Impact of the National Living Wage using Geographic, Age and Gender Wage Variation

Research report by the Low Pay Commission

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September 2023

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Executive Summary

This study is part of our in-house research programme that extends previously commissioned analysis to study more recent upratings of the minimum wage. This analysis categorises workers (using geography, age, and gender) into groups that are more or less affected by the minimum wage, and compares their labour market outcomes. We should expect a greater impact from the NLW in areas and among groups that are more likely to be low paid. In contrast to much of the previous research that estimates effects on employment retention, this method also enables us to capture all employment change and not just job retention. Outcomes studies include employment, unemployment, hours of work, self-employment, inactivity, and use of zero-hours contracts.

We construct a panel data set of these (region-age-gender cell) segments for each year from 2013 to 2019 using wage data from the Annual Survey of Hours and Earnings (ASHE) and employment outcomes and characteristics from the quarterly Labour Force Survey (LFS). We initially segment the labour market into 20 regions, eight age groups and by gender, which results in 320 separate region/age/gender segments. We then adopt a difference-in-difference estimation approach, using both the bite of the NLW (the ratio of the minimum wage to a specific point on the earnings distribution, in this case the median) and the coverage rate (the proportion of jobs paid at or below the NLW in an area) in 2015 (the baseline year) as two alternative measures of the impact across the different area, age and gender groups. We estimate effects using standard year-on-year panel regressions and also the total differences between 2015 and 2019.

As expected, we found that segments most affected by the minimum wage (those with higher bites or coverage) experienced faster average wage increases. These increases were higher at lower percentiles of the pay distribution. In line with previous findings, we found no evidence of significant negative impacts on employment or hours across the whole period. We did find that the NLW may have boosted participation, as inactivity was significantly reduced without a corresponding increase in unemployment.

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A. Introduction

1 An unexpected step-change in UK minimum wage policy was announced by the Chancellor of the Exchequer, George Osborne, in his July 2015 Budget (HMT, 2015). He announced the introduction of a 'National Living Wage', with a target of 60 per cent of median hourly pay by 2020. For those aged 25

and over, the minimum wage increased from £6.50 in October 2014 to £6.70 in October 2015 and to £7.20 in April 2016. Between April 2015 and April 2016, the NLW increased by 10.8 per cent – its highest annual increase since the 40 pence hike (also a 10.8 per cent increase) in October 2001.

2 Furthermore, the remit of the Low Pay Commission was changed. The Chancellor tasked the Low Pay Commission with plotting a path to reach 60 per cent of median hourly pay by 2020. Previously, the objective had been to have NMW rates that help as many low-paid workers as possible, without damaging their employment prospects. This had been the general guiding principle of the Low Pay Commission since its establishment in 1997 but was only formalised by the Government in 2013 in the remit for the 2014 Report.

3 Up to the introduction of the NLW, the evidence available from research and in-house analysis suggested that while the minimum wage had raised the hourly and weekly earnings of the lowest paid, it had not had detrimental effects on employment or hours. However, that evidence was derived from a period when only around 4 per cent of the adult workforce (about 800,000 workers) were typically directly affected by the minimum wage.

4 From its introduction in April 1999 to the Chancellor's announcement in July 2015, the minimum wage's bite – its value relative to median hourly pay – increased from around 46 per cent to about 52 per cent. In percentage point terms, the NLW was expected to increase the bite by more in 5 years than it had done in the previous 16 years.

5 The Government asked the Office for Budget Responsibility (OBR) to assess the likely impact on jobs by 2020. Its Economic and Fiscal Outlook (OBR, 2015), which accompanied the July 2015 Budget, estimated that the new NLW policy was likely to lead to a loss of 20,000-110,000 jobs, with a central estimate of 60,000. The OBR assumed that half of the impact would come through a reduction in hours, with the rest from jobs. If the whole impact was on employment, the job loss would increase to 120,000. The OBR described this impact on employment as 'fractional', particularly against their prediction of one million more jobs for the economy over the same period. Nevertheless, the new NLW policy represented a greater tolerance for job loss than had previously been the case.

6 In this report, we examine the impact of the introduction of the National Living Wage at £7.20 an hour in April 2016 and its subsequent upratings to £8.21 in April 2019. This study informed our review of the NLW (Low Pay Commission, 2022). The original intention had been to study the impact of the NLW from 2016 to when it met its target of 60 per cent in April 2020. However, the global pandemic made it difficult to distinguish the impacts of the pandemic (with several low-paying sectors locked down) from the impact of increases in the NLW.

7 There are analytical problems that arise when assessing the impact of a national minimum wage. Other than variations by age and a few exemptions for specific workers or particular sectors, the minimum wage is the same rate for all workers. That means that some approaches, most notably those used to assess the impact of minimum wages in cities and States of the United States, are not applicable in the UK. The approach in the UK has tended to compare the labour market outcomes of groups that are more or less affected by changes in the minimum wage. One common method (such as used by Aitken, Dolton, and Riley, 2018 and Capuano, Cockett, Gray and Papoutsaki, 2019) has been to

assess the outcomes at different points on the wage distribution. These researchers compared changes in job retention rates of those directly affected by increases in the minimum wage (the 'treated' group) with those paid just above the minimum wage and thus unaffected by the increases (the 'control' group). This difference-in-difference methodology assumes common trends; essentially that the trends in job retention for the treated and control groups would have been the same in the absence of the treatment (the increase in the minimum wage). While this cannot be directly tested, often the approach is to examine trends prior to any treatment.

8 Another method has been to compare groups of workers, often defined by geography. Although the minimum wage is the same across all regions and countries of the UK, there is considerable variation in pay across those geographies. Thus, a national minimum wage would be expected to have larger impacts in some areas (low-paying ones) than in other areas (high-paying ones). This approach also uses a difference-in-difference methodology, where the intensity of treatment now varies according to the extent to which the minimum wage impacts upon the wage distribution in each region. Studies that have used this spatial approach include Dolton, Rosazza-Bondibene and Stops (2012), Dolton, Rosazza-Bondibene and Wadsworth (2012), Manning (2016), Dickens and Lind (2018) and Dube (2019).

9 An alternative approach by Cengiz, Dube, Lindner, and Zipperer (2019) considers the number of jobs below versus at-or-just-above the minimum wage as the rate changes. This "bunching" approach compares the fall in the number of jobs paying below the minimum to the increase in the number of jobs paying at-or-just-above the minimum wage to provide an estimate for the employment effect of minimum wage increases. Cribb, Giupponi, Joyce, Lindner, Waters, Wernham and Xu (2021) apply this bunching approach across different regional labour markets in the UK. This approach exploits the fact that similar workers will be paid just above or just below the forthcoming NLW depending on where in the UK they are located.

10 In this paper, we exploit the variation in minimum wage exposure by geography, but following the research developed by Manning (2016) and Dube (2019), we also incorporate age and gender differences. We construct an annual panel of area, gender, and age groups to estimate the effects of the NLW on wage distributions and a range of labour market outcomes.

11 Our results first establish that those area-gender-age groups most exposed to the NLW have seen the largest increases in pay and the greatest compression of pay. However, that increased pay does not seem to have led to negative impacts on hours or employment. We found some evidence that labour participation has increased but that has been reflected in reductions in inactivity rather than increases in unemployment. These findings appear robust.

12 In sections B and C, we outline the methodological approach and discuss the data that we use. We present some descriptive labour market analysis in Section D with our results in Section E. We then present some robustness checks in Section F before concluding in Section G.

B. Methodology

13 As we noted in the Introduction, we adopt a methodology similar to that of Manning (2016) and Dube (2019) to identify the impact of the introduction and subsequent increases in the National Living

Wage (NLW). We examine differential changes in labour market outcomes of interest (Y_{it}) across area-gender-age groups that are more or less exposed to the minimum wage. For example, we know that the fraction of workers directly affected by increases in the minimum wage varies across regions, age groups and gender. As such we should expect a greater exposure to the minimum wage in lower-paying areas of the UK, such as the North East, Northern Ireland, or Wales, rather than in London or the South East. Women, who are more likely to work part-time and in lower-paying occupations, are also likely to be more exposed to the minimum wage than men. Similarly, we might expect greater exposure among younger and older age groups than those in mid-career.

