



# The economic impact of increasing the National Minimum Wage and National Living Wage to £10 per hour

*A report for Unite by Howard Reed  
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Data from the Family Resources Survey (2013-14, 2014-15 and 2015-16 survey years) are Crown Copyright and are provided by kind courtesy of the ESRC's Economic and Social Data service (ESDS) and distributed by the UK Data Archive.

## Executive Summary

This report looks at the potential economic impact of an immediate increase in the UK National Living Wage (NLW) and National Minimum Wage (NMW) from their current rates of £7.83 per hour for workers aged 25 and over, £7.38 per hour for workers aged 21-24 and £5.90 per hour for workers aged 18-20, to £10 per hour for all workers aged 18 and over<sup>1</sup>. The analysis uses the pooled data from the 2013/14, 2014/15 and 2015/16 Family Resources Survey and the IPPR/Resolution Foundation/Landman Economics tax-transfer model to estimate the number of workers affected, the distributional impact on household incomes and net wages of the workers affected, the impact of increasing the NMW on the public finances, and the potential employment effects.

The increase is analysed in two stages – an ‘intermediate’ increase to £9 per hour for workers aged 25 and over, £8.70 for workers aged 21-24 and £8 per hour for workers aged 18-20, and then an increase to the full ‘target’ level of £10 per hour. The intermediate rates for each age group are just over halfway between the current levels of the NLW/NMW and the target level of £10 per hour.

The results show that an increase in the NLW and NMW to the intermediate levels would benefit around 6.25 million workers, while an increase to £10 per hour would benefit 9 million workers, 58 percent of whom are women. 55 per cent of workers aged 21-24, and 78 per cent of workers aged 18-20. The average gain in net income per worker from increasing the NLW and NMW to £10 per hour is just over £1,300 per year.

Increasing the NLW and NMW is a progressive policy in distributional terms, with the largest percentage increases in net household income for households in the poorest decile (especially households with low-paid workers aged under 25), and much bigger percentage gains in the bottom 60 percent of the income distribution than in the top 40 percent. The impact on household income is particularly beneficial for low-income households containing people who work in the hospitality, retail and cleaning industries, which have large numbers of workers on very low pay rates. Around two-thirds of workers in the retail sector, and three-quarters of workers in the hospitality sector, would benefit from NLW and NMW rates of £10 per hour. The distributional impacts are progressive across all ethnicities, and particularly so for asian and black workers. Across the age distribution, average net gains from increasing the minimum wage are largest for workers aged under 35. The effects of increasing the NMW and NLW to £10 per hour are particularly progressive for migrant workers aged under 25.

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<sup>1</sup> For information on data on 16-17 year olds and apprentices please see Appendix A of the report (page 54).

Increasing the NLW and NMW to £10 per hour would also benefit the public finances through increased income tax and National Insurance Contributions receipts, increased receipts from expenditure tax (due to higher consumer spending by workers with higher net wages) and lower in-work benefit, tax credit and Universal Credit spending. Overall, this report estimates that the public finances would improve by around £5.6 billion as a result of the minimum wage increase.

While increases in the minimum wage are often opposed on the grounds that they would lead to job losses, initial analysis by the Low Pay Commission of the impact of the introduction of the National Living Wage in 2016 shows no adverse employment effects. Chapters 4 and 5 of this report show that once the potential stimulus effects of increasing the NLW and NMW are taken into account, overall negative effects on employment seem unlikely, and there could in fact be modest *gains* in employment.

Overall, the analysis presented here builds on the previous report by Landman Economics for Unite in 2014<sup>2</sup> and makes a powerful economic case for an increase in the National Living Wage to £10 per hour as soon as possible. The policy is distributionally progressive, would improve the public finances, and has the potential to create jobs through stimulating the economy.

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<sup>2</sup> H. Reed (2014), *The Economic Impact of a £1.50/hour increase in the National Minimum Wage: A report for Unite by Howard Reed (Director, Landman Economics)*.  
<http://www.unitetheunion.org/uploaded/documents/MinimumWageReport211-19867.pdf>

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## Introduction

Unite has commissioned Landman Economics to carry out an economic analysis of the potential impact of an increase in the National Minimum Wage in the UK to £10 per hour. At the time of writing (May 2018) the current rates of the National Minimum Wage (NMW) in the UK are as follows:

- Workers aged 25 and over (the “National Living Wage”): £7.83 per hour
- Workers aged 21 to 24: £7.38 per hour
- Workers aged 18 to 20: £5.90 per hour
- Workers aged 16 to 17: £4.20 per hour
- Apprentices<sup>3</sup>: £3.70 per hour

This report looks in detail at the impact of increasing the National Minimum Wage rates to £10 per hour for all employees aged 18 and over. The increase is analysed in two stages – the ‘intermediate’ level and the ‘target’ level. **Table 1** below shows the hourly rates used for the intermediate and target levels, for workers in each of the three age groups we are looking at in detail.

**Table 1. Modelled rates of increase in National Minimum Wage**

Group	New hourly rates	
	Intermediate	Target
Workers aged 25 and over	£9.00	£10.00
Workers aged 21 to 24	£8.70	£10.00
Workers aged 18 to 20	£8.00	£10.00

The effects of increasing the National Minimum Wage to the Stage 1 and Stage 2 levels are analysed according to the following worker and job characteristics:

- Gender (men and women);
- Age group (18 to 20, 21 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 and over);
- Ethnicity (white, asian, black, other, mixed);
- The specific impact on migrant workers;
- The specific impact on temporary workers (e.g. agency workers);

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<sup>3</sup> The apprentice rate applies to apprentices aged 18 or under, plus those aged 19 or over in the first year of their apprenticeship. Apprentices aged 19 or over in the second or subsequent years of their apprenticeship are entitled to the standard hourly rate for their age group (e.g. £5.90 per hour for 19 or 20 year olds).

- The effects on workers in specific industrial sectors (retail, hospitality, cleaning, agriculture, food manufacturing, warehousing and care workers).

The impacts are looked at separately for workers aged 25 and over (those currently entitled to the National Living Wage rate) and workers under 25 (those currently entitled to one of the lower rates).

The impacts looked at comprise the following:

- The distributional impacts on household incomes;
- The impact on the public finances arising from higher receipts of income tax, National Insurance Contributions and expenditure taxes, lower spending on tax credits, in-work benefits and Universal Credit, lower corporation tax receipts and a higher public sector wage bill;
- The impact on net wages of the workers affected by the increase;
- Potential employment effects – including the multiplier effects of increased demand for goods and services arising from higher spending by workers whose wages have increased.

This report does not conduct a detailed costing or distributional analysis of the impact of increasing the National Minimum Wage rates for workers aged under 18, or the apprentice rate, because limitations in the UK Family Resources Survey (FRS) data (the data used for the empirical modelling in the main part of this report) make it difficult to model the impacts of increasing hourly rates for these workers. Appendix A of this report discusses the limitations of the FRS for modelling wages for 16-17 year olds and apprentices and provides references to other recent work discussing these groups from the Low Pay Commission to assess what the impacts of minimum wage increases for these groups might be.

Since 2015 the National Minimum Wage rate for workers aged 25 and over has been known as the National Living Wage and In the following chapters we refer to the “National Minimum Wage/National Living Wage” (or NMW/NLW for short).

## Chapter 1. The incidence of low pay in the UK: evidence from the Family Resources Survey

The analysis in this report uses data from the UK Family Resources Survey [FRS] to identify the numbers of people in the UK who would be affected by an increase in the current rates of the NMW/NLW and their characteristics. The FRS is an annual survey of around 20,000 UK households per year which contains information on employment, earnings and other income. The FRS is a reliable source of information on *weekly* earnings, but the *hourly* wage information is not fully reliable because the survey responses on the number of hours each person works per week, and the survey response on weekly wages, are taken from different weeks in many cases. Because of this, the FRS hourly wage measure is an overestimate of the proportion of workers in the UK working at, or just above, the minimum wage.

To address this problem, the analysis in this report uses data from the Annual Survey of Hours and Earnings – a much bigger survey than the FRS which explicitly collects accurate hourly wage information – to recalibrate the hourly wage measures in the FRS so that the adjusted FRS offers a more accurate representation of the hourly wage distribution in the UK.

The analysis uses three years of FRS data (2013/14, 2014/15 and 2015/16) pooled together; this enables detailed analysis of the impact of increasing the NMW according to gender, ethnicity, industrial sector, migrant workers and temporary jobs. In the pooled FRS data, the sample size is large enough to conduct the analysis separately for workers aged under 25 and those aged 25 and over. Appendix B gives details of the calibration procedure and the procedure used to uprate the wages in the pooled FRS dataset to current (spring 2018) levels.

The groups in the various subcategories which the report is specifically looking at are identified as follows:

- For age, sex and ethnicity, the FRS data contain data on these characteristics for each person in the survey.
- Migrants are identified using the FRS variable on country of origin, with a ‘migrant’ being identified as someone whose country of origin is outside the UK<sup>4</sup>.
- Temporary workers are identified using the FRS variable TEMPJOB which identifies whether a worker’s main job is an agency job, casual, seasonal, a fixed-term contract or some other kind of temporary job. Note that the TEMPJOB variable does not include workers on zero-hours contracts, of

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<sup>4</sup> Using the variable CORIGNAN (anonymised country of origin) on the FRS public release dataset.

whom there are around 900,000 in the UK, based on recent data from the Labour Force Survey (ONS, 2018).

- Industry sector is defined using the 2-digit Standard Industrial Classification (SIC2007) variable in the FRS dataset; details of the industrial classifications used are given in Appendix B.

**Table 2** gives details of the estimated number of people who would be affected by an immediate increase in the NMW/NLW to the intermediate levels specified in

**Table 1** above, and to the target level of £10 per hour.

**Table 2. Number of people who would be directly affected by an increase in the National Minimum Wage/National Living Wage to intermediate levels and to £10/hour – estimates from the Family Resources Survey**

Group	Estimated number of workers affected (thousands)		Affected workers as % of workers in group	
	Intermediate	£10/hour	Intermediate	£10/hour
<b>All workers</b>	6,250	9,000	22.2	32.0
<b>Gender:</b>				
Men	2,510	3,760	17.6	26.3
Women	3,740	5,240	27.0	37.9
<b>Age:</b>				
18-20	450	820	42.9	78.0
21-24	900	1,340	37.1	55.0
25-34	1,500	2,120	22.0	31.0
35-44	1,160	1,600	18.1	24.9
45-54	1,210	1,710	17.7	25.1
55-64	810	1,130	20.8	29.1
65 and over	220	290	31.9	42.6
<b>Ethnicity:</b>				
White	5,420	7,880	21.6	31.5
Asian	460	620	27.7	37.0
Black	200	270	25.3	34.4
Mixed	80	120	23.6	35.2
Other	90	110	32.5	40.5
<b>Migrants</b>	1,210	1,660	26.6	36.4
<b>Temporary workers</b>	310	460	29.6	43.6
<b>Sector:</b>				
Retail	1,350	1,740	50.2	65.0
Hospitality	940	1,110	62.9	74.7
Cleaning	270	320	49.6	60.0
Agriculture	60	90	35.1	52.9
Food manufacturing	110	160	29.9	43.2
Care	800	1,070	39.6	53.4
Warehousing	40	90	10.7	22.1

Source: author's calculations using Family Resources Survey data and Annual Survey of Hours and Earnings. See Appendix B for full methodological details.

Note: 'Care' sector comprises approximately 87 per cent social care workers and 13 per cent childcare workers, based on data from the UK Labour Force Survey. See Appendix C for details.

**Table 2** shows that around 6.25 million workers in total are likely to be directly affected by an increase in the NMW/NLW to the intermediate levels specified here - £9 per hour for workers aged 25 and over, £8.70 for 21-24 year olds and £8 for 18-

20 year olds. A further increase to £10/hour for all age groups would affect an additional 2.75 million workers, increasing total coverage of the NMW/NLW to 9 million – just under a third of all employees. Of those affected, around 60 per cent at the intermediate level (just over 3.7 million) are women; at £10 per hour, the proportion of women in the affected group is slightly lower, at 58 per cent. We estimate that a £10/hour minimum wage would directly affect around 38 per cent of women and 26 per cent of men.

In terms of the age breakdown, workers aged under 25 are the most likely to be affected by either increase. This is especially the case for the increase to £10 per hour, where 78 per cent – almost four-fifths – of 18 to 20 year olds are affected by an increase to £10 per hour, and well over half (55 per cent) of 21 to 24 year olds. Workers aged 65 and over are the next most likely group to be affected, with around 32 per cent affected at £9 per hour, and over 42 per cent at £10/hour. Workers in the 35 to 44 and 45 to 54 age groups are the least likely to be affected by the increases.

Analysis by ethnicity shows that workers of black, asian, mixed-race and other ethnicities are more likely to be affected by increases to the NMW/NLW than white workers, with asian workers and other-ethnicity workers being the most likely to all to be affected (37 per cent and 40.5 per cent of workers after the Level 2 increase, respectively).

Migrant workers have a higher-than-average incidence of low pay, with over 36 per cent affected by an increase in the NMW/NLW to £10 per hour. For temporary workers, the proportion affected by a £10 per hour minimum wage is even higher, at almost 44 per cent of the workforce.

