-1.759,1.954]
δ (wg)	0.047***	0.054	-0.074
	(0.007)	(0.046)	(0.529)
	[0.033,0.061]	[-0.036,0.143]	[-1.112,0.964]
N	1,168	1,644	1,179
N (old)	752	1,057	757

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 68: Low pay occupation: storage (FT men) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.043***	0.049	0.311
	(0.008)	(0.036)	(0.503)
	[0.026,0.060]	[-0.021,0.119]	[-0.675,1.297]
δ (old)	0.056*	0.110*	0.507
	(0.025)	(0.049)	(1.694)
	[0.008,0.104]	[0.014,0.206]	[-2.813,3.828]
δ (wg)	0.041***	0.047	0.304
	(0.008)	(0.033)	(0.470)
	[0.026,0.056]	[-0.019,0.112]	[-0.616,1.225]
N	1,965	2,738	1,970
N (old)	1,230	1,696	1,233

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 69: Low pay occupation: transport (FT men) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.021**	0.098+	0.268
	(0.008)	(0.052)	(0.432)
	[0.005,0.037]	[-0.004,0.200]	[-0.578,1.113]
δ (old)	0.049***	0.000	-0.386
	(0.014)	(0.084)	(1.929)
	[0.023,0.076]	[-0.164,0.164]	[-4.167,3.394]
δ (wg)	0.021**	0.088+	0.216
	(0.008)	(0.049)	(0.408)
	[0.006,0.036]	[-0.008,0.184]	[-0.584,1.016]
N	1,071	1,514	1,076
N (old)	635	909	636

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 70: Low pay occupation: social care (FT and PT women) (2015), ASHE

	FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.030***	0.041	-0.321	0.030***	0.059	-0.493
	(0.006)	(0.040)	(0.924)	(0.007)	(0.042)	(0.835)
	[0.019,0.042]	[-0.037,0.119]	[-2.131,1.489]	[0.016,0.044]	[-0.023,0.141]	[-2.128,1.143]
δ (old)	0.047***	0.020	-1.095	0.045***	0.175**	1.157
	(0.009)	(0.059)	(1.463)	(0.011)	(0.063)	(1.372)
	[0.029,0.064]	[-0.096,0.136]	[-3.962,1.773]	[0.023,0.067]	[0.052,0.298]	[-1.532,3.845]
δ (wg)	0.029***	0.041	-0.278	0.030***	0.060	-0.401
	(0.006)	(0.037)	(0.866)	(0.007)	(0.039)	(0.782)
	[0.018,0.040]	[-0.033,0.114]	[-1.975,1.419]	[0.017,0.043]	[-0.017,0.137]	[-1.934,1.132]
N	1,737	2,442	1,789	1,584	2,341	1,620
N (old)	893	1,246	925	898	1,300	917

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, [*] p<0.05, [**] p<0.01, [***] p<0.001

Table 71: Low pay occupation: social care (FT and PT women) (2016), ASHE

	FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.018**	-0.052	-0.634	0.018**	0.067	-0.630
	(0.007)	(0.042)	(0.960)	(0.007)	(0.044)	(0.895)
	[0.005,0.031]	[-0.133,0.030]	[-2.517,1.248]	[0.005,0.031]	[-0.019,0.152]	[-2.383,1.124]
δ (old)	0.018+	-0.096+	-2.024	0.011	0.083	-0.375
	(0.010)	(0.054)	(1.301)	(0.010)	(0.057)	(1.191)
	[-0.001,0.037]	[-0.201,0.010]	[-4.573,0.526]	[-0.007,0.030]	[-0.029,0.196]	[-2.709,1.958]
δ (wg)	0.017**	-0.053	-0.627	0.017**	0.065	-0.623
	(0.006)	(0.040)	(0.925)	(0.007)	(0.042)	(0.863)
	[0.005,0.030]	[-0.132,0.025]	[-2.441,1.186]	[0.005,0.030]	[-0.017,0.148]	[-2.315,1.069]
N	2,076	2,912	2,135	1,884	2,804	1,921
N (old)	1,174	1,632	1,209	1,131	1,700	1,151

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, [*] p<0.05, [**] p<0.01, [***] p<0.001

Table 72: Growth in real wages, low pay occupation: cleaning (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.043***	0.025	0.059**	0.056	0.040**
	(0.011)	(0.025)	(0.022)	(0.045)	(0.015)
	[0.022,0.065]	[-0.024,0.075]	[0.016,0.103]	[-0.032,0.143]	[0.010,0.070]
δ (old)	0.049***	0.072*	0.048+	0.043	0.042*
	(0.013)	(0.030)	(0.028)	(0.056)	(0.018)
	[0.023,0.075]	[0.013,0.131]	[-0.006,0.103]	[-0.067,0.153]	[0.007,0.076]
δ (wg)	0.040***	0.025	0.054**	0.050	0.038**
	(0.010)	(0.023)	(0.021)	(0.041)	(0.014)
	[0.020,0.060]	[-0.021,0.071]	[0.014,0.094]	[-0.031,0.131]	[0.010,0.066]
N	5,484	972	1,015	657	2,840
N (old)	3,160	586	609	386	1,579

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 73: Employment retention, low pay occupation: cleaning (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.025	-0.011	0.012	0.066	0.051
	(0.025)	(0.056)	(0.053)	(0.077)	(0.035)
	[-0.024,0.073]	[-0.121,0.099]	[-0.093,0.116]	[-0.085,0.216]	[-0.019,0.120]
δ (old)	0.031	0.051	-0.009	0.107	0.036
	(0.029)	(0.071)	(0.064)	(0.086)	(0.041)
	[-0.026,0.087]	[-0.087,0.190]	[-0.135,0.118]	[-0.061,0.275]	[-0.045,0.117]
δ (wg)	0.024	-0.008	0.013	0.063	0.047
	(0.023)	(0.052)	(0.049)	(0.071)	(0.033)
	[-0.020,0.069]	[-0.110,0.095]	[-0.084,0.110]	[-0.076,0.202]	[-0.017,0.111]
N	8,028	1,356	1,411	1,091	4,170
N (old)	4,623	796	823	656	2,348

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 74: Change in conditional hours, low pay occupation: cleaning (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.456	-2.752*	2.384	-1.825	-0.603
	(0.600)	(1.388)	(1.460)	(2.098)	(0.747)
	[-1.631,0.719]	[-5.473,-0.031]	[-0.477,5.245]	[-5.937,2.288]	[-2.067,0.862]
δ (old)	-0.012	-0.593	2.930	-2.513	-0.460
	(0.737)	(1.915)	(1.888)	(2.216)	(0.885)
	[-1.456,1.432]	[-4.347,3.161]	[-0.771,6.631]	[-6.857,1.830]	[-2.195,1.274]
δ (wg)	-0.408	-2.519+	2.309+	-1.865	-0.530
	(0.556)	(1.292)	(1.353)	(1.938)	(0.692)
	[-1.497,0.681]	[-5.052,0.013]	[-0.343,4.960]	[-5.663,1.933]	[-1.886,0.826]
N	5,556	981	1,039	663	2,873
N (old)	3,198	593	621	389	1,595

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2012.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 75: Growth in real wages, low pay occupation: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.027***	0.018	0.033*	0.007	0.032***
	(0.006)	(0.016)	(0.014)	(0.022)	(0.008)
	[0.016,0.039]	[-0.012,0.049]	[0.006,0.060]	[-0.036,0.050]	[0.017,0.047]
δ (old)	0.034***	0.030	0.062**	-0.013	0.040***
	(0.008)	(0.026)	(0.019)	(0.031)	(0.010)
	[0.018,0.050]	[-0.021,0.081]	[0.025,0.099]	[-0.074,0.048]	[0.020,0.060]
δ (wg)	0.027***	0.018	0.033*	0.006	0.031***
	(0.006)	(0.015)	(0.013)	(0.020)	(0.007)
	[0.016,0.038]	[-0.011,0.047]	[0.008,0.058]	[-0.034,0.046]	[0.017,0.045]
N	14,690	2,121	3,102	1,579	7,888
N (old)	7,337	1,178	1,600	801	3,758