14 We model these outcomes as set out in equation (1):

$$Y_{it} = \beta_0 + \sum_{t=2016}^{2019} \varphi_t^{DiD}(D_t . MW_{i,2015}) + \alpha_i + \gamma_t + \beta X_{it} + e_{it} \quad (1)$$

where,

Y_{it} are the various labour market outcomes (the hourly wage, employment rate, unemployment rate, inactivity rate, self-employment share, part-time share and zero hours contracts share) in group i and year t for $t = 2015,..2019$;

α_i are time-invariant group fixed effects;

γ_t are aggregate time dummies; and

X_{it} are other control variables.

15 The $MW_{i,2015}$ captures the baseline exposure to the minimum wage in group i. For each area-gender-age group (i), we measure the exposure to the minimum wage in April 2015 (prior to the announcement of the introduction of the NLW). We use two alternative measures of minimum wage exposure in our analysis: the 'bite' of the NLW in 2015 (as measured by the ratio of the NLW to the median earnings of each area-gender-age group); and the coverage of the NLW in 2015 for each area-gender-age group (the proportion paid below the then upcoming NLW rate of £7.20 an hour).

16 For our analysis in this report, we derive both of these minimum wage exposure measures from the April 2015 Annual Survey of Hours and Earnings (ASHE). For robustness, other base years (2013 and 2014) were tested but the results were largely unchanged. The baseline exposure measures are then interacted with the time effects (Dt) for each year from 2016 to 2019. It is these interactions that allow us to estimate the difference-in-difference parameters (φ_t^{DiD}). We run the model so that we can identify the cumulative effect over the whole post NLW period. Here we define D_t to be zero prior to 2016 and equal to one in the period 2016-19. We also investigate whether there are additional effects as the NLW is further increased beyond 2016. In this case we define four separate dummies D_t to indicate that the observation is post 2016, 2017, 2018 and 2019. As such they capture any cumulative impacts over the years following the 2016 introduction.

17 One of the key assumptions using this type of model is that of common trends. That is, the labour market measures of interest would have evolved in a similar way for both greater and less affected area-gender-age groups in the absence of the introduction of the NLW. While common trends are impossible to test one generally can investigate whether any pre-treatment differences in trends exist. That is made more difficult as a minimum wage policy existed prior to the introduction of the NLW. Indeed, the

minimum wage increased in every October between 2000 and 2015. We would need to go back to before 1997 to a period with limited regulation in the labour market. And the UK labour market has much changed since then. We carry out some placebo tests on the period prior to 2015, when the increases in the minimum wage were more modest.

18 We also control for other factors that may vary among these groups across the UK. We include controls for migration and skill. We use the share of migrants in each area-gender-age group. We use qualifications as a proxy for skills. In our model, we use the proportion of workers with qualifications below Level 3 (equivalent to having a highest educational qualification below A-level) to define the share of low-skilled workers in each area-gender-age group.

19 When estimating our results, we use robust standard errors, clustered at the group level. We also weight the regressions by the population size in the group.

C. Data Sources

20 Our analysis is conducted using the Annual Survey of Hours and Earnings (ASHE) and the quarterly Labour Force Survey (LFS) data over the period from 2013 to 2019. It covers the impact of the increases in the NLW up to 2019, when the NLW increased to £8.21. ASHE provides us with our basic measure of hourly earnings that defines the bite and coverage of the minimum wage. The earnings measure we use is hourly earnings excluding overtime pay (hrpayx). We can derive average and median hourly earnings from this variable for each of the area-gender-age groups from ASHE. Our measures for the labour market outcomes are generally taken from the quarterly LFS but are supplemented on hours worked by ASHE. These can be derived for each of the area-gender-age groups.

21 ASHE is the main source of structural earnings data in the UK and is regarded by the ONS as the best source of earnings information for cross-sectional analysis. It provides information on the level, distribution, and composition of earnings, as well as information on hours worked, gender, age, geography, occupation, and industry. It is a survey of employees completed by employers and conducted in April each year. The sampling frame consists of a one per cent sample of employee jobs in Pay As You Earn income tax schemes obtained from HM Revenue & Customs (HMRC). Self-employed workers are excluded. For this analysis, we use ASHE data from 2013 to 2019.

22 The LFS is the official data source used to measure employment and unemployment. It is a quarterly survey of around 60,000 UK households conducted on a rolling monthly basis and provides information on: employment; unemployment; earnings; and personal and socio-economic characteristics, including gender, ethnicity, and disability. We use LFS data from the second quarter of 2013 to the first quarter of 2020.

23 For the purposes of our analysis, we define minimum wage years as the period from April to March. That is the final year of our analysis, 2019, uses the 2019 ASHE and the quarterly LFS from the second quarter of 2019 to the first quarter of 2020. These periods are pre-Covid so are not affected by measures to control the pandemic outbreak.

24 We create annual panels of area, gender, and age groups. For example, in our base analysis, we use the 20 regions and countries of the UK (Standard Government Office Regions with separate

Metropolitan counties and London divided into inner and outer). We limit our analysis to those aged 25 and over as they were the workers covered by the introduction of the NLW. We define eight age groups (25-29, 30-34, 35-39, 40-45, 45-49, 50-54, 55-59, 60-64) and two genders (male and female). We therefore have 320 separate region/age/sex groups. We also experiment with alternative geographies, such as NUTS2 and travel-to-work areas (TTWAs), and age groups (the larger the number of geographies, the smaller the cell sizes). We will need to aggregate some age groups when we investigate more disaggregated geographies.

D. Descriptive analysis

25 As discussed above, we use two different measures to determine minimum wage exposure in April 2015: coverage (the proportion of working age employees aged 25 and over paid less than the introductory level of the NLW) and bite (the minimum wage as a percent of the median).

Coverage

26 The first – coverage – looks at the proportion of working age employees aged 25 and over paid less than the introductory level of the NLW (£7.20). Table 1 shows that among the region-gender-age groups coverage ranges from 3.2 per cent for 45-49 year old men in the rest of the South East and 50-54 year old men in Outer London to over 25 per cent among the youngest female group in Northern Ireland and the oldest female group in the rest of the North of England. It is noticeable, although not surprising, that the top twenty-five highest region-gender-age groups are all female with eleven of the top twelve being either the youngest (25-30) or the oldest (60-64) age groups. In contrast, none of the twenty-five lowest coverage groups is female. They are all male but are geographically spread.

27 When we consider our regression analyses, we will compare those at the 25th percentile with those at the 75th percentile. The coverage groups at the 25th percentile are: 60-64 year old females from Inner London; 55-59 year old males from the rest of the West Midlands; and 35-39 year old females from Outer London. They all have coverage rates of around 7.5 per cent. The groups at the 75th percentile are: 25-29 year old females from the South West; 45-49 year old females from the rest of North West; and 45-49 year old females from the East Midlands. They have coverage rates of around 15.9 per cent – more than double those at the 25th percentile.