The incidence of low pay varies markedly by industrial sector: 22 per cent of workers in the warehousing sector are paid at or below £10 per hour, compared with 43 per cent in the food manufacturing sector, 53 per cent in the agriculture and care sectors, 60 per cent in the cleaning sector, 65 per cent in the retail sector, and almost 75 per cent (three quarters) in the hospitality sector. With the exception of warehousing, all of the industries featured in this report have proportions of workers affected by an increase to £10/hour (or to the intermediate levels) of the NMW/NLW which are higher than the national average of 22.2 per cent for the intermediate level and 32 per cent for £10/hour. By contrast, the proportion of workers who would be affected by either of the minimum wage increases is much lower in certain other industries (for example, an increase to £10/hour would affect only around 18 per cent of health workers, 15 per cent of workers in legal services, and 8 percent of workers in financial services).

## Chapter 2. The impact of increasing the National Minimum Wage and National Living Wage on the public finances and net wages for workers

This section of the report estimates the impact of increasing the NMW/NLW to the intermediate levels specified in **Table 1**, and to the target levels of £10 per hour. We present results for both sets of simulated increases. The estimates use calculations from the IPPR/Landman Economics/Resolution Foundation tax-transfer model (TTM)<sup>5</sup>, which is a tax-benefit microsimulation model with equivalent functionality to those used by HM Treasury and the Institute for Fiscal Studies to analyse the costs and distributional impacts of policies. The TTM is set up to run on the three years of pooled FRS data used for this project (2013-14, 2014-15 and 2015-16)<sup>6</sup>.

To ensure that the FRS modelling gives an accurate assessment of the impact of increasing wages for the low-paid workforce as it currently stands, the FRS earnings data for the three-year pooled sample are updated to April 2018 earnings levels using information from the Annual Survey for Hours and Earnings (ASHE) on hourly and weekly wages for workers in the lower part of the earnings distribution, by industrial sector. The FRS is used to calculate the increase in the gross wage bill arising from the increase in the NMW and NLW for those employees in the FRS who earn at the current minimum wage levels of hourly wages, up to the intermediate level of increase proposed here, and finally up to £10 per hour for all workers aged 18 or over. The 'grossing factors' in the FRS dataset are then used to scale the increase in the gross wage bill up to the national level, giving an estimate of what the increase in the gross wage bill would be if the NMW were raised to the intermediate levels specified in **Table 1**, and then to £10 per hour. A further adjustment is made to the FRS grossing factors based on recent data from the Office for National Statistics on the total number of employees in work in the UK, to ensure that the estimates from the TTM reflect the current size of the labour force. Appendix B gives more details of the methodology used to adjust wages in the FRS.

In addition to the increase in the gross wage bill, this section shows the following impacts of the increase in the NMW/NLW on the public finances (estimated using the TTM):

- The increase in income tax paid by employees;
- The increase in employee National Insurance Contributions (NICs);
- The increase in employer NICs;

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<sup>5</sup> Full details of the methodology used for the tax-transfer model can be found in Appendix A of Reed and Portes (2018).

<sup>6</sup> A more recent year of FRS data (2016/17) became available in March 2018, but the TTM has not been updated to run on this year of the data yet.

- The decrease in social security payments (tax credits and benefits, or Universal Credit) occurring because higher gross wages means that some families on the taper for tax credits, benefits or Universal Credit receive lower payments;
- The increase in the public sector wage bill resulting from higher wages for public sector workers;
- The increase in expenditure tax receipts for the government resulting from higher consumer spending as a result of higher net wages. This is calculated using plausible values from recent research for the propensity of workers to consume extra income<sup>7</sup>;
- The reduction in corporation tax payments arising from a shift from profits to wages. In line with the most recent available data from the ONS national accounts and HMRC, this report assumes that corporation tax receipts amount to around 7 per cent of total operating surplus in the UK economy.

Note that the size of the decrease in social security payments is calculated in two different ways, corresponding to two different systems of transfer payments for low income working people and families:

**Scenario 1:** the ‘legacy’ system of benefits and tax credits, which most low-income social security claimants are still covered by at the time of writing (May 2018);

**Scenario 2:** the Universal Credit (UC) system, which is gradually being rolled out to replace the legacy system across the UK.

Because the UC system and the legacy system work differently, it is possible that the fiscal impact of increasing the NMW/NLW could be different under each system. This is examined in the results tables below, which show two different columns for ‘reduction in social security expenditure’ and ‘overall fiscal impact’ – one for the legacy system, and one for the UC system.

The overall fiscal impact of increasing the NMW is therefore equal to:

Increased income tax receipts

*Plus* increased NICs receipts (employee and employer)

*Plus* reduced spending on social security (in the legacy or UC systems)

*Plus* increased expenditure tax receipts

*Minus* reduced corporation tax receipts

*Minus* increased public sector wages.

**Tables 3 to 6** below present these various components of the fiscal impact of increasing the NMW and NLW with a plus sign if they have a positive impact on the

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<sup>7</sup> Recent survey research by NMG Consulting for the Bank of England suggests that the average marginal propensity to consume for households in the UK is 0.43 (Bank of England, 2017).

public finances (i.e. increased tax receipts or reduced spending), and a minus sign if they have a negative impact on the public finances (reduced tax receipts or increased spending). **Table 3**, which gives the overall fiscal impacts across all workers and for men and women separately, shows two sets of results: firstly for the increase in the NMW/NLW from current levels to the intermediate level (£9 for 25 and over, £8.70 for 21- 24 year olds, £8 for 18-20 year olds) and secondly for the increases to £10 per hour. **Tables 2 to 6** show the results for an increase to £10 per hour only.

The results also show the following statistics relating to the incomes of workers who benefit directly from the NMW:

- The total increase in net wages for workers directly affected by the increase in the NMW;
- The average net wage increase per worker affected by the increase;
- The average net wage increase per hour of work for the workers affected by the increase – this shows how much extra income employees affected by the increase are gaining *per hour worked*;
- The average *marginal deduction rate (MDR)* on the increase in gross earnings for each subgroup – defined as the proportion of gross wages that goes to the Government (via increased income tax and NICs, and/or reduced benefit, tax credit and UC spending) rather than increasing household net incomes.

## Impacts overall and by gender

**Table 3** presents results for the overall sample and for men and women separately.

**Table 3. Fiscal and household income impacts of increases in National Minimum Wage and National Living Wage: overall and by gender**

	Current levels to intermediate levels			Current levels to £10 per hour		
	Whole sample	Men	Women	Whole sample	Men	Women
Total change in gross wages (£m)	6,540	3,010	3,530	17,910	8,400	9,510
<b>Fiscal impact (£m):</b>						
Increased income tax receipts	+870	+440	+430	+2,690	+1,370	+1,320
Increased employee NICs	+620	+310	+310	+1,800	+900	+910
Increased employer NICs	+720	+360	+360	+2,110	+1,050	+1,060
Reduction in social security spending:						
Legacy system	+730	+310	+420	+1,610	+690	+940
UC system	+630	+260	+380	+1,380	+570	+830
Increased expenditure taxes	+280	+130	+150	+750	+350	+400
Reduced corporation tax	-420	-200	-210	-1,130	-560	-570
Increased public sector wage bill	-750	-210	-540	-2,150	-600	-1,550
<b>Total improvement in public finances (£m):</b>						
Legacy system	2,040	1,140	910	5,680	3,200	2,500
UC system	1,950	1,080	870	5,470	3,080	2,410
<b>Household incomes (legacy system):</b>						
Total change in net incomes (£m)	4,330	1,950	2,380	11,820	5,440	6,350
Average net gain per worker per year	£693	£778	£636	£1,310	£1,450	£1,210
Average net gain per hour worked	£0.41	£0.39	£0.42	£0.76	£0.72	£0.78
Average MDR on additional income	33.8%	35.2%	32.6%	34.0%	35.2%	33.2%
<b>Household incomes (UC system):</b>						
Total change in net incomes (£m)	4,430	2,010	2,420	12,040	5,570	6,450
Average net gain per worker per year	£708	£801	£645	£1,340	£1,480	£1,230
Average net gain per hour worked	£0.42	£0.40	£0.43	£0.77	£0.74	£0.80
Average MDR on additional income	32.3%	33.3%	31.6%	32.8%	33.8%	32.1%

Source: author's calculations using IPPR/Resolution Foundation/Landman Economics tax-transfer model.

Note: in 'fiscal impact' rows, positive numbers show an improvement in the public finances, negative numbers show a deterioration

**Table 3** shows that overall, for the increase in the NMW/NLW to intermediate levels, the public finances improve by just over £2 billion in the case of the legacy (benefits/tax credits) social security system, and just under £2 billion in the case of

Universal Credit. This is equal to around 30 per cent of the increase of just over £6.5 billion in the gross wage bill. In the case of the increase to £10 per hour, the public finances improve by just under £5.5 billion if we assume that the legacy social security system is still in force, and just under £5.7 billion if we assume that Universal Credit is fully rolled out.

Workers affected by the increase in the NMW/NLW to intermediate levels experience net gains in income of around £690 per worker under the legacy social security system, and around £710 per worker under Universal Credit. The average MDR on additional income earned is slightly higher under the legacy system (33.8%) than under UC (32.3%). This reflects slightly lower net income taper rates for claimants of UC compared to tax credits. For the increase to £10 per hour, the average MDRs are slightly higher, reflecting the fact that larger numbers of workers achieve gross earnings above the income tax personal allowance and the lower earnings limits for employee and employer National Insurance Contributions when their hourly wage rate is raised to £10 per hour.

Looking separately at men and women, male workers gain slightly more from the increases in the NMW on average than female workers because men are more likely to be working full-time, and full-time workers gain more from an increase in the hourly wage rate than part-time workers (other things being equal). The opposite is true when looking at net gain per hour worked, with women gaining slightly more than men. Accordingly, the average MDR on the increase in gross wages to £10 per hour for men is 35.2%, slightly higher than for women (33.2%). The higher hourly gain (and lower marginal deduction rate) for women occurs because women are more likely to be working part-time and hence more likely to be below the income tax personal allowance and the National Insurance thresholds, and hence not paying income tax or NICs on any marginal increase in incomes<sup>8</sup>.

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<sup>8</sup> The increase in the real-terms level of the income tax personal allowance since 2014 also helps explain why the average MDRs for workers affected by the NMW/NLW increases in this report are somewhat lower than the equivalent MDRs in an earlier report Landman Economics produced for Unite in 2014 on the distributional impact of increasing the NMW (Reed, 2014). There were more workers earning at minimum wage levels or just above minimum wage levels in 2014 who were above the income tax personal allowance level, resulting in higher MDRs.

## Impacts by age group

**Table 4** shows the fiscal and household income impacts of increasing the NMW/NLW to £10/hour, broken down by the age group of the workers affected.

**Table 4. Fiscal and household income impacts of increases in National Minimum Wage and National Living Wage from current levels to £10/hour, by age group**

	Age group						
	18-20	21-24	25-34	35-44	45-54	55-64	65+
Total change in gross wages (£m)	2,140	3,110	4,270	3,000	3,180	1,890	320
<b>Fiscal impact (£m):</b>							
Increased income tax receipts	+270	+480	+670	+440	+480	+300	+60
Increased employee NICs	+200	+320	+450	+310	+330	+190	0
Increased employer NICs	+230	+370	+520	+350	+380	+220	+30
Reduction in social security spending:							
Legacy system	+60	+140	+480	+420	+330	+160	+20
UC system	+50	+130	+420	+400	+270	+100	+20
Increased expenditure taxes	+100	+140	+170	+120	+130	+80	+20
Reduced corporation tax	-150	-200	-270	-180	-190	-120	-20
Increased public sector wage bill	-130	-260	-480	-440	-510	-290	-40
<b>Total improvement in public finances (£m):</b>							
Legacy system	590	990	1,530	1,020	950	550	70
UC system	580	980	1,480	990	900	490	60
<b>Household incomes (legacy system):</b>							
Total change in net incomes (£m)	1,620	2,160	2,680	1,830	2,040	1,240	230
Average net gain per worker per year	£1,968	£1,613	£1,263	£1,146	£1,195	£1,100	£816
Average net gain per hour worked	£1.21	£0.90	£0.69	£0.66	£0.69	£0.66	£0.65
Average MDR on additional income	24.6%	30.5%	37.3%	39.0%	35.7%	34.3%	26.4%
<b>Household incomes (UC system):</b>							
Total change in net incomes (£m)	1,630	2,180	2,730	1,850	2,100	1,310	240
Average net gain per worker per year	£1,984	£1,622	£1,289	£1,161	£1,227	£1,156	£824
Average net gain per hour worked	£1.22	£0.90	£0.70	£0.67	£0.70	£0.70	£0.65
Average MDR on additional income	24.0%	30.0%	36.0%	38.2%	34.0%	31.0%	25.7%

Source: author's calculations using IPPR/Resolution Foundation/Landman Economics tax-transfer model.

Note: in 'fiscal impact' rows, positive numbers show an improvement in the public finances, negative numbers show a deterioration

**Table 4** shows that the total change in gross wages arising from the increase in the NMW is greatest for the 25-34 age group and then is progressively smaller for older age groups. However, the 18-20 and 21-24 age groups are much smaller (in terms of number of workers) than the 25-34 age group; summing the total change in gross wages for the 18-20 and 21-24 age groups together gives a total increase in gross wages of over £5.2 billion, which is considerably higher than the increase for the 25-34 age group.

The average net gain per worker from the increase in the minimum wage is highest for the 18-20 age group followed by the 21-24 age group, and lowest for the oldest age group (65 and over). The average MDR on additional income is lowest for the 18-20 year old group (at 24%) followed by the over-65 age group (at 25.7%). This is mainly because these groups are less likely to be claiming in-work benefits than other groups, and also because people in the over-65 age group do not pay employee National Insurance Contributions. For all the other age groups, the average MDR on additional income is at least 30 per cent; it is highest for the 35-44 age group at 38.2%, reflecting the fact that this age group has a high proportion of minimum wage earners in families with children who claim tax credits (or Universal Credit under the new system).