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 76: Employment retention, low pay occupation: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.013	0.010	0.007	0.062	0.009
	(0.017)	(0.042)	(0.036)	(0.054)	(0.024)
	[-0.020,0.046]	[-0.072,0.093]	[-0.063,0.076]	[-0.044,0.167]	[-0.038,0.057]
δ (old)	-0.022	0.136*	-0.009	0.046	-0.063*
	(0.025)	(0.069)	(0.054)	(0.056)	(0.028)
	[-0.070,0.027]	[0.000,0.271]	[-0.114,0.097]	[-0.065,0.156]	[-0.118,-0.009]
δ (wg)	0.022	0.019	0.019	0.059	0.019
	(0.017)	(0.042)	(0.036)	(0.054)	(0.024)
	[-0.011,0.056]	[-0.064,0.101]	[-0.051,0.089]	[-0.047,0.164]	[-0.029,0.067]
N	18,666	2,654	3,752	2,263	9,997
N (old)	9,487	1,477	1,942	1,198	4,870

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 77: Change in conditional hours, low pay occupation: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.302	-0.307	-0.690	1.733	0.431
	(0.299)	(0.743)	(0.660)	(1.158)	(0.370)
	[-0.284,0.888]	[-1.764,1.149]	[-1.984,0.604]	[-0.537,4.004]	[-0.295,1.156]
δ (old)	0.179	0.191	-2.431*	1.818	0.530
	(0.441)	(1.304)	(1.025)	(1.608)	(0.523)
	[-0.686,1.045]	[-2.366,2.747]	[-4.440,-0.423]	[-1.333,4.969]	[-0.495,1.555]
δ (wg)	0.286	-0.308	-0.689	1.632	0.423
	(0.281)	(0.704)	(0.624)	(1.080)	(0.347)
	[-0.265,0.837]	[-1.688,1.073]	[-1.912,0.533]	[-0.485,3.749]	[-0.258,1.104]
N	14,818	2,132	3,151	1,585	7,950
N (old)	7,393	1,180	1,624	802	3,787

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 78: Growth in real wages, low pay occupation: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.036***	0.030	0.013	0.006	0.056***
	(0.011)	(0.020)	(0.023)	(0.040)	(0.016)
	[0.015,0.057]	[-0.009,0.068]	[-0.032,0.058]	[-0.073,0.085]	[0.024,0.088]
δ (old)	0.039**	0.050*	0.021	-0.001	0.044*
	(0.012)	(0.022)	(0.031)	(0.039)	(0.019)
	[0.015,0.063]	[0.007,0.094]	[-0.040,0.082]	[-0.077,0.076]	[0.006,0.082]
δ (wg)	0.034***	0.029	0.013	0.007	0.052***
	(0.010)	(0.019)	(0.022)	(0.037)	(0.015)
	[0.015,0.053]	[-0.007,0.066]	[-0.030,0.055]	[-0.065,0.080]	[0.022,0.082]
N	5,669	1,243	1,158	759	2,509
N (old)	3,247	707	634	475	1,431

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 79: Employment retention, low pay occupation: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.023	-0.075	0.027	0.003	-0.016
	(0.024)	(0.049)	(0.053)	(0.075)	(0.037)
	[-0.071,0.024]	[-0.172,0.021]	[-0.076,0.130]	[-0.144,0.149]	[-0.089,0.058]
δ (old)	-0.017	-0.065	-0.011	-0.006	0.009
	(0.028)	(0.062)	(0.066)	(0.079)	(0.044)
	[-0.072,0.038]	[-0.186,0.056]	[-0.140,0.118]	[-0.161,0.149]	[-0.077,0.094]
δ (wg)	-0.021	-0.069	0.023	0.002	-0.013
	(0.023)	(0.046)	(0.049)	(0.069)	(0.035)
	[-0.065,0.023]	[-0.159,0.021]	[-0.073,0.119]	[-0.133,0.136]	[-0.081,0.054]
N	9,318	2,098	1,736	1,607	3,877
N	5,464	1,223	947	1,037	2,257

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2012.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 80: Change in conditional hours, low pay occupation: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.695	-1.336	-1.919	-2.273	-0.307
	(0.636)	(1.330)	(1.320)	(2.400)	(0.838)
	[-1.941,0.551]	[-3.942,1.271]	[-4.506,0.669]	[-6.977,2.432]	[-1.949,1.335]
δ (old)	-0.869	-2.997+	-0.718	-2.375	-0.611
	(0.761)	(1.720)	(1.695)	(2.593)	(1.014)
	[-2.362,0.623]	[-6.369,0.374]	[-4.041,2.604]	[-7.456,2.707]	[-2.598,1.375]
δ (wg)	-0.647	-1.242	-1.748	-2.192	-0.279
	(0.590)	(1.242)	(1.232)	(2.207)	(0.778)
	[-1.804,0.511]	[-3.678,1.193]	[-4.162,0.667]	[-6.518,2.134]	[-1.804,1.245]
N	5,745	1,248	1,184	766	2,547
N (old)	3,292	711	649	479	1,453

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

C.2 Low-paying industries

Table 81: Low pay industry: cleaning (PT women) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.090***	0.096	-0.571
	(0.005)	(0.064)	(0.717)
	[0.080,0.101]	[-0.030,0.222]	[-1.976,0.834]
δ (old)	0.097***	0.099	0.057
	(0.002)	(0.070)	(0.741)
	[0.094,0.101]	[-0.039,0.236]	[-1.395,1.508]
δ (wg)	0.084***	0.090	-0.576
	(0.005)	(0.059)	(0.659)
	[0.074,0.094]	[-0.026,0.206]	[-1.869,0.716]
N	1,116	1,880	1,138
N (old)	654	1,100	664

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2012.

[+] p<0.10, [*] p<0.05, [**] p<0.01, [***] p<0.001

Table 82: Low pay industry: cleaning (PT women) (2016), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.018***	0.040	0.513
	(0.004)	(0.065)	(0.692)
	[0.010,0.026]	[-0.087,0.167]	[-0.843,1.869]
δ (old)	0.023***	0.071	0.400
	(0.001)	(0.068)	(0.662)
	[0.021,0.024]	[-0.062,0.204]	[-0.898,1.697]
δ (wg)	0.017***	0.040	0.473
	(0.004)	(0.062)	(0.660)
	[0.010,0.025]	[-0.081,0.161]	[-0.820,1.766]
N	1,189	1,904	1,207
N (old)	761	1,230	772

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2012.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 83: Low pay industry: food processing (FT men) (2015), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.042***	-0.056	-0.474
	(0.005)	(0.050)	(0.896)
	[0.032,0.051]	[-0.154,0.042]	[-2.231,1.282]
δ (old)	0.065***	-0.057	-0.969
	(0.008)	(0.075)	(1.102)
	[0.049,0.082]	[-0.203,0.090]	[-3.129,1.191]
δ (wg)	0.040***	-0.053	-0.412
	(0.004)	(0.047)	(0.831)
	[0.032,0.049]	[-0.145,0.039]	[-2.041,1.217]
N	1,229	1,657	1,244
N (old)	702	942	708

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 84: Low pay industry: food processing (FT men) (2016), ASHE

	wages	retention	hours
	(1)	(2)	(3)
δ	0.019***	0.011	-0.429
	(0.004)	(0.050)	(0.890)
	[0.010,0.028]	[-0.088,0.110]	[-2.172,1.315]
δ (old)	0.021**	0.022	-0.049
	(0.007)	(0.064)	(0.923)
	[0.008,0.034]	[-0.104,0.147]	[-1.859,1.760]
δ (wg)	0.018***	0.009	-0.363
	(0.004)	(0.048)	(0.844)
	[0.010,0.027]	[-0.086,0.104]	[-2.016,1.291]
N	1,269	1,693	1,286
N (old)	797	1,052	810