Table 1: Highest and lowest coverage by region-gender-age group, UK, 2015

Highest impact				Lowest impact			
Region	Sex	Age	% < £7.20 in 2015	Region	Sex	Age	% < £7.20 in 2015
Rest of the North	Female	60-64	28.5	Rest of South East	Male	45-49	3.2
Northern Ireland	Female	25-29	27.8	Outer London	Male	55-59	3.2
East Midlands	Female	25-29	24.0	Rest of South East	Male	50-54	3.3
West Yorkshire	Female	60-64	23.5	Rest of West Midlands	Male	45-49	3.4
Tyne & Wear	Female	30-34	23.2	Strathclyde	Male	40-44	3.5
Wales	Female	60-64	23.0	Rest of Scotland	Male	40-44	3.8
Merseyside	Female	25-29	22.6	Rest of South East	Male	40-44	3.9
East Midlands	Female	60-64	22.3	Strathclyde	Male	55-59	3.9
Rest of the North	Female	25-29	22.3	Strathclyde	Male	35-39	3.9
Rest of West Midlands	Female	25-29	22.1	Inner London	Male	30-34	4.1
Wales	Female	25-29	22.0	Rest of Scotland	Male	35-39	4.1
West Midlands	Female	60-64	21.9	Rest of Scotland	Male	50-54	4.2
Rest of Yorkshire & Humberside	Female	60-64	21.8	Rest of Scotland	Male	45-49	4.3
Tyne & Wear	Female	50-54	21.5	Rest of South East	Male	55-59	4.4
Rest of Yorkshire & Humberside	Female	25-29	21.5	East Anglia	Male	50-54	4.6
Rest of North West	Female	25-29	21.4	Rest of Scotland	Male	55-59	4.6
Tyne & Wear	Female	45-49	21.3	Rest of West Midlands	Male	40-44	4.6
South Yorkshire	Female	45-49	21.1	Tyne & Wear	Male	40-44	4.6
Rest of Yorkshire & Humberside	Female	35-39	20.5	West Yorkshire	Male	50-54	4.6
West Midlands	Female	25-29	20.3	Strathclyde	Male	50-54	4.7
West Midlands	Female	50-54	20.1	East Anglia	Male	40-44	4.7
Greater Manchester	Female	25-29	20.1	Rest of South East	Male	35-39	4.7
Rest of Yorkshire & Humberside	Female	30-34	19.7	South West	Male	40-44	4.9
East Midlands	Female	50-54	19.5	Outer London	Male	30-34	4.9
South Yorkshire	Female	55-59	19.3	East Anglia	Male	55-59	5.0
Tyne & Wear	Female	60-64	19.3	Merseyside	Male	45-49	5.2

Source: LPC calculations using ASHE, 2015.

Bite

28 We can see a similar picture when we use the bite as a measure of minimum wage exposure. Table 2 shows that the bite among region-gender-age groups ranges from 35.7 per cent in London for men aged 30-34 years old to 83.4 per cent for 60-64 year old women in the rest of the Northern Region.

In contrast to the coverage measure, there is more diversity by gender in the bite measure. However, only one of the twenty-five highest bite groups is male and just four of the lowest twenty-five bite groups are female.

29 Similar to the regression analysis comparisons for coverage, we will also compare the 25th percentile with the 75th percentile for bite. The bite groups at the 25th percentile are: 45-49 year old males from the West Midlands; 50-54 year old males from Northern Ireland; and 35-39 year old females from Greater Manchester. They all have minimum wage bites of around 53.0 per cent. The groups at the 75th percentile are: 50-54 year old females from the rest of the North West; 45-49 year old females from Wales; and 45-49 year old females from the West Midlands. They have bites of around 68.8 per cent – around a third higher than those at the 25th percentile.

Table 2: Highest and lowest bite by region-gender-age group, UK, 2015

Highest impact				Lowest impact			
Region	Sex	Age	NLW as % of median in 2015	Region	Sex	Age	NLW as % of median in 2015
Rest of the North	Female	60-64	83.4	Inner London	Male	35-39	35.7
West Midlands	Female	60-64	81.9	Rest of South East	Male	40-44	38.5
East Midlands	Female	25-29	81.1	Inner London	Male	30-34	39.3
Rest of Yorkshire & Humberside	Female	25-29	80.4	Outer London	Male	40-44	39.5
South Yorkshire	Female	60-64	80.1	Inner London	Male	45-49	39.8
South Yorkshire	Female	55-59	80.0	Inner London	Female	35-39	40.3
Wales	Female	60-64	79.9	Rest of South East	Male	45-49	40.3
West Yorkshire	Female	60-64	79.7	Inner London	Female	30-34	40.6
East Midlands	Female	60-64	79.0	Inner London	Male	40-44	40.8
Greater Manchester	Female	60-64	78.9	Outer London	Male	50-54	41.6
Rest of North West	Female	60-64	78.0	Rest of South East	Male	50-54	41.7
Northern Ireland	Female	25-29	77.8	Outer London	Male	45-49	41.7
Northern Ireland	Male	25-29	77.8	Outer London	Male	35-39	41.8
Rest of West Midlands	Female	55-59	77.8	East Anglia	Male	50-54	42.0
Merseyside	Female	60-64	77.7	Rest of South East	Male	35-39	42.9
Rest of Yorkshire & Humberside	Female	60-64	77.6	Rest of South East	Male	55-59	43.0
West Midlands	Female	25-29	77.5	East Anglia	Male	40-44	44.1
Northern Ireland	Female	60-64	77.5	Outer London	Male	55-59	44.2
Merseyside	Female	25-29	76.7	East Anglia	Male	45-49	44.2
Wales	Female	25-29	76.7	Inner London	Female	40-44	44.4
Rest of Yorkshire & Humberside	Female	45-49	76.4	Inner London	Male	55-59	45.0
South Yorkshire	Female	25-29	76.0	Outer London	Male	30-34	45.2
Rest of Yorkshire & Humberside	Female	50-54	75.9	East Anglia	Male	35-39	45.3
Tyne & Wear	Female	60-64	75.8	Rest of Scotland	Male	40-44	46.4
Rest of the North	Female	25-29	75.7	Outer London	Female	35-39	46.9

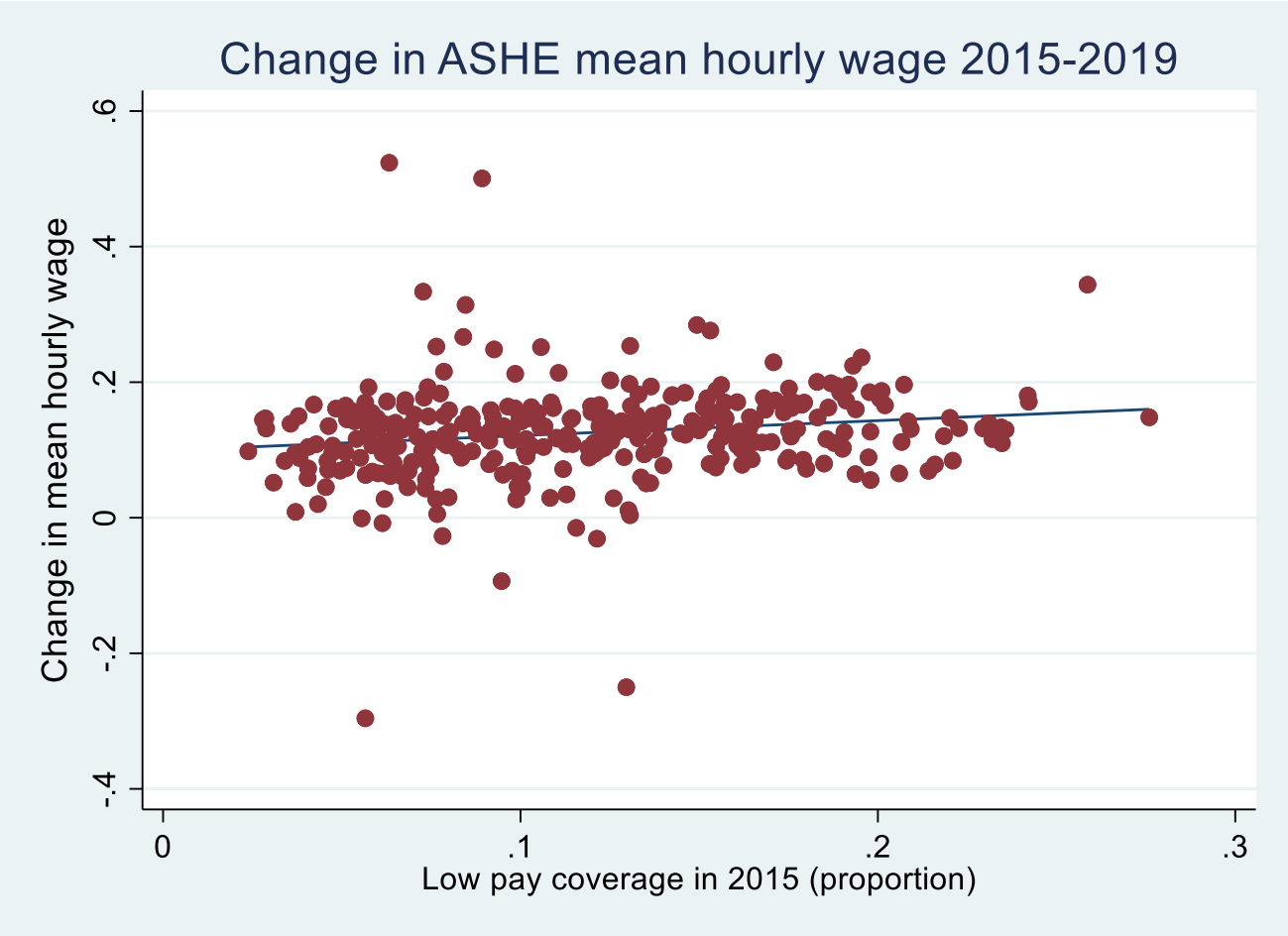
Source: LPC calculations using ASHE, 2015.