## Impacts by ethnicity

**Table 5** shows the fiscal and household income impacts of the NMW/NLW increase by ethnic group.

**Table 5. Fiscal and household income impacts of increases in National Minimum Wage and National Living Wage from current levels to £10/hour, by ethnicity**

	Ethnicity				
	White	Mixed	Asian	Black	Other
Total change in gross wages (£m)	15,700	230	1,180	510	270
<b>Fiscal impact (£m):</b>					
Increased income tax receipts	+2,400	+30	+160	+70	+40
Increased employee NICs	+1,590	+20	+120	+50	+30
Increased employer NICs	+1,860	+30	+140	+60	+30
Reduction in social security spending:					
Legacy system	+1,320	+30	+150	+70	+40
UC system	+1,120	+30	+140	+60	+40
Increased expenditure taxes	+660	+10	+50	+20	+10
Reduced corporation tax	-990	-20	-80	-30	-20
Increased public sector wage bill	-1,940	-20	-110	-70	-20
<b>Total improvement in public finances (£m):</b>					
Legacy system	4,900	90	430	160	110
UC system	4,710	90	410	150	110
<b>Household incomes (legacy system):</b>					
Total change in net incomes (£m)	10,420	150	760	320	160
Average net gain per worker per year	£1,322	£1,249	£1,221	£1,210	£1,413
Average net gain per hour worked	£0.76	£0.75	£0.74	£0.72	£0.80
Average MDR on additional income	33.7%	35.2%	35.9%	37.3%	39.6%
<b>Household incomes (UC system):</b>					
Total change in net incomes (£m)	10,620	150	770	330	160
Average net gain per worker per year	£1,348	£1,244	£1,242	£1,247	£1,424
Average net gain per hour worked	£0.77	£0.75	£0.76	£0.74	£0.81
Average MDR on additional income	32.4%	35.5%	34.8%	35.3%	39.1%

Source: author's calculations using IPPR/Resolution Foundation/Landman Economics tax-transfer model.

Note: in 'fiscal impact' rows, positive numbers show an improvement in the public finances, negative numbers show a deterioration

**Table 5** shows that around 88 per cent of the increase in gross wages arising from the increase in the NMW/NLW to £10 per hour goes to white workers – this reflects the fact that almost 90 per cent of workers on hourly rates between the current NMW/NLW levels and £10 per hour are white (as shown in **Table 2**). The next largest ethnic group is asian workers, who comprise around 7 per cent of the increase in gross wages. Around 14 per cent of the improvement in the public finances arising from the NMW increase (under the legacy system) is due to increased wages for black, asian and mixed-race workers and workers of other ethnicities, with 86 per cent arising from increased wages for white workers. The biggest net gain from increasing the minimum wage is workers of ethnicity other than black, white, asian or mixed-race (at £1,413 per year under the legacy social security system, and £1,424 per year under the UC system), followed by white workers (at £1,348 under the UC system). Average net gain per hour worked is also highest for other-ethnicity and white workers although the differences between white, black, asian and mixed-race workers are fairly small, with average net gains of between 74 and 77 pence per hour in every case.

## Impacts for migrant and temporary workers

**Table 6** shows the fiscal and household income impacts of the NMW/NLW increase to £10 per hour for migrant workers and temporary workers.

**Table 6. Fiscal and household income impacts of increases in National Minimum Wage and National Living Wage from current levels to £10/hour, for migrant and temporary workers**

	Worker status	
	Migrant	Temporary
Total change in gross wages (£m)	3,390	910
<b>Fiscal impact (£m):</b>		
Increased income tax receipts	+510	+120
Increased employee NICs	+350	+90
Increased employer NICs	+410	+100
Reduction in social security spending:		
Legacy system	+390	+70
UC system	+370	+60
Increased expenditure taxes	+140	+40
Reduced corporation tax	-230	-50
Increased public sector wage bill	-250	-180
<b>Total improvement in public finances (£m):</b>		
Legacy system	1,320	190
UC system	1,300	190
<b>Household incomes (legacy system):</b>		
Total change in net incomes (£m)	2,140	630
Average net gain per worker per year	£1,289	£1,383
Average net gain per hour worked	£0.74	£0.84
Average MDR on additional income	36.9%	30.7%
<b>Household incomes (UC system):</b>		
Total change in net incomes (£m)	2,160	640
Average net gain per worker per year	£1,303	£1,394
Average net gain per hour worked	£0.75	£0.84
Average MDR on additional income	36.3%	30.1%

Source: author's calculations using IPPR/Resolution Foundation/Landman Economics tax-transfer model.

Note: in 'fiscal impact' rows, positive numbers show an improvement in the public finances, negative numbers show a deterioration

**Table 6** shows that increasing the NMW/NLW to £10 per hour boosts gross wages by around £3.4 billion for migrant workers – just under one-fifth of the whole of the gross wage increase across the workforce, as shown in **Table 3** earlier. The average MDR on additional income for migrant workers is 36.9% (under the legacy social security system) and 36.3% (under the UC system), which is slightly higher than the average MDR across all workers. The public finances improve by about £1.3bn as a result of the minimum wage increase to £10/hour.

For temporary workers, the boost in gross wages is £900 million, with the public finances improving by just under £200 million. The MDR on additional income for

temporary workers is just over 30% under the UC system which is slightly lower than the average MDR across all workers. The average net gain per affected worker per year for temporary workers, at just under £1,400, is slightly higher than for the minimum-wage-eligible workforce as a whole.

## Impacts by industrial sector

Finally in this section, **Table 7** shows the fiscal impact of the NMW/NLW increase to £10 per hour for the industrial sectors highlighted in this report.

**Table 7. Fiscal and household income impacts of increases in National Minimum Wage and National Living Wage from current levels to £10/hour, by industrial sector**

	Sector						
	Retail	Hosp.	Cleaning	Agri.	Food	Care	Ware.
Total change in gross wages (£m)	3,340	2,700	580	210	400	2,200	140
<b>Fiscal impact (£m):</b>							
Increased income tax receipts	+440	+370	+70	+40	+70	+350	+20
Increased employee NICs	+310	+260	+50	+20	+50	+230	+20
Increased employer NICs	+370	+300	+60	+30	+50	+270	+20
Reduction in social security spending:							
Legacy system	+330	+280	+100	+10	+30	+230	+20
UC system	+310	+270	+90	+10	+20	+190	+10
Increased expenditure taxes	+140	+110	+20	+10	+20	+90	+10
Reduced corporation tax	-240	-180	-40	-20	-30	-140	-10
Increased public sector wage bill	-10	-140	-80	0	0	-240	0
<b>Total improvement in public finances (£m):</b>							
Legacy system	1,350	1,010	180	90	190	780	70
UC system	1,330	990	170	90	180	740	70
<b>Household incomes (legacy system):</b>							
Total change in net incomes (£m)	2,260	1,780	370	140	240	1,390	90
Average net gain per worker per year	£1,294	£1,600	£1,128	£1,507	£1,486	£1,298	£1,010
Average net gain per hour worked	£0.86	£0.99	£0.83	£0.64	£0.71	£0.76	£0.51
Average MDR on additional income	32.5%	33.9%	37.0%	32.4%	38.4%	36.6%	39.3%
<b>Household incomes (UC system):</b>							
Total change in net incomes (£m)	2,280	1,800	370	140	260	1,440	90
Average net gain per worker per year	£1,308	£1,615	£1,149	£1,523	£1,556	£1,340	£1,044
Average net gain per hour worked	£0.87	£1.00	£0.85	£0.65	£0.74	£0.79	£0.52
Average MDR on additional income	31.8%	33.3%	35.9%	31.7%	35.5%	34.6%	37.3%

Source: author's calculations using IPPR/Resolution Foundation/Landman Economics tax-transfer model.

Note: in 'fiscal impact' rows, positive numbers show an improvement in the public finances, negative numbers show a deterioration

**Table 7** shows that retail, hospitality and care are the sectors with the largest gross increases in wages arising from the increase in the NMW/NLW to £10 per hour. As shown in **Table 2**, this reflects the fact that these sectors have larger numbers of

employees in the affected group than the other sectors. The biggest gain per worker arising from the increase in the minimum wage is in the hospitality sector (at £1,615 under the UC system), followed by the food and agriculture sectors. All three of these sectors have a high incidence of low pay according to the ASHE data. The largest net gain per hour worked is also in the hospitality sector, at £1.00 per hour, with the lowest gain being in the warehousing sector, at 52 pence per hour. Average MDRs from the NMW/NLW increase show some variation, with the lowest MDRs (below 32%) for agricultural and retail workers and the highest MDR (above 37%) for workers in the warehousing sector.

## Chapter 3. The distributional impacts of increasing the National Minimum Wage/National Living Wage

This chapter uses the IPPR/Resolution Foundation/Landman Economics tax-transfer model to look at the distributional impact of increasing the National Minimum Wage and National Living Wage to £10/hour, in two stages (first to the intermediate levels of £9 per hour for workers aged 25 and over, £8.70 per hour for 21-24 year olds, and £8 per hour for 18-20 year olds, and then to the target level of £10 per hour for all age groups). As with Chapters 1 and 2, the analysis uses the pooled Family Resources Survey dataset. Households are ranked in terms of their equivalised<sup>9</sup> net income in the FRS, and the distribution is then divided into ten equally sized deciles going from decile 1 (the poorest households) to decile 10 (the richest households).

### Impacts across all households

**Figure 1** shows the average annual impacts on household net income in cash terms of the minimum wage increases by household income decile. The blue lines show the impact of the increases in the National Living Wage for workers aged 25 and over, while the red lines show the impact of the increases in the National Minimum Wage for workers aged under 25. In each case, the dotted line shows the impact of the increase from the current NMW/NLW level to an intermediate level, while the unbroken line shows the impact an increase from current levels to £10 per hour.

**Figure 1** shows that the average cash impacts of an increase in the National Living Wage for workers aged 25 and over are highest in household net income decile 6. The ‘inverse U shaped’ relationship between net cash gain and position in the household income distribution is strongest for the increase to £10 per hour, where the increase is worth over £350 on average to households between deciles 4 and 7, but the average cash gains are lower for the poorest and richest households. The average cash gain for middle-income households is higher than for low-income households for two reasons. Firstly, many households at or near the bottom of the income distribution do not have many adults in work, and so cannot benefit from wage increases. Secondly, some people earning at the level of the NLW or just above it are second earners in households where the primary earner is well-paid,

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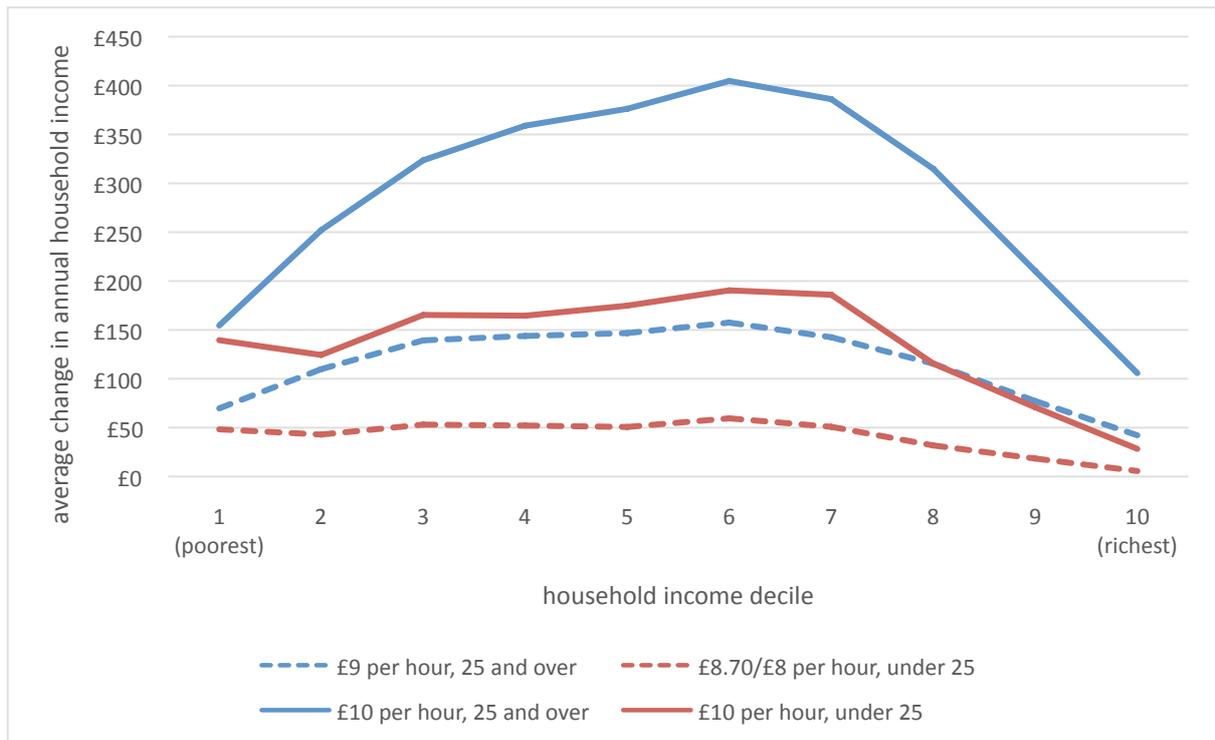
<sup>9</sup> Equivalisation of income is a process used to adjust income for household size so that it is a better measure of living standards, on the basis that households with more adults and children in them need a higher income to reach a standard of living equivalent to smaller households. The equivalence scale used to adjust net income in this report is the OECD equivalence scale which is the same scale used by the UK Department for Work and Pensions in its Households Below Average Income (HBAI) income distribution publication (DWP, 2018).

and so household income is in the middle or upper reaches of the income distribution.

