

<b>Title:</b> Amendment to the National Minimum Wage regulations 2018 - increase in National Minimum and National Living Wage rates  <b>IA No:</b> BEIS004(F)-18-LM  <b>RPC Reference No:</b> RPC-4201(1)-BEIS  <b>Lead department or agency:</b> Department for Business, Energy and Industrial Strategy  <b>Other departments or agencies:</b> N/A	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> 05/02/2018			
	<b>Stage:</b> Final			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Secondary legislation			
<b>Contact for enquiries:</b> James.Barber@beis.gov.uk				
<b>Summary: Intervention and Options</b>				<b>RPC Opinion:</b> GREEN

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB in 2014 prices)	One-In, Three-Out	Business Impact Target Status
-£2.9m	-£256.54m	£76.6m* <sup>1</sup>	Not in scope	To be determined

**What is the problem under consideration? Why is government intervention necessary?**

The National Minimum Wage (NMW) was introduced in 1999 to protect workers from exploitative wages due to unequal bargaining power, with the aim of increasing the wages of the lowest paid without damaging their employment prospects. The National Living Wage (NLW) was introduced in 2016 and is centred on equity, primarily around reducing wage inequality and ensuring that low paid workers enjoy the benefits of economic growth. The aim for the NLW is to reach 60% of median earnings by 2020, subject to sustained economic growth. The Low Pay Commission (LPC) has made recommendations to Government on the NLW and NMW rates that should apply from April 2018.

**What are the policy objectives and the intended effects?**

The objective of the NMW is to maximise the wages of low paid younger workers without damaging their employment prospects by setting it too high, whilst the aim of the NLW is to reach 60% of median earnings by 2020, subject to sustained economic growth. The NMW/NLW set a wage floor below which pay cannot fall ensuring protection for low-paid workers, while also providing incentives to work.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

This impact assessment considers changes to the NLW and NMW that should apply from April 2018. The independent LPC was set up in 1997 to make recommendations on the NMW to Government. In making its recommendations to Government, the LPC has consulted extensively and undertaken substantial analysis. Details are contained in its autumn 2017 report. The Government has considered two options this year:

0. Do nothing - maintain current NMW/NLW rates and system
1. Implement the LPC recommended rate increases (preferred option)

The Government's preferred option is to implement the LPC's recommended rate increases. This is to ensure that the NMW continues to achieve its objective of maximising the wages of the low paid younger workers without damaging their employment prospects. The recommendation on the NLW is on track to reach 60% of median earnings by 2020. Option 0 would not achieve these objectives.

<b>Will the policy be reviewed?</b> It will be reviewed by the LPC <b>If applicable, set review date:</b> 11/2018					
Does implementation go beyond minimum EU requirements?			N/A		
Are any of these organisations in scope?		<b>Micro</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b>		<b>Non-traded:</b>

***I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.***

Signed by the responsible Minister: \_\_\_\_\_ Andrew Griffiths Date: \_\_\_\_\_ 2 February 2018

<sup>1</sup> \*The EANDCB is calculated over 3 years. 99.9% of the impacts are expected in the first two years; if a 2 year appraisal period were used then the EANDCB would be £113.0m.

# Summary: Analysis & Evidence

# Policy Option 1

## Description:

### FULL ECONOMIC ASSESSMENT

Price Base Year: 2017	PV Base Year: 2018	Time Period Years: 3	Net Benefit (Present Value (PV)) (£m)		
			Low: -2.00	High: -2.90	Best Estimate: -2.90

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	2.0	118.0	355.3
High	2.9	192.6	578.1
Best Estimate	2.9	192.6	578.1

#### Description and scale of key monetised costs by 'main affected groups'

Our best estimate of the overall impacts of the LPC NMW/NLW rate recommendations is a total cost of £578.1m. This includes transition costs (£2.9m) and an increased labour cost to employers of £577.7m (£264m direct impacts and £313.8m indirect impacts). This is a transfer with a neutral net economic impact. It is made up of £482.5m of increased wages for employees, and £95.2m of increased non-wage labour costs, which are mainly employer pensions and national insurance contributions (the discrepancy in totals is due to rounding).

#### Other key non-monetised costs by 'main affected groups'

The evidence from the LPC report suggests that the NMW rates recommended by the LPC will not have a negative impact on employment, with negligible impacts on hours worked and training. The NLW may have macroeconomic impacts in the long-run. These are not formally quantified here as they are highly uncertain but could include negative employment impacts (OBR previously estimated 60,000 fewer people in employment by 2020 due to the NLW).

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	118.0	353.3
High	0	192.6	575.2
Best Estimate	0	192.6	575.2

#### Description and scale of key monetised benefits by 'main affected groups'

Our best estimate of the overall benefits of the LPC NMW rate recommendations is for a total benefit to employees and the Exchequer of £577.7m (difference with above box is due to discounting). This is a transfer from employers with a neutral net impact. Employees benefit from £482.5m of increased wages, while employees and the Exchequer benefit from £95.2m of non-wage labour benefits, made up of a number of benefits but predominantly consisting of pension and National Insurance contributions.

#### Other key non-monetised benefits by 'main affected groups'

Employers who provide accommodation are expected to benefit from an increased amount that can be offset against NMW/NLW pay. Workers can also benefit as these are often mutually beneficial arrangements. Take up of this is likely to be low. As above, there could also be macroeconomic benefits in the long-run (e.g. improved productivity or increased consumption).

Key assumptions/sensitivities/risks	Discount rate (%)	3.5%
<p>The key assumption is on the counterfactual for how wages would change in the absence of minimum wage rises. There is background to this and so we commissioned independent experts to recommend a suitable counterfactual based on the growth in wages at the 20<sup>th</sup> percentile of the wage distribution. This is the lowest point in the distribution where NIESR's evidence suggests there is no ripple effect (indirect impact). There is a high degree of uncertainty around this assumption and it extensive work has been done on it in the past. There are other potential methods to estimate the counterfactual and the annex outlines an approach to estimate the 'shadow wage curve' using the 1998 wage distribution, which is a framework proposed by the RPC in previous opinions. The evidence and NIESR's research does not necessarily support using this approach.</p>		

### BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 73.0	Benefits: 0.0	Net: 73.0	
			N/A

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## **Impact Assessment Scope**

1. The Low Pay Commission (LPC) has recommended increases in the National Living Wage (for those aged 25 and over), the National Minimum Wage (for those aged 16-17, 18-20, 21-24, the apprentice rate for those aged under 19 or in the first year of an apprenticeship) and the accommodation offset. The Government has accepted these recommendations<sup>1</sup> in full and they will come into force on 1<sup>st</sup> April 2018, subject to parliamentary approval.
2. Almost all workers in the UK are eligible to be paid at least the minimum wage. Eligibility for specific rates is determined by a worker's age and, if they are an apprentice, when they started their Apprenticeship.
3. This Impact Assessment (IA) appraises the impacts of uprating the current NLW and NMW rates to the LPC's latest recommendations, as set out in the autumn 2017 report<sup>2</sup>. Since this IA does not consider a scenario where the NMW/NLW is completely removed, in the hypothetical absence of an NMW/NLW uprating, the current minimum wage rates would remain legally binding.

## **Background to the Impact Assessment**

### **Policy Context**

4. The economic rationale for a statutory wage floor is to address the welfare loss caused by unequal bargaining power in the labour market. In a perfectly competitive labour market, equilibrium arises when the wage rate equates the demand for labour – based on the marginal revenue product of labour – with the supply of labour. However, when employers have market power, a socially sub-optimal market outcome can occur with lower wages and lower employment. Annex A further depicts the theoretical rationale for intervention, aided by a diagram.
5. The National Minimum Wage was introduced in 1999 to protect low-paid workers from 'extreme low pay'<sup>3</sup> whereby certain employers in the absence of government intervention may pay unacceptably low wages. As mentioned below, extreme low pay has now largely been stamped out, but the NMW continues to provide this protection for workers and it also helps to provide a level playing field for firms, preventing them from undercutting competitors. When uprating the NMW the LPC is asked to recommend the rates such that they do not damage the employment prospects of younger workers.
6. The National Living Wage was introduced in April 2016 and has a specific target to reach 60% of median earnings by 2020, subject to sustained economic growth. By doing this, the

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<sup>1</sup><https://www.gov.uk/government/publications/national-living-wage-and-national-minimum-wage-government-response-to-the-low-pay-commissions-autumn-2017-report>

<sup>2</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

<sup>3</sup> Prior to the introduction of the NMW in 1999, a third of low-paid workers were in extreme low pay: [More than a Minimum \(2014\)](#)

NLW seeks to ensure low paid workers over 25 enjoy the benefits of economic growth. The LPC recommend the path of the NLW such that it reaches 60% of median earnings in October 2020, if they judge economic growth will be sustained.

7. As the decision on the appropriate NMW rates is an empirical one, the LPC report contains a large body of evidence and analysis on the impact to date of the NMW and NLW. The LPC considers the prospects for the UK economy by considering the latest available forecasts for growth, average earnings, inflation, employment and unemployment from the Office for Budget Responsibility and the median of the HM Treasury panel of independent forecasters. They also have an extensive consultation period to include the views and analysis of a number of interested stakeholders. The Government also provides oral evidence on the economy, labour market and policy developments. The evidence and data collected and produced by the LPC have been used to inform this IA.
8. The youth labour market is much more sensitive to economic shocks and young people can be exposed to longer-term scarring effects from prolonged spells of worklessness, as well as facing a comparative disadvantage when entering the labour market due to a lack of work experience and less knowledge. Consequently, the Government asks the LPC to recommend separate NMW rates by age band (16-17, 18-20 year olds, and 21-24 year olds). The NMW as recommended by the LPC is designed to be set as high as possible while not damaging employment prospects for these age groups.
9. The NLW is set higher than the NMW and has an explicit 2020 target subject to sustained economic growth. Whilst considering the prospects for the UK economy, the LPC assess whether the 'sustained economic growth' caveat holds. Because the target is a proportion of median earnings rather than a pound value, there is flexibility as the target moves in line with the state of the economy, i.e. if forecast average earnings fall then so will the pound value of the NLW.
10. The Apprentice National Minimum Wage (ANMW) was introduced in 2010 to ensure Apprentices previously exempt from the NMW received the legal protection of the NMW. It applies to those Apprentices who are aged under 19 or aged 19 or over and in the first year of their Apprenticeship. The level of the ANMW should provide a fair deal for Apprentices, protecting them from exploitation whilst at the same time not deterring businesses from taking them on and providing quality training.
11. The LPC also makes recommendations for the value of the accommodation offset. The accommodation offset was introduced in 1999 and provides a mechanism to offset the cost of providing accommodation for workers against the NMW. Accommodation is the only benefit-in-kind that can count towards the NMW as there are scenarios when the provision of accommodation can be mutually beneficial for both employer and worker. The offset arrangements provide protection to workers and give some recognition of the value of the benefit, but are not intended to reflect the actual costs of provision.

## **Rationale for continued intervention**

12. As alluded to in the previous section, the economy and labour market today are markedly different to that of the 90's when the NMW was first introduced: It has a higher participation

rate, higher employment rates; the demographics of workers have evolved with more diversity in the workplace (for example, employment rate for women and disabled people are at record highs), lower unionisation (from 30% of employees in unions in 1999 to 25% in 2015) and rates of 'extreme low pay have essentially fallen to zero'<sup>4</sup>.

13. These changes to the labour market have occurred in parallel with annual upratings of the NMW and the introduction of the NLW. This will be the second annual uprating of the NLW to progress towards the 2020 target.
14. The economic rationale for continued intervention for the NMW is based on maintaining a wage rate for younger workers that is close to the competitive market equilibrium. The Government seeks to achieve this by giving the LPC a remit to recommend a NMW rate that does not damage the employment prospects of low paid workers. The economic rationale for the NLW is broader, with its purpose centred on equity, primarily around reducing wage inequality and ensuring that low paid workers enjoy the benefits of economic growth. The 60% target for the NLW means that wages of the lowest paid will rise relative to the middle of the wage distribution.

## **Policy Objective**

15. The NMW and NLW set a legal minimum wage floor below which pay should not fall. This ensures protection for low-paid workers and raising wages whilst also providing incentives to work and reducing reliance on the State of topping up wages through the benefits system.
16. The objective of the NLW is to reach 60% of median earnings in 2020, subject to sustained economic growth. Meanwhile the aim when setting the NMW rates for workers under 25 is to raise the wages of the lowest paid young workers as much as possible, without damaging their employment prospects by setting it too high.

## **Consultation**

17. The NLW and NMW rates are underpinned by extensive consultation, analysis, and evidence-gathering carried out by the LPC. On top of its own expertise and analysis the LPC consults with a wide range of stakeholders from across civil society. This year the LPC received more than 55 responses to their consultation, with over 15 organisations and 35 representatives from various organisations presenting at regular Commission meetings and providing evidence at oral evidence sessions across the country. Appendix 1 of their 2017 report lists who they consulted. The LPC makes recommendations on the future rates but the final decision on whether to accept them is made by the Government.
18. In response to previous IAs, the RPC has commented on the suitability of the counterfactual we have used to estimate the direct wage cost to business/benefit to workers as a result of

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<sup>4</sup>Resolution Foundation's Low Pay Britain 2016 report (p16). As a result, the Resolution Foundation have stopped calculating this measure for their 2017 report: <http://www.resolutionfoundation.org/app/uploads/2016/10/Low-Pay-Britain-2016.pdf>

NMW/NLW upratings. Detailed discussion of this can be found in last year's IA<sup>5</sup> and the subsequent RPC opinion. Consequently, we commissioned the National Institute of Economic and Social Research (NIESR) to carry out a research project to identify the most appropriate counterfactual for us to employ in this and future impact assessments.