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 85: Low pay industry: social care (FT and PT women), 2015 (ASHE)

	FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.038***	-0.001	0.588	0.051***	-0.025	-0.072
	(0.004)	(0.030)	(0.581)	(0.004)	(0.031)	(0.498)
	[0.030,0.046]	[-0.060,0.057]	[-0.551,1.727]	[0.044,0.058]	[-0.085,0.036]	[-1.048,0.905]
δ (old)	0.053***	-0.017	0.374	0.062***	0.046	-0.325
	(0.006)	(0.046)	(1.132)	(0.005)	(0.045)	(0.743)
	[0.041,0.066]	[-0.107,0.073]	[-1.845,2.593]	[0.052,0.072]	[-0.043,0.136]	[-1.780,1.131]
δ (wg)	0.037***	0.000	0.554	0.048***	-0.020	-0.050
	(0.004)	(0.028)	(0.545)	(0.003)	(0.029)	(0.466)
	[0.029,0.044]	[-0.054,0.055]	[-0.514,1.622]	[0.042,0.055]	[-0.077,0.037]	[-0.963,0.863]
N	3,067	4,127	3,141	3,068	4,361	3,140
N (old)	1,764	2,312	1,804	1,784	2,518	1,821

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 86: Low pay industry: social care (FT and PT women), 2016 (ASHE)

	FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.025***	-0.027	-0.725	0.025***	-0.018	-0.674
	(0.005)	(0.032)	(0.598)	(0.004)	(0.033)	(0.658)
	[0.016,0.033]	[-0.090,0.037]	[-1.897,0.447]	[0.017,0.033]	[-0.083,0.048]	[-1.964,0.616]
δ (old)	0.022***	-0.028	-1.260	0.022***	-0.006	-0.720
	(0.006)	(0.043)	(0.921)	(0.005)	(0.043)	(1.204)
	[0.009,0.034]	[-0.112,0.057]	[-3.065,0.544]	[0.011,0.032]	[-0.090,0.078]	[-3.080,1.640]
δ (wg)	0.024***	-0.028	-0.717	0.024***	-0.016	-0.649
	(0.004)	(0.031)	(0.576)	(0.004)	(0.032)	(0.633)
	[0.015,0.032]	[-0.089,0.033]	[-1.847,0.412]	[0.017,0.032]	[-0.079,0.047]	[-1.888,0.591]
N	3,185	4,332	3,251	3,189	4,557	3,251
N (old)	1,998	2,655	2,032	2,007	2,890	2,042

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 87: Growth in real wages, low pay industry: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.036***	0.025***	0.029***	0.038***	0.041***
	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)
	[0.030,0.041]	[0.015,0.035]	[0.023,0.036]	[0.030,0.046]	[0.032,0.049]
δ (old)	0.056***	0.047***	0.054***	0.048***	0.062***
	(0.005)	(0.008)	(0.007)	(0.006)	(0.007)
	[0.047,0.065]	[0.030,0.063]	[0.039,0.068]	[0.036,0.061]	[0.049,0.075]
δ (wg)	0.035***	0.025***	0.029***	0.037***	0.041***
	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)
	[0.030,0.040]	[0.016,0.034]	[0.023,0.035]	[0.030,0.044]	[0.033,0.048]
N	21,996	4,359	4,582	2,381	10,674
N (old)	10,963	2,400	2,394	1,197	4,972

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 88: Employment retention, low pay industry: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.014	0.009	0.010	0.028	-0.038*
	(0.012)	(0.026)	(0.023)	(0.038)	(0.018)
	[-0.037,0.009]	[-0.041,0.060]	[-0.036,0.056]	[-0.046,0.102]	[-0.073,-0.004]
δ (old)	-0.037*	0.076+	0.018	0.031	-0.093***
	(0.017)	(0.045)	(0.041)	(0.049)	(0.024)
	[-0.070,-0.003]	[-0.012,0.164]	[-0.062,0.098]	[-0.065,0.128]	[-0.140,-0.045]
δ (wg)	-0.014	0.011	0.010	0.025	-0.039*
	(0.011)	(0.024)	(0.022)	(0.035)	(0.017)
	[-0.035,0.008]	[-0.037,0.058]	[-0.033,0.053]	[-0.044,0.094]	[-0.071,-0.006]
N	27,526	5,465	5,430	3,329	13,302
N (old)	13,871	3,035	2,841	1,709	6,286

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 89: Change in conditional hours, low pay industry: retail (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.028	0.068	-0.222	-0.046	0.262
	(0.114)	(0.276)	(0.350)	(0.740)	(0.199)
	[-0.195,0.251]	[-0.474,0.609]	[-0.908,0.464]	[-1.498,1.405]	[-0.129,0.652]
δ (old)	0.257	0.202	0.226	0.779	0.461
	(0.254)	(2.292)	(2.078)	(2.172)	(0.559)
	[-0.241,0.756]	[-4.291,4.694]	[-3.846,4.298]	[-3.478,5.035]	[-0.634,1.557]
δ (wg)	0.037	0.074	-0.194	-0.006	0.251
	(0.108)	(0.262)	(0.328)	(0.691)	(0.191)
	[-0.174,0.249]	[-0.440,0.587]	[-0.838,0.449]	[-1.359,1.348]	[-0.123,0.625]
N	22,159	4,377	4,637	2,391	10,754
N (old)	11,040	2,408	2,420	1,201	5,011

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 90: Growth in real wages, low pay industry: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.051***	0.034***	0.041***	0.068***	0.065***
	(0.004)	(0.008)	(0.007)	(0.005)	(0.008)
	[0.044,0.058]	[0.019,0.049]	[0.026,0.055]	[0.057,0.078]	[0.049,0.081]
δ (old)	0.068***	0.050***	0.048***	0.027***	0.081***
	(0.002)	(0.010)	(0.007)	(0.001)	(0.003)
	[0.064,0.072]	[0.031,0.069]	[0.035,0.061]	[0.026,0.029]	[0.075,0.088]
δ (wg)	0.049***	0.034***	0.039***	0.064***	0.062***
	(0.003)	(0.007)	(0.007)	(0.005)	(0.007)
	[0.043,0.055]	[0.020,0.048]	[0.026,0.051]	[0.055,0.074]	[0.048,0.076]
N	7,554	1,994	1,792	1,070	2,698
N (old)	4,464	1,142	1,003	686	1,633

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 91: Growth in real wages, low pay industry: hospitality (ASHE) 2016

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.013***	0.006	0.011+	0.017***	0.018***
	(0.002)	(0.007)	(0.006)	(0.004)	(0.004)
	[0.009,0.018]	[-0.008,0.021]	[-0.000,0.021]	[0.009,0.024]	[0.010,0.026]
δ (old)	0.012***	0.006	0.006	0.017***	0.017***
	(0.002)	(0.009)	(0.006)	(0.001)	(0.002)
	[0.008,0.015]	[-0.011,0.023]	[-0.006,0.018]	[0.016,0.018]	[0.012,0.021]
δ (wg)	0.013***	0.007	0.010+	0.015***	0.017***
	(0.002)	(0.007)	(0.005)	(0.003)	(0.004)
	[0.008,0.017]	[-0.007,0.021]	[-0.000,0.021]	[0.008,0.022]	[0.010,0.025]
N	7,783	2,064	1,821	1,111	2,787
N (old)	4,958	1,270	1,134	757	1,797