The distributional impacts of the increase in the NMW for workers aged under 25 do not have such a clear inverse U-shape. Instead, the gain from the increase to £8.70 per hour for 21-24 year olds, and £8 per hour for 18-20 year olds, is roughly flat across the lowest six deciles of the household income distribution, and then is progressively lower in the four highest deciles. This reflects the fact that younger adult workers are more likely to be found in households at the bottom of the net income distribution than workers aged 25 or over. The distributional impact of the full increase to £10 per hour for workers aged under 25 is slightly higher in deciles 6 and 7 than for the lower deciles but the 'hump' is not as pronounced as for the over-25s.

The final point to note here is that the average cash gains from increasing the NMW and NLW to £10 per hour are much larger than the gains from increasing the NLW to £9 per hour, and the NMW to £8.70/£8 per hour. This reflects the figures in **Table 3** above showing that the overall gain in net income from the increase to £10 per hour was almost three times larger than the gain from the intermediate increase. This is because an increase to £10 per hour for all workers aged 18 and over 'bites' a lot further up the income distribution and affects a much larger number of workers than an increase to the intermediate levels. **Table 2**, earlier in the report, showed that an increase in the NMW/NLW to £10/hour affects around 9 million workers – almost 3 million more than the increase to intermediate levels.

**Figure 1. Average cash gains from increases in National Minimum Wage and National Living Wage, by household income decile**



Source: author's calculations using Landman Economics tax-transfer model

**Figure 2** shows the same average distributional results by household net income decile as **Figure 1** but as a percentage of household net income rather than as an average annual cash increase. This enables us to assess the *progressivity* of the changes in net income arising from the increase in the NMW and NLW. An increase in household net incomes is defined as progressive if lower deciles gain more in percentage terms than higher deciles. **Figure 2** shows that this is indeed the case across most of the income distribution for both age groups. For workers aged 25 and over, the gains from the increase in the NLW are highest in percentage terms in the bottom four deciles of the household income distribution, and then fall off higher up the distribution. For workers aged under 25 the progressive impact of the NMW increases is more pronounced at the bottom of the distribution, with households in the lowest income decile gaining around 1.4 per cent of net income from the increase to £10 per hour, compared with less than 0.8 per cent for other deciles.

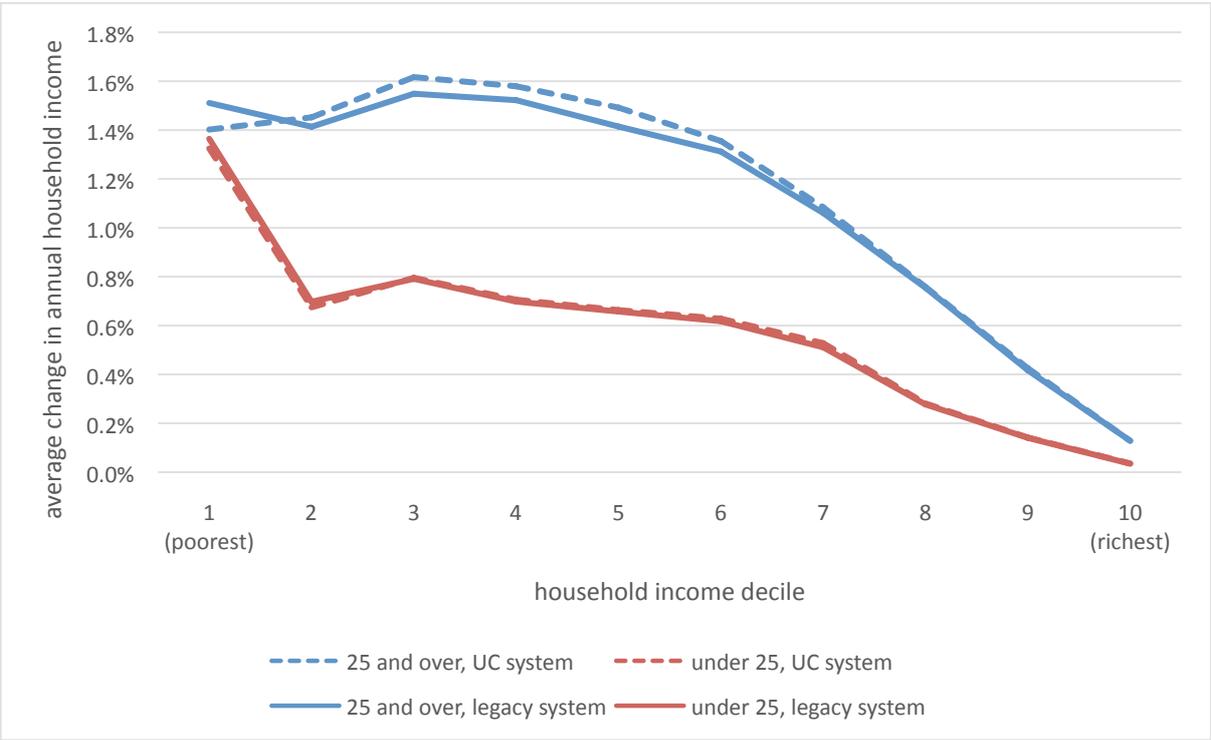
**Figure 2. Average gains as a percentage of net income from increases in National Minimum Wage and National Living Wage, by household income decile**



Source: author's calculations using Landman Economics tax-transfer model

So far in this section, the distributional impacts have all been based on modelling using the legacy social security system (i.e. benefits and tax credits) rather than the Universal Credit system which is currently being rolled out. **Figure 3** shows how much difference it makes if the Universal Credit system is used for the modelling of increases in net income instead. The unbroken lines in **Figure 3** show the impacts (separately for workers aged 25 and over, and under 25) of increasing the NMW/NLW to £10 per hour assuming that the legacy social security system is still in place, whereas the dashed lines show the distributional impacts assuming that the UC system has been fully rolled out. The differences between the two sets of lines are fairly small for workers aged 25 and over; the distributional impact is slightly less progressive under the UC system because of slightly lower gains in the bottom decile, and slightly higher gains in deciles 2 to 6, but the differences in the overall distributional pattern are fairly minor. For workers aged under 25 the two sets of results are almost identical. The rest of the results in this chapter assume that the legacy social security system is still in place, on the understanding that assuming a full roll-out of UC would not change the results to any great extent.

**Figure 3. Average gains as a percentage of net income from increases in National Minimum Wage and National Living Wage to £10 per hour under different assumptions about the social security system in place, by household income decile**



Source: author's calculations using Landman Economics tax-transfer model

## Impacts by gender

**Figures 4a and 4b** show the percentage impacts of the NMW and NLW increases for women as ‘stacked column’ charts, meaning that the percentage impacts on household income of the increase in the NMW/NLW for men’s wages and for women’s wages are shown separately, but added together to sum to the total increase in household net incomes by net income decile. **Figure 4a** shows the distributional impacts of the increases in the NLW and NMW to the intermediate levels shown in **Table 1** (£9 per hour for workers aged 25 and over, £8.70 for 21-24 year olds and £8 per hour for 18-20 year olds) while **Figure 4b** shows the full impact of an increase from current levels to £10 per hour. The vertical scale of the graphs is the same, so that the size of the impacts in both graphs can be easily compared. The distributional effects are separated out for men and women aged 25 and over and for the under-25s.

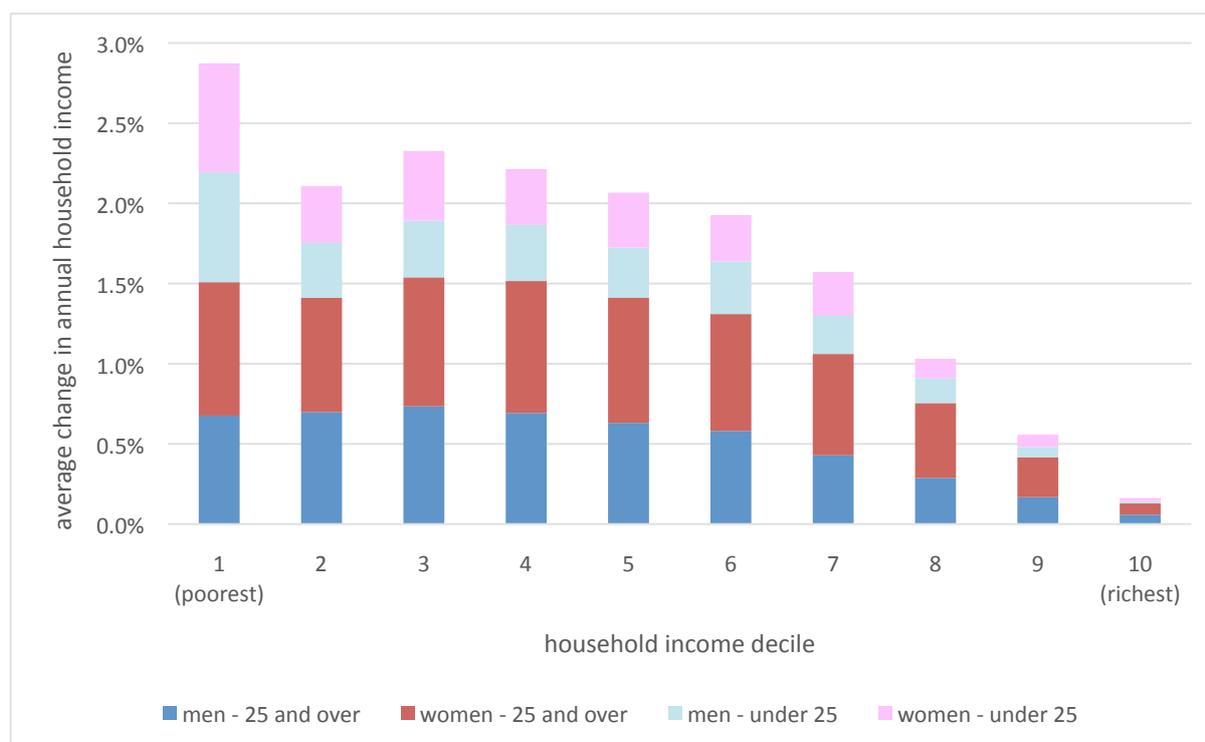
**Figure 4a. Average gains as a percentage of net income from increases in National Living Wage to £9/hour and National Minimum Wage to £8.70/£8/hour, by gender and household income decile**



Source: author’s calculations using Landman Economics tax-transfer model

**Figure 4a** shows that slightly more of the distributional impact of increasing the NMW and NLW to intermediate levels accrues to households with female workers than to households with male workers. This is because, as shown in **Table 3** above, female workers' net income increases by a total of around £2.4 billion as a result of increasing the NMW/NLW to intermediate levels, compared to an increase in net income for male workers of less than £2 billion. The effects of the minimum wage increase are progressive for both men and women.

**Figure 4b. Average gains as a percentage of net income from increases in NMW/NLW to £10/hour, by gender and household income decile**



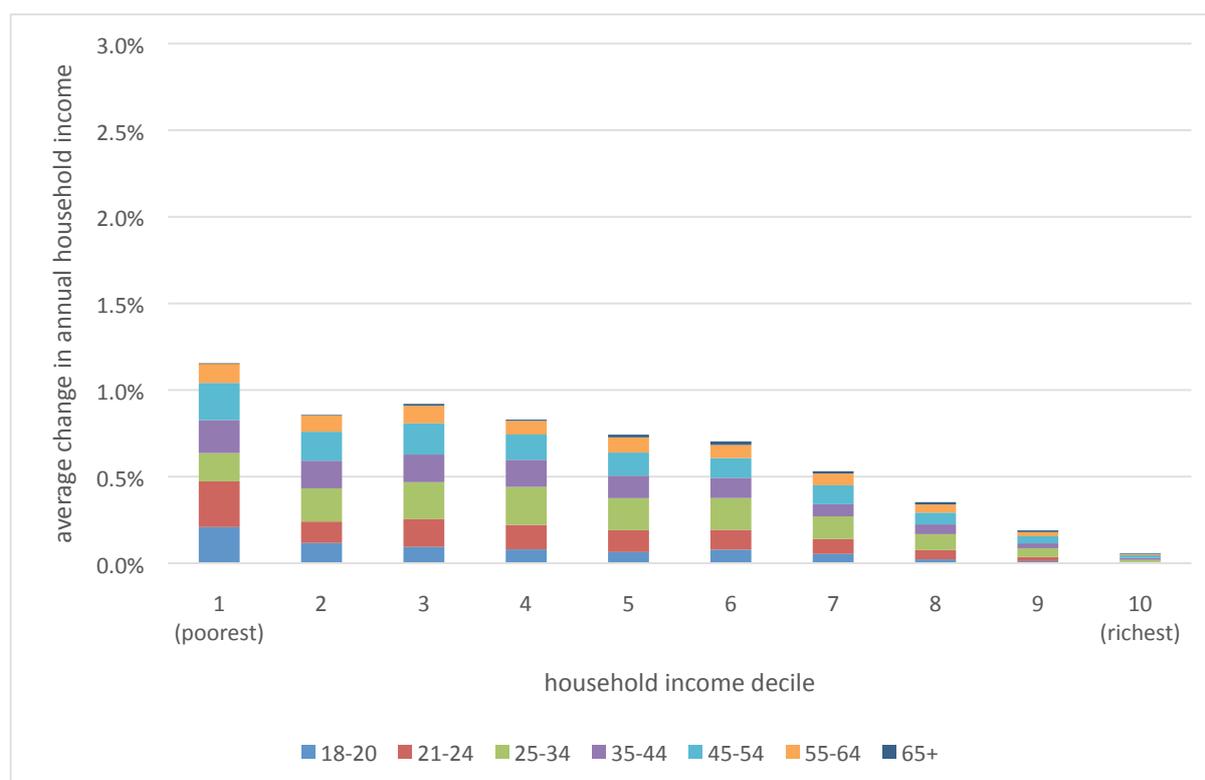
Source: author's calculations using Landman Economics tax-transfer model

**Figure 4b** shows more clearly that for workers aged 25 and over, women's wages are a particularly large proportion of the household income increase in deciles 7, 8 and 9, reflecting the fact that women are more likely than men to be second earners earning at or just above minimum wage levels in a household where the primary earner is better paid.