19. NIESR conducted empirical econometric analysis and collected qualitative evidence from 10 low paying employers across the country through in-depth structured interviews, as well as industry representatives from various low paying sectors. They also consulted with leading labour market experts and academics, a list of who can be found in table 3 on page 51 of their report, before reaching a firm conclusion as to what the most appropriate counterfactual is for this IA. NIESR's recommendation is explained fully in the 'Approach to the Appraisal' section below and their full report has been published<sup>6</sup> alongside this IA.

## **Options Identification**

20. This Impact Assessment considers two options which will be assessed against the policy objectives set out above:

- Option 0) Do nothing – maintain the existing NLW and NMW rates
- Option 1) Implement the LPC recommended rate recommendations for April 2018

### **Option 0: Do nothing**

21. If the LPC's rate recommendations are not implemented, then the status quo would prevail and the current NLW and NMW rates would continue to be the statutory pay floor that workers are legally entitled to.

22. This option would not achieve the policy objectives of the NMW and NLW rates. Minimum wage workers over 25 would not see their pay increase relative to the middle of the pay distribution.

### **Option 1: Implement the LPC recommended rate recommendations**

23. The LPC rate recommendations for April 2018, as outlined in their report, are as follows:

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<sup>5</sup> Amendment to the NMW regulations 2017 Impact Assessment

<sup>6</sup> <https://www.gov.uk/government/publications/national-minimum-wage-evaluation-counterfactual-research>



**Table 1: Low Pay Commission NMW/NLW rate recommendations for April 2018**

	Current rate	LPC recommendation	Annual percent increase
National Living Wage rate	£7.50	£7.83	4.4%
21-24 year old rate	£7.05	£7.38	4.7%
18-20 year old rate	£5.60	£5.90	5.4%
16-17 year old rate	£4.05	£4.20	3.7%
Apprentice rate	£3.50	£3.70	5.7%
Accommodation offset	£6.40	£7.00	9.4%

24. The LPC has extensively outlined in their 2017 report<sup>7</sup> the analysis, consultation and subsequent rationale behind its recommendations for the NLW and NMW rates which should apply from April 2018. The Government has considered this and subject to parliamentary approval will implement the LPC's recommendations in full. Below is a brief summary of the rationale for this. Further detail is available in the LPC's report. This IA appraises the impacts of the increase in the NLW and NMW from April 2018.

### Prospects for the economy

25. The state of the economy plays an important role in the LPC's minimum wage rate recommendations, and the Government's decision to accept them. The Government published an overview of the economic outlook at Autumn Budget 2017, based on the Office of Budget Responsibility's latest economic and fiscal outlook<sup>8</sup>. This short section summarises the macroeconomic assessment carried out by the LPC.

26. The data available to the LPC at the time of their recommendations led them to conclude that growth remained reasonably strong in the second half of 2016 – growing roughly in line with the post-2010 trend, but weaker than the pre-crisis trend. The LPC noted that GDP growth appeared to weaken in the first half of 2017 with growth of 0.3% in each of the first two quarters. The ONS estimates the economy grew by 0.4% in Q3 2017 and forecasters are expecting GDP growth of around 1.5% in 2018 (see table 2 below), providing further support that the LPC's rationale was valid.

27. The LPC concluded that the labour market, however, has continued to show considerable strength. The employment rate is close to record highs (75.0% in Q3 2017) and the unemployment rate at the joint lowest since 1975 (4.3% in Q3 2017).

28. The LPC also concluded that productivity growth has continued to remain weak over the last year. However, the ONS's flash estimates of productivity showed quarterly growth of 0.9% in Q3, the strongest quarter of growth since 2011 Q2. In addition, due to a combination of high inflation – as a result of the depreciation in sterling – and relatively low nominal wage growth, average real wages continued to fall.

<sup>7</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

<sup>8</sup> The Autumn Budget 2017 is available at: <https://www.gov.uk/government/publications/autumn-budget-2017-documents>

**Table 2: Forecasts of selected economic variables**

	2017			2018		
	OBR <sup>a</sup>	BoE <sup>b</sup>	HMT average <sup>c</sup>	OBR	BoE	HMT average
GDP	1.5%	1.6%	1.6%	1.4%	1.6%	1.4%
Unemployment rate	4.4%	4.2%	4.3%	4.3%	4.2%	4.5%
Average earnings	2.3%	2.25%	2.3%	2.3%	3%	2.7%

Sources

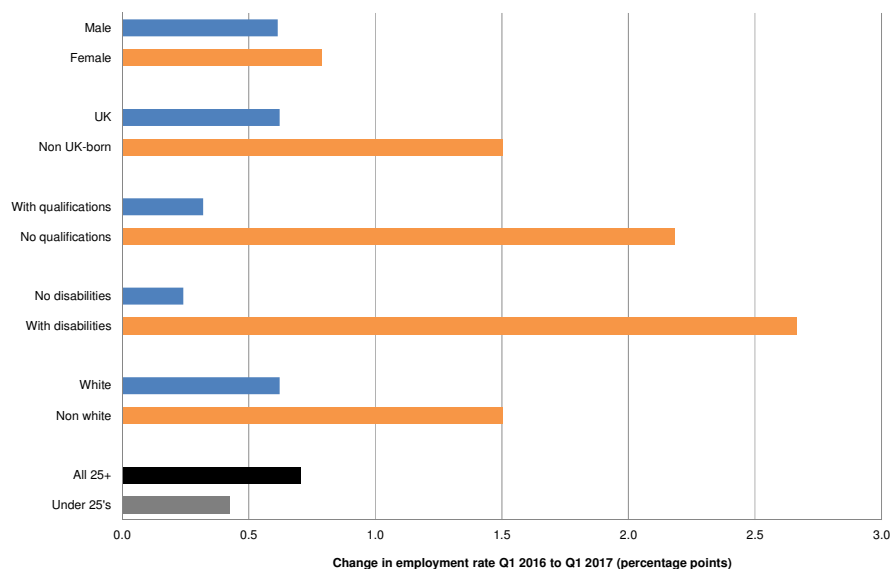
a: [OBR EFO, November 2017](#)  
b: [Bank of England November 2017 Inflation Report](#)  
c: [HMT, Average of Independent Forecasts, November 2017 release](#)

## The National Living Wage

29. In part influenced by the economic performance summarised above, the LPC has judged that the NLW should remain on the straight line bite path to hit 60% of median earnings in October 2020. In addition, the LPC's consultation revealed that employers' concerns about the impact of the NLW may have lessened – especially with respect to negative employment effects. However, it is important to note that some sectors still feel particularly exposed, especially in the social care, convenience, retail and hair and beauty sectors. The LPC judged that although it is too early to tell conclusively, the data since the introduction of the NLW does not currently point to significant employment effects.

30. The LPC's analysis shows that the employment rate of workers aged 25+ increased between 2016 and 2017 (0.6ppts for men and 0.8ppts for women), and that in particular, the labour market performance of workers most likely to be affected by minimum wage increases due to higher coverage (e.g. women, disabled workers, ethnic minorities, low skilled) has also continued to improve (see figure 1 below). Employment growth has been relatively flat for low-paying sectors, although this has been offset by an increase in non-low-paying sectors.

**Figure 1: Change in employment rates for those aged 25 and over, by worker characteristics, UK, 2016-2017**



Source: LPC estimates using: LFS Microdata, population weights, quarterly, four quarter moving average, UK, Q2 2015 to Q1 2017, UK.

31. Median hourly pay growth for employees aged 25+ and not in the first year of their apprenticeship grew by 2.1% between 2016 and 2017, although increases in the lower half of the distribution were higher – in part driven by the introduction of the NLW last year (4.4% at the 10<sup>th</sup> percentile and 2.5% at the 25<sup>th</sup> percentile).

### **NMW rates for 16-24 year olds**

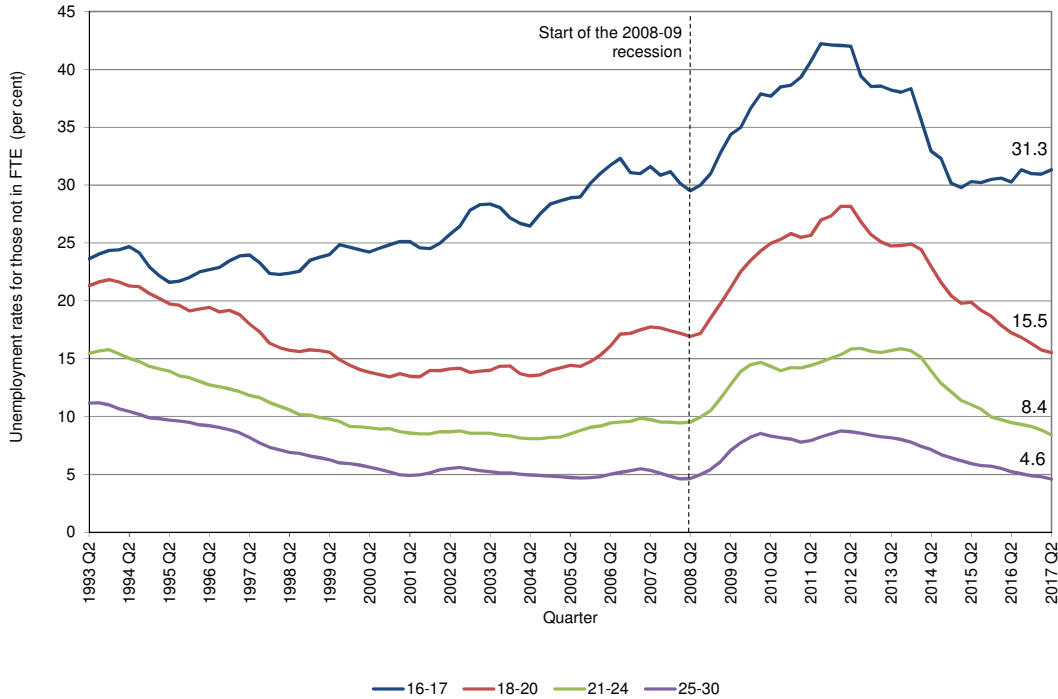
32. Given their remit for the NMW rate, the LPC's assessment of the youth labour market has justified more ambitious recommendations for younger workers. In particular:

- Employment in the UK continues to grow more strongly than forecast and is at record levels.
- Unemployment has fallen to its lowest rate since 1975.
- There have been ongoing improvements in the employment and unemployment rates of 18-24 year olds, despite two increases in their NMW rates in quick succession in the last year.
- Wage growth for those aged 18-24 has been higher than those aged 25 and over for the last three years. As a result, the bite, which is the NMW as a percentage of median earnings and a key measure of pressure, has fallen for workers of these ages.
- Both employers and unions raised the importance of fairness and employee relations between age groups in the workforce in response to the LPC's consultation.
- Analysis shows that the use of the NMW rates for the two older age groups (21-24 and 18-20 year olds) has fallen because more employers are choosing to pay above those minimum rates.
- Finally, the evidence does not suggest there is a particular compliance problem in relation to the NMW rates, suggesting employers are paying younger workers the legal minimum wage they are entitled to.

33. For the 21-24 year old rate, the Government is planning to implement the LPC's recommendation which exactly maintains the 45p differential between the NLW and the 21-24 NMW rate.

34. While a significant proportion of 16-17 year olds are in full-time education, the labour market and pay evidence for this group is not as strong as their older contemporaries. Figure 2 shows the unemployment rate for 16-17 year olds not in full-time education has remained relatively flat over the last year, whereas it has decreased for other age groups. In addition, pay growth at the median for this group was 1.8% between 2016 and 2017, compared with 4.2% for 18-20 year olds and 5.2% for 21-24 year olds.

**Figure 2: Unemployment rates for young people not in full-time education, by age, UK, 1992-2017**



Source: LPC estimates using LFS Microdata, quarterly, four-quarter moving average, UK, Q3 1992-Q2 2017.

### The Apprentice NMW

35. There have been some substantial changes to Apprenticeship policy in recent years which have a direct bearing on setting the Apprentice NMW. In particular, the introduction of the Apprenticeship Levy from April 2017 and the significant increase to the Apprentice NMW (21%) implemented by the Government in October 2015. Research commissioned by the LPC suggests that this increase did not have a significant impact on Apprenticeship starts suggesting that increases to the Apprentice NMW might carry a low risk to volumes.
36. In 2016/17, overall there was a 4% (18,000) decrease in Apprenticeship starts compared with the previous academic year. The number of people aged 25 and over starting an Apprenticeship was 2% higher than the previous year, but starts for younger apprentices were 8% lower. Falls were also concentrated at level 2 Apprenticeships (lower skilled). These data span the period in which funding changes were introduced and so there is some uncertainty over the underlying trend.
37. The LPC's analysis of apprentice pay show that hourly earnings have increased faster than for non-apprentices and pay growth has been higher at the lower end of the pay distribution; the 10<sup>th</sup> and 25<sup>th</sup> percentiles. The result is that the minimum wage as a proportion of median earnings has fallen significantly for apprentices aged 16-18, potentially reducing the risk from future rate rises.