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 92: Employment retention, low pay industry: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.018	-0.061	-0.020	-0.039	0.050
	(0.023)	(0.042)	(0.045)	(0.069)	(0.044)
	[-0.063,0.028]	[-0.143,0.021]	[-0.108,0.068]	[-0.173,0.095]	[-0.037,0.137]
δ (old)	-0.016	-0.024	-0.080	-0.050	0.073
	(0.026)	(0.053)	(0.057)	(0.072)	(0.048)
	[-0.067,0.036]	[-0.128,0.080]	[-0.191,0.031]	[-0.190,0.091]	[-0.020,0.167]
δ (wg)	-0.015	-0.054	-0.022	-0.037	0.051
	(0.021)	(0.039)	(0.042)	(0.063)	(0.041)
	[-0.057,0.027]	[-0.130,0.022]	[-0.104,0.060]	[-0.160,0.086]	[-0.029,0.131]
N	12,655	3,232	2,703	2,221	4,499
N (old)	7,572	1,881	1,518	1,460	2,713

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 93: Employment retention, low pay industry: hospitality (ASHE) 2016

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.022	0.013	-0.009	0.017	0.075+
	(0.022)	(0.041)	(0.045)	(0.061)	(0.040)
	[-0.021,0.065]	[-0.068,0.094]	[-0.097,0.079]	[-0.103,0.137]	[-0.003,0.152]
δ (old)	0.040+	0.036	-0.017	0.017	0.102*
	(0.024)	(0.049)	(0.052)	(0.064)	(0.042)
	[-0.007,0.088]	[-0.060,0.132]	[-0.120,0.085]	[-0.108,0.142]	[0.019,0.184]
δ (wg)	0.022	0.015	-0.011	0.017	0.071+
	(0.021)	(0.040)	(0.043)	(0.058)	(0.038)
	[-0.019,0.063]	[-0.062,0.093]	[-0.095,0.074]	[-0.097,0.132]	[-0.003,0.145]
N	13,198	3,399	2,815	2,328	4,656
N (old)	8,569	2,166	1,734	1,629	3,040

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 94: Change in conditional hours, low pay industry: hospitality (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.247	-1.093	0.415	-2.179	-0.153
	(0.502)	(0.789)	(0.737)	(1.675)	(0.611)
	[-1.232,0.737]	[-2.639,0.453]	[-1.030,1.860]	[-5.462,1.104]	[-1.350,1.044]
δ (old)	0.052	-1.747+	1.274	-2.094	0.049
	(0.678)	(0.978)	(0.903)	(1.615)	(0.654)
	[-1.277,1.381]	[-3.663,0.170]	[-0.495,3.044]	[-5.259,1.071]	[-1.232,1.330]
δ (wg)	-0.187	-1.033	0.444	-1.922	-0.077
	(0.465)	(0.736)	(0.689)	(1.537)	(0.563)
	[-1.099,0.724]	[-2.476,0.411]	[-0.906,1.794]	[-4.934,1.091]	[-1.181,1.027]
N	7,661	1,998	1,840	1,078	2,745
N (old)	4,522	1,145	1,028	691	1,658

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 95: Change in conditional hours, low pay industry: hospitality (ASHE) 2016

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.719	1.398+	1.094	-0.664	0.429
	(0.598)	(0.807)	(0.734)	(1.429)	(0.565)
	[-0.452,1.891]	[-0.184,2.980]	[-0.346,2.533]	[-3.465,2.137]	[-0.678,1.536]
δ (old)	1.148	1.783*	1.981*	0.277	0.836
	(0.816)	(0.879)	(0.842)	(1.347)	(0.582)
	[-0.452,2.748]	[0.061,3.505]	[0.330,3.631]	[-2.363,2.916]	[-0.304,1.977]
δ (wg)	0.714	1.354+	1.095	-0.577	0.442
	(0.573)	(0.775)	(0.705)	(1.363)	(0.539)
	[-0.409,1.838]	[-0.164,2.873]	[-0.286,2.477]	[-3.249,2.094]	[-0.614,1.497]
N	7,881	2,068	1,862	1,121	2,830
N (old)	5,015	1,274	1,156	765	1,820

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

C.3 Regions

Table 96: Growth in real wages: London (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.052***	0.054**	0.059***	0.050***	0.048***
	(0.006)	(0.017)	(0.011)	(0.007)	(0.007)
	[0.040,0.065]	[0.020,0.088]	[0.037,0.081]	[0.036,0.065]	[0.035,0.062]
δ (old)	0.056***	0.046	0.064	0.049***	0.056***
	(0.011)	(0.050)	(0.047)	(0.006)	(0.006)
	[0.034,0.077]	[-0.051,0.144]	[-0.027,0.156]	[0.037,0.060]	[0.043,0.068]
δ (wg)	0.049***	0.050**	0.055***	0.045***	0.046***
	(0.006)	(0.016)	(0.010)	(0.007)	(0.006)
	[0.038,0.060]	[0.019,0.082]	[0.035,0.075]	[0.032,0.059]	[0.033,0.058]
N	4,803	1,272	1,119	758	1,654
N (old)	3,019	799	699	480	1,041

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 97: Employment retention: London (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	0.008	-0.076	0.032	-0.035	0.048
	(0.025)	(0.050)	(0.051)	(0.065)	(0.042)
	[-0.041,0.057]	[-0.173,0.022]	[-0.068,0.133]	[-0.161,0.092]	[-0.035,0.130]
δ (old)	0.046	-0.114	0.111	0.012	0.069
	(0.032)	(0.070)	(0.074)	(0.074)	(0.054)
	[-0.017,0.110]	[-0.251,0.023]	[-0.033,0.256]	[-0.132,0.157]	[-0.036,0.175]
δ (wg)	0.009	-0.072	0.032	-0.030	0.045
	(0.023)	(0.046)	(0.048)	(0.060)	(0.039)
	[-0.037,0.054]	[-0.163,0.019]	[-0.062,0.127]	[-0.147,0.087]	[-0.032,0.122]
N	8,276	2,188	1,798	1,517	2,773
N (old)	5,161	1,384	1,096	975	1,706

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 98: Change in conditional hours: London (ASHE) 2015

	All	FT men	FT women	PT men	PT women
	(1)	(2)	(3)	(4)	(5)
δ	-0.366	0.013	1.326	0.269	-1.655***
	(0.346)	(0.823)	(0.930)	(1.407)	(0.499)
	[-1.045,0.312]	[-1.600,1.626]	[-0.497,3.149]	[-2.488,3.026]	[-2.633,-0.677]
δ (old)	-0.340	1.392	2.006	0.198	-2.108***
	(0.432)	(2.430)	(2.381)	(1.506)	(0.630)
	[-1.188,0.507]	[-3.372,6.155]	[-2.661,6.673]	[-2.754,3.150]	[-3.342,-0.874]
δ (wg)	-0.341	0.037	1.256	0.203	-1.551***
	(0.323)	(0.765)	(0.878)	(1.299)	(0.466)
	[-0.975,0.293]	[-1.461,1.536]	[-0.464,2.977]	[-2.343,2.749]	[-2.463,-0.638]
N	4,863	1,278	1,146	763	1,676
N (old)	3,050	803	714	482	1,051