## Impacts by age group

**Figures 5a and 5b** show the impact of the increases in the National Minimum Wage and National Living Wage by the age group of the affected workers, again presenting the average gains from the increase to intermediate levels in **Figure 5a**, and then the average gains from the increase to £10 per hour in **Figure 5b**.

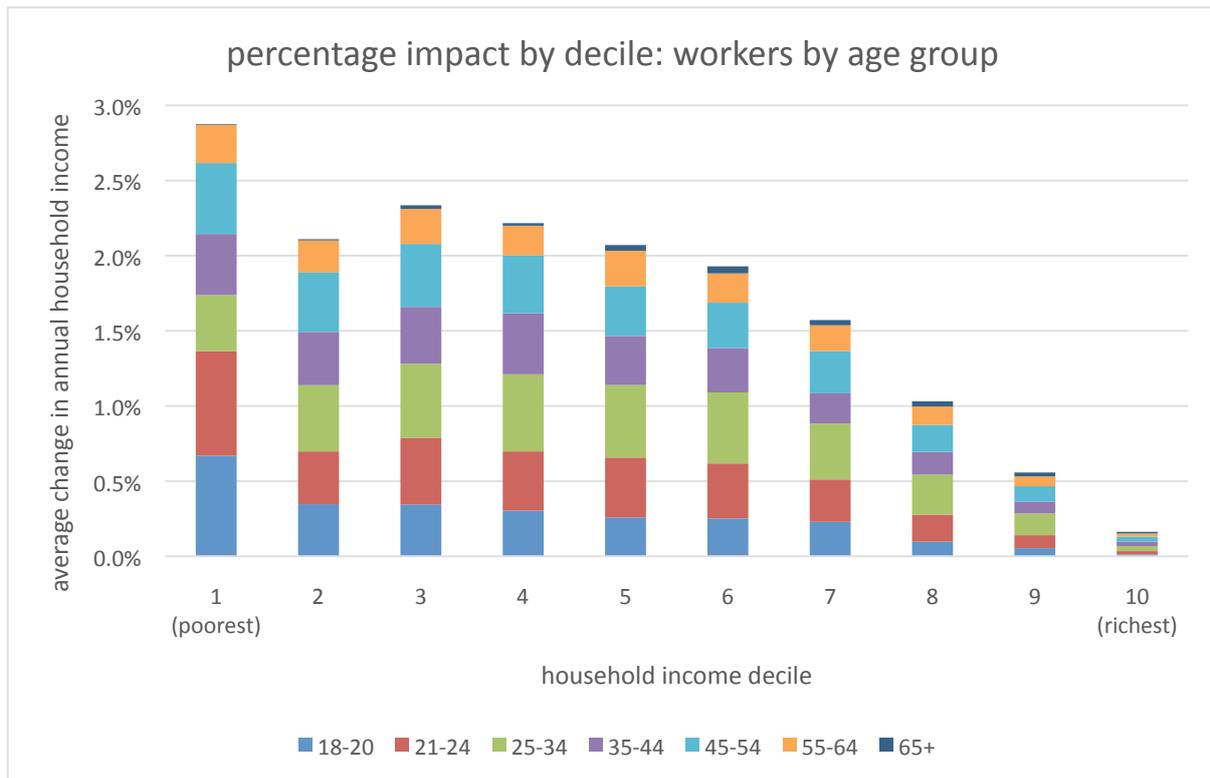
**Figure 5a. Average gains as a percentage of net income from increases in National Living Wage to £9/hour and National Minimum Wage to £8.70/£8/hour, by age group and household income decile**



Source: author's calculations using Landman Economics tax-transfer model

**Figure 5a** shows that in the bottom decile, net income gains for workers aged 18-20 and 21-24 make up a substantial proportion (around 40 per cent) of all the gains from the NMW/NLW increase to intermediate levels. For the second and higher income deciles, workers aged under 25 are a smaller proportion of the total net income gain, but workers aged under 35 (i.e. including the 25-34 age group) account for around half of the total increase in net income in these deciles. Net income gains for workers aged 55-64 and (especially) for workers aged 65 and over are relatively limited, reflecting the smaller numbers of these workers in low-earning jobs in the labour market.

**Figure 5b. Average gains as a percentage of net income from increases in NMW/NLW to £10/hour, by age group and household income decile**



Source: author's calculations using Landman Economics tax-transfer model

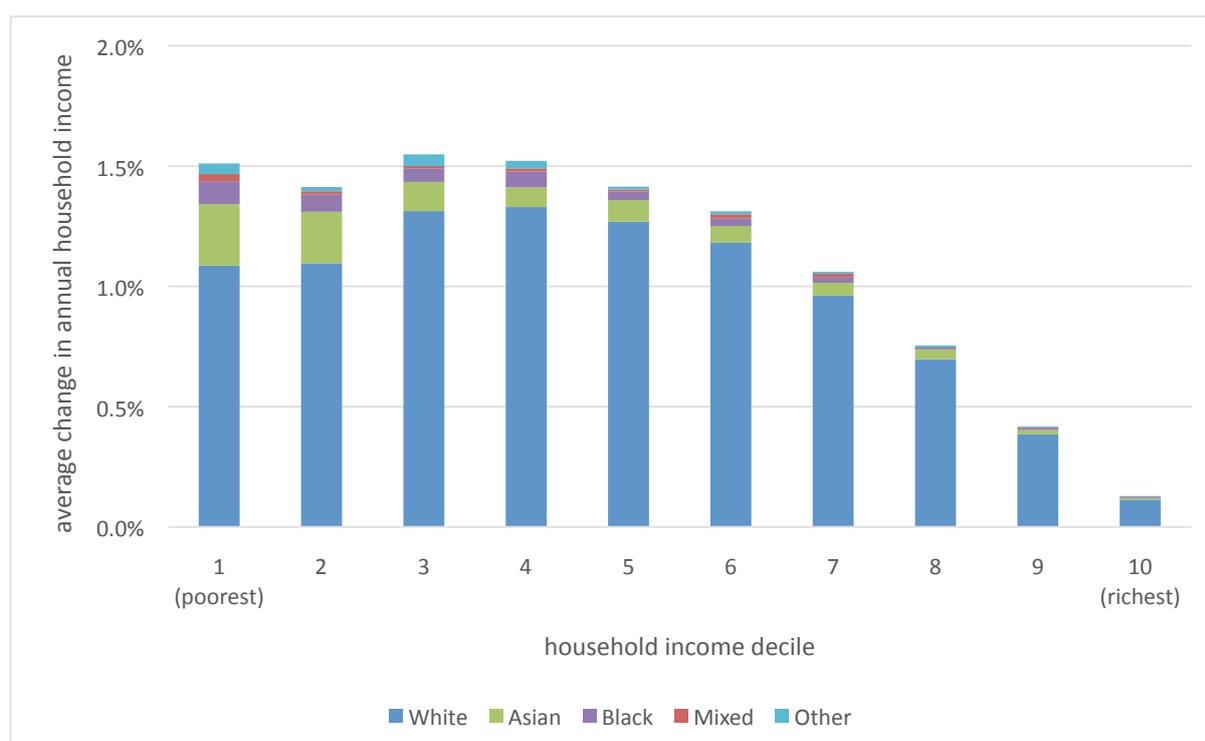
**Figure 5b** shows that the age composition of the gains from increasing the NMW and NLW to £10 per hour is approximately similar to the gains from the more modest increases shown in **Figure 5a**. In the remainder of this chapter we focus on the distributional gains from increasing the NMW and NLW to £10 per hour, presenting the results separately for workers aged under 25 and workers aged 25 and over.

## Impacts by ethnicity

**Figures 6a and 6b** show the average percentage impacts of increasing the NMW and NLW to £10 per hour by ethnic group, for workers aged 25 and over and workers aged under 25 respectively. Note that the vertical scale of the axis is smaller for these graphs than for **Figures 5a and 5b**, in order to make it easier to show the effects for black, asian, mixed-race and other-ethnicity workers (who are a relatively small proportion of the overall low-paid workforce, as shown in **Table 2** above).

**Figure 6a** shows that the distributional impact for white workers as a percentage of net income is similar to the overall pattern for workers aged 25 and over shown in **Figure 2** above. For asian workers and black workers the impact of the NLW increases is more progressive than for white households, with especially large gains in the bottom half of the income distributions (and for asian households, the bottom two deciles in particular). The distributional impacts for mixed-race workers and workers of other ethnicities are also more progressive than for white workers although it is hard to see this on **Figure 6a** because mixed-race and other ethnicity workers are such a small part of the overall sample.

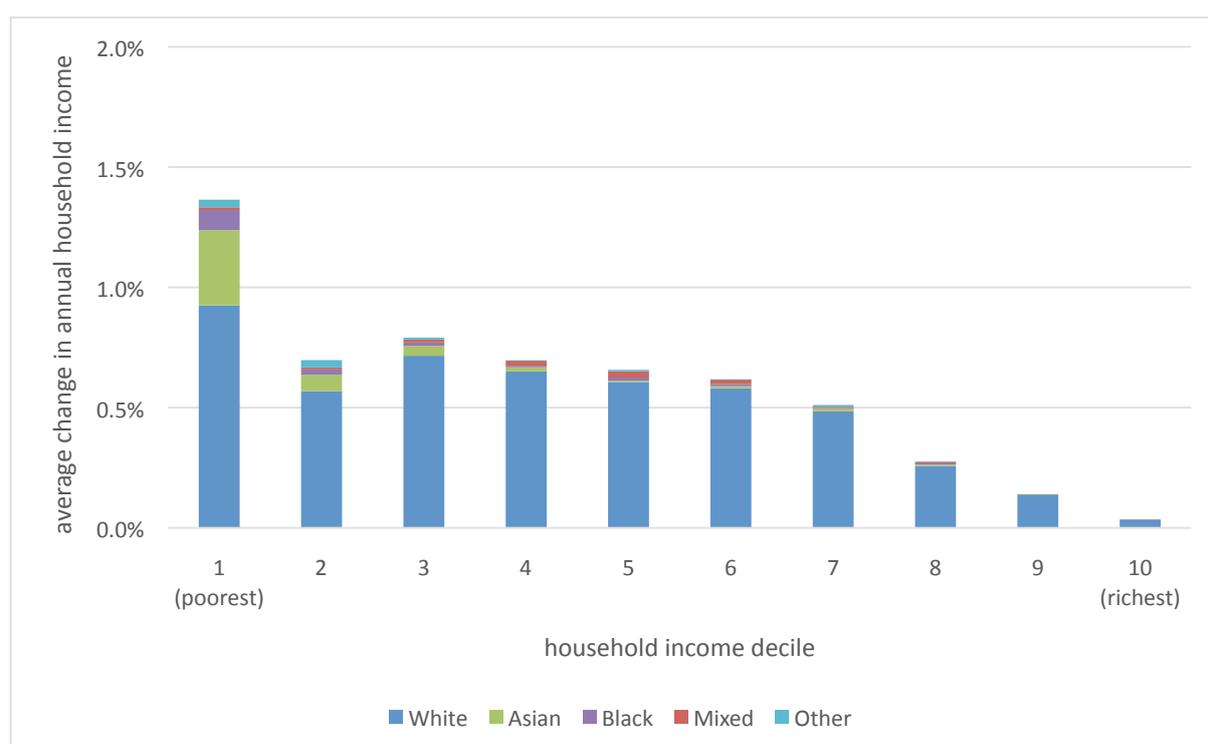
**Figure 6a. Average gains as a percentage of net income from increases in NLW to £10/hour, by ethnicity and household income decile: workers aged 25 and over**



Source: author's calculations using Landman Economics tax-transfer model

**Figure 6b** shows that the distributional impact of increasing the NLW to £10 per hour results in bigger percentage gains in net income in the bottom decile, relative to the gains across the rest of the household income distribution, for white, asian and black workers aged under 25 than it is for workers aged 25 and over. Across deciles 2 to 6 the distributional effects are relatively flat in percentage terms for white workers but are more progressive for asian workers in particular.