30 Although the coverage and bite exposure measures differ, the degree of correlation is high (0.9). This suggests that the results in our impact analyses should be similar irrespective of the exposure measure used.

Wage growth

31 Between April 2015 and April 2019, the NLW increased by 26.3 per cent from £6.50 to £8.21. That compares with an increase at the median of just 11.7 per cent. The NLW was intended to increase the hourly pay of low-paid employees relative to other employees. Figure 1 suggests that has been the case. Each point on the figure represents one of the region-gender- age groups. It shows a positive relationship between minimum wage coverage in 2015 and mean hourly wage growth over the period from 2015 to 2019. The region-gender-age groups with the highest coverage generally had faster wage growth at the mean between 2015 and 2019 than those with groups with lower coverage. A simple regression of minimum wage coverage on the change in hourly pay between 2015 and 2019 shows a significant positive relationship as shown by the regression line in Figure 1 (see Table A1 in Appendix A for further details). Looking at the impact of minimum wage coverage on wage growth at the lowest decile or lowest quartile shows an even stronger relationship.

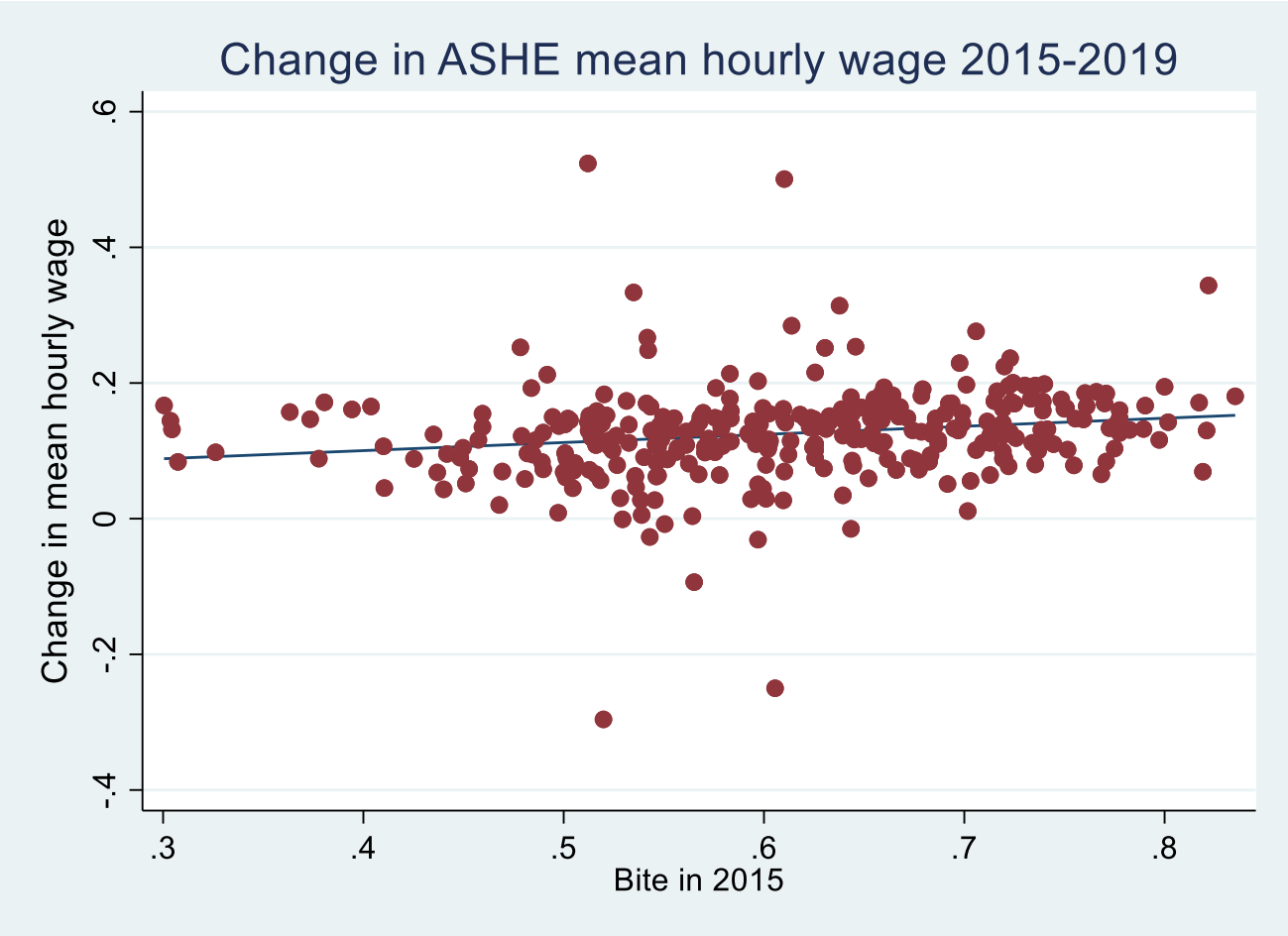
Figure 1: Coverage of the minimum wage and wage growth between 2015 and 2019



Source: LPC estimates based on ASHE, 2015-19.

32 Alongside a positive relationship between minimum wage coverage and wage growth, Figure 2 also suggests a positive relationship between the bite of the minimum wage (its value relative to the median) and wage growth at the mean for the region-gender-age groups. That is, wages on average tended to grow faster between 2015 and 2019 in those region-gender-age groups with the highest bite of the minimum wage. A simple regression of minimum wage bite on the change in hourly pay between 2015 and 2019 shows a significant positive relationship as shown by the regression line in Figure 2 (see Table A2 in Appendix A for further details). Looking at the impact of minimum wage bite on wage growth at the lowest decile or lowest quartile shows an even stronger relationship.

Figure 2: Bite of the minimum wage and wage growth between 2015 and 2019



Source: LPC estimates based on ASHE, 2015-19.

33 This descriptive analysis is suggestive that the NLW has had effects on wages further up the distribution. We will look further at these effects in the more sophisticated regression models that we show and discuss in the next section. Before that, we comment on the labour market outcomes that we investigate.