## **Accommodation offset**

38. The LPC has recommended an increase in the daily accommodation offset of 60 pence, taking the rate to £7.00. This is in-line with their long-term objective of equalising the offset to the 21-24 year old NMW rate and means that the rate better reflects the cost of providing accommodation – helping the horticulture sector in particular because employer’s in this sector often provide accommodation for their workers.

## **Approach to the Appraisal: Wage Bill Impacts**

39. To estimate the impacts of the NLW and NMW on the earnings distribution, we use the Annual Survey of Hours and Earnings (ASHE), from 2017, to conduct wage distribution analysis for each of the rates.

## **Counterfactual**

### **Finding the counterfactual**

40. The core assumption in our analysis is the counterfactual: ‘The profile of the counterfactual is both a function of the wage level low paid workers would receive in the absence of the policy and the wage growth they would have experienced over the course of the minimum wage uprating.’ (p. 3 of NIESR report)<sup>9</sup>. The true counterfactual is unobservable and given the NLW and NMW is universally applicable across the UK; there is no pure control group to compare the policy intervention against.
41. There are multiple approaches that could be used to estimate the counterfactual – see annex F for a list of previous work done on this subject – and because of its intrinsic nature none can be proven or falsified, i.e. we rely on making normative economic statements. Moreover, the true cost to business/benefit to workers can vary between zero and infinity, whereby the wages of those impacted by the NMW/NLW could grow at an equal rate to the size of the uprating or experience zero wage growth, respectively.
42. Page 57 of NIESR’s report states that no new information could ever become available on the counterfactual and therefore it is not possible to prove or disprove the choice of counterfactual. For this reason a judgement is required on what is the most suitable counterfactual based on the available evidence. Our choice of this has varied in recent years and the RPC has often commented on the evidence to support our chosen method, although the previous approach received a ‘green’ fit-for-purpose rating.

### **Counterfactual for this IA**

43. The counterfactual in this IA is underpinned by NIESR’s research. This research was commissioned in response to the concerns of the RPC, who fed into the project specification and were consulted at the draft reporting stage (see annex G outlining NIESR and the RPC’s

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<sup>9</sup> <https://www.gov.uk/government/publications/national-minimum-wage-evaluation-counterfactual-research>

engagement). NIESR's report collects evidence from a range of sources to enable them to form a solid understanding of the low paid labour market and what wages at the lower end of the distribution would be without a minimum wage. These sources involved a literature review; qualitative interviews with employers in low paid sectors, industry bodies and trade unions; consultations with labour market experts and academics; and a quantitative strategy.

44. NIESR's quantitative strategy involved three different approaches before arriving at their final recommendation. The first of these sought to address both the level and the growth rate of counterfactual wages by estimating the impact of minimum wage upratings at different points in the wage distribution. Controlling for the impact of previous minimum wage upratings aimed to reveal what the RPC have referred to in the past as the 'shadow wage curve'<sup>10</sup> that would have prevailed if the minimum wage policy had not been introduced. For the reasons explained in box 1 below, this approach was unsuccessful. Secondly, they sought to estimate the counterfactual by looking at within year wage growth for low paid workers, however this method was not possible because of anticipation effects associated with the minimum wage, illustrating the extent to which the NMW/NLW has changed wage setting behaviour (discussed in box 1).
45. NIESR's third and final approach, which is outlined in their recommendations, involved using 'the lowest percentile  $p^*$  at which there are no spillovers from minimum wage upratings' (p. 12) as a proxy for counterfactual wage growth and applying this to the current wage distribution. Therefore NIESR's research was successful in identifying the counterfactual *growth* rate for a typical minimum wage worker. This result was informed by their quantitative strategy as well as qualitative interviews with labour market academics (pp. 51-52). Using their model, NIESR identified the 20<sup>th</sup> percentile to equal  $p^*$  where there are no spillovers from the minimum wage. They then use Labour Force Survey (LFS) data to calculate a mean growth rate for wages at this percentile since 2004. Consequently we use a uniform counterfactual growth rate to be representative of a mean worker impacted by the proposed rates.
46. Driven by findings in the literature, qualitative evidence and their quantitative analysis, NIESR also introduced some structural breaks to test for the impact of the recession and business cycle on wage growth. Their proposed quarterly mean growth rates depend on the time period covered in the LFS, which are broadly based on where the economy is in the business cycle. They are reproduced in table 3.

**Table 3: Options for quarterly nominal wage growth assumptions recommended by NIESR**

<i>Period covered in LFS</i>	<i>Quarterly growth rate at the 20th percentile (nominal)</i>
2001-2007	1.07
2011-2016	0.68

<sup>10</sup> Further discussion of the shadow wage curve can be found in Annex B.

47. The most suitable growth rate to use depends on how the economy is expected to perform over the appraisal period. The Government can use the OBR and other independent forecasts as a gauge in future years, albeit there are difficulties in practically predicting this. For this IA NIESR have recommended we use the quarterly growth rate in wages between 2011 and 2016, which is equivalent to 0.68%, as our best case scenario. As our low cost scenario we follow NIESR's assumption that 2014-2016 growth will continue and use 0.92% as the quarterly uniform growth rate. Since our best case scenario uses the lowest quarterly growth rate that NIESR have recommended – generating the highest cost – our high cost scenario is equal to our best case.

### **Box 1: Sources of uncertainty when estimating the counterfactual**

As the counterfactual for minimum wage upratings is unobservable, our choice of assumption is inherently uncertain and we will never know the extent to which it truly reflects what would have happened in the absence of the NMW/NLW uprating. Annex F contains an exhaustive list of the analysis and work we have done on the counterfactual, culminating in the NIESR research which we implement in this IA.

NIESR and our previous work have provided us with a detailed understanding of the uncertainty associated with estimating a counterfactual. These effects have the potential to shift segments of the wage distribution up or down.

There is evidence that having had a minimum wage framework in the UK over a sustained period of time has had a significant impact on the wage setting behaviour of firms. For example one employer interviewed by NIESR said:

*“... back in the day before minimum wage came in wage negotiations used to be a heated discussion in October and now it's a discussion over a cup of coffee because minimum wage is X and therefore wages are X. There's no discussion about it”.* (p.32)

This anecdotal evidence indicates that the negotiating environment has changed since the introduction of the NMW, and so wage setting in reality may not occur according to economic theory whereby firms demand specific workers for specific hours of work according to the marginal revenue product of labour of that worker. This is supported by the NIESR employer interviews which uncovered that low paying businesses would struggle to set pay in the absence of a minimum wage, and therefore it is incredibly difficult to predict what wage workers at the bottom of the distribution would be paid.

Technological progress has changed the skills/jobs composition of the workforce to an extent that many low paid jobs that were in existence before the NMW was introduced would not be worker jobs today. Firms have invested in labour saving technologies such as robotics and automation which have displaced many low paid jobs, and potentially may have resulted in the upskilling of low paid workers. These technological advances are not necessarily a result of the NMW/NLW and NIESR argue that it is not appropriate to count increased wage costs

from low productivity jobs that no longer exist<sup>11</sup> as a 'cost' to business.

Other than technological progress there have been significant underlying labour market trends, such as regulation and globalisation which have fundamentally changed the way in which the labour market operates. For example the strengthening of broader worker rights over the past 20 years has arguably changed the way workers and firms determine the level (e.g. long term increases in the participation rate) and price of labour in a way which is impossible to disentangle from outcomes observed in the data.

There is uncertainty about whether there are cumulative, long-term effects of the minimum wage, and if so, what these might be. The RPC have previously suggested a framework in which cumulative increases in the minimum wage would mean that the wage levels of the lowest segment of the wage distribution are below the current minimum wage level (see discussion on 'shadow wage curve' in annex B). If this framework held true in practice – it cannot be disproven because the counterfactual is unobservable – it would have implications for the counterfactual. Specifically, it would typically imply a downward bias on the counterfactual wage profile, especially for jobs most affected by the minimum wage. As with the other factors discussed in this box, if there were evidence supporting this framework, it should be factored in to a modelled counterfactual.

The factors above explain in part why NIESR found very low predictive power from their quantitative model where they sought to estimate the effect of increases on the minimum wage at different percentiles of the wage distribution at different points in time. It was hoped that the coefficients obtained from the model excluding the coefficient associated with the previous upratings themselves would uncover the counterfactual wage level and its growth rate, however due to the low explanatory power associated with the model this was not possible (p. 67).

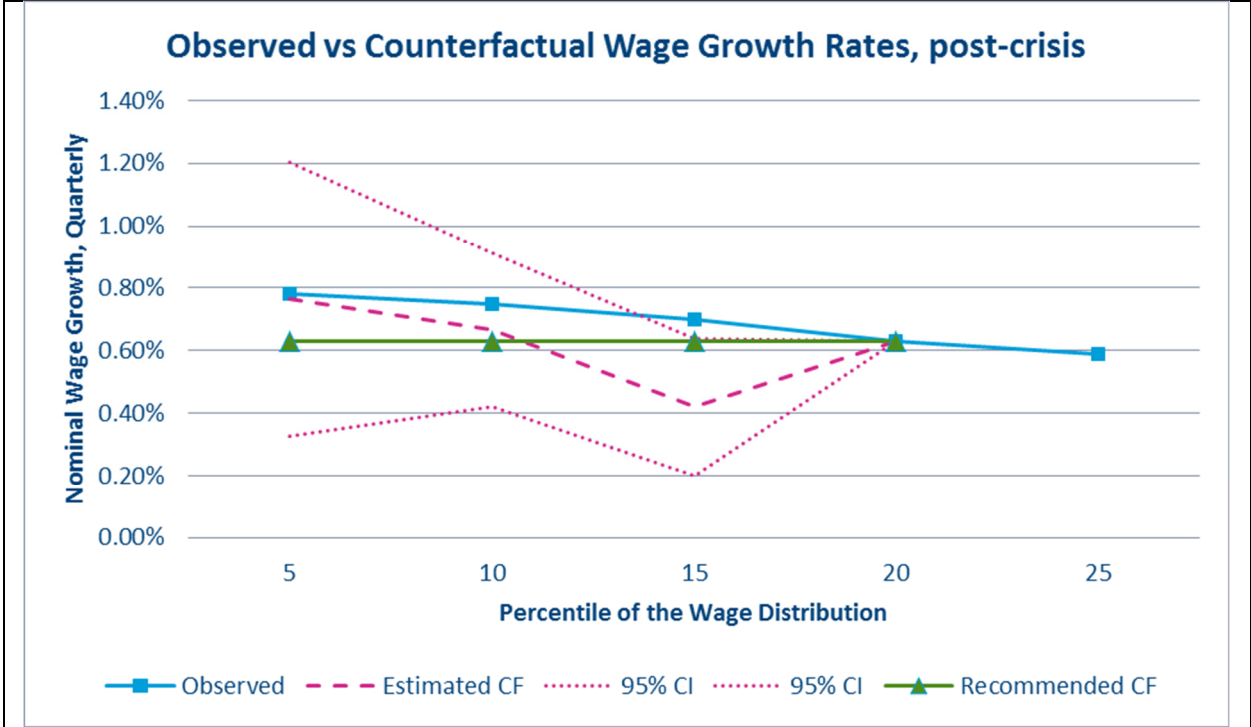
NIESR considered the 'shadow wage curve' framework at length in their research but they do not necessarily find positive evidence supporting a systematic downward bias to the wage growth of the lowest paid. Specifically, box 2 on pages 80-83 of their report is devoted to examining whether counterfactual wage growth is zero/lower at the bottom of the wage distribution compared to further up. NIESR do not find evidence for either of these hypotheses and their justification is provided by figure 3 below.

**Figure 3: Observed and counterfactual nominal wage growth at certain percentiles of the wage distribution, post-crisis**

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<sup>11</sup> "A higher minimum wage will make some kinds of low-productivity jobs unprofitable, and we can expect the technologies employed in the production of goods and services to shift to favour higher-productivity jobs. The larger the gap between the current or prospective level of the minimum wage and the 'deep' counterfactual minimum wage (i.e. in the absence of any minimum wage policy), the larger we would expect the impact on the types of jobs in the economy." (Page 58 of NIESR report).





Source: Figure B2.2 on page 83 of NIESR report

Essentially figure 3 contains the observed wage growth (blue line), their recommended counterfactual (green line), and then they have used the coefficients from their regression to estimate the counterfactual growth in wages at different percentiles (pink dashed line with the 95% confidence interval). As shown, the estimated counterfactual growth rate at the 5<sup>th</sup> and 10<sup>th</sup> percentiles in the post crisis period (2008-2016) is above their recommended growth rate of 0.68%. Moreover, using the 95% confidence interval, they find in the post-crisis period ‘there is only a 5% chance that the counterfactual wage growth rate at the 5<sup>th</sup> percentile is either below 0.33% or above 1.21%’ (p. 82). Consequently, NIESR argue if we were to consider the possibility that counterfactual wage growth was between zero and 0.33%, we would have to also consider the possibility that counterfactual wage growth exceeded 1.21% per quarter (p. 82).