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 99: East of England (FT men, FT women, and PT women) 2015 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.047***	0.026	0.401	0.037***	-0.034	0.648	0.051***	0.004	0.154
	(0.009)	(0.043)	(0.651)	(0.006)	(0.045)	(0.717)	(0.006)	(0.035)	(0.320)
	[0.029,0.064]	[-0.058,0.111]	[-0.874,1.676]	[0.025,0.048]	[-0.123,0.055]	[-0.758,2.053]	[0.039,0.063]	[-0.065,0.072]	[-0.474,0.782]
δ (old)	0.052	0.147*	2.046	0.040***	-0.061	1.542	0.072***	0.039	-0.133
	(0.037)	(0.065)	(2.119)	(0.009)	(0.067)	(2.851)	(0.010)	(0.047)	(0.457)
	[-0.021,0.125]	[0.019,0.275]	[-2.107,6.200]	[0.021,0.058]	[-0.193,0.071]	[-4.045,7.129]	[0.053,0.091]	[-0.054,0.131]	[-1.028,0.763]
δ (wg)	0.044***	0.030	0.416	0.035***	-0.035	0.618	0.049***	0.004	0.128
	(0.008)	(0.041)	(0.607)	(0.005)	(0.043)	(0.673)	(0.005)	(0.033)	(0.301)
	[0.029,0.060]	[-0.049,0.110]	[-0.774,1.606]	[0.024,0.045]	[-0.118,0.048]	[-0.702,1.938]	[0.039,0.060]	[-0.060,0.069]	[-0.462,0.718]
N	1,647	2,332	1,658	1,442	1,918	1,470	2,668	3,693	2,692
N (old)	1,009	1,406	1,018	891	1,168	910	1,542	2,101	1,554

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 100: East of England (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.009	0.067	-0.191	0.020***	0.048	-0.641	0.007+	0.079*	0.144
	(0.008)	(0.044)	(0.554)	(0.006)	(0.044)	(0.604)	(0.004)	(0.036)	(0.360)
	[-0.007,0.024]	[-0.019,0.153]	[-1.278,0.895]	[0.009,0.031]	[-0.039,0.135]	[-1.824,0.542]	[-0.001,0.014]	[0.008,0.149]	[-0.561,0.849]
δ (old)	-0.010	0.131*	0.804	0.005	-0.015	-1.110	0.002	0.114**	0.056
	(0.010)	(0.057)	(1.836)	(0.008)	(0.057)	(1.666)	(0.005)	(0.044)	(0.482)
	[-0.029,0.009]	[0.019,0.243]	[-2.794,4.403]	[-0.012,0.021]	[-0.126,0.097]	[-4.376,2.156]	[-0.008,0.011]	[0.028,0.201]	[-0.889,1.001]
δ (wg)	0.008	0.064	-0.179	0.019***	0.044	-0.618	0.007+	0.077*	0.138
	(0.007)	(0.042)	(0.533)	(0.005)	(0.043)	(0.580)	(0.004)	(0.035)	(0.345)
	[-0.007,0.023]	[-0.019,0.147]	[-1.224,0.867]	[0.009,0.030]	[-0.040,0.128]	[-1.756,0.519]	[-0.001,0.014]	[0.010,0.145]	[-0.537,0.813]
N	1,767	2,478	1,776	1,572	2,102	1,602	2,732	3,814	2,758
N (old)	1,165	1,623	1,172	1,031	1,369	1,053	1,701	2,373	1,717

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 101: East Midlands (FT men, FT women, and PT women) 2015 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.039***	-0.034	0.147	0.053***	0.050	-0.706	0.049***	-0.021	0.174
	(0.006)	(0.041)	(0.640)	(0.007)	(0.043)	(0.573)	(0.004)	(0.040)	(0.421)
	[0.028,0.050]	[-0.115,0.047]	[-1.107,1.401]	[0.039,0.066]	[-0.034,0.134]	[-1.830,0.418]	[0.040,0.057]	[-0.099,0.057]	[-0.650,0.999]
δ (old)	0.053***	0.091	-0.079	0.074***	0.018	-2.226**	0.074***	-0.034	-0.191
	(0.009)	(0.056)	(2.065)	(0.013)	(0.058)	(0.750)	(0.007)	(0.054)	(0.822)
	[0.035,0.070]	[-0.020,0.201]	[-4.126,3.968]	[0.047,0.100]	[-0.096,0.132]	[-3.696,-0.756]	[0.060,0.087]	[-0.140,0.071]	[-1.803,1.421]
δ (wg)	0.038***	-0.027	0.112	0.051***	0.047	-0.717	0.048***	-0.021	0.128
	(0.005)	(0.039)	(0.602)	(0.007)	(0.040)	(0.530)	(0.004)	(0.037)	(0.398)
	[0.028,0.048]	[-0.102,0.049]	[-1.068,1.291]	[0.038,0.064]	[-0.032,0.125]	[-1.756,0.323]	[0.040,0.056]	[-0.094,0.052]	[-0.651,0.907]
N	1,779	2,425	1,790	1,604	2,134	1,648	2,227	3,100	2,257
N (old)	1,101	1,487	1,106	937	1,255	958	1,108	1,586	1,123

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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Table 102: East Midlands (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.009	0.001	-0.763	0.014**	0.010	-0.132	0.008*	-0.003	-0.257
	(0.006)	(0.041)	(0.694)	(0.005)	(0.042)	(0.461)	(0.004)	(0.040)	(0.451)
	[-0.002,0.020]	[-0.079,0.082]	[-2.123,0.597]	[0.005,0.023]	[-0.073,0.093]	[-1.035,0.771]	[0.000,0.016]	[-0.081,0.075]	[-1.141,0.627]
δ (old)	0.006	-0.006	-1.474	0.013*	-0.002	-0.171	0.005	0.011	-0.283
	(0.008)	(0.050)	(1.295)	(0.006)	(0.052)	(0.762)	(0.005)	(0.049)	(0.750)
	[-0.010,0.023]	[-0.104,0.092]	[-4.012,1.064]	[0.001,0.024]	[-0.105,0.101]	[-1.665,1.322]	[-0.005,0.016]	[-0.084,0.107]	[-1.752,1.187]
δ (wg)	0.008	0.001	-0.739	0.014**	0.008	-0.130	0.008*	-0.002	-0.228
	(0.005)	(0.040)	(0.668)	(0.004)	(0.041)	(0.443)	(0.004)	(0.038)	(0.437)
	[-0.002,0.019]	[-0.076,0.079]	[-2.048,0.571]	[0.005,0.022]	[-0.071,0.088]	[-0.999,0.739]	[0.001,0.016]	[-0.077,0.073]	[-1.085,0.629]
N	1,861	2,564	1,873	1,667	2,219	1,704	2,219	3,073	2,243
N (old)	1,203	1,672	1,210	1,057	1,397	1,078	1,246	1,754	1,261

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 103: North West (FT men, FT women, and PT women) 2015 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.045***	-0.018	-0.172	0.047***	0.028	0.167	0.060***	-0.011	0.214
	(0.006)	(0.035)	(0.351)	(0.005)	(0.036)	(0.554)	(0.003)	(0.031)	(0.316)
	[0.034,0.056]	[-0.086,0.050]	[-0.859,0.516]	[0.039,0.056]	[-0.042,0.098]	[-0.919,1.253]	[0.053,0.066]	[-0.073,0.050]	[-0.405,0.832]
δ (old)	0.064***	0.008	-0.530	0.068***	0.018	0.306	0.078***	0.019	0.348
	(0.015)	(0.051)	(0.499)	(0.007)	(0.055)	(3.133)	(0.003)	(0.040)	(0.471)
	[0.035,0.092]	[-0.092,0.107]	[-1.507,0.448]	[0.054,0.081]	[-0.090,0.126]	[-5.836,6.447]	[0.072,0.083]	[-0.059,0.097]	[-0.576,1.271]
δ (wg)	0.044***	-0.016	-0.173	0.046***	0.028	0.181	0.056***	-0.008	0.198
	(0.005)	(0.033)	(0.329)	(0.004)	(0.034)	(0.523)	(0.003)	(0.029)	(0.295)
	[0.033,0.054]	[-0.080,0.048]	[-0.818,0.472]	[0.037,0.054]	[-0.038,0.094]	[-0.844,1.206]	[0.050,0.062]	[-0.065,0.049]	[-0.381,0.776]
N	2,492	3,388	2,508	2,262	2,972	2,310	3,442	4,696	3,487
N (old)	1,510	2,082	1,520	1,249	1,635	1,274	1,882	2,604	1,909