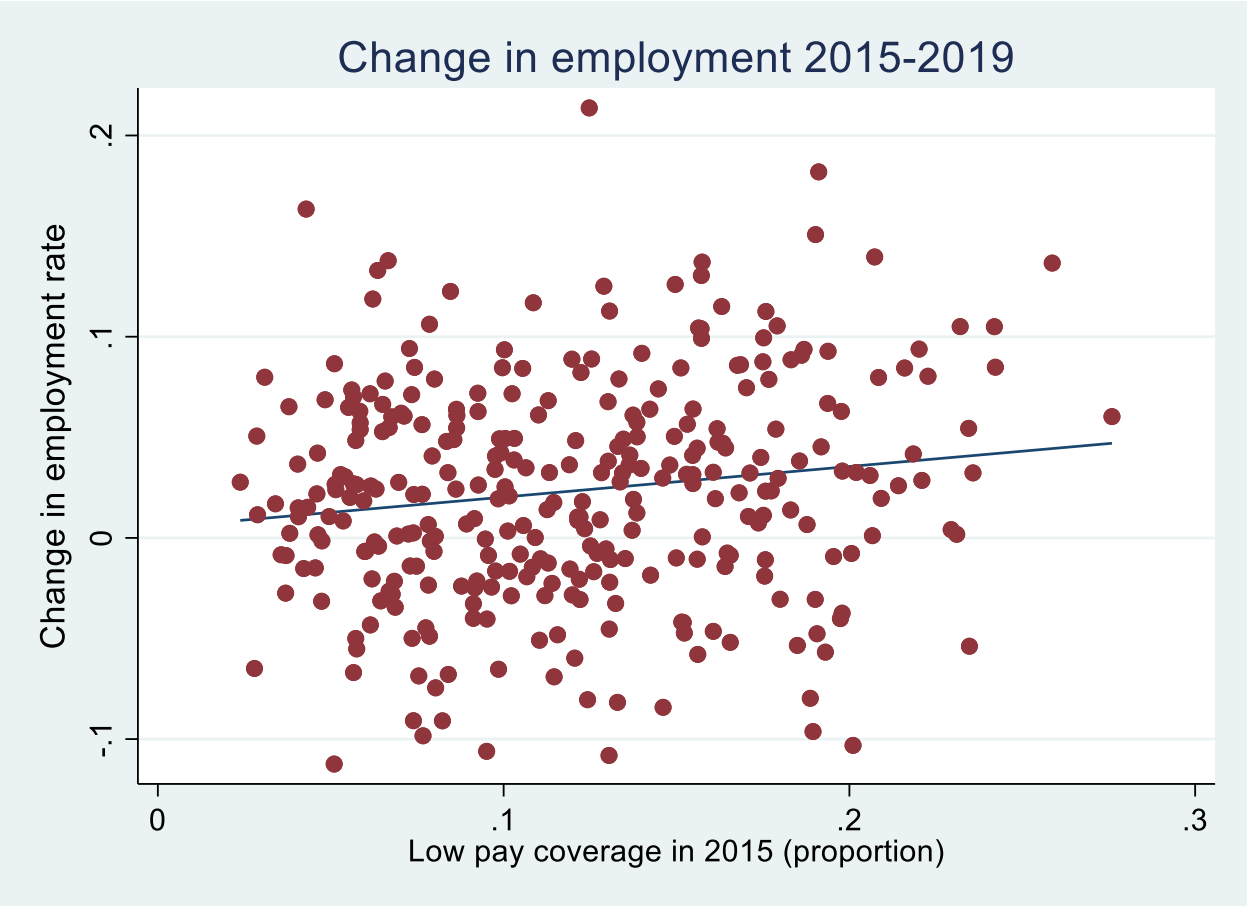
Labour market outcomes

34 The advantage of the methodological approach here is that it captures all employment change, not just job retention. Having shown that there is a positive relationship between minimum wage exposure (whether measured using bite or coverage) and wage growth on average between 2015 and 2019, we

take a similar approach in this section to look at the relationship between minimum wage exposure and change in labour market outcomes.

35 Figure 3 plots the change in the employment rate between 2015 and 2019 against minimum wage coverage in 2015 for all 320 region-gender-age groups. Overall, it shows a positive relationship. That is, the region-gender-age groups with the highest minimum wage coverage in 2015 have tended to have seen larger increases in their employment rates between 2015 and 2019 than those groups with lower coverage. A simple regression for the whole period suggests a significant positive relationship (as shown in Table A3 in Appendix A).

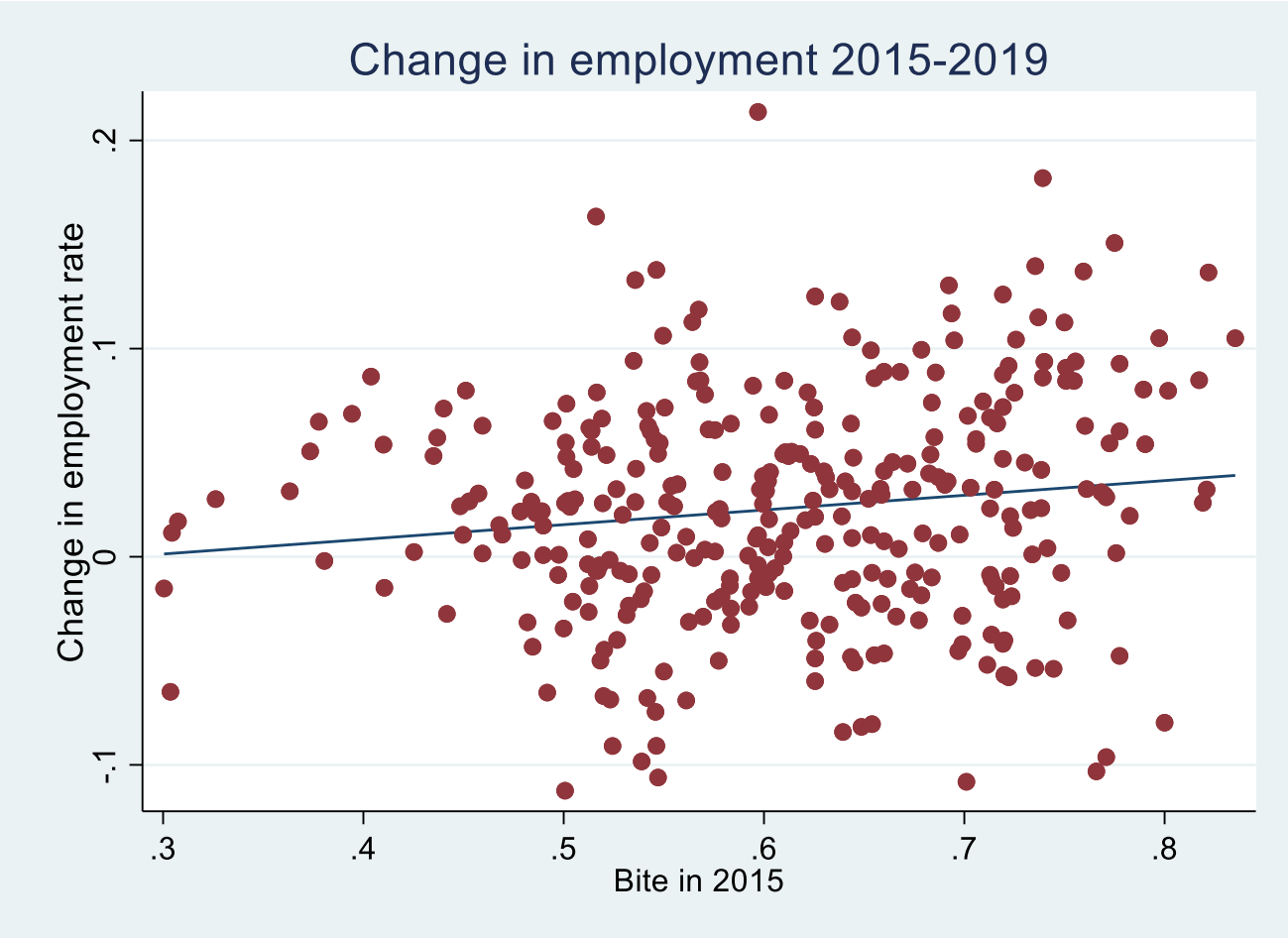
Figure 3: Coverage of the minimum wage and change in employment rate between 2015 and 2019



Source: LPC estimates based on ASHE 2015 and LFS (2015 Q2 to 2020 Q1).

36 Figure 4 plots the change in employment rate between 2015 and 2019 against the minimum wage bite in 2015 for all 320 region-gender-age groups. Overall, it also shows a similar positive relationship to that seen when using minimum wage coverage. A simple regression for the whole period also suggests a significant positive relationship (as shown in Table A4 in Appendix A).

Figure 4: Bite of the minimum wage and change in employment rate between 2015 and 2019



Source: LPC estimates based on ASHE (up to 2019) and LFS (up to 2020 Q1).

37 This descriptive analysis suggests the NLW has not had detrimental net aggregate effects on the employment rates of the most exposed minimum wage workers. Although it can be seen in Figures 3 and 4 that there are some areas with high bite and coverage that have seen falls in employment, there is a clear positive relationship overall between increases in employment, and minimum wage bite and coverage. We will investigate these effects further when we consider our more sophisticated regression models.