In summary, the evidence does not necessarily suggest that counterfactual wages of those for whom the minimum wage is most binding will grow at the slowest rate. However, since the ‘shadow wage curve’ framework is an attractive theoretical proposition, we have considered a quantitative approach to give some idea of how one may appraise the NMW/NLW uprating in this manner, which is contained in annex B. It is important to emphasise the uncertainty of using such an approach as it relies on data from almost 20 years ago. Also as aforesaid, because of the underlying changes in the labour market, technological progress and indications that the NMW/NLW has permanently changed wage setting behaviour, it is difficult to accept that the proposed method in annex B to estimate the shadow wage curve is a robust appraisal of NMW/NLW upratings.

48. In light of the three factors and evidence presented in box 1, NIESR believe that their recommendation of growth at the lowest percentile where there are no spillovers detected

from the minimum wage is the best estimator of the counterfactual growth rate. They formed this judgement, in part, by carrying out 'common trends analysis' (see box 1 on pages 76-79 of their report). This analysis used a pseudo panel of 141 low paid occupations to test if it is suitable to use the average growth rate for all workers affected by the NMW/NLW. It 'exploit[s] the fact that wages of individual occupations were closer to or more distant from the incoming level of the NLW in Q2/2016, and analyse whether this was correlated with differential growth in the years ahead of the NLW introduction' (p. 76). The difference in the trend growth among different occupations was not statistically significant from zero, therefore NIESR were able to conclude that using an average uniform growth rate, as recommended, is suitable because there was 'no significant evidence for differential growth in the data' (p. 79).

49. Additionally, NIESR found that in the post-crisis period their estimated counterfactual growth at the 5<sup>th</sup> and 10<sup>th</sup> percentile (the NLW reached around the 5<sup>th</sup> percentile of the wage distribution in April 2017) is greater than the observed growth in wages at the 20<sup>th</sup> percentile. Whilst in the pre-crisis period, the estimated counterfactual wage growth rate for the 5<sup>th</sup> to 15<sup>th</sup> percentiles lies below the 20<sup>th</sup> percentile nominal wage growth. This provides support that using the growth in wages at the 20<sup>th</sup> percentile as a proxy for counterfactual wage growth does not systemically under or over-estimate wage growth for low paid workers, and therefore it is an unbiased estimator of counterfactual wage growth for minimum wage workers. Consequently taking this and the common trends analysis into consideration, there is no systematic bias in using a uniform growth rate as the counterfactual trajectory, and therefore the mean growth rate is representative of a typical minimum wage worker.
50. Furthermore, NIESR argue that because of forecasting inaccuracies and bias due to asymmetries arising from forecast errors, they recommend we continue to apply the counterfactual growth rate to the current wage distribution (i.e. the existing minimum wage analogous to what we have done in previous IAs), and that this will result in an unbiased estimator of the cost to business/benefit to workers. Specifically, they argue in favour of 'resetting' the counterfactual each year because the converse (using past counterfactuals and old data/forecasts) will result in the following issues:
  - Forecast accuracy and forecast horizon: NIESR provide graphics from the Bank of England to highlight the uncertainties from forecasting over a long time period and the large margin for error. Since no new information on the outturns of the counterfactual ever becomes available, the greater the inaccuracies of using past forecasts becomes. Therefore NIESR argue, '...the uncertainty associated with those longer-term forecasts would be so great as to render the associated estimates of costs to business substantially less meaningful than under the current procedure' (p. 57).
  - Bias due to asymmetries arising from forecast errors: NIESR claim that estimates of counterfactual wage growth that are too low lead to larger overestimates of cost to business than vice versa and explain this with the aid of a diagram. In effect, the risk of under or over-estimating is asymmetric because the *impact* of underestimating the growth rate is more significant than overestimating the growth rate. Although this risk also arises when the counterfactual is reset each year, NIESR argue 'the RPC method would exacerbate the issue because the asymmetry is magnified as the forecast horizon grows, leading to a greater upward bias in the estimates of the costs to business of minimum wage upratings' (p. 58).

51. In addition to these issues, NIESR's regression results provide us with illustrative evidence of what the counterfactual wage level may have been at different percentiles of the wage distribution (although they cannot be used to estimate the counterfactual due to the low predictive power of the model). Figure B2.1 in their report shows that in the pre-crisis period counterfactual wages at the 5<sup>th</sup> percentile were 0.86% per quarter (equivalent to 3.44% per annum). When using the upper bound of the confidence interval this equates to 5.2% growth per year. Given the size of the average annual uprating of the NMW pre-NLW was 4%, it is not implausible that the current level of the minimum wage is the true counterfactual wage level. This is supported by the fact there have been no adverse employment effects associated with the NMW, suggesting the LPC had successfully fulfilled their remit by recommending increases in the NMW that do not damage employment prospects. Effectively, the LPC have targeted the competitive equilibrium wage rate because we have not seen an increase in unemployment. Of course, this situation may change for the NLW as it has a different objective, but we will monitor the situation and possibly adjust the methodology if and when the evidence suggests we should.
52. Overall, "taking all of these factors into account, we recommend that BEIS continue to use its current method of re-setting the counterfactual, so as to take the current level of the minimum wage as the starting point for the counterfactual analysis" (p. 59). Therefore, in this IA we implement NIESR's recommendation and apply the uniform counterfactual growth rate to the existing wage distribution.
53. To implement NIESR's recommendation we estimate the cost to business/benefit to worker by calculating how long it takes for the counterfactual growth trajectory to 'catch-up' with the proposed NMW and NLW rates. Further detail of the arithmetic calculations on how the 'catch up' is estimated can be found in last year's IA.
54. The second source of direct cost associated with the NMW/NLW upratings is associated with non-wage labour costs, such as pensions and employer national insurance contributions. Therefore we have uprated the employer wage bill impacts by 19.73% to account for these additional costs. This figure comes from Eurostat analysis for April 2017 and NIESR believes it 'is likely to be an overestimate because it does not account for the fact that some workers do not meet the national insurance contribution (NIC) threshold' (p. 50).
55. NIESR add that this figure does not include future auto-enrolment of pensions which will gradually increase employment costs as it is progressively rolled out. On balance, our approach is likely to balance the overestimate arising from not all workers meeting the NIC threshold. We will continue to review this assumption in future.

## Summary

56. The counterfactual is, by its very nature, unobservable; it is very difficult to identify the shadow wage distribution. NIESR have deployed advanced econometric techniques to attempt to estimate the counterfactual; however, their research found these models to have low predictive power. Since we are in a world of normative economics rather than positive economics, NIESR have had to make a judgement of what the available evidence dictates is the most suitable counterfactual.

57. Of the growth rates presented in NIESR's report (table 3), we have used the most pessimistic of these as recommended by NIESR, which is the rationale for why our high scenario equals our best case. Based on the available evidence, NIESR believe this uniform growth rate is unbiased and representative of the typical minimum wage worker. There is no positive evidence that the counterfactual wage level is different to the existing minimum wage, nor is it falsifiable. Similarly evidence does not necessarily support the shadow wage curve argument that workers at the bottom of the distribution will experience the lowest wage growth (see annex B for a fuller description), although as above this cannot be proven or rejected.
58. Annex F lists all the previous work we have done on the counterfactual and because it has become a contentious issue, we have implemented the recommendations of independent experts. We acknowledge that there may be other approaches which could be used but all of these will be beset with similar issues previously outlined; and none have been shown to be more appropriate than the approach used in this impact assessment.

## **Appraisal period**

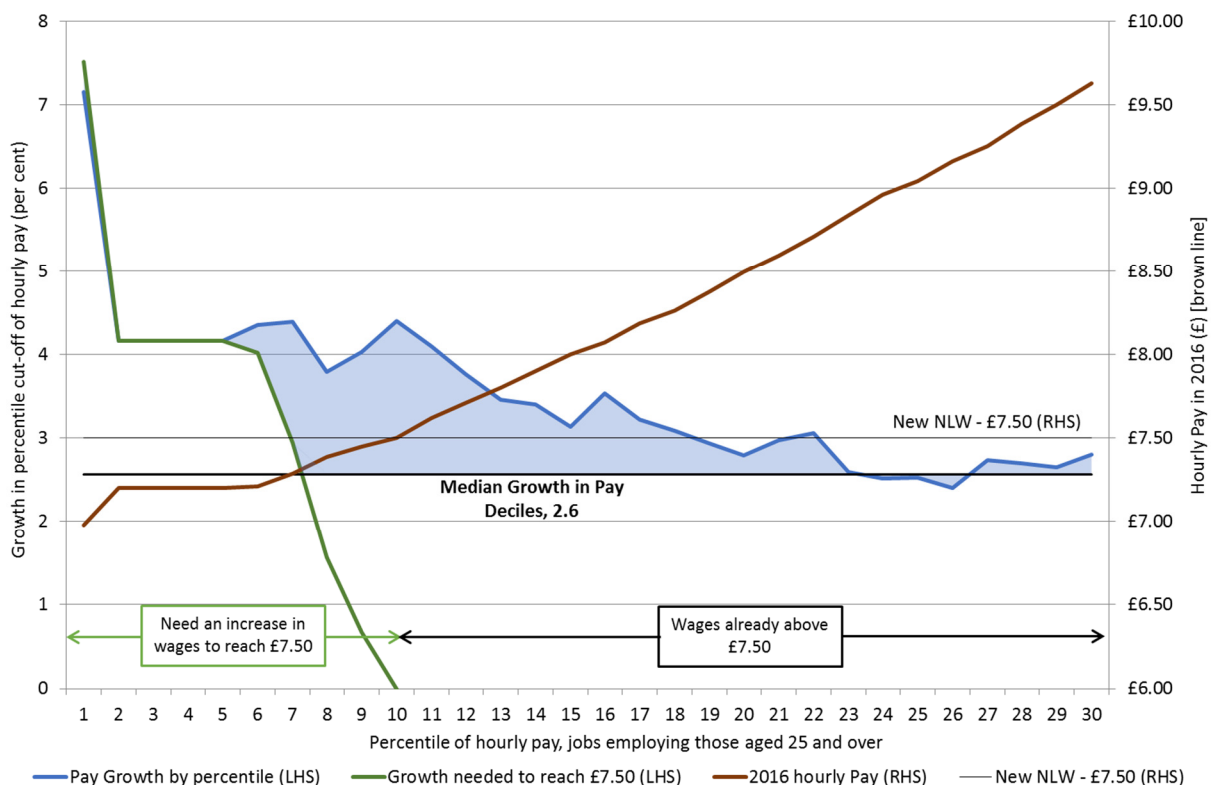
59. The length of our appraisal period is how long it takes the counterfactual, on average, to catch up with the LPC rate recommendations. As we have a uniform counterfactual growth rate for all rates, which is what NIESR recommend in their report, and the percentage increase in the rates varies across the age bands, the appraisal period differs for each of the NLW and NMW rates.
60. The LPC's recommended increase in the NLW and 21-24 year old rate is equivalent to a 4.4% and 4.7% increase respectively. Given our best/high case counterfactual quarterly growth rate of 0.68%, we estimate it will take 7 quarters for these two rates to catch-up. Conversely given the relatively small increase in the 16-17 rate, it will only take 6 quarters for the counterfactual to catch up, whilst the appraisal period for the Apprentice rate is 9 quarters because the increase is equivalent to 5.7%.
61. In sensitivity analysis; in our low cost estimate the counterfactual growth rate assumption is higher than 0.68% and therefore the catch-up time will be shorter and hence the cost will be smaller than our best case scenario. Conversely in our hypothetical shadow wage distribution illustration outlined in annex B, the total appraisal period would be between 6-7 years depending on the NMW/NLW rate, as we assume there is 4.2 years of zero wage growth for workers currently earning the minimum wage before adding on our best case estimate.

## **Spillovers**

62. As conjectured in previous IAs, we make an assumption that the increase in the minimum wage has an impact on other parts of the wage distribution, not directly impacted by the increase in the NLW and NMW. The rationale for this is that as a higher wage floor is implemented, some employers will choose to give pay rises to those paid above but near the new minimum wage, and choose to increase the pay of some workers previously paid below the new minimum to a greater level than just bringing pay into line with the new statutory minimum. Employers do this out of a desire to maintain wage differentials between their employees to recognise different roles and responsibilities.

63. In the past we have assumed spillovers last up until the 25<sup>th</sup> percentile of the earnings distribution, albeit the effect dissipates from 20% for those earning just above the new minimum wage floor and then linearly reducing in magnitude up until the 25<sup>th</sup> percentile of the income distribution.
64. NIESR explored the concept of spillovers in depth throughout their report and it ultimately formed an integral part of their final recommendations. As already set out, their model identified that spillovers can be detected at the 15<sup>th</sup> percentile of the wage distribution but not at the 20<sup>th</sup>. Therefore, we adjust our spillover assumption from previous years in light of this new evidence and assume that the 20% impact linearly tapers down until the 20<sup>th</sup> percentile rather than the 25<sup>th</sup>.
65. Previous studies have found no evidence of spillovers in the UK from the NMW, for example Stewart (2012). Although given the date of this study and with the bite increasing to 60%, it is unlikely that this finding will still hold over the appraisal period covered by this IA. Other studies have come to different conclusions on how high up the distribution the NMW reaches.
66. Our assumption contrasts with the LPC's recent conclusion that spillovers from the NLW in 2017 may have reached the 30<sup>th</sup> percentile of the wage distribution. They use figure 4 (figure 2.12 in their 2017 report), which shows that pay growth for the bottom 30 percent of earners is, on average, higher than median pay growth over the past year, to make their assessment of where spillovers reach.