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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Table 104: North West (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.019***	-0.027	0.451	0.017***	-0.010	-0.633+	0.013***	-0.030	0.132
	(0.005)	(0.036)	(0.383)	(0.004)	(0.038)	(0.375)	(0.003)	(0.033)	(0.311)
	[0.008,0.029]	[-0.097,0.043]	[-0.298,1.201]	[0.009,0.026]	[-0.084,0.065]	[-1.369,0.103]	[0.008,0.019]	[-0.095,0.034]	[-0.477,0.740]
δ (old)	0.012	0.041	0.179	0.011+	-0.024	-0.839	0.015***	-0.015	0.172
	(0.010)	(0.046)	(0.486)	(0.006)	(0.051)	(1.401)	(0.003)	(0.039)	(0.542)
	[-0.008,0.032]	[-0.049,0.131]	[-0.774,1.133]	[-0.000,0.023]	[-0.124,0.075]	[-3.585,1.906]	[0.009,0.022]	[-0.091,0.061]	[-0.891,1.235]
δ (wg)	0.018***	-0.025	0.429	0.017***	-0.010	-0.625+	0.014***	-0.031	0.131
	(0.005)	(0.034)	(0.369)	(0.004)	(0.037)	(0.362)	(0.003)	(0.032)	(0.300)
	[0.008,0.028]	[-0.092,0.043]	[-0.293,1.152]	[0.009,0.025]	[-0.082,0.062]	[-1.335,0.085]	[0.008,0.019]	[-0.092,0.031]	[-0.457,0.719]
N	2,619	3,578	2,634	2,219	2,965	2,260	3,432	4,646	3,466
N (old)	1,719	2,373	1,728	1,352	1,805	1,375	2,049	2,800	2,071

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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Table 105: Scotland (FT men, FT women, and PT women) 2015 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.030***	-0.027	-0.813	0.033***	0.012	0.504	0.048***	0.002	0.001
	(0.006)	(0.049)	(0.512)	(0.007)	(0.044)	(0.529)	(0.006)	(0.037)	(0.310)
	[0.017,0.042]	[-0.122,0.069]	[-1.815,0.190]	[0.019,0.047]	[-0.075,0.099]	[-0.532,1.540]	[0.036,0.061]	[-0.071,0.074]	[-0.606,0.609]
δ (old)	0.046***	0.080	0.184	0.063***	-0.027	0.602	0.063***	-0.049	0.554
	(0.011)	(0.073)	(2.294)	(0.012)	(0.074)	(0.889)	(0.010)	(0.050)	(0.566)
	[0.024,0.067]	[-0.063,0.223]	[-4.313,4.681]	[0.040,0.087]	[-0.172,0.118]	[-1.140,2.345]	[0.045,0.082]	[-0.148,0.049]	[-0.556,1.664]
δ (wg)	0.029***	-0.022	-0.769	0.033***	0.012	0.500	0.046***	-0.000	0.008
	(0.006)	(0.046)	(0.482)	(0.007)	(0.042)	(0.499)	(0.006)	(0.034)	(0.290)
	[0.017,0.041]	[-0.112,0.068]	[-1.714,0.177]	[0.020,0.046]	[-0.070,0.094]	[-0.477,1.478]	[0.035,0.058]	[-0.068,0.068]	[-0.560,0.576]
N	1,488	2,082	1,494	1,579	2,059	1,608	2,471	3,366	2,495
N (old)	895	1,238	897	819	1,087	835	1,239	1,749	1,253

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 106: Scotland (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.012+	0.015	-0.306	0.016*	-0.001	-0.187	0.016**	0.072+	0.238
	(0.007)	(0.049)	(0.447)	(0.007)	(0.048)	(0.542)	(0.005)	(0.038)	(0.327)
	[-0.002,0.026]	[-0.082,0.111]	[-1.182,0.571]	[0.003,0.029]	[-0.094,0.092]	[-1.249,0.874]	[0.006,0.026]	[-0.002,0.147]	[-0.402,0.879]
δ (old)	0.018+	0.003	-0.482	0.026**	0.018	-0.131	0.017	0.056	0.182
	(0.010)	(0.067)	(1.371)	(0.010)	(0.063)	(0.709)	(0.011)	(0.048)	(0.693)
	[-0.002,0.038]	[-0.128,0.134]	[-3.168,2.205]	[0.007,0.045]	[-0.106,0.142]	[-1.520,1.258]	[-0.004,0.038]	[-0.037,0.149]	[-1.177,1.541]
δ (wg)	0.012+	0.015	-0.305	0.016*	-0.001	-0.191	0.015**	0.071+	0.226
	(0.007)	(0.048)	(0.435)	(0.006)	(0.046)	(0.522)	(0.005)	(0.037)	(0.317)
	[-0.001,0.025]	[-0.079,0.108]	[-1.157,0.547]	[0.003,0.028]	[-0.091,0.089]	[-1.214,0.832]	[0.006,0.025]	[-0.001,0.142]	[-0.396,0.848]
N	1,527	2,183	1,533	1,529	2,046	1,557	2,473	3,335	2,492
N (old)	963	1,403	966	886	1,191	902	1,326	1,837	1,338

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 107: South East (FT men, FT women, and PT women) 2015 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.060***	0.003	-0.076	0.033***	0.031	-0.002	0.041***	-0.042	-0.107
	(0.007)	(0.042)	(0.398)	(0.006)	(0.040)	(0.431)	(0.005)	(0.031)	(0.296)
	[0.047,0.073]	[-0.079,0.084]	[-0.857,0.704]	[0.022,0.045]	[-0.048,0.110]	[-0.847,0.843]	[0.032,0.051]	[-0.102,0.018]	[-0.687,0.473]
δ (old)	0.086***	0.104	0.096	0.059***	0.034	-0.031	0.059***	-0.071	0.042
	(0.011)	(0.064)	(0.645)	(0.009)	(0.067)	(2.604)	(0.006)	(0.046)	(0.709)
	[0.066,0.107]	[-0.022,0.229]	[-1.168,1.360]	[0.041,0.078]	[-0.098,0.166]	[-5.136,5.073]	[0.047,0.071]	[-0.161,0.020]	[-1.347,1.430]
δ (wg)	0.058***	0.005	-0.068	0.032***	0.031	0.048	0.040***	-0.038	-0.095
	(0.006)	(0.039)	(0.375)	(0.005)	(0.038)	(0.404)	(0.004)	(0.029)	(0.278)
	[0.046,0.070]	[-0.072,0.081]	[-0.803,0.668]	[0.022,0.043]	[-0.044,0.105]	[-0.743,0.839]	[0.031,0.049]	[-0.094,0.018]	[-0.640,0.450]
N	1,803	2,617	1,806	1,797	2,456	1,832	3,341	4,677	3,371
N (old)	1,154	1,642	1,156	1,132	1,519	1,154	1,950	2,717	1,967

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 108: South East (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.014+	0.066	-0.070	0.005	0.026	-0.245	0.012*	-0.020	0.021
	(0.008)	(0.044)	(0.460)	(0.007)	(0.043)	(0.568)	(0.005)	(0.033)	(0.389)
	[-0.001,0.029]	[-0.019,0.151]	[-0.971,0.831]	[-0.010,0.019]	[-0.059,0.111]	[-1.358,0.868]	[0.002,0.022]	[-0.086,0.045]	[-0.740,0.783]
δ (old)	0.008	0.111+	0.158	0.004	0.077	-0.693	0.008	-0.022	-0.116
	(0.011)	(0.059)	(0.694)	(0.015)	(0.058)	(3.020)	(0.011)	(0.044)	(1.042)
	[-0.013,0.029]	[-0.004,0.226]	[-1.203,1.519]	[-0.026,0.035]	[-0.037,0.190]	[-6.612,5.227]	[-0.014,0.029]	[-0.107,0.064]	[-2.159,1.927]
δ (wg)	0.013+	0.065	-0.063	0.005	0.026	-0.235	0.012*	-0.019	0.021
	(0.007)	(0.042)	(0.444)	(0.007)	(0.042)	(0.542)	(0.005)	(0.032)	(0.377)
	[-0.001,0.028]	[-0.018,0.147]	[-0.934,0.808]	[-0.009,0.019]	[-0.056,0.108]	[-1.298,0.829]	[0.002,0.021]	[-0.082,0.044]	[-0.718,0.761]
N	1,803	2,617	1,806	1,797	2,456	1,832	3,341	4,677	3,371
N (old)	1,154	1,642	1,156	1,132	1,519	1,154	1,950	2,717	1,967