38 We also examine the impact of the NLW on a range of other labour market outcomes (hours of work, unemployment, inactivity, self-employment, and zero hours contracts). These are discussed in the next section.

E. Findings

39 The next section sets out our findings.

Wage

40 We now examine the impact of the introduction and subsequent increases in the NLW on average wage growth among our region-gender-age groups. We estimate the model as set out in equation (1) in the methodology section. This wage analysis is conducted using ASHE data. We present estimates for

the years, 2016-2019, where the wage is measured in April each year. All the specifications include area fixed effects and time dummies. We also cluster the standard errors to account for correlated shocks at the region-gender-age group level.

41 In Table 3, we present our estimates of the impact of the NLW on hourly wage growth. Columns 1-4 use the NLW bite as the measure of minimum wage exposure while Columns 5-8 analyse NLW coverage. Columns 1 and 5 look at the impact of the NLW on average hourly pay on its introduction in 2016 and each of its subsequent upratings from 2017 to 2019. Columns 2 and 6 add controls to the regression (as noted earlier these are the migrant share and the low-skill share in each of the region-gender-age groups). Columns 3 and 7 estimate the cumulative effect of the NLW over the whole period from 2015 to 2019 without controls, Columns 4 and 8 show the results using the controls.

Table 3: Impact of the NLW on hourly wages by region-gender-age group, UK, 2013-19

LHS variable	Log (hourly pay)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	0.027**	0.027**	0.044***	0.042***				
	(0.012)	(0.012)	(0.013)	(0.013)				
log(bite)*post-2017	0.020	0.019						
	(0.014)	(0.014)						
log(bite)*post-2018	-0.005	-0.005						
	(0.013)	(0.013)						
log(bite)*post-2019	0.018	0.015						
	(0.011)	(0.011)						
% coverage*post-2016					0.073*	0.072*	0.156***	0.148***
					(0.044)	(0.044)	(0.042)	(0.042)
% coverage*post-2017					0.098**	0.095**		
					(0.045)	(0.045)		
% coverage*post-2018					-0.022	-0.027		
					(0.051)	(0.050)		
% coverage*post-2019					0.082*	0.076*		
					(0.045)	(0.045)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC calculations using ASHE, 2013-19.

42 Table 3 shows that the introduction of the NLW had a significant impact on the average hourly wages of our region-gender-age groups. This is found using both measures of minimum wage exposure (Columns 1-2 and 5-6). However, there does not appear to have been any significant impact from the subsequent NLW upratings when using bite as the measure of minimum wage exposure (Columns 1-2). In contrast, when using minimum wage coverage as the measure of minimum wage exposure

(Columns 5-6), we find significant effects from the upratings in 2017 and 2019. Adding the controls does not affect the magnitude of the coefficients.

43 Taking the period as a whole (Columns 3-4 and 7-8), we find significant impacts of the NLW, which are stronger in all specifications than for just the introduction of the NLW. Interpreting the results is somewhat complex given the different functional forms and minimum wage measures. Perhaps the simplest way to interpret these results is to compare the implied wage changes for a region-gender-age group at the 75th percentile of the coverage distribution and with one at the 25th percentile. For our coverage measure this would mean comparing a group who have around 15 per cent of workers covered to one with 7.5 per cent of workers. An example of a group at the 75th percentile would be females aged 55-60 in Greater Manchester and one at the 25th percentile, females aged 55-60 in Outer London. The estimates suggest that average hourly wages for the group at the 75th percentile have increased by around 1.1 per cent faster than for the 25th percentile group.[1] A similar exercise can be conducted with the bite measure. The bite at the 25th percentile is approximately 53 per cent, compared with 69 per cent at the 75th percentile. The implied hourly wage change there is 1.2 per cent.

44 Overall, we can clearly demonstrate that the NLW significantly increased the average hourly wage in our region-gender-age groups and that the impact was stronger in those groups most exposed to the NLW (whether measured by the minimum wage bite or coverage). Having shown that the NLW has had an effect on wages, we can now look at whether this affected labour market outcomes.

Employment

45 We begin by looking at whether the minimum wage affected the employment rate of the region-gender-age groups. We derive the employment rate from the quarterly Labour Force Survey for each of these groups. We aggregate the quarterly data into minimum wage years (the second quarter of each year to the first quarter of the following year, covering the months from April to March). We then derive an employment rate in each of the minimum wage years. We then run a regression model based on equation (1) to estimate the impact of the NLW on employment. As in Table 3 described above, Columns 1-4 of Table 4 use the bite of NLW and Columns 5-8 use NLW coverage, as the measure of minimum wage exposure.

46 As shown in Table 4, we find no evidence of any significant negative employment effects under any specification – on either measure of minimum wage exposure with or without controls. Indeed, we find some weakly significant positive effects on the employment rate in some specifications. However, these effects fall away or become smaller when we include controls for migration and the share of low-skilled workers in our region-gender-age groups. If we conduct a similar exercise as above and compare groups at the 75th and 25th coverage distribution we see from Column 4 that the employment rate increased by 0.42 percentage points more over the period we considered (2016-2019). Using the same

[1] For example, this is derived from the difference in coverage between the 25th and 75th percentiles multiplied by the co-efficient multiplied by 100 (0.075 * 0.148 *100 = 1.11).

approach with the bite measure, Column 8 shows an increase in the employment rate by 0.39 percentage points.

Table 4: Impact of the NLW on employment by region-gender-age group, UK, 2013-19

LHS variable	Employment rate (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	0.014	0.013	0.019*	0.013				
	(0.011)	(0.011)	(0.010)	(0.010)				
log(bite)*post-2017	-0.001	-0.005						
	(0.010)	(0.010)						
log(bite)*post-2018	0.003	0.004						
	(0.010)	(0.010)						
log(bite)*post-2019	0.018	0.009						
	(0.012)	(0.013)						
% coverage*post-2016					0.059	0.054	0.077*	0.057
					(0.044)	(0.043)	(0.039)	(0.038)
% coverage*post-2017					-0.030	-0.036		
					(0.041)	(0.040)		
% coverage*post-2018					0.034	0.024		
					(0.038)	(0.037)		
% coverage*post-2019					0.095**	0.078*		
					(0.044)	(0.044)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

47 Overall, we can conclude that we did not find any significant impacts of the NLW on the employment rates of our region-gender-age groups. Indeed, there is some evidence of a weak positive effect for the period as a whole.

Hours worked

48 We next look at the impact of the NLW on hours worked. The measure of hours worked is total hours derived from the ASHE data. We use the ASHE data from 2016-2019 to assess the impact of the NLW in each year and then cumulatively over the whole period from 2015 to 2019. As with the previous analysis, Columns 1-4 of Table 5 analyses the impact use the bite of the NLW, while Columns 5-8 considers NLW coverage.

49 When using the bite of the NLW as our measure of minimum wage exposure, we find a statistically significant impact on hours worked. That is, hours fell among those region-gender-age

groups with the highest bite compared with those groups with the lowest bite in 2016. However, these negative effects were reversed in subsequent years whether we include controls or not. Over the whole period, we find no effects of the bite of the NLW on hours worked. Using minimum wage coverage, we again find a negative impact of the introduction of the NLW but, unlike for the bite, it is not significant. We do find some positive effects on hours worked following the upratings in 2018 and 2019. Again, over the whole period, we find no significant effect of NLW coverage on hours worked.

Table 5: Impact of the NLW on hours worked by region-gender-age group, UK, 2015-19

LHS variable	Log (total hours worked)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	-0.021**	-0.021**	0.010	0.008				
	(0.011)	(0.010)	(0.009)	(0.009)				
log(bite)*post-2017	0.025*	0.023*						
	(0.014)	(0.014)						
log(bite)*post-2018	0.017*	0.017*						
	(0.010)	(0.010)						
log(bite)*post-2019	0.017**	0.015*						
	(0.008)	(0.009)						
% coverage*post-2016					-0.065	-0.064	0.059	0.050
					(0.043)	(0.043)	(0.036)	(0.036)
% coverage*post-2017					0.071	0.068		
					(0.045)	(0.045)		
% coverage*post-2018					0.102***	0.097***		
					(0.037)	(0.037)		
% coverage*post-2019					0.076**	0.071**		
					(0.032)	(0.032)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015-2019.