**Figure 4: Hourly pay growth, hourly pay rates in 2016 and growth needed to reach £7.50 for workers aged 25 and over, UK, 2016-17**



67. Given the descriptive nature of this element of the LPC's analysis, there is some uncertainty in this conclusion and NIESR's regression-based approach controlled for many other explanatory variables such as demographic and firm characteristic variables. For this reason we use NIESR's recommendation to model spillover impacts up to the 20<sup>th</sup> percentile of the distribution.
68. There may be some emerging evidence that the NLW specifically may have spillover impacts on the wages of younger workers not legally eligible for the rate<sup>12</sup>. We have not quantified this for this IA as the impacts remain uncertain – especially in relation to how trends will develop as the NLW continues to increase. Indeed, some stakeholders suggested they may use youth rates more to absorb costs of the NLW<sup>13</sup>.
69. In addition, evidence suggests that minimum wage rates may have an anchoring effect which could also serve to pull down wages just above the minimum.

## Direct and indirect effects

70. We appraise the direct impact of the NMW/NLW rates as the cost of increasing wages to the new statutory minimum (with the associated non-wage labour costs). We have classified the increase in labour costs caused by the spillover effect up the earnings distribution as an indirect impact. This distinction is appropriate because the only regulatory requirement on employers is to meet the new pay floor. The decision to raise wages of those earning above the new rates in order to maintain pay differentials is at the discretion of employers and not required by the regulation – in fact, some employers may choose to use the squeeze in wage differentials as a way of mitigating the overall labour cost impact of an increase in the NMW/NLW. There is evidence of this in the latest LPC report which quotes research conducted by Incomes Data Research, which surveyed 120 medium and large firms across low-paying sectors and found around half of these had narrowed or removed wage differentials, of which many contributed this to the NLW (p.200 of LPC report).
71. The RPC have commented in the past that our classification did not capture the possibility that some of the ripple effect may be non-discretionary because pay differentials are written into contracts. As we argued in last year's IA, the evidence from XpertHR and the LPC found that while the minimum wage has an impact on wider wage setting behaviour, employers tend not to set wages at X% above the rates, indicating that increases in pay differentials between employees is an indirect business response to the change in legislation. This is supported by qualitative evidence gathered by NIESR this year which found that the overall wage budget in large firms is often set at senior/board level which includes considerations about percentage increases in the NMW/NLW. Decisions about allocation to groups of employees and individuals are then made after this.

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<sup>12</sup> Page 78 of the LPC report:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

<sup>13</sup> For example, paragraph 36 of LPC report.

# **Approach to the Appraisal: Non-wage Bill Impacts**

## **Transition costs**

72. The concept of annual minimum wage increases are fully embedded in the UK labour market; they have occurred regularly for the last 18 years. Employers, in particular those in low paid sectors, will generally expect the minimum wage to increase, following the trends of the last few years and the general awareness that the NLW will rise to 60% of median earnings by 2020. This awareness is, in part, thanks to extensive communications campaigns in the lead up to past NMW/NLW upratings. The Government will once again be running a campaign, targeted at both workers and employers around the new rates.
73. Businesses may need to take some time to familiarise themselves with the new rates to ensure they are compliant with this incoming legislation. Therefore, we estimate the opportunity cost of businesses familiarising themselves with the legislation in paragraphs 89-91.

## **Non-compliance**

74. Section 1.9 of the Better Regulation Framework Manual<sup>14</sup> recommends that 100% compliance is assumed unless there is evidence to the contrary. Consequently, we assume full compliance of the NLW and NMW because we do not have a reliable basis on which to make a robust estimate of the true level of non-compliance for future upratings.
75. ASHE data is able to estimate the number of jobs paid on hourly pay rates below the age applicable NMW and NLW. However both the ONS and BEIS make clear that this should not be considered as a direct measure of NMW/NLW non-compliance as a) there are legitimate reasons for a job to be paid below the NMW (e.g. a deduction can be made for accommodation) and b) some jobs remain out of scope of ASHE e.g. those in the hidden economy.
76. In light of this uncertainty, we assume full compliance with the NMW and NLW. This is a conservative approach because including cases of potential non-compliance in our cost estimate will increase the total estimated direct cost to business as we assume non-compliant employers will increase wages to the new rates to comply with the law. As discussed below, we do not have comprehensive estimates of minimum wage non-compliance. However, to give a sense of scale of this assumption; if we assumed that the number of employees registering pay below minimum wage rates in ASHE 2017 were excluded from our estimates, this would result in a reduction in affected workers of around 17%<sup>15</sup>.

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<sup>14</sup> <http://regulatoryreform.com/wp-content/uploads/2015/02/UK-better-regulation-framework-manual-guidance-for-officials-July-2013.pdf>

<sup>15</sup> Paragraph 124 states that according to ASHE 2017, 342,000 workers were paid below the relevant NMW/NLW. Given our projected coverage is 2.01 million (table 4), controlling for non-compliance would lower coverage by around 17%.

## Data Quality

77. Our estimates of the impact of rate increases are based on the Annual Survey of Hours and Earnings (ASHE). ASHE is the official source of low pay data.
78. For the purposes of appraising the Apprentice NMW - this data includes information on apprentices specifically (around 2,000 apprentices surveyed per year). The Apprentice Pay Survey has a larger sample of 10,000 apprentices and has more detailed pay information, broken down by bonuses, accommodation offset etc. The Apprenticeship Pay Survey is available for 2016 but (a) the information is reported by apprentices themselves, (b) the survey is not annual and (c) is not directly comparable with ASHE findings used for other employee job groups therefore has not been used here. This is in line with the LPC's when estimating coverage and bite of the NMW/NLW rates.
79. To calculate the quarterly counterfactual growth rate NIESR have used the LFS which is a quarterly household survey. Arguably ASHE provides superior earnings data as it is employer reported rather than household. However NIESR's preference was LFS as it provides more observations to calculate the mean growth rate. To mitigate the risk that using the LFS brings, NIESR have used the 'hrrate' variable rather than 'hourpay'<sup>16</sup> because the latter is a derived variable and is considered less reliable.

## **Appraisal of Impacts: Monetised Impacts**

### Coverage

80. Coverage of the incoming rates is sensitive to when in the year it is measured and to the forecasted counterfactual. We have ASHE earnings data from April 2017 and we apply our NIESR's recommended counterfactual growth rate to forecast coverage in April 2018 when the rates will be introduced. The nature of our appraisal methodology means that coverage of the rates falls over the course of the appraisal period.
81. We estimate that just over 2 million workers will be covered by the incoming NMW/NLW rates. Table 4 contains our estimates of coverage as well as the LPC's projections, as set out on page 190 of their 2017 report<sup>17</sup>. The range between our estimates and the LPC's emphasises the uncertainty associated with projecting coverage of the minimum wage and therefore these figures are only indicative of what true coverage will be.

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<sup>16</sup> 'Hourpay' is derived from the individual's reported hours and earnings for all employees. It is considered to be less reliable than 'hrrate', due to greater measurement error in the derived variable.

<sup>17</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)



**Table 4: Breakdown of coverage across different NMW/NLW rates, April 2018**

	<i>Proposed rate</i>	<i>BEIS projected coverage (assuming our best estimate for the counterfactual)</i>	<i>LPC projected coverage (assuming average earnings growth)</i>
NLW (25+)	£7.83	1,630,000	2,088,000
21-24 NMW	£7.38	186,000	232,000
18-20 NMW	£5.90	140,000	134,000
16-17 NMW	£4.20	32,000	36,000
Apprentice NMW	£3.50	22,000	34,000
<b>Total</b>		<b>2,010,000</b>	<b>2,524,000</b>

### **Best and high estimate: labour costs**

82. As discussed previously, our best/high cost estimate is based on a quarterly counterfactual growth rate of 0.68%, as recommended by NIESR. In this scenario the total cost to employers from implementing the LPC rate recommendations, and thus complying with the incoming legislation, is **£577.7 million**. This is a transfer from firms to workers, with some benefits for the exchequer (e.g. employer NICs) and therefore has a net neutral economic impact. It is made up of £482.5million in increased wages and £95.2million in additional employer NICs and pension contributions. (Numbers may not sum due to rounding).

83. The total benefits to workers and the exchequer are estimated to be £577.7m – the same value as the total labour costs.

**Table 5: Total labour costs in the best/high estimate:**

Central	Year 1			Year 2			Year 3			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£359.0	£70.8	£429.8	£53.1	£10.5	£63.6	£0.0	£0.0	£0.0	£493.4
Main (21 - 24)	£32.2	£6.4	£38.6	£4.8	£0.9	£5.7	£0.0	£0.0	£0.0	£44.3
Development (18 - 20)	£23.0	£4.5	£27.5	£4.7	£0.9	£5.6	£0.0	£0.0	£0.0	£33.1
Youth (16 - 17)	£0.9	£0.2	£1.1	£0.1	£0.0	£0.1	£0.0	£0.0	£0.0	£1.2
Apprentice	£4.1	£0.8	£4.9	£0.7	£0.1	£0.8	£0.012	£0.002	£0.014	£5.7
Total	£419.2	£82.7	£501.9	£63.3	£12.5	£75.8	£0.0	£0.0	£0.0	£577.7

**Table 6: Direct labour costs in the best/high estimate:**

Central	Year 1			Year 2			Year 3			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£161.7	£31.9	£193.6	£12.3	£2.4	£14.7	£0.0	£0.0	£0.0	£208.3
Main (21 - 24)	£20.5	£4.1	£24.6	£1.9	£0.4	£2.3	£0.0	£0.0	£0.0	£26.8
Development (18 - 20)	£17.7	£3.5	£21.2	£2.8	£0.6	£3.4	£0.0	£0.0	£0.0	£24.6
Youth (16 - 17)	£0.4	£0.1	£0.5	£0.0	£0.0	£0.0	£0.0	£0.0	£0.0	£0.5
Apprentice	£2.9	£0.6	£3.5	£0.2	£0.05	£0.3	£0.003	£0.001	£0.003	£3.7
Total	£203.2	£40.1	£243.3	£17.2	£3.4	£20.6	£0.00	£0.00	£0.00	£264.0

**Table 7: Indirect labour costs in the best/high estimate:**

Central	Year 1			Year 2			Year 3			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£197.3	£38.9	£236.2	£40.8	£8.1	£48.9	£0.0	£0.0	£0.0	£285.1
Main (21 - 24)	£11.7	£2.3	£14.0	£2.9	£0.6	£3.5	£0.0	£0.0	£0.0	£17.5
Development (18 - 20)	£5.3	£1.0	£6.3	£1.8	£0.4	£2.2	£0.0	£0.0	£0.0	£8.5
Youth (16 - 17)	£0.5	£0.1	£0.6	£0.1	£0.0	£0.1	£0.0	£0.0	£0.0	£0.7
Apprentice	£1.2	£0.2	£1.4	£0.5	£0.1	£0.6	£0.01	£0.002	£0.01	£2.0
<b>Total</b>	<b>£216.0</b>	<b>£42.6</b>	<b>£258.6</b>	<b>£46.1</b>	<b>£9.1</b>	<b>£55.2</b>	<b>£0.0</b>	<b>£0.0</b>	<b>£0.0</b>	<b>£313.8</b>

## Low cost estimate: labour costs

84. We reproduce the analysis with a different counterfactual growth rate for our low cost scenario. Here, we use NIESR's assumption that growth will continue at the same level between 2014 and 2016. The quarterly counterfactual growth rate corresponding to this is 0.92%. Given the counterfactual 'catches up' quicker than in our central estimate the cost to business and benefit to workers is lower than our best case scenario above.

85. Overall our low cost estimate of the total labour costs is **£353.9 million**. This is split into wage bill impacts of £295.5m and non-wage impacts of £58.3m (numbers may not sum due to rounding).