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 109: South West (FT men, FT women, and PT women) 2015 (ASHE)

	FT men			FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.033***	0.091*	-0.429	0.033***	-0.046	-0.278	0.042***	-0.052	0.338
	(0.008)	(0.045)	(0.470)	(0.007)	(0.047)	(0.622)	(0.005)	(0.036)	(0.322)
	[0.018,0.048]	[0.002,0.180]	[-1.350,0.491]	[0.019,0.047]	[-0.139,0.046]	[-1.497,0.940]	[0.033,0.052]	[-0.123,0.020]	[-0.294,0.970]
δ (old)	0.035*	0.146+	-0.652	0.036**	-0.111	-1.042	0.067***	-0.047	1.080*
	(0.015)	(0.082)	(0.744)	(0.014)	(0.077)	(0.930)	(0.006)	(0.053)	(0.539)
	[0.006,0.064]	[-0.014,0.306]	[-2.110,0.807]	[0.009,0.063]	[-0.262,0.039]	[-2.866,0.781]	[0.056,0.078]	[-0.150,0.056]	[0.023,2.137]
δ (wg)	0.032***	0.086*	-0.419	0.031***	-0.044	-0.266	0.043***	-0.050	0.355
	(0.007)	(0.043)	(0.438)	(0.007)	(0.044)	(0.585)	(0.004)	(0.034)	(0.303)
	[0.017,0.046]	[0.003,0.170]	[-1.277,0.439]	[0.018,0.045]	[-0.131,0.043]	[-1.412,0.880]	[0.035,0.052]	[-0.117,0.017]	[-0.240,0.949]
N	1,512	2,081	1,514	1,357	1,839	1,399	2,494	3,463	2,511
N (old)	962	1,299	961	806	1,062	824	1,289	1,824	1,303

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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Table 110: South West (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.003	0.057	0.536	0.024***	0.007	-0.353	0.009+	0.006	0.760*
	(0.009)	(0.048)	(0.471)	(0.007)	(0.050)	(0.658)	(0.005)	(0.038)	(0.350)
	[-0.014,0.020]	[-0.038,0.152]	[-0.388,1.460]	[0.010,0.039]	[-0.090,0.105]	[-1.643,0.937]	[-0.000,0.018]	[-0.068,0.080]	[0.073,1.446]
δ (old)	0.004	0.042	0.822	0.016	-0.084	0.175	0.006	0.042	0.448
	(0.011)	(0.066)	(0.613)	(0.011)	(0.072)	(0.881)	(0.005)	(0.047)	(0.511)
	[-0.019,0.026]	[-0.087,0.171]	[-0.379,2.023]	[-0.006,0.038]	[-0.225,0.056]	[-1.552,1.902]	[-0.004,0.016]	[-0.050,0.135]	[-0.553,1.450]
δ (wg)	0.003	0.054	0.519	0.024***	0.005	-0.333	0.009*	0.007	0.735*
	(0.008)	(0.047)	(0.455)	(0.007)	(0.048)	(0.636)	(0.004)	(0.036)	(0.338)
	[-0.013,0.019]	[-0.037,0.145]	[-0.374,1.411]	[0.010,0.038]	[-0.089,0.100]	[-1.579,0.913]	[0.000,0.017]	[-0.065,0.078]	[0.073,1.397]
N	1,551	2,152	1,560	1,348	1,842	1,390	2,564	3,577	2,578
N (old)	1,034	1,429	1,039	842	1,138	860	1,450	2,059	1,461

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

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Table 111: West Midlands (FT men, FT women, and PT women) 2015 (ASHE)

	FT men			FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.032***	0.072+	-0.074	0.042***	-0.019	-0.154	0.057***	-0.054	-0.201
	(0.006)	(0.039)	(0.361)	(0.006)	(0.039)	(0.357)	(0.003)	(0.035)	(0.305)
	[0.021,0.043]	[-0.006,0.149]	[-0.782,0.634]	[0.031,0.053]	[-0.097,0.058]	[-0.853,0.546]	[0.051,0.064]	[-0.122,0.014]	[-0.799,0.398]
δ (old)	0.059***	0.096	0.013	0.071***	-0.049	0.455	0.075***	-0.048	-0.264
	(0.009)	(0.060)	(0.468)	(0.008)	(0.059)	(0.780)	(0.004)	(0.046)	(0.628)
	[0.041,0.077]	[-0.022,0.214]	[-0.903,0.930]	[0.056,0.085]	[-0.164,0.066]	[-1.073,1.983]	[0.068,0.083]	[-0.138,0.042]	[-1.494,0.966]
δ (wg)	0.031***	0.067+	-0.051	0.041***	-0.021	-0.121	0.055***	-0.051	-0.182
	(0.005)	(0.037)	(0.340)	(0.005)	(0.037)	(0.335)	(0.003)	(0.032)	(0.287)
	[0.021,0.042]	[-0.005,0.140]	[-0.717,0.615]	[0.031,0.052]	[-0.093,0.052]	[-0.779,0.536]	[0.049,0.061]	[-0.115,0.012]	[-0.744,0.379]
N	2,022	2,850	2,037	1,900	2,496	1,926	2,678	3,718	2,713
N (old)	1,234	1,734	1,243	1,071	1,434	1,089	1,452	2,042	1,471

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 112: West Midlands (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.011*	-0.017	0.261	0.021***	-0.026	0.010	0.009**	-0.063+	0.215
	(0.006)	(0.041)	(0.349)	(0.005)	(0.042)	(0.363)	(0.003)	(0.036)	(0.406)
	[0.000,0.022]	[-0.098,0.065]	[-0.424,0.946]	[0.012,0.030]	[-0.109,0.056]	[-0.700,0.721]	[0.003,0.015]	[-0.133,0.007]	[-0.581,1.011]
δ (old)	0.008	-0.030	0.129	0.012*	0.002	0.145	0.008*	-0.025	0.133
	(0.007)	(0.052)	(0.425)	(0.006)	(0.056)	(1.183)	(0.003)	(0.044)	(0.822)
	[-0.006,0.021]	[-0.132,0.072]	[-0.703,0.962]	[0.000,0.023]	[-0.107,0.112]	[-2.174,2.464]	[0.002,0.015]	[-0.110,0.061]	[-1.478,1.743]
δ (wg)	0.011*	-0.016	0.265	0.020***	-0.025	0.016	0.009**	-0.060+	0.212
	(0.005)	(0.040)	(0.337)	(0.004)	(0.041)	(0.350)	(0.003)	(0.034)	(0.393)
	[0.000,0.021]	[-0.094,0.063]	[-0.396,0.925]	[0.011,0.028]	[-0.105,0.054]	[-0.670,0.702]	[0.003,0.015]	[-0.127,0.008]	[-0.559,0.982]
N	2,126	2,990	2,139	1,914	2,551	1,935	2,736	3,808	2,764
N (old)	1,415	1,972	1,424	1,160	1,571	1,178	1,607	2,282	1,621

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 113: Yorkshire (FT men, FT women, and PT women) 2015 (ASHE)