50 In summary, although we found some negative effects of the introduction of the NLW on hours worked when using bite as the measure of minimum wage exposure, these effects are offset by positive effects following subsequent upratings. Overall, we find no impact of the NLW on hours over the whole period from 2015-2019.

Unemployment

51 We next look at whether the NLW has had an impact on unemployment. The measure of unemployment we use is the standard ILO measure (seeking work in the last four weeks and available to start in the next two), which we derive from the quarterly LFS. We aggregate the quarterly data into

minimum wage years and then derive an unemployment rate in each of the minimum wage years for each of our region-gender-age groups. As with the previous analysis, Columns 1-4 of Table 6 analyse the impact using the bite of the NLW, while Columns 5-8 analyse NLW coverage.

52 As shown in Table 6, the only significant impacts of the NLW on the unemployment rate are found in 2018 and then only for the bite measure of minimum wage exposure. No effects are found using the coverage measure.

Table 6: Impact of the NLW on unemployment by region-gender-age group, UK, 2015-19

LHS variable	Unemployment rate (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	0.001	0.001	0.006	0.007				
	(0.005)	(0.004)	(0.004)	(0.004)				
log(bite)*post-2017	0.002	0.002						
	(0.005)	(0.005)						
log(bite)*post-2018	0.009**	0.008**						
	(0.004)	(0.004)						
log(bite)*post-2019	-0.004	-0.002						
	(0.005)	(0.005)						
% coverage*post-2016					-0.011	-0.009	0.008	0.011
					(0.018)	(0.017)	(0.016)	(0.015)
% coverage*post-2017					0.017	0.017		
					(0.019)	(0.019)		
% coverage*post-2018					0.021	0.021		
					(0.016)	(0.016)		
% coverage*post-2019					-0.019	-0.015		
					(0.017)	(0.018)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

53 In summary, we find no effect of the NLW on the unemployment rate when considering the period as whole. This result is consistent whether we use coverage or bite as our exposure measure.

Inactivity

54 However, when we conduct the analyses looking at inactivity, we do find some significant effects. The measure of unemployment we use is the inactivity rate, which we derive from the quarterly LFS. We aggregate the quarterly data into minimum wage years and then derive an inactivity rate in each of the minimum wage years for each of our region-gender-age groups. As with the previous analysis,

Columns 1-4 of Table 7 analyse the impact use the bite of the NLW, while Columns 5-8 analyse NLW coverage.

55 As shown in Table 7 in Columns 3-4 and 7-8, when considering the period as a whole, we find significant reductions in the inactivity rate for those most exposed to the minimum wage relative to the least exposed. If we again compare groups at the 75th percentile of coverage with the 25th percentile the implied fall in inactivity from the introduction of the NLW is of the order of 0.6 percentage points. A similar fall is implied by the specifications that use the bite. This strong finding holds for both measures of minimum wage exposure: coverage and bite. However, looking at the individual years we find no impact on inactivity from the introduction of the NLW. There is some weak evidence of reductions in inactivity in 2018 using bite as the measure of minimum wage exposure and in 2019 using coverage as the measure. We find no effects in 2016 or 2017.

Table 7: Impact of the NLW on inactivity by region-gender-age group, UK, 2015-19

LHS variable	Inactivity rate (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	-0.008	-0.007	-0.023**	-0.017**				
	(0.009)	(0.009)	(0.009)	(0.009)				
log(bite)*post-2017	-0.006	-0.002						
	(0.009)	(0.009)						
log(bite)*post-2018	-0.014	-0.015*						
	(0.008)	(0.008)						
log(bite)*post-2019	-0.014	-0.006						
	(0.009)	(0.009)						
% coverage*post-2016					-0.053	-0.049	-0.101***	-0.079**
					(0.034)	(0.034)	(0.033)	(0.032)
% coverage*post-2017					-0.004	0.004		
					(0.034)	(0.034)		
% coverage*post-2018					-0.050	-0.038		
					(0.036)	(0.036)		
% coverage*post-2019					-0.079**	-0.061*		
					(0.034)	(0.034)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

56 Overall, the findings in Tables 6 and 7 would suggest that the NLW may have led to increased labour market participation among those region-gender-age groups most exposed to the NLW but without an increase in the unemployment rate of those groups. Indeed, there is some evidence from Table 4 that the increased participation was reflected in a higher employment rate.

Self-employment

57 We next look at the impact of the NLW on self-employment. Since the minimum wage was introduced, there had been some concern that self-employment may be used to avoid minimum wage regulations. These concerns have been noted in various Low Pay Commission reports over the years but there has been little econometric evidence to suggest that this was widespread. The introduction of the NLW may have provided further incentives for employers to classify their workers as self-employed.

58 Our measure of self-employment is the share of self-employed in their job among each region-gender-age group, which we derive from the quarterly LFS. We aggregate the quarterly data into minimum wage years and then derive a self-employment share in each of the minimum wage years for each of our region-gender-age groups. As with the previous analysis, Columns 1-4 of Table 7 analyse the impact using the bite of the NLW, while Columns 5-8 use NLW coverage.

Table 8: Impact of the NLW on self-employment by region-gender-age group, UK, 2015-19

LHS variable	Self-employment as a percentage of total employment (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	-0.006	-0.006	-0.001	-0.002				
	(0.009)	(0.009)	(0.008)	(0.008)				
log(bite)*post-2017	0.005	0.005						
	(0.007)	(0.007)						
log(bite)*post-2018	0.003	0.003						
	(0.007)	(0.007)						
log(bite)*post-2019	-0.001	-0.002						
	(0.008)	(0.008)						
% coverage*post-2016					0.001	0.000	0.013	0.011
					(0.030)	(0.030)	(0.026)	(0.026)
% coverage*post-2017					0.021	0.020		
					(0.025)	(0.025)		
% coverage*post-2018					-0.004	-0.006		
					(0.025)	(0.025)		
% coverage*post-2019					-0.004	-0.006		
					(0.025)	(0.025)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

59 We find no effects of the NLW on self-employment under any of our specifications using either of our definitions of minimum wage exposure.

Part-time employment

60 We next look at the impact of the NLW on part-time employment. The measure of part-time employment we use is the share of part-time workers in our region-gender-age groups, which we derive from the quarterly LFS. We aggregate the quarterly data into minimum wage years and then derive an inactivity rate in each of the minimum wage years for each of our region-gender-age groups. As with the previous analysis, Columns 1-4 of Table 7 analyse the impact use the bite of the NLW, while Columns 5-8 consider NLW coverage. We find no evidence of any impacts of the NLW in any of our specifications.

Table 9: Impact of the NLW on part-time share by region-gender-age group, UK, 2015-19

LHS variable	Part-time employment as a percentage of total employment (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	-0.000	-0.001	-0.003	-0.003				
	(0.007)	(0.007)	(0.007)	(0.007)				
log(bite)*post-2017	-0.001	-0.001						
	(0.009)	(0.009)						
log(bite)*post-2018	-0.007	-0.006						
	(0.008)	(0.008)						
log(bite)*post-2019	0.006	0.006						
	(0.008)	(0.009)						
% coverage*post-2016					0.010	0.009	-0.020	-0.021
					(0.031)	(0.031)	(0.028)	(0.028)
% coverage*post-2017					-0.030	-0.030		
					(0.031)	(0.032)		
% coverage*post-2018					-0.036	-0.036		
					(0.032)	(0.032)		
% coverage*post-2019					0.042	0.040		
					(0.032)	(0.032)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

61 As with self-employment, we find no impact of the share of part-time workers among our region-gender-age groups. That is the case for each year, the period as a whole, and using either measure of minimum wage exposure.