**Figure 6b. Average gains as a percentage of net income from increases in NMW to £10/hour, by ethnicity and household income decile: workers aged under 25**



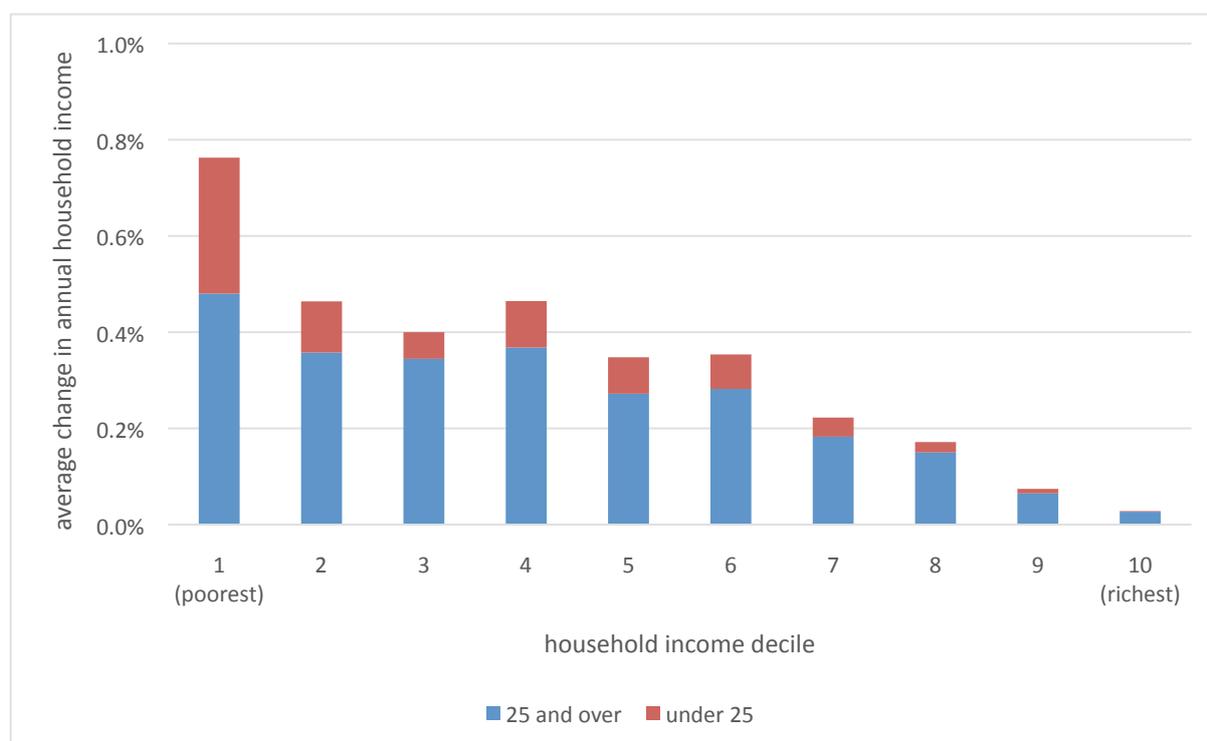
Source: author's calculations using Landman Economics tax-transfer model

## Impacts for migrant workers

**Figure 7** shows the distributional impacts of increasing the NMW and NLW to £10 per hour for migrant workers (as a stacked column, with the impacts for workers aged 25 and over and workers aged under 25 shown on the same graph). Note that a smaller vertical scale has been used for this graph compared to **Figures 6a and 6b**, because migrant workers are only about one in five of the total workforce affected by the increases in the NLW and NMW.

**Figure 7** shows that for workers aged under 25 the distributional impacts of increasing the NMW are particularly large in the bottom decile; this echoes the analysis by age group in **Figure 5b**. For workers aged 25 and over, the distributional impacts of raising the NLW are progressive, but the percentage increase in net income in the bottom decile is not that much greater than in deciles 2, 3 and 4.

**Figure 7. Average gains as a percentage of net income from increases in NMW/NLW to £10/hour, by household income decile: migrant workers**



Source: author's calculations using Landman Economics tax-transfer model

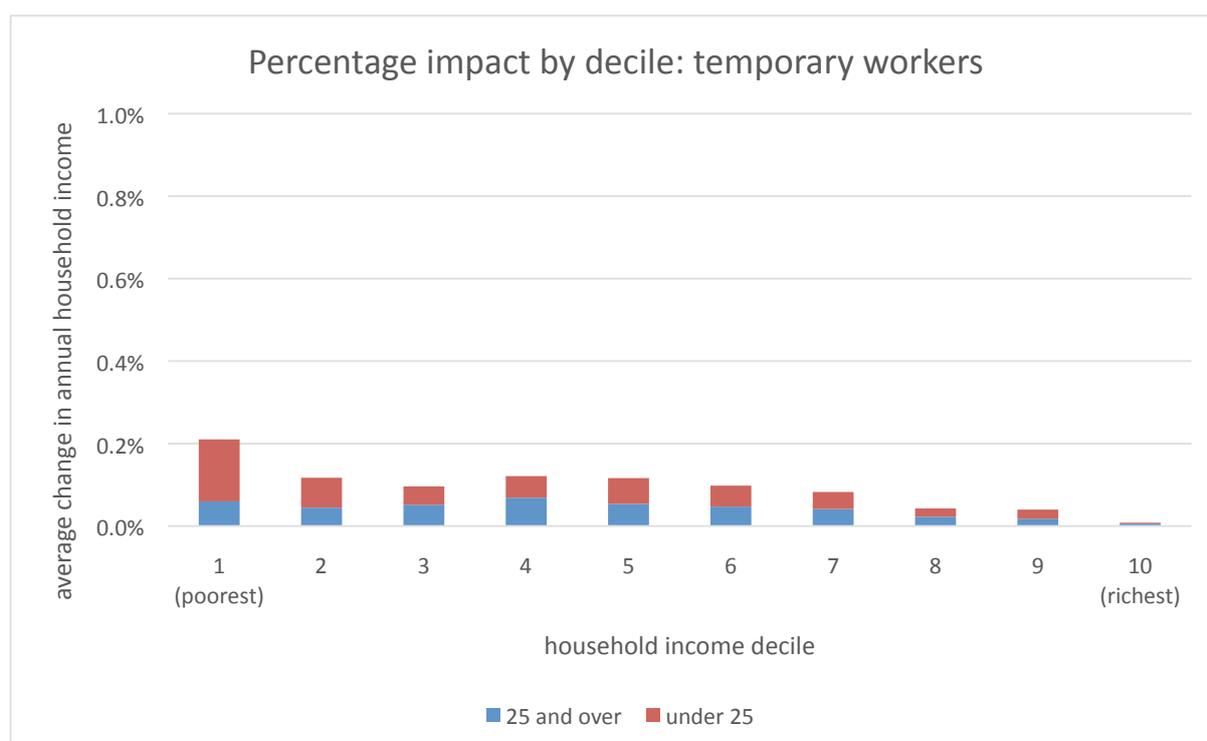
## Impacts for temporary workers

**Figure 8** shows the distributional impacts of increasing the NMW and NLW to £10 per hour for temporary workers. As with **Figure 7** the results are presented as a stacked column, with the impacts for workers aged 25 and over and workers aged under 25 shown on the same graph). The same vertical scale is used as for **Figure 7**, but the average distributional impacts are smaller – mainly because there are fewer workers identified as in temporary jobs in the FRS than there are migrant workers in the FRS.

**Figure 8** shows that for temporary workers, the average gains from increasing the NMW for workers aged under 25 are larger than the gains from increasing the NLW for workers aged 25 and over in most deciles. In the bottom decile, in particular, the

gains for workers under 25 are far larger than for the 25-and-over age group. This reflects a relatively high incidence of temporary work among the under-25 age group. The distributional impacts of increasing the NMW for under-25s are particularly large in the bottom two deciles of the household income distribution, whereas for workers aged 25 and over, the distributional impacts are relatively flat as a proportion of net income in the bottom half of the income distribution, and are in fact largest in decile 4.

**Figure 8. Average gains as a percentage of net income from increases in NMW/NLW to £10/hour, by household income decile: temporary workers**



Source: author's calculations using Landman Economics tax-transfer model

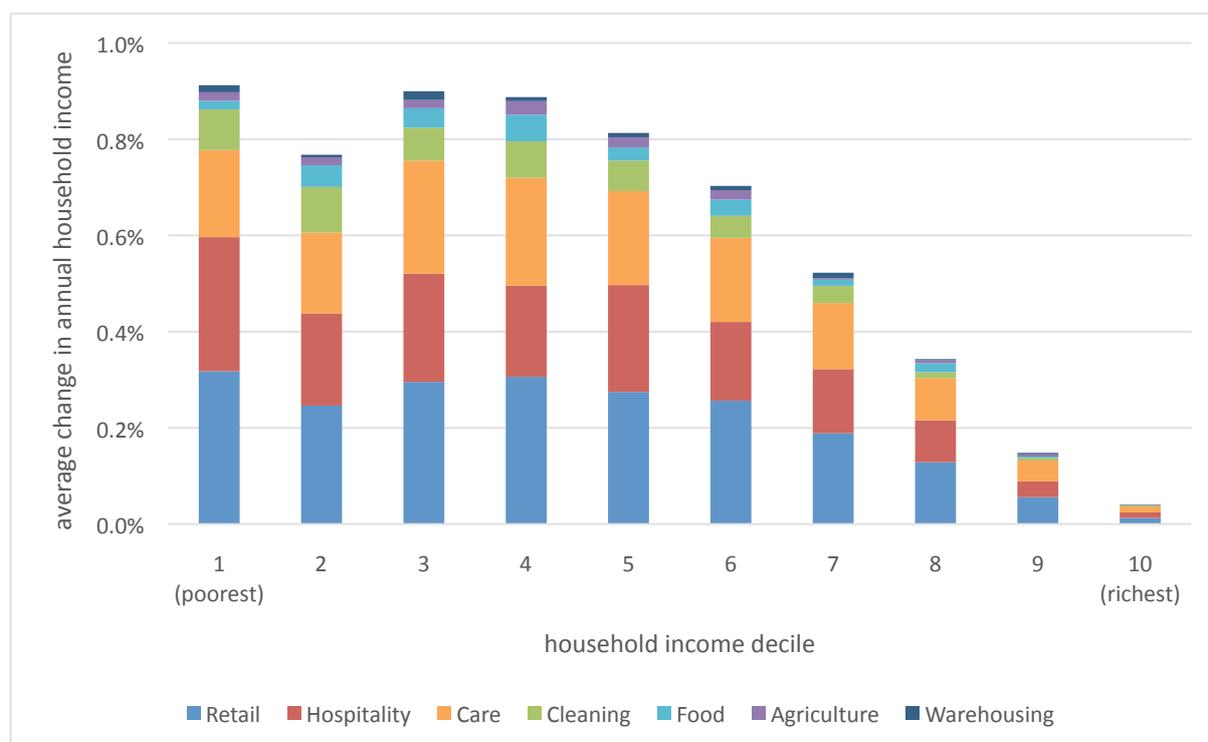
## Impacts by industrial sector

Finally in this chapter, **Figures 9a and 9b** show the impact of increasing the NLW and NMW to £10 per hour for workers in the seven specific industrial sectors looked at earlier in this report. The results are shown on the same vertical scale as for **Figures 7 and 8**.

**Figure 9a** shows that for workers aged 25 and over, the distributional impacts on net household income are particularly large in the retail, hospitality and care industries. As shown in **Table 2**, this is mostly because there are a particularly large number of workers in these industries who would be affected by an increase in the NLW to £10

per hour. The distributional impacts are particularly progressive for hospitality workers, where there are a large number of workers on very low pay according to the most recent ASHE statistics. For care workers, the biggest distributional impact in percentage terms is in deciles 3 and 4, while in retail, the biggest impact is in deciles 1, 3 and 4. The distributional impacts for cleaning workers aged 25 and over are also progressive, with the biggest percentage impact in the bottom income decile.

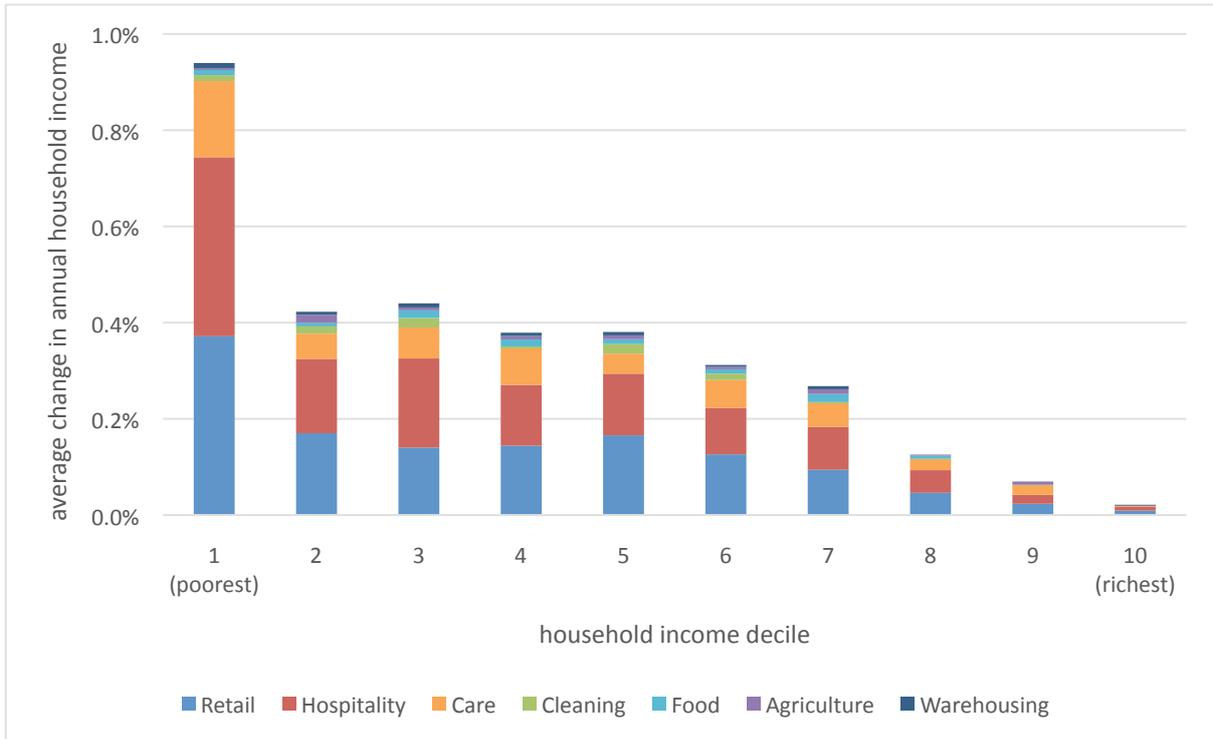
**Figure 9a. Average gains as a percentage of net income from increases in NLW to £10/hour, by industry sector and household income decile: workers aged 25 and over**



Source: author's calculations using Landman Economics tax-transfer model

**Figure 9b** shows that the percentage impacts on household net incomes of increasing the NMW to £10/hour for workers aged under 25 are especially large in the retail, hospitality and care industries, both of which contain a particularly large number of low-paid young workers. Unlike for workers aged 25 and over, the distributional impacts for workers under 25 are particularly large for the bottom decile in these three industries. In the other four industries this pattern does not hold; for example, the impacts of increasing the NMW for young workers in the food industry are largest in decile 3, whereas for cleaning the impacts are largest in decile 5. The other four industries also have much smaller numbers of workers aged under 25, resulting in much smaller measured distributional effects for these industries relative to the effects shown in **Figure 9a**.