	FT men			FT women			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.032***	0.057	0.110	0.053***	0.007	0.734	0.054***	-0.021	0.406
	(0.006)	(0.041)	(0.769)	(0.005)	(0.042)	(0.457)	(0.005)	(0.035)	(0.353)
	[0.021,0.044]	[-0.024,0.139]	[-1.397,1.616]	[0.042,0.064]	[-0.074,0.089]	[-0.161,1.630]	[0.044,0.064]	[-0.089,0.047]	[-0.286,1.098]
δ (old)	0.076***	0.062	0.255	0.068***	-0.091	0.468	0.073***	-0.022	0.243
	(0.009)	(0.063)	(2.998)	(0.009)	(0.062)	(0.933)	(0.004)	(0.047)	(0.964)
	[0.060,0.093]	[-0.062,0.186]	[-5.621,6.132]	[0.052,0.085]	[-0.213,0.032]	[-1.361,2.297]	[0.065,0.081]	[-0.113,0.070]	[-1.646,2.133]
δ (wg)	0.033***	0.056	0.134	0.050***	0.005	0.711+	0.052***	-0.021	0.390
	(0.006)	(0.039)	(0.725)	(0.005)	(0.039)	(0.429)	(0.005)	(0.032)	(0.329)
	[0.022,0.044]	[-0.020,0.133]	[-1.287,1.555]	[0.040,0.060]	[-0.071,0.082]	[-0.130,1.553]	[0.043,0.061]	[-0.084,0.043]	[-0.255,1.036]
N	1,847	2,565	1,852	1,713	2,219	1,742	2,868	3,811	2,893
N (old)	1,129	1,583	1,134	1,009	1,278	1,022	1,525	2,062	1,534

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 114: Yorkshire (FT men, FT women, and PT women) 2016 (ASHE)

| | FT men | | | FT women | | | PT women | | |
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours	(7) wages	(8) retention	(9) hours
δ	0.013*	-0.059	-0.043	0.006	-0.024	0.020	0.010*	0.034	0.528+
	(0.005)	(0.040)	(0.674)	(0.005)	(0.043)	(0.474)	(0.005)	(0.035)	(0.288)
	[0.003,0.024]	[-0.138,0.020]	[-1.365,1.279]	[-0.004,0.016]	[-0.109,0.062]	[-0.909,0.949]	[0.000,0.020]	[-0.034,0.102]	[-0.035,1.092]
δ (old)	0.021**	-0.061	0.270	0.005	-0.059	-0.047	0.010+	0.065	0.424
	(0.007)	(0.052)	(2.001)	(0.008)	(0.057)	(0.609)	(0.005)	(0.043)	(0.334)
	[0.007,0.034]	[-0.163,0.041]	[-3.652,4.191]	[-0.011,0.021]	[-0.171,0.053]	[-1.240,1.147]	[-0.000,0.019]	[-0.019,0.150]	[-0.230,1.079]
δ (wg)	0.013**	-0.056	-0.034	0.006	-0.024	0.008	0.010*	0.035	0.495+
	(0.005)	(0.039)	(0.655)	(0.005)	(0.042)	(0.458)	(0.005)	(0.033)	(0.278)
	[0.003,0.023]	[-0.132,0.020]	[-1.317,1.249]	[-0.004,0.016]	[-0.106,0.059]	[-0.890,0.906]	[0.001,0.019]	[-0.031,0.100]	[-0.049,1.039]
N	1,935	2,675	1,941	1,727	2,293	1,758	2,858	3,808	2,889
N (old)	1,270	1,778	1,275	1,063	1,392	1,076	1,654	2,262	1,671

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 115: Wales (FT men and PT women) 2015 (ASHE)

	FT men			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.054***	-0.027	0.054***	0.062	0.040	0.062
	(0.010)	(0.058)	(0.010)	(0.541)	(0.054)	(0.541)
	[0.034,0.074]	[-0.141,0.086]	[0.034,0.074]	[-0.998,1.123]	[-0.066,0.146]	[-0.998,1.123]
δ (old)	0.052***	0.121	-0.746	0.045***	-0.032	-0.562
	(0.015)	(0.081)	(0.791)	(0.010)	(0.069)	(0.548)
	[0.023,0.081]	[-0.037,0.279]	[-2.296,0.804]	[0.025,0.065]	[-0.168,0.104]	[-1.637,0.513]
δ (wg)	0.055***	-0.027	-0.986+	0.046***	0.054	0.029
	(0.010)	(0.058)	(0.577)	(0.007)	(0.054)	(0.539)
	[0.036,0.074]	[-0.141,0.086]	[-2.117,0.145]	[0.032,0.060]	[-0.052,0.160]	[-1.027,1.085]
N	1,197	1,591	1,202	1,602	2,127	1,628
N (old)	694	923	696	816	1,068	823

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] $p<0.10$, [*] $p<0.05$, [**] $p<0.01$, [***] $p<0.001$

Table 116: Wales (FT men and PT women) 2016 (ASHE)

	FT men			PT women		
	(1) wages	(2) retention	(3) hours	(4) wages	(5) retention	(6) hours
δ	0.011+	-0.039	-0.111	0.007	0.068	-0.550
	(0.006)	(0.054)	(0.451)	(0.005)	(0.048)	(0.423)
	[-0.002,0.024]	[-0.145,0.066]	[-0.996,0.773]	[-0.003,0.017]	[-0.025,0.161]	[-1.380,0.280]
δ (old)	0.009	-0.018	0.159	0.007	0.025	-0.604
	(0.009)	(0.069)	(0.587)	(0.006)	(0.060)	(0.527)
	[-0.008,0.026]	[-0.153,0.118]	[-0.991,1.309]	[-0.006,0.020]	[-0.091,0.142]	[-1.636,0.429]
δ (wg)	0.011+	-0.040	-0.094	0.007	0.064	-0.555
	(0.006)	(0.052)	(0.436)	(0.005)	(0.046)	(0.409)
	[-0.001,0.023]	[-0.142,0.061]	[-0.948,0.760]	[-0.002,0.016]	[-0.026,0.154]	[-1.357,0.248]
N	1,219	1,652	1,226	1,602	2,128	1,625
N (old)	776	1,040	779	896	1,195	908

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2016. Control years 2011-2014.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 117: North East (PT women) 2015 (ASHE)

	wages	retention	hours
	(1)	(2)	(3)
δ	0.057***	-0.107*	-0.002
	(0.004)	(0.048)	(0.406)
	[0.048,0.066]	[-0.200,-0.013]	[-0.798,0.794]
δ (old)	0.075***	-0.054	0.200
	(0.004)	(0.061)	(0.622)
	[0.067,0.083]	[-0.175,0.066]	[-1.019,1.420]
δ (wg)	0.054***	-0.094*	0.039
	(0.004)	(0.044)	(0.376)
	[0.046,0.062]	[-0.181,-0.007]	[-0.698,0.776]
N	1,551	2,015	1,571
N (old)	769	1,043	779

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 118: North East (PT women) 2016 (ASHE)

	wages	retention	hours
	(1)	(2)	(3)
δ	0.006	-0.064	-0.044
	(0.004)	(0.049)	(0.449)
	[-0.001,0.014]	[-0.161,0.033]	[-0.923,0.836]
δ (old)	0.008*	0.041	-0.013
	(0.003)	(0.060)	(0.673)
	[0.002,0.015]	[-0.076,0.157]	[-1.333,1.306]
δ (wg)	0.006	-0.058	-0.027
	(0.004)	(0.047)	(0.436)
	[-0.001,0.014]	[-0.151,0.035]	[-0.881,0.827]
N	1,551	2,015	1,571
N (old)	810	1,109	820

Authors' calculations from ASHE data (Office for National Statistics, 2018).

Moulton corrected standard errors in parentheses.

Treatment year 2015. Control years 2010-2013.

[+] p<0.10, * p<0.05, ** p<0.01, *** p<0.001