Zero hours

62 We next look at the impact of the NLW on whether that has led to an increase in the use of zero hours contracts. We use the share of our region-gender-age groups that are employed on zero hours

contracts, which we derive from the quarterly LFS. We aggregate the quarterly data into minimum wage years and then derive the share of zero hours workers each of the minimum wage years for each of our region-gender-age groups.[2] As with the previous analysis, Columns 1-4 of Table 7 analyse the impact use the bite of the NLW, while Columns 5-8 consider NLW coverage. We again find no evidence of any effects of the NLW on the share of workers employed on zero hours contracts.

Table 10: Impact of the NLW on zero hours by region-gender-age group, UK, 2015-19

LHS variable	Zero hours contract employment as a percentage of total employment (%)							
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(bite)*post-2016	0.006	0.006	-0.000	0.000				
	(0.006)	(0.006)	(0.005)	(0.005)				
log(bite)*post-2017	-0.005	-0.006						
	(0.005)	(0.005)						
log(bite)*post-2018	-0.007	-0.007						
	(0.006)	(0.006)						
log(bite)*post-2019	0.005	0.005						
	(0.005)	(0.005)						
% coverage*post-2016					0.008	0.009	-0.014	-0.013
					(0.021)	(0.021)	(0.017)	(0.018)
% coverage*post-2017					-0.011	-0.011		
					(0.019)	(0.019)		
% coverage*post-2018					-0.031	-0.032		
					(0.022)	(0.022)		
% coverage*post-2019					0.008	0.008		
					(0.022)	(0.022)		
Observations	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Number of groups	320	320	320	320	320	320	320	320
Area Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Source: LPC estimates based on ASHE 2015 and LFS, 2013Q2 to 2020 Q1.

63 The findings for the use of zero hours contracts are very similar to those of part-time employment. We find no significant effects for any year or the period as a whole using either exposure measure.

[2] As part of the survey, the LFS asks people in employment if their main job has flexible working and, if so, to choose from a list of employment patterns those which best describe their situation. Only those people who select "zero-hours contract" as an option will be included in this analysis. The number of people who are shown as on a zero-hours contract will therefore be affected by whether people know they are on a zero-hours contract and also by how aware they are of the concept. It should be noted that this question was only asked in the fourth quarter of each year up to 2013. From 2014 to 2019, it was asked in the second and fourth quarters. Since the first quarter of 2020, it has been asked in each quarter. We have taken the average of the available data for each minimum wage year. We thus still have

Summary of findings

64 Using both the bite and the coverage measures of exposure, we find significant effects of the NLW on hourly wages. However, we find no significant and robust negative effects on either the employment rate or the number of hours worked. In contrast, we do find a significant negative effect on the inactivity rate but not on the unemployment rate. This implies that the NLW may have encouraged participation but did not lead to increased unemployment. Indeed, we find some weak evidence of a positive employment effect.

65 For comparison with other studies, we can calculate the own wage elasticity (OWE). This is the percentage change in employment divided by the percentage change in wage (due to NLW). We take the percentage change in wage from Table 3, column 4 of 0.042. The percentage point change in employment is 0.013 (Table 4, column 4). We can convert this to a percentage change at the overall employment rate of 65 per cent. This then gives an OWE of 0.476 – that is (0.013/0.65)/0.042.

F. Robustness checks

66 As a robustness check, we also investigated the impact of the NLW using various geographies. First, we looked at the NUTS2 geographies. There are 37 of these in the UK. Essentially, the counties or combinations of counties in England, combinations of council areas in Scotland, and groups of unitary authorities in Wales. Northern Ireland is treated as a whole. We were able to use the same gender and age bands as in the analysis detailed above. The results are very similar.

67 We also assessed the impact using travel-to-work areas (TTWAs). There are currently 228 TTWAs in the UK. However, their definition changes over time. We are able to produce a consistent series back to 2012 with 207 areas. However, we are unable to identify the ones in Northern Ireland using our data sets. That leaves 197 TTWAs. There are also issues with cell sizes for some TTWAs. Not only does that force us to reduce the number of age groups (to two), it also reduces the number of TTWAs that can be used in our model to 161. Despite those restrictions, the results from our regressions yield similar results to those using the other geography-gender-age definitions.

68 We assessed whether it was appropriate to assume common trends. A typical approach is to test for common trends in some pre-treatment period, which can be suggestive of whether we might expect common trends to hold in the treatment period. However, in the immediate period before the introduction of the NLW, the adult rate of the minimum wage was increased each year. We would need to go back before 1999 to find a period in which there were no minimum wage increases (and indeed no minimum wage). The data used in this analysis, ASHE, is not available on a consistent basis back to that period. Further, even where it is available, the series only goes back to 1997. That would only give at most a two-year pre-treatment period. Given the National Minimum Wage was a major policy commitment of the Labour Government that was elected in 1997, it is difficult to see how this pre-period would not have been affected by anticipation effects. Indeed, we observe higher increases in wages at the bottom of the earnings distribution in 1998, a year prior to the introduction of the National Minimum Wage. Even if such an exercise was possible, it would be unlikely to provide a good guide to what might have happened between 2016 and 2020. The UK labour market has substantially changed

since 1999, not least due to the accession of new countries in the EU from 2004 onwards, that transformed the workings of the UK labour market, particularly in the low-paying sectors.

69 We can potentially examine pre-trends in the period from 2013-2015, when the increases in the minimum wage were more modest than those that have been implemented since 2016. However, as noted above, the minimum wage was still increasing in this time period, it does not provide us with a completely clean pre-treatment period. Nevertheless, we investigate these pre-NLW estimates as a robustness check.

70 When we run the model for the pre-NLW period (2013-15), with the base year set to 2013 we do find a significant wage effect in the years 2014 and 2015. Average hourly wages rise faster in the higher bite groups. This is not surprising as the NMW was increasing over this time period. However, we find no significant effects on employment or inactivity over this pre period.

G. Conclusions

71 Using a methodology that makes use of the variation in wages across area-gender-age groups, we find significant effects of the introduction and subsequent upratings of the NLW on hourly pay at the average (using both bite and coverage measures of minimum wage exposure). Despite that, we have found no significant negative impacts on employment or hours across the whole period. These results appear to be robust to using different definitions of geography and the age gender mix.

72 The NLW may have boosted participation as inactivity fell without an increase in unemployment. Self-employment, the use of zero hours contracts, and the share of part-time workers do not seem to be affected by the NLW in any of our specifications.

73 These results are consistent with previous analysis suggesting no adverse employment effects of the NLW up to first quarter of 2020. However, since then we have seen further increases in the NLW during a period that has been affected by measures to control the global pandemic. Future work will look at how labour market outcomes have been affected since the onset of the pandemic in March 2020.

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Appendix A

Table A.1: Simple regression of NLW coverage on wage growth by region-gender-age group, UK, 2015-19

	Coef.	Std. Err	t	P>|t|	[95% Conf. Interval]	
change in hourly pay (2015-2019)						
NMW coverage in 2015 (%)	0.231226	0.059337	3.9	0	0.114486	0.347967
constant	0.099121	0.008133	12.19	0	0.083121	0.115121

Table A.2: Simple regression of NLW bite on wage growth by region-gender-age group, UK, 2015-19

	Coef.	Std. Err	t	P>|t|	[95% Conf. Interval]	
change in hourly pay (2015-2019)						
NMW bite in 2015 (%)	0.059954	0.015834	3.79	0	0.028801	0.091107
constant	0.156864	0.008392	18.69	0	0.140353	0.173375

Table A.3: Simple regression of NLW coverage on change in employment rate by region-gender-age group, UK, 2015-19

	Coef.	Std. Err	t	P>|t|	[95% Conf. Interval]	
change in employment (2015-2019)						
NLW coverage in 2015 (%)	0.157882	0.051015	3.09	0.002	0.057514	0.25825
constant	0.006983	0.006054	1.15	0.25	-0.00493	0.018893

Table A.4: Simple regression of NLW bite on change in employment rate by region-gender-age group, UK, 2015-19

	Coef.	Std. Err	t	P>|t|	[95% Conf. Interval]	
change in employment (2015-2019)						
NMW bite in 2015 (%)	0.033003	0.013796	2.39	0.017	0.00586	0.060146
constant	0.04209	0.008475	4.97	0	0.025417	0.058764