**Figure 9b. Average gains as a percentage of net income from increases in NMW to £10/hour, by industry sector and household income decile: workers aged under 25**



Source: author's calculations using Landman Economics tax-transfer model

## **Chapter 4. The microeconomic employment impact of increasing the National Minimum Wage and National Living Wage**

This chapter discusses the potential employment impact of increasing the National Minimum Wage, focusing on the ‘microeconomic’ impacts – not taking account, for the moment, of potential macroeconomic impacts on employment resulting from increased demand for goods and services in the economy. Chapter 5 below discusses potential macroeconomic impacts.

### **Theoretical models of the effect of minimum wages on employment**

The predictions from economic theory about the potential employment effect of a wage floor depend on the assumptions made about the way the labour market works.

The most simplistic economic model of the labour market assumes ‘perfect competition’, whereby each worker is paid the value of what he or she produces. This model predicts that a minimum wage will either have no effect on the labour market whatsoever (if set at a level below what the lowest-paid worker in the labour market is paid) or will reduce employment (if set above this level). In this view, the higher the minimum wage is, the higher unemployment will be. Any worker for whom the minimum wage is greater than the value of their hourly productivity will lose their job when the minimum wage is introduced in this model.

Alternative models based on ‘imperfect competition’ in the labour market (e.g. Manning 2003) suggest that due to features of real-world labour markets such as employers’ market power and the costs to employees of moving jobs, it is quite possible that many workers are being paid less than the value of what they produce. In this situation, it is possible for a minimum wage to raise wages without having any adverse effect on employment. In fact, in certain models there may be a positive impact on employment (Card and Krueger, 1995). There is still a certain critical level of minimum wage above which we would expect to encounter adverse employment effects, but it is an empirical question as to where that level is.

Kaufman (2009) suggests that there is an additional rationale for minimum wages that goes beyond arguments about the structure of the labour market. This is the inequality of bargaining power between workers and employers. Bargaining inequality arises partly from the fact that labour is a perishable good which cannot be inventoried like most other production goods. Most workers’ bargaining power in

employment negotiations is limited by the fact that they cannot afford to live for long without working – in other words they are likely to have 'shallower pockets' than employers. This is particularly the case for workers on very low wages who are unlikely to be able to save large amounts. Also, in countries with relatively weak employment protection, unskilled workers are easier to substitute with alternative sources of labour in the event of industrial action (because employers do not need to spend a lot on training up new workers if they dismiss the strikers). Hence, the particular conditions of low-wage labour markets tilt bargaining power in favour of employers and results in low-wage workers having to accept lower average wages than they would do if bargaining strength of employers and workers were equal.

## Empirical research on minimum wage employment effects

Theory, then, suggests that the employment impact of a minimum wage is an open question. What does the empirical evidence suggest? The debate has swung wildly between defenders and opponents of minimum wages ever since 1995, when two eminent American labour economists, David Card and Alan Krueger, produced results from micro-studies on US data<sup>10</sup> which seemed to overturn the standard orthodoxy, showing that the best estimate of the effects of the minimum wage on US employment using micro-data from the 1980s and early 1990s was zero (Card and Krueger, 1995). This conclusion has since been challenged: Neumark and Wascher (2007) argued, based on a meta-analysis of findings from micro-studies in the US and other countries, that there is a significant negative impact of increases in the minimum wage on employment, averaging across all studies.

However, more recent analysis by Doucouliagos and Stanley (2009) using a meta-study of 1,474 empirical estimates of the effect of minimum wages on employment from 64 studies using US data finds that the results of Neumark and Wascher – at least for the US – are entirely driven by publication bias. This is the tendency, well-documented in empirical academic publications in a host of subjects, for empirical research which produces an outcome of an intervention or policy significantly different from zero to be more “interesting”, and hence more likely to be published, than research which shows no effects of the policy or intervention (Sackett, 1979). In a minimum wage context, this gives two implications:

1. Studies which find a negative impact of minimum wages on employment are more likely to be published than studies which find no effects.

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10 In the US there is a national (federal) minimum wage but each individual state can choose to set a state-level minimum wage in excess of the national minimum. Most of the US studies are based on “difference-in-differences” estimates which look at the change in employment levels in a state or states where the minimum wage was increased and compare this with the change in employment levels in a state or state where the minimum wage was held constant. Often, the studies look at matched workplaces in each state (for example, fast food outlets).

2. Where researchers conduct an empirical study which produces several different results<sup>11</sup>, there is a tendency to focus on the results which are statistically significant and different from zero, as this will make the paper more likely to be published (publication being the immediate objective of most researchers).

Once publication bias is controlled for using appropriate statistical techniques<sup>12</sup>, the estimated average effect of minimum wages on employment in the United States from the meta-analysis is almost exactly zero.

More recent meta-analysis studies from Stanley and Doucouliagos (2012), Belman and Wolfson (2014) and Wolfson and Belman (2016) confirm the finding that in the US, increases in minimum wages at state level have had no statistically significant impact on employment.

Recent evidence for the UK reaches comparable conclusions. Hafner *et al* (2017) conducted a recent meta-analysis study for the UK Low Pay Commission (LPC) on the impact of the National Minimum Wage on employment, using evidence from research studies up to and including 2016. The results were that there is “no overall ‘genuine’ adverse employment effect, neither on employment and hours nor on employment retention probabilities.” (Hafner *et al* 2017, introduction). This confirms the findings of an earlier meta-analysis conducted for the LPC by de Linde Leonard *et al* (2014).

## The employment effects of the National Living Wage

The National Living Wage for workers aged 25 and over was only introduced in April 2016, which means that there is only a limited amount of data to go on so far in assessing its employment impacts. Whereas previous upratings to the National Minimum Wage had been made based on advice from the LPC “to increase pay for the lowest earners without any detriment to their employment prospects”, the NLW represented a significant increase in hourly wages for workers aged 25 and over (initially from £6.70 to £7.20 in April 2016, £7.50 in April 2017 and £7.83 in 2018). Because of the size of the increase, the UK Government estimated that the

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<sup>11</sup> Most empirical research, whether based on macro or micro data, produces several different estimates of the impact of the policy intervention being studied. The reason is that there are many different specifications that can be used for a regression (in terms of which variables are included and which are left out, the sample period, the particular econometric estimation technique used, etc.)

<sup>12</sup> The techniques are based around the idea that in the absence of publication bias, the probability distribution of the estimated effects of a policy should follow a symmetric distribution around the average. If the estimated effects are asymmetrically distributed (as is the case for the minimum wage studies examined by Doucouglias and Stanley, 2009) then it is clear evidence of publication bias, and the 'real' average effect has to be estimated from the 'truncated' distribution.

introduction of the NLW would result in small-scale job losses, of between 20,000 and 110,000 jobs.

In its Autumn 2017 report (LPC, 2017) the Low Pay Commission assessed the impact of the introduction of the NLW in April 2016 by looking at the change in employment and hours worked for workers aged 25 and over who were especially likely to be paid at the NLW rate – in particular women, ethnic minorities, workers with disabilities, non-UK born workers and workers without qualifications. The results from this comparison suggested that employment growth was *stronger* for workers who were more likely to be affected by the introduction of the NLW (LPC 2017, Figure 2.18, p85). In particular:

- Employment for female workers grew faster than for male workers;
- Employment for workers born outside the UK grew more quickly than for those born in the UK;
- Employment for workers with no qualifications grew more quickly than for those with qualifications;
- Employment for workers with disabilities grew more quickly than for workers without disabilities;
- Employment for workers from ethnic minorities grew more quickly than for white workers;
- Employment for workers aged 25 or over grew more quickly than for workers aged under 25 (who are not covered by the NLW).

As the LPC observes, “these positive labour market outcomes suggest that these groups of workers have suffered no obvious initial impacts from the NLW”. There is some evidence of lower growth in hours worked for affected workers who were already in employment following the introduction of the NLW, but overall the results from data from April 2016 onwards are consistent with the imperfect competition model of the labour market outlined above, where increasing the minimum wage can – up to a certain level – result in *increases* in employment.

Overall, there does not seem to be any evidence of an adverse employment impact of the NLW based on the increases so far, and there may even be evidence of a *positive* employment impact.

## Chapter 5. Macroeconomic impacts of increasing the National Minimum Wage and National Living Wage

This section discusses the potential for increases in the NLW and NMW to result in increases in employment through the stimulus impact of increased demand in the economy.

To estimate the impacts of increasing the NMW and NLW on the UK economy it is necessary to make assumptions about the size of the fiscal **multiplier**. The relevant multiplier for the current report is a number capturing the extent to which increases in net incomes and the improvement in the government's fiscal balance arising from the increase in the minimum wages feed through into increases in GDP through increased economic activity among UK-based companies and workers.

An increase in the NMW and NLW to £10 per hour would have three potential multiplier impacts on UK GDP:

- The *wages* impact: the increase in net incomes arising from the increase in gross wages should lead to increased consumer demand which has a positive multiplier impact on GDP.
- The *profits* impact: the reduction in net incomes arising from a decrease in profits may lead to reduced consumer demand which would have a negative multiplier impact on GDP.
- The *public finances* impact: the increase in income tax, expenditure tax and NICs receipts and the reduction in benefit and tax credit (or Universal Credit) spending leads to an improvement in the public finances even after taking into account increases in the public sector wage bill and reductions in corporation tax revenue.

The UK Office for Budget Responsibility makes the following assumptions about the size of the multiplier in the UK in its economic forecasting model<sup>13</sup>, with the size of the multiplier depending on where the increase (or decrease) in demand comes from. **Table 8** below shows the OBR's multiplier assumptions. In general the multiplier impact of increases in public spending is higher than the multiplier impact of tax cuts or benefit increases, largely because consumers tend to save rather than spend a portion of the extra disposable income which they gain from the tax cut, which reduces the multiplier effects.

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<sup>13</sup> The OBR model is the same model that HM Treasury uses.

**Table 8. OBR multiplier assumptions**

Source of demand increase (decrease)	Multiplier
Reduction (increase) in VAT	0.35
Reduction (increase) in personal tax and NICs	0.3
Increase (reduction) in benefit/tax credit/UC spending	0.6
Change in government current spending on departments	0.6
Change in government capital investment spending	1.0

Source: OBR (2015), Box 3.2

Using the OBR multiplier assumptions, the macroeconomic effects of increasing the NMW and NLW to £10 per hour can be calculated by estimating the change in GDP arising from increased wages, reduced profits and improved government finances, and then converting this into a number of (full-time equivalent) extra jobs. The calculation proceeds as follows:

**The wages impact:** as explained previously, increasing the NMW/NLW to £10 per hour leads to an increase in net incomes for low-paid workers of between £11.8 billion and £12.0 billion (depending on the precise assumptions made about the social security system which is in force). In terms of the multiplier effects, these are likely to depend to a large extent on how much the income of poorer households is boosted compared to richer households. Research from the Bank of England (Bank of England 2012, pp338-339) suggests that the marginal propensity to consume out of income is higher for lower income households than for high income households<sup>14</sup>. Meanwhile, the distributional results from **Figure 1** earlier in this report show that the cash impact of increases in the NMW and NLW is highest for households in the middle of the income distribution.

The OBR multiplier estimates suggest that increases in demand arising from cuts to income tax and National Insurance Contributions have a multiplier effect of 0.3 whereas increases in demand arising from benefit and tax credit increases have a multiplier effect of 0.6. Given that the distributional effect of increasing the NMW is more progressive than the effect of income tax and NICs cuts but less progressive than the impact of benefit and tax credit (or UC) increases, it makes sense to use a value for the multiplier impact of minimum wage increases that is somewhere in between the OBR's multiplier estimates for tax cuts and its estimate for benefit increases. Therefore, I assume that the multiplier impact of increasing the National Minimum Wage and National Living Wage is 0.45.

<sup>14</sup> Specifically, the Bank of England research (based on a household survey carried out by NMG Consulting) suggests that the reduction in consumption for a negative income shock is around 78 pence for every pound of reduced income for households with gross incomes of less than £9,500 per year compared with 45 pence for every pound of reduced income for households with gross incomes of more than £50,000 per year.

Using an intermediate value of £11.9 billion for the overall increase in net incomes arising from the increase in the NMW/NLW, a multiplier of 0.45 implies that the impact on GDP is  $0.45 \times £11.9\text{bn} = \mathbf{£5.4bn}$  (to the nearest £100 million).