**Table 8: Total labour costs in the low cost estimate:**

Low cost	Year 1			Year 2			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£243.1	£48.0	£291.1	£11.7	£2.3	£14.0	<b>£305.1</b>
Main (21 - 24)	£19.7	£3.9	£23.6	£1.1	£0.2	£1.3	<b>£24.9</b>
Development (18 - 20)	£15.2	£3.0	£18.2	£1.6	£0.3	£1.9	<b>£20.1</b>
Youth (16 - 17)	£0.5	£0.1	£0.6	£0.0	£0.0	£0.0	<b>£0.6</b>
Apprentice	£2.4	£0.5	£2.9	£0.2	£0.0	£0.3	<b>£3.2</b>
<b>Total</b>	<b>£280.9</b>	<b>£55.4</b>	<b>£336.4</b>	<b>£14.6</b>	<b>£2.9</b>	<b>£17.5</b>	<b>£353.9</b>

**Table 9: Direct labour costs in the low cost estimate:**

Low cost	Year 1			Year 2			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£75.1	£14.8	£89.9	£2.6	£0.5	£3.1	<b>£93.1</b>
Main (21 - 24)	£10.0	£2.0	£12.0	£0.4	£0.1	£0.5	<b>£12.5</b>
Development (18 - 20)	£10.7	£2.1	£12.8	£1.0	£0.2	£1.2	<b>£14.0</b>
Youth (16 - 17)	£0.1	£0.0	£0.1	£0.0	£0.0	£0.0	<b>£0.1</b>
Apprentice	£1.3	£0.3	£1.6	£0.0	£0.01	£0.0	<b>£1.6</b>
<b>Total</b>	<b>£97.3</b>	<b>£19.2</b>	<b>£116.5</b>	<b>£4.0</b>	<b>£0.8</b>	<b>£4.8</b>	<b>£121.3</b>

**Table 10: Indirect labour costs in the low cost estimate:**

Low cost	Year 1			Year 2			Total (£m)
	Wage and Non-wage Impacts (£m)			Wage and Non-wage Impacts (£m)			
	Wage Costs	Non-wage Labour Costs	Total	Wage Costs	Non-wage Labour Costs	Total	
NLW (25+)	£168.0	£33.1	£201.2	£9.1	£1.8	£10.9	<b>£212.0</b>
Main (21 - 24)	£9.7	£1.9	£11.6	£0.7	£0.1	£0.8	<b>£12.4</b>
Development (18 - 20)	£4.5	£0.9	£5.3	£0.6	£0.1	£0.8	<b>£6.1</b>
Youth (16 - 17)	£0.4	£0.1	£0.5	£0.0	£0.0	£0.0	<b>£0.5</b>
Apprentice	£1.1	£0.2	£1.3	£0.2	£0.0	£0.2	<b>£1.5</b>
<b>Total</b>	<b>£183.7</b>	<b>£36.2</b>	<b>£219.9</b>	<b>£10.6</b>	<b>£2.1</b>	<b>£12.7</b>	<b>£232.6</b>

## Transition costs

86. There are no official statistics that provide estimates of the number of businesses which are covered by the NMW and NLW increases examined in this IA. However, a number of surveys run by stakeholders provide some evidence. A CIPD survey of its members found that 43% are affected by the NMW/NLW. Whereas a survey by the Federation of Small Businesses found the proportion of its members affected to be 52%. Moreover BEIS' Small Business Survey 2016<sup>1</sup> (page 105) found that 54% of SME employers to be unaffected by the NLW, even if it rises to £9 an hour by 2020, meaning 46% are affected.
87. Naturally coverage will vary across sectors, and some representative organisations representing employers in specific low paid sectors found higher proportions. These latest surveys suggest the proportion affected has increased slightly from last year when we took a range between 35% and 51% in the previous IA. This is unsurprising given the rising bite of the NLW since the bite is an indicator for the extent to which employers will be impacted by the minimum wage.
88. Consequently, in this IA we take a range between 43% and 54% of employers who are affected by the proposed increase in the NMW/NLW. Using the 2017 Business Population Estimates (BPE)<sup>2</sup>, we estimate that between 820,000 and 1,190,000 employers will be affected by the changes to the minimum wage.

## Familiarisation costs

89. As the IA is assessing only the marginal costs of implementing new NLW and NMW rates, it is relatively straightforward for an employer to familiarise themselves with this change. It will involve either checking Gov.uk or calling the Acas helpline – traffic through these routes tend to increase around the implementation of new rates, as supported by evidence in last year's IA. Additionally, employers may also hear about the rates via official Government communications or through third party channels, such as the news. After the Government's communications campaign for the introduction of the NLW 48% of those aware of the NLW reported that the source of their awareness was a TV programme or news, 22% cited TV advertising, 13% mentioned their accountant and 13% mentioned national newspaper advertisements.
90. We assume it will take employers 5 minutes to establish what the new rates are – which includes some time finding the right place to look for information. This assumption is based on:
- Between September 2016 and November 2017, the average duration of visits on to the minimum wage rate landing page<sup>3</sup> on Gov.uk was around 4 minutes. Average durations were much lower for other pages of guidance.
  - Acas call handlers advised us that calls from employers tended to last around 5 minutes.

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<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/624580/small-business-survey-2016-sme-employers.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624580/small-business-survey-2016-sme-employers.pdf)

<sup>2</sup> <https://www.gov.uk/government/statistics/business-population-estimates-2017>

<sup>3</sup> <https://www.gov.uk/national-minimum-wage-rates>

91. To calculate the burden we estimate the opportunity cost of a HR Manager/ Director's<sup>4</sup> time by using the median hourly pay from ASHE 2017, uplifted for non-wage labour costs of 19.73%. Applying this to our estimate of businesses affected equates to a **one-off familiarisation cost of between £2.0m and £2.9m**. The former is our low cost estimate, whilst the latter is our best/high cost estimate.

## Implementation costs

92. In April 2017 the NMW cycle was aligned with the NLW and future upratings of the NMW would take place in April rather than October. Given this structural change in the regulations we decided to estimate implementation costs in last year's impact assessment.

93. However in last year's IA, we provided some evidence from the Bank of England Wage Dynamics Survey<sup>5</sup> and the Workplace Employment Relation Study 2011<sup>6</sup> both of which state that the median frequency at which firms conduct pay reviews was once a year. Moreover, qualitative evidence uncovered by NIESR found 'pay rounds themselves were reported to now largely take place in April to correspond with increases in the minimum wage. Adjustments to comply with these rates therefore had minimal implications for administrative resources because pay was adjusted annually in any case' (p. 37).

94. This evidence suggests that firms generally review pay on an annual basis, and that many firms in low paying industries in particular have moved this review to April. Consequently, there is a negligible, if any, additional burden as a result of the changes to this legislation. Even so, firms that do have to implement the changes out of sync from their usual pay review processes, NIESR reference a brewery chain who make their 'general pay increases in January, finding that applying the NLW increases to relevant staff in April was little additional work' (p. 37).

95. In light of this evidence we do not monetise implementation costs as a result of uprating the NMW/NLW as we expect them to be either equal to or near zero for businesses.

## Net cost to business

96. We separate the impact on the private, public and voluntary sectors in order to calculate the EANDCB for our best estimate. We do this by calculating what proportion of workers eligible for each rate are in the private and voluntary sectors, and then we multiply this by the overall cost and coverage estimates above. A full breakdown is provided in annex C.

97. Using the IA Calculator, we estimate that the equivalent annual direct impact on business is net £76.6 million (over maximum appraisal period of three years). 99.9% of the impacts are

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<sup>4</sup><https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashtabl e14> (Table 14.5a, SOC 1135)

<sup>5</sup><http://www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp568.pdf>

<sup>6</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/336651/bis-14-1008-WERS-first-findings-report-fourth-edition-july-2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/336651/bis-14-1008-WERS-first-findings-report-fourth-edition-july-2014.pdf)

expected in the first two years; if a two year appraisal period were used then the EANDCB would equal £113.0m. These are based on our best case/high cost scenario. The Business Impact Target for this Parliament still needs to be agreed.

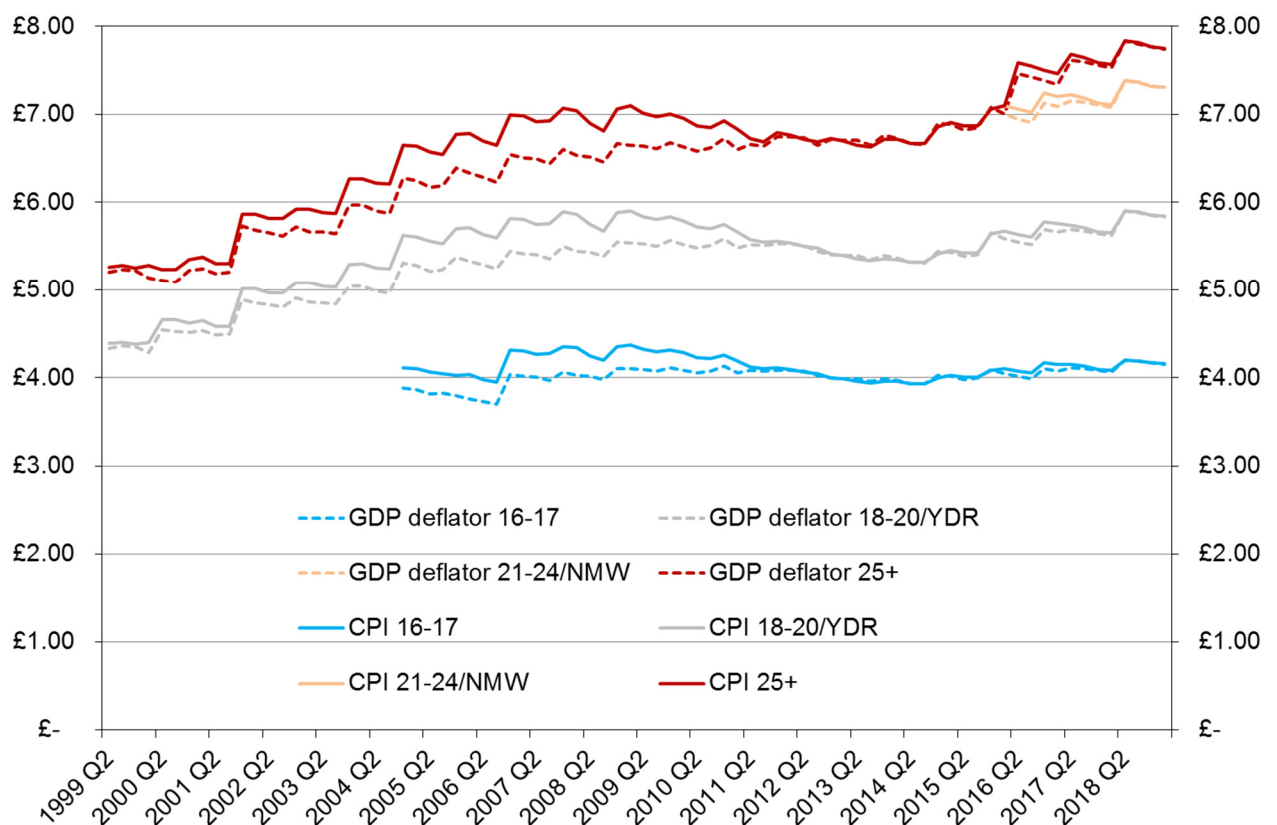
## **Appraisal of Impacts: Non-monetised Impacts**

98. Thus far we have monetised the direct and indirect impacts caused by an increase in the NMW/NLW. These have been a cost to business/benefit to workers as a result of an increase in employers wage bill. However there are non-monetised impacts that may arise as a result of accepting the LPC rate recommendations. These are discussed here, and where possible, we quantify to an extent.

### **Inflation and wages**

99. First, we discuss the relationship between inflation and the minimum wage. Figure 5 shows the real value of the minimum wage and average earnings over time deflating by CPI and the GDP deflator. This is indicative of the consumption and production value of these wages.

**Figure 5: Real value of the minimum wage, Q2 1999 – Q1 2019**



Source: BEIS calculations based on ONS data, CPI (D7BT) and GDP deflator (YBGB). OBR forecasts used from Q4 2017



100. As outlined in box 1 of our 2015 impact assessment, the real product wage is perhaps more relevant to employers as it is the wage relative to the price of the products they sell. In theory, this should also encompass all elements of labour costs such as NICs and other non-wage labour costs. In contrast, the real consumption wage is perhaps more relevant to workers. It is the level of wages relative to the price of goods and services they wish to consume. In theory, this should include the impacts of income tax and NICs, as well as other non-wage benefits.
101. The 4.4% nominal increase in the NLW in Q2 2018 is expected to be around 1.9% when adjusted for CPI and 2.8% when adjusted for the GDP deflator. Compared with the introduction of the NMW in Q2 1999, the NLW is expected to be around 50% higher in real terms according to both deflators.
102. In a standard theoretical economic model of production with capital and labour as the main factors of production, and near-perfect competition in the labour, product and capital markets, the relative cost of capital and labour will determine the levels of these factors of production, all other things equal. Under this model, if the product wage increases, for example driven by a minimum wage increase above the rate of the GDP deflator, this would shift the relative demand for labour if all other factors remained equal. In practice, the cost of capital does not remain constant and there are a wide range of factors which influence demand for labour and broader wage setting behaviour. Some of these were exposed by qualitative research undertaken by NIESR for this impact assessment, for example the concept of 'fair pay' on pages 37 and 41. In addition, there are other economic models which provide different theoretical outcomes to rises in wages, for example in a monopsony labour market, as discussed in annex A.
103. Comparing increases in the minimum wage to changes in consumer and economic costs can be a useful way to consider the scale of potential impacts, however as discussed above, there is not necessarily a direct link between these indicators and actual outcomes. The LPC and much of the literature tend to compare minimum wages to the median wage, the 'bite', as a measure of the 'toughness' of the wage floor. Nevertheless, numerous studies have evaluated the impact of the minimum wage on the labour market and economy. The balance of evidence suggests that there has been little or no negative employment effect of the NMW – indeed it has been set with the intention of reaching as high a wage as possible without damaging employment. This can be seen in the context of targeting the equilibrium wage rate where the demand for labour equates with labour supply.
104. The NLW was introduced with a more ambitious objective. The following section considers the potential macroeconomic impacts of the NLW in more detail. However, the LPC notes in its latest report that while it is too early to tell conclusively, the data does not yet point to significant negative employment impacts associated with the introduction of the NLW – the largest proportional increase expected on the trajectory to 60% of median earnings.