**The profits impact:** the impact of reduced profits on consumer demand is likely to be relatively minor, at least in the short run. A proportion of profits is paid out to shareholders as dividends and it is likely that reductions in profits will result in reduced dividend payments. However, most company shares are held by institutional investors such as pension funds; in most cases there will be a considerable time lag between the dividends being paid and the accumulated pension funds being used by the relevant policyholder to purchase an annuity. Furthermore, a substantial proportion of UK company shares are held by institutions or individuals who are not based in the UK. For these two reasons, I have assumed here that the short-run impact of reduced profits on consumer demand is zero.

**The impact of improved government finances:** as shown in **Table 3** above, increasing the NMW and NLW to £10 per hour results in an improvement of between £5.5 billion and £5.7 billion in the public finances (receipts minus expenditure), depending on the assumptions made about the social security system. If this extra income is used to increase public spending relative to current government plans, the OBR estimate of the multiplier impact depends on what the extra resources are spent on. I assume here that half of the improvement in the public finances is spent on capital investment (e.g. infrastructure) with the other half being used to increase other aspects of departmental spending. This implies a multiplier impact of 0.8 (halfway between the OBR's estimate for investment spending and its estimate for other spending) which means that using an intermediate value of £5.6 billion for the estimated improvement in the public finances, the overall increase in GDP resulting from the improvement in the public finances arising from the increase in the NMW and NLW is equal to:

$£5.6\text{bn} \times 0.8 = \mathbf{£4.5bn}$  (to the nearest £100 million).

This implies that increasing the NMW and NLW to £10 per hour results in a total GDP increase (via multiplier effects) of £5.4bn (wages impact) + £4.5bn (public finances impact) = **£9.9bn**.

How many jobs is this macroeconomic stimulus likely to lead to? The most recent currently available estimates of the share in wages in GDP suggest that it is about 54 percent – implying that the increase in the total wage bill arising from the macroeconomic stimulus provided by the increase in the NMW and NLW is around £5.35 billion. Given current average (full-time) wages of around £28,700 per year, this implies  $(£5.35 \text{ billion} / 28,700) =$  approximately **185,000** extra full-time equivalent jobs.

However, it is possible that the overall positive macroeconomic employment effect from increasing the NMW/NLW could be higher than this. There is substantial evidence that fiscal multipliers are higher during an economic downturn (for example,

IMF, 2013; Glocker *et al*, 2017). If the UK's exit from the EU causes a significant reduction in GDP (as is predicted by most leading forecasters)<sup>15</sup> then it is likely that the fiscal multiplier will be higher than the OBR estimates.

Furthermore, as explained in Chapter 4, the LPC's initial analysis of employment growth since the introduction of the NLW in 2016 suggests that the UK government was overly pessimistic about the potential negative employment impacts of minimum wage increases. So far, the NLW does not seem to have had any negative impacts, and indeed may even have had *positive* employment impacts (in line with the predictions from the imperfect competition model of the labour market outlined in the previous chapter). Of course, an increase from current levels of the NMW and NLW to £10 per hour is a substantial increase, and particularly so for workers aged under 25. But even if it turns out that there is a small amount of job loss due to microeconomic factors if the NLW and NMW are raised to £10 per hour, the macroeconomic estimates here suggest that overall employment impact of £10/hour is likely to be at worst neutral, and perhaps slightly positive.

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<sup>15</sup> For example, HM Treasury (2017), Dhingra *et al* (2016), House of Commons Exiting the European Union Committee (2018).

## Chapter 6. The target level for the National Living Wage

The UK Government's current objective is for the National Living Wage to reach 60 per cent of median earnings by 2020, subject to sustainable economic growth. This chapter discusses the Unite proposal for a rate of £10 per hour for the NLW and NMW in that context.

The LPC's estimate for median earnings in 2018, based on forecasts from HM Treasury's forecast panel in autumn 2017, was £13.33, and on this basis the LPC recommended (and the Government accepted) an increase for the NLW from £7.50 to £7.83 in April 2018. Based on a median earnings forecast of £13.33, the NLW rate of £7.83 is just under 59 per cent of median earnings. A NLW of £10 per hour would be 75 per cent of median earnings.

Is "75 per cent of median earnings" a reasonable target level for the National Living Wage? Based on the evidence presented in this report, it would appear so. An increase in the NLW to £10 per hour as soon as possible has progressive distributional impacts and, based on the evidence outlined in Chapters 4 and 5, the employment impacts look like they are unlikely to be negative, and could in fact be positive.

A National Minimum Wage of £10 per hour for workers aged under 25 would be higher as a share of the median for those age groups than for workers over 25; in fact, the results from **Table 2** show that £10 per hour would be *above* the median for those age groups (by definition, because more than half of the workforce in those age groups would be affected by a NMW of £10/hour – 55 per cent of workers aged 21-24, and 78 per cent of workers aged 18-20. Because of the large number of workers affected, there is a case for a phased increase to £10 per hour for these groups. The NMW could be increased initially to the intermediate levels of the NMW suggested in this report (£8.70 for 21-24 year olds and £8 for 18-20 year olds), then, after monitoring the employment effects, provided they are not significantly negative, the full increase to £10 per hour could be implemented.

## Chapter 7. Conclusion

This report has shown that an immediate increase in the National Living Wage to £10 per hour for workers aged 25 and over, and an increase in the National Minimum Wage to £10 per hour for workers aged under 25, would result in an average gain in net income per worker of just over £1,300 per year for around 9 million workers. The public finances would also improve by around £5.5 billion. The distributional impacts of the increase in the NMW and NLW are progressive as a percentage of net income.

While increases in the NMW and NLW are often opposed on the grounds that they would lead to job losses, the analysis in Chapters 4 and 5 of the report shows that based on existing evidence, the employment effects of increasing the NLW and NMW to £10 per hour are unlikely to be negative, and could even be positive. Overall, the analysis presented here makes a powerful economic case for increasing the National Living Wage and National Minimum Wage to £10 per hour as soon as possible.

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## **Appendix A: Limitations in the Family Resources Survey data for 16 and 17 year olds, and apprentices**

### **16 and 17 year olds**

It was not possible to use the IPPR/Resolution Foundation/Landman Economics tax-transfer model to estimate the distributional impact of increasing the National Minimum Wage for 16 and 17 year olds because the Family Resources Survey only collects information on hours of work for survey respondents in the Adult survey record. Respondents aged 16 or over are placed in the Adult survey record if they have either (a) left full-time education, or (b) are not living with their parent(s) or guardians.

The leaving age for full-time education was raised to 18 in 2015 in England. This means that in the 2015-16 FRS, very few of the 16 and 17 year olds based in England in the survey are in the Adult survey record (because they are still in full time education and are living with parents or guardians in the vast majority of cases). Instead these 16 and 17 year olds are in the Child Survey record, which collects information on weekly earnings but does not collect hours information. This makes it impossible to calculate an hourly earnings variable for these 16 and 17 year olds.

### **Apprentices**

It was not possible to use the tax-transfer model to get a specific estimate of the distributional impact of increasing the National Minimum Wage for apprentices because the FRS does not collect information on whether workers are apprentices. Thus, for the purposes of this report, apprentices aged 18 or over have been treated as workers who are entitled to the standard National Minimum Wage rate for 18-20 year olds (apprentices over 19 are entitled to the standard NMW or NLW rate for their age group anyway, while apprentices aged under 18 are not included in the analysis due to the data limitations for 16 and 17 year olds explained above).

## Implications of including 16-17 year olds and apprentices in the analysis

An important question is how much difference it would make to the results in this report for the impact of increasing the National Minimum Wage to £10 per hour if 16 and 17 year olds and apprentices were included in the analysis.

Looking first at 16-17 year olds, the LPC's most recent annual report estimates (using Labour Force Survey data) that around 350,000 16-17 year olds were in employment in the year to June 2017, compared to 1.1 million 18-20 year olds. This means that the distributional and fiscal impacts of including 16-17 year olds in the analysis, had I been able to do so, would have been relatively limited. 18-20 year olds account for less than a tenth of the total number of workers affected by the increase in the NMW and NLW, around one-tenth of the fiscal impacts, and around 15 per cent of the net earnings impacts. Given that the group of 16-17 year olds in employment is only around one-third the size of the group of 18-20 year olds in employment, the impact of including 16-17 year olds in the analysis would be fairly limited.

Turning to apprentices, we need to distinguish between three separate groups:

- Apprentices aged 19 or over, and apprentices aged 18 in the second or subsequent year of their apprenticeship, are entitled to the standard NMW or NLW rate for their age group, and will therefore be included in the overall distributional results (although they cannot be specifically identified due to the lack of an apprentice identifier variable in the FRS data).
- Apprentices aged 18 in the first year of their apprenticeship are entitled to the NMW apprentice rate of £3.40. In this report they are modelled as if they are entitled to the standard 18-20 year old NMW rate of £5.90. Hence I underestimate the distributional impact of increasing their earnings to £10 per hour, but they are not entirely left out.
- Apprentices aged under 18 are not included in the analysis – they are a subgroup of the 16-17 year olds discussed above.

Therefore, the implication of not having an apprentice identifier variable in the FRS, over and above the omission of 16 and 17 year olds from the analysis as discussed above, is that apprentices aged 18 in the first year of their apprenticeship are miscategorised as employees who are entitled to the full NMW rate of £5.90 per hour rather than the apprentice rate. Given that there were around 900,000 people participating in an apprenticeship in England based on the most recent statistics

(from 2016/17 – see Powell, 2018 for more details), and much smaller numbers in Scotland, Wales and Northern Ireland (LPC 2017, ch 4), and only a small proportion of those (probably less than 10%) were 18-year olds in the first year of their apprenticeship, the impact of not specifically identifying the apprentice NMW rate for 18-year olds in the analysis is likely to be limited.

## Appendix B: Adjustment of hourly wages in the Family Resources Survey using the Annual Survey of Hours and Earnings

The FRS is a reliable source of information on *weekly* earnings, but the *hourly* wage information is not fully reliable because the survey responses on the number of hours each person works per week in the survey, and the survey responses on weekly wages, are taken from different weeks in many cases. Because of this, the FRS hourly wage measure is an overestimate of the proportion of workers in the UK working at, or just above, the minimum wage.

To address this problem, the analysis in this report uses data from the Annual Survey of Hours and Earnings – a much bigger survey than the FRS which explicitly collects accurate hourly wage information – to recalibrate the hourly wage measures in the FRS so that the adjusted FRS offers a more accurate representation of the hourly wage distribution in the UK.

The recalibration of the FRS hourly wage distribution is achieved by using published statistics from the Annual Survey of Hours and Earnings for 2017 (ONS, 2017) which show various percentiles of the hourly wage distribution for workers, disaggregated by 2-digit industrial sector using the SIC07 industrial classification (giving 88 sectors in total). These percentile points were then compared with percentile points in the FRS distribution of hourly wages after uprating the pooled FRS dataset (for 2013-14, 2014-15 and 2015-16) to 2017 levels using data from ASHE on average earnings growth between 2013 and 2017. Hourly wages for workers in each industry in the pooled FRS dataset were adjusted so that the distribution of hourly wages in the FRS matches the distribution of hourly wages in ASHE. **Table A** below gives an example of this process for a particular industry sector (retail - 2-digit SIC code 47) which is featured in the report.

**Table B. Percentiles of hourly wage distribution in ASHE (2012) and FRS (2011-12) and multipliers used at various percentile points: retail sector (SIC 47)**

Percentile	Hourly wage: ASHE 2017	Hourly wage: pooled FRS dataset (uprated by average earnings)	Multiplier
10 <sup>th</sup>	£7.50	£5.45	1.376
20 <sup>th</sup>	£7.55	£6.51	1.159
25 <sup>th</sup>	£7.66	£6.76	1.132
30 <sup>th</sup>	£7.80	£6.98	1.117
40 <sup>th</sup>	£8.15	£7.42	1.098
50 <sup>th</sup> (median)	£8.56	£7.97	1.074
60 <sup>th</sup>	£9.21	£8.63	1.067
70 <sup>th</sup>	£10.16	£9.51	1.069
75 <sup>th</sup>	£11.02	£10.16	1.084
80 <sup>th</sup>	£12.15	£11.02	1.103
90 <sup>th</sup>	£16.66	£14.92	1.116

After these adjustments, the FRS hourly *and weekly* wages were uprated from 2017 to 2018 using the latest ONS estimates of annual growth in weekly earnings (2.6 percent in the year to March 2018).

## Appendix C: Identification of industry sectors in the Family Resources Survey

The FRS SIC variable (which is defined using the 2-digit SIC07 classification) was used to identify the industrial sectors used in the analysis of the impact of increasing the minimum wage for specific sectors as explained in **Table C** below.

**Table C. Sectors used for industry analysis: 2 digit codes and description**

<b>Industry</b>	<b>2-digit SIC07</b>
Retail	47: retail trade, except of motor vehicles and motorcycles
Hospitality	55: accommodation 56: food and beverage service activities
Cleaning	81: services to buildings and landscape activities
Agriculture	1: crop and animal production, hunting and related service activities 2: forestry and logging 3: fishing and aquaculture
Food manufacturing	10: manufacture of food products
Care (childcare and social care)	87: residential care activities 88: social care activities without accommodation
Warehousing	52: Warehousing and support activities for transportation

It should be noted that according to data for 2017 from the UK Labour Force Survey (which contains more detailed industry information than the FRS), around 87 per cent of workers in the the care sector as defined using the two SIC codes 87 and 88 are social care workers, with the rest being childcare workers.





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