## **Macroeconomic impacts**

105. Economic theory dictates that the most prominent macroeconomic impact resulting from an increase in the minimum wage is higher unemployment if the minimum wage rate is set above the competitive market equilibrium. Due to the LPC's remit, we do not expect there to

be any adverse employment effects as a result of the proposed NMW increases that are the purpose of this IA. They fulfil this remit by consulting broadly and analysing a thorough body of evidence. Moreover, LPC evaluations on the impact of the NMW (and it is one of the most evaluated policy interventions) have found no evidence that it has led to significant impacts on employment. Therefore we believe our assumption here is justified.

106. For the NLW the LPC carried out a full macroeconomic assessment to judge whether economic growth is likely to be sustained to justify sticking to the trajectory to 60% of median earnings by 2020. A brief snapshot of the economic context is provided in paragraphs 25-28, and a more integrated discussion can be found in chapter 1 of the LPC's latest report. Overall the LPC judged that the evidence available was consistent with the NLW remaining on its path to 60% of median earnings by 2020.

107. As discussed in their report, preliminary findings indicate there is mixed evidence of any negative employment effects arising from the NLW, and the LPC highlight that businesses have generally coped better than they had expected when the policy was first announced. Evidence from stakeholders suggests their preferential mechanisms to cope with the increased wage bill are to raise prices or absorb the higher costs by lowering profits, although survey data does not allow quantification of these impacts and there is no conclusive evidence in the official data. However, the LPC report states that inflation (both CPI and RPI) has been higher in low paying sectors relative to general prices since the introduction of the NLW. They argue this 'provides some evidence to suggest that firms are passing on at least part of the cost of the increase in the NLW to consumers.' (pp.95)<sup>7</sup>. However there did not seem to be the same impact on prices following April 2017's uprating to £7.50. Therefore there is uncertainty on the impact of the NMW/NLW on inflation.

108. In their March 2015 EFO<sup>8</sup>, the OBR revised up their forecast unemployment rate by 0.2 percentage points (table B.1, pp.205), and as the NLW continues to rise to 60% of median earnings there is the possibility that unemployment may rise, and the OBR state in their November 2017 Economic and Fiscal Outlook<sup>9</sup> (pp. 8):

*"we still expect [unemployment] to rise a little over the next few years as the National Living Wage prices some workers out of employment."*

109. Moreover, in their March 2017 EFO<sup>10</sup> the OBR revised up their estimate for the equilibrium rate of unemployment (ERU) to 5.1% of the labour force and attributed a small part of this revision as a result of the NLW being expected to rise faster than productivity growth. In their November 2017 EFO (p. 41) the OBR reduced the ERU to 4.5% due to other factors, but maintained their assumption that the NLW will increase the ERU and so forecast it will rise to 4.6% as a result.

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<sup>7</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

<sup>8</sup> [http://budgetresponsibility.org.uk/docs/dlm\\_uploads/July-2015-EFO-234224.pdf](http://budgetresponsibility.org.uk/docs/dlm_uploads/July-2015-EFO-234224.pdf)

<sup>9</sup> <http://cdn.budgetresponsibility.org.uk/Nov2017EFOwebversion-2.pdf>

<sup>10</sup> <http://cdn.budgetresponsibility.org.uk/March2017EFO-231.pdf>

110. The increase in the NMW/NLW is universal for all workers of the same age, so efficiency wage theory argument might suggest there may be limited opportunities to increase labour productivity because workers cannot be paid below the pay floor that the NMW/NLW provides.
111. However, increasing productivity is possible with the NLW (and to an extent NMW) as employers seek to increase the marginal product that each unit of labour produces in order to offset the increased labour cost. Firms could do this by increasing capital investment which can often complement labour rather than substitute for it. Alternatively firms could invest in human capital to raise worker's skills, which may also improve motivation and retention both of which increase labour productivity. Econometric evidence commissioned by the LPC suggests there may be a positive link between NMW increases and productivity<sup>11</sup>. The OBR increased their hourly productivity forecast by 0.3 percentage points in their March 2015 EFO in response to the NLW being introduced (table B.1, p. 205). This is supported by research carried out by Incomes Data Research for the LPC which found:
- "Many employers have implemented productivity changes since the NLW was introduced and the most common approaches are to reorganise roles and responsibilities (50%), provide staff with extra training (45%) and upskill staff (44%)."* (p. 9)<sup>12</sup> and (p. 212) of LPC report<sup>13</sup>.
112. Moreover, stakeholder surveys by CIPD and BIFM for the LPC found that of employers affected by the NLW, 29% and 32% respectively have improved productivity in response to the NLW. On the other hand, qualitative evidence uncovered by NIESR; 'employers did not generally feel that the NMW/NLW in themselves lead to productivity increases. Some employers saw limitations to increases in productivity which could be realised through pay mechanisms. Factors other than pay were seen to act as constraints on productivity' (p. 39).
113. Other potential macroeconomic impacts include increased consumption as low paid workers have higher levels of disposable income. This will depend on individual household preferences and their marginal propensity to save. In the short term if consumption increases it will lead to increased aggregate demand, whereas in the longer term output may increase if individuals choose to save their increased income.
114. All of the macroeconomic impacts mentioned here would not be first round effects, in some cases they would be third or fourth round as a result of the direct impact from uprating the NMW/NLW. Therefore we do not quantify or monetise these impacts in this impact assessment, although as mentioned above the OBR have in the past sought to model the impacts of the NLW on employment and productivity.

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<sup>11</sup> See for example:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/520387/Bernini\\_and\\_Riley\\_Report\\_2016.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/520387/Bernini_and_Riley_Report_2016.pdf)

<sup>12</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/660565/IDR\\_Employer\\_research\\_FINAL\\_2017\\_Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/660565/IDR_Employer_research_FINAL_2017_Report.pdf)

<sup>13</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

## Fiscal impacts

115. In 2015 the OBR estimated that the total effect on net borrowing of introducing the NLW would be -£0.1billion in 2018-19.
116. However when doing their calculation the OBR emphasised significant modelling uncertainties and the estimates necessarily involved a series of challenging assumptions over how workers and wages react to minimum wages, including judgements over the extent to which firms absorb the costs through changing employment, or prices and profits. These assumptions are outlined in Annex B of the July 2015 Economic and Fiscal Outlook.
117. The OBR also needed to make their own assumption of an appropriate counterfactual of what minimum wages would have been in the absence of the NLW. As we and NIESR have discussed at length in this IA and in their report respectively, this is not straightforward. Thus, the OBR assumed that minimum wages would have risen in line with the average hourly earnings forecast and that the NLW would rise in a straight line, year-on-year, to the 2020 target of 60% of median earnings. This counterfactual is similar to the counterfactual we used in last year's IA, as well as by the LPC and the Resolution Foundation.
118. Even so, the first 18 months of the OBR's forecast period has now been realised, and forecasts to 2020 have been revised. The cash amount of the NLW, and the baseline NMW, have both decreased with lower average hourly earnings. The absolute difference between the two is now smaller in cash terms than projected in 2015, although the relative difference remains the same.
119. In terms of exchequer impacts, the OBR set out a number of channels through which public finances would be affected, including:
- Deductions to in-work benefits (negative impact on net borrowing);
  - Increases in income tax receipts and NICs (negative impact on net borrowing);
  - Increased VAT and excise duties receipts due to higher household consumption (negative impact on net borrowing);
  - Increased current expenditure on public sector pay for workers earning the minimum wage (positive impact on net borrowing);
  - Higher spending on unemployment-related benefits (positive impact on net borrowing);
  - Increases in the basic state pension via the triple lock on uprating (positive impact on net borrowing); and
  - Decreases in corporation tax receipts due to lower profits (positive impact on net borrowing).
120. The above assumptions resulted in the OBR revising public sector net borrowing down by small amounts (as in Table B.3 of the July 2015 EFO reproduced in table 11). Even though the cash path of realised and forecast NLW rates has decreased, we still expect the OBR's work to be a good guide to the broad scale and nature of the exchequer impacts.

**Table 11: OBR estimates of the effects on net borrowing from introducing the NLW, July 2015**

	<i>£ billion</i>				
	Forecast				
	2016-17	2017-18	2018-19	2019-20	2020-21
Average earnings of which:	-0.2	-0.3	-0.4	-0.5	-0.6
<i>Tax credits and housing benefit</i>	-0.2	-0.3	-0.5	-0.7	-0.8
<i>Income tax and NICs</i>	0.0	0.0	0.0	-0.1	-0.1
<i>Pension upratings</i>	0.0	0.1	0.2	0.2	0.3
Employment welfare	0.1	0.1	0.2	0.2	0.3
Inflation: upratings and debt interest	0.1	0.1	0.2	0.2	0.3
Profits: corporation tax	0.0	0.1	0.1	0.1	0.1
Consumption: VAT	0.0	-0.1	-0.1	-0.1	-0.2
Other economy effects	0.0	0.0	0.0	0.0	0.0
<b>Total effect on net borrowing</b>	<b>0.0</b>	-0.1	-0.1	-0.2	-0.2

Source: OBR Economic and Fiscal Outlook July 2015, table B.3 (pp.209)<sup>14</sup>

121. We have not estimated the net fiscal impacts in more detail than this because of the uncertainty associated with estimating the potential impacts listed above – some of which will be third or fourth round effects of the direct impact of the proposed increases in the NMW/NLW. However, our estimates of non-wage labour costs used in this IA (on both direct and indirect wage impacts) include a range of costs, but are largely made up of employer NICs which will go to the exchequer in the first instance. Indirectly these exchequer benefits are also for employees as a proportion of NIC receipts are paid in to the National Insurance Fund and go towards the state pension.

122. Moreover, we have estimated the wage costs on public sector employers. A fuller depiction of this is provided in annex C, but in summary 4% of the total cost in this IA is estimated to be borne by public sector employers; equivalent to £20.9m over the appraisal period in our best case scenario, however only £9.7m is a direct cost as a result of the proposed NMW/NLW rates. The remaining £11.3m is an indirect cost and will depend on behavioural responses of public sector employers. Increases to the NLW and NMW rates are expected to be met from within departments' existing budgets.

## Enforcement

123. The NMW & NLW are enforced by HMRC on behalf of BEIS. HMRC investigates all complaints made to the ACAS Helpline. In addition, HMRC conducts risk-based enforcement in sectors or areas where there is a higher risk of workers not getting paid the legal minimum

<sup>14</sup> [http://budgetresponsibility.org.uk/docs/dlm\\_uploads/July-2015-EFO-234224.pdf](http://budgetresponsibility.org.uk/docs/dlm_uploads/July-2015-EFO-234224.pdf)

wage. If HMRC investigate an employer that is breaking the NMW law and issues a Notice of Underpayment containing details of the underpayments, the period to which they relate and the workers affected, then the employer will have to pay back the arrears owed to workers, face a financial penalty, and can be publically named and shamed under the NMW Naming scheme, unless it successfully appeals against the Notice of Underpayment. Generally, a broad base of analysis suggests that non-compliance is mostly through mistake, not malice.

124. In April 2017 ASHE estimates there were 342,000 jobs with pay less than the NMW/NLW rates held by employees aged 16 and over, this constitutes 1.2% of all 16+ UK employee jobs. This represents a slight decrease from 365,000 jobs (1.3%) in 2016.
125. It is possible that as the NLW continues on its path of 60% of median earnings by 2020, the incidence of non-compliance will increase due to the associated increase in coverage of jobs paid near the statutory wage floor. This potentially creates a larger number of instances where non-compliance could occur; however, this is highly uncertain and has not been borne out by the data to date.
126. However, it should be noted that the Government continues to work with employers and workers to support compliance and tackles any underpayment through strengthened enforcement action. For example in 2016/17 the Government has:
- Increased the enforcement budget to £25.3 million in 2017/18 up from £20 million in 2016/17.
  - Undertaken a £1.7 million communications campaign to encourage workers to check their pay and to educate employers on the ways in which they can be found to be non-compliant.
  - Established a new 'Promote' team with HMRC, dedicated to improving compliance by changing the behaviour of employers and workers. This approach allowed HMRC to reach 250,000 employers, workers and intermediaries using a combination of webinars, targeted mail shots, face to face contact, digital contact and project work with sector specific bodies.
  - Launched a new online complaint form to improve the routes to enforcement. The online-form has now become the preferred route to raising a complaint.
  - Appointed a Director of Labour Market Enforcement responsible for setting the strategic direction of the three labour market enforcement bodies.
  - Set-up a Serious Non-Compliance team within HMRC to focus on targeting the most serious cases of wilful non-compliance.
127. The additional Exchequer expenditure on enforcement is not a direct result of the LPC recommendations for the April 2018 rates which are the focus of this IA, therefore we have assumed there is no change in the cost to the Exchequer of enforcement from the NMW/NLW upratings.

# Small and Micro Business Assessment

## Impact on small and micro businesses

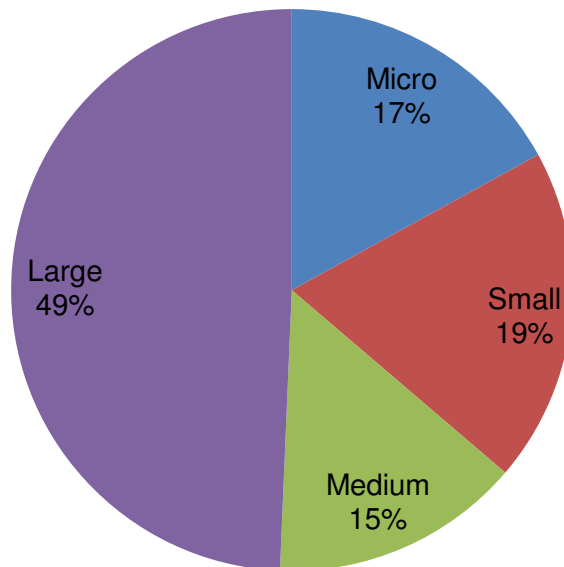
128. Table 12 contains our estimates of projected coverage of workers on the NMW/NLW at the start of our appraisal period (April 2018) and our best estimate of the total costs corresponding to each business size, over the course of the appraisal period.

**Table 12: Coverage of NMW/NLW workers by business size, Q2 2018**

Business size:	Micro		Small		Medium		Large	
	Coverage	Total Cost	Coverage	Total Cost	Coverage	Total Cost	Coverage	Total Cost
NLW (25+)	331,000	£82.1	329,000	£88.1	237,000	£70.0	730,000	£252.9
Main (21 - 24)	29,000	£7.3	42,000	£10.4	30,000	£6.8	85,000	£19.8
Others	40,000	£8.5	59,000	£12.1	31,000	£6.6	65,000	£12.8
<b>Total</b>	<b>400,000</b>	<b>£98.0</b>	<b>429,000</b>	<b>£110.7</b>	<b>298,000</b>	<b>£83.4</b>	<b>880,000</b>	<b>£285.5</b>

Source: BEIS calculations using ASHE 2017. Note: Coverage and cost estimates by business size may not match total costs and coverage exactly due to rounding and sampling error when data is disaggregated

**Figure 6: Total Cost by business size pie chart**



129. As the pie chart above shows, we expect 36% of the costs of this policy to be borne by small and micro businesses. According to the BPE 2017, 31% of workers are employed in small and micro businesses. Therefore the burden is expected to fall slightly more on small and micro businesses compared to larger firms, although we do not expect them to be significantly disproportionately affected by the changes to this legislation. Paragraphs 130-131 explain why it is not feasible to exempt these businesses.

## **The possibility of exempting small and micro businesses**

130. There are both equity and economic reasons why small and micro businesses are not exempt from the NMW/NLW. Firstly, an exemption would undermine the objectives of the policy because a large proportion (almost half) of NMW/NLW workers work in small and micro businesses and so an exemption would significantly undermine the ability of the minimum wage to address the possibility of employers exploiting the vulnerability of certain workers to pay them unacceptably low wages and undercut their competitors. Moreover, the cost imposed on small and micro businesses is equal to the benefits that the workers receive. Consequently, exempting small and micro firms would mean a significant proportion of the expected benefits from this proposal would not be realised.
131. There are also economic reasons against an exemption. Exempting small and micro businesses would enable them to avoid the increase in labour costs associated with raising the wages of the lowest paid. This would create economic inefficiencies through three effects. Firstly, it would create a distortion in the market by distorting cost-competitiveness at the expense of medium and large businesses which would undermine competition. Secondly, it would create a disincentive for businesses to grow – if they were to expand sufficiently to be classified as a medium sized business, they would be obliged to raise wages for all their employees to meet the NLW/NMW rates, thereby introducing a significant cost of expansion at the threshold between small and medium sized businesses. Thirdly, there would be labour supply effects with workers (especially more productive ones) likely to favour working for larger businesses where they would be guaranteed to be paid the minimum wage, leaving less productive workers to work in smaller businesses which could create a misallocation of resources.
132. The annual NMW/NLW increases are fully embedded in the UK labour market and this will be the 18<sup>th</sup> annual increase. The majority of employers are aware of the increasing minimum wage, in particular the NLW: Following a Government communication campaign, 92% of employers were aware of the NLW (a figure that was 70% before the campaign). Given the success of previous communications campaigns, there will be employer targeted communications activity and guidance to ensure small and micro businesses are aware of the NMW/NLW changes. Moreover we pre-announced the rates in November 2017 – before the legislation has gone through Parliament – to maximise adjustment time for businesses. This combined with the communications campaigns will seek to mitigate the burden placed on small and micro businesses.

## **Specific Impact Tests**

### **Equalities impact**

133. Section 149 of the Equality Act 2010 requires BEIS to have due regard to promoting equality of opportunity, eliminating discrimination, and fostering good relations between groups. The impact of the NLW and NMW increases on equalities considerations is considered in full in annex E.



## **Sector impact**

134. Low-pay sectors will be impacted disproportionately by the NMW/NLW rate increases. Annex D provides a detailed estimate of the coverage of the NLW and NMW rates for a range of low-pay sectors, as defined by the LPC such as social care, retail, and hospitality. A sector breakdown for some individual rates is not provided because of sample size issues.

## **Implementation**

135. The changes to the NMW and NLW regulations will be made by secondary legislation and will come into force on 1<sup>st</sup> April 2018.

## **Monitoring and evaluation**

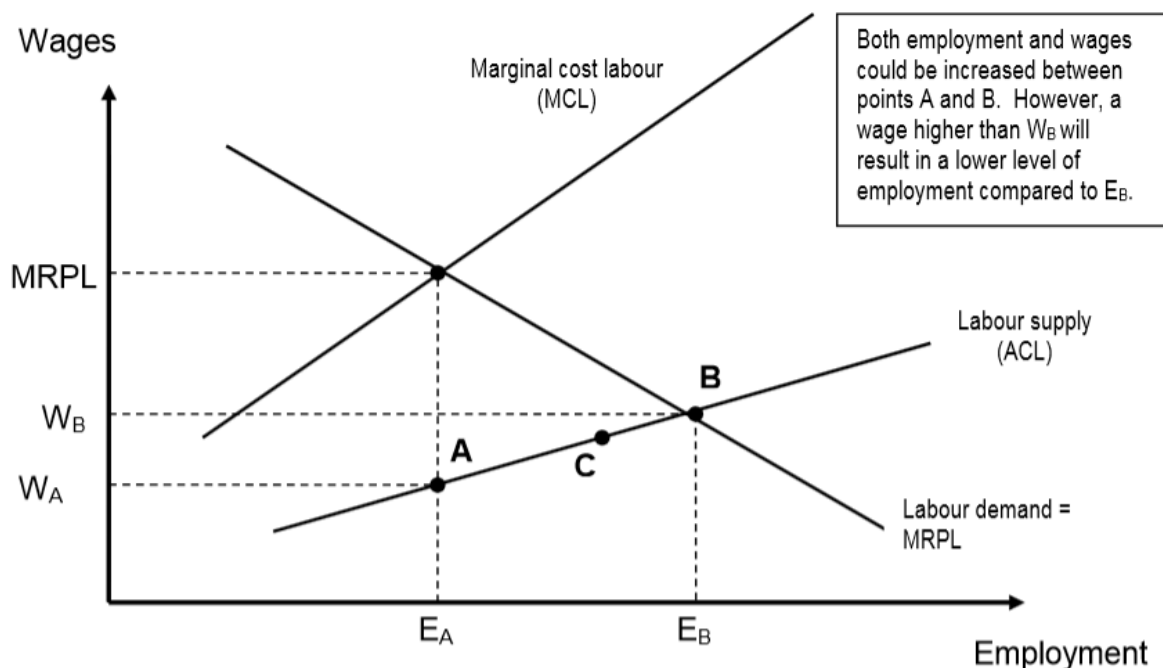
136. The remit for the LPC will continue to include the requirement to monitor, evaluate and review the levels of the different minimum wage rates. Historically, the LPC's report has included extensive discussion of the impacts of the NMW rates on a range of considerations, and this year's report is no different as it begins to build the evidence base on the impact of the introduction of the NLW. In making future recommendations for NMW rate increases, the LPC will carry out extensive monitoring and evaluation of the current rates.

## Annex A: Theoretical rationale for intervention

137. To illustrate the implications of imperfect labour markets where employers have market power, consider a stylised example of a monopsonist where workers have homogenous skills. The monopsonist will initially hire the cheapest workers first. In order to attract new workers, it must raise the marginal wage, but it must pay this new, higher wage to all its employees. Consequently, the marginal cost of labour is greater than the average cost, as captured by the labour supply curve.

138. The employer will maximise profits when the marginal cost of labour equals the marginal revenue product. This is illustrated by point A in the diagram below: This equilibrium has lower wages and lower employment than the perfectly competitive equilibrium at point B. A statutory wage floor can address this market power and bring the market equilibrium closer to the efficient, perfectly competitive outcome – such as point C.

**Figure 7: A labour market characterised by market power for low paid workers**



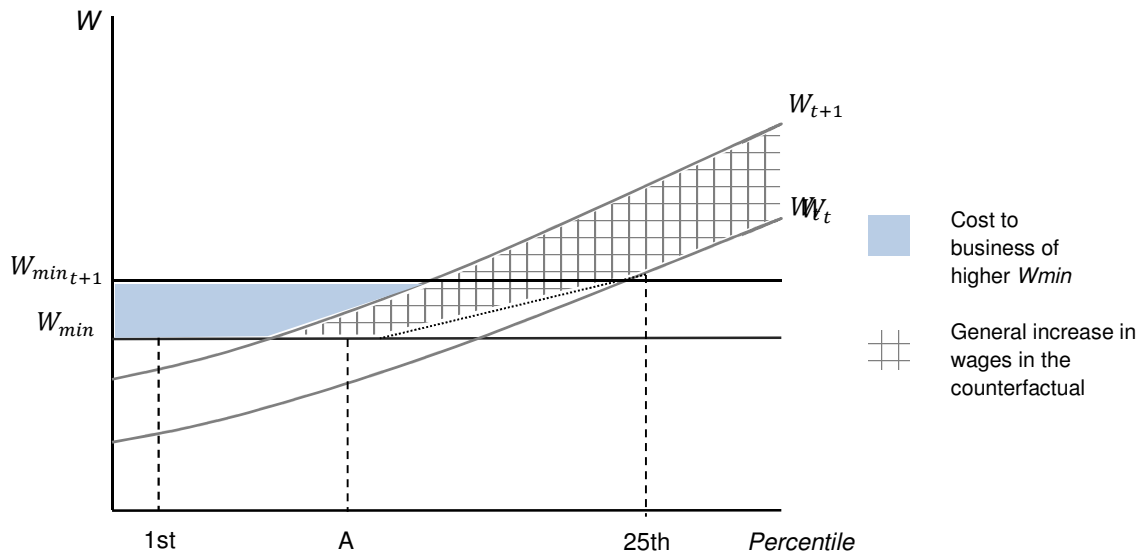
139. In practice, the qualitative evidence provided by businesses in the NIESR report indicates that it is unlikely that this stylised pure market structure is representative of competition in low paying sectors today. Certain sectors may share features of a monopsonistic market, in the sense that there are many workers but also many employers; however there is an excess supply of labour resulting in weak bargaining power for employees in low paid sectors. As mentioned in paragraph 4, unequal bargaining power can result in sub-optimal outcomes, and therefore part of the rationale of the NMW/NLW is to correct this market failure and ensure that weak bargaining power does not lead to exploitative wages.

140. Conversely, some low paid sectors may also demonstrate features of a perfectly competitive market. The NIESR report describes how many of the employers interviewed take appreciation for – or at least consider – their competitors pay when it comes to making pay decisions.

## Annex B: Shadow wage curve in RPC's proposed counterfactual

141. The RPC have previously proposed a framework whereby a significant proportion of workers at the very bottom of the wage distribution would likely experience zero wage growth in the counterfactual in the absence of an NMW/NLW uprating due to the cumulative effects of minimum wage increases over time. This is based on figure 8 below.

**Figure 8: A labour market characterised by market power for low paid workers**



142. Figure 8 shows the people earning the current minimum wage,  $W_{min}$ . The 'shadow wage curve',  $W_t$ , shows what people would have been earning in the absence of the NMW policy and that there would be some workers earning less than the minimum wage (along  $W_t$  beneath  $W_{min}$ ). The following year, the NMW increases to  $W_{min_{t+1}}$ , and the whole distribution also experiences wage growth to the new theoretical shadow wage curve  $W_{t+1}$ .

143. Under this wage growth assumption (roughly uniform across the shadow distribution in the diagram above), the counterfactual wage growth for those earning the NMW, such as workers at the 1<sup>st</sup> percentile, in the absence of an uprating, would be zero for a period before later catching up with the new rate. This is because  $W_{min}$  still lies above the shadow wage curve,  $W_{t+1}$ , at this point. However, people at point A for instance, who were previously on  $W_{min}$  will have seen an increase in their wages from  $W_{min}$  to  $W_{t+1}$ . This increase will be less than for the distribution to the right of point A, but more than those who remain on  $W_{min}$ .

144. In summary, the framework postulates that if the minimum wage had never been implemented, the wage distribution in present time would extend below the current value of the minimum wage (i.e. some workers would be earning less than the minimum wage) – referred to as the 'shadow wage curve/distribution'. This cannot be observed because compliance with minimum wage legislation is high. In addition, while the existence of a shadow wage curve extending below the current minimum wage level cannot be falsified because the counterfactual is unobservable, on the balance of evidence outlined previously in this IA and in their report, NIESR conclude that the counterfactual may not extend below the current minimum wage and that 'resetting' the counterfactual is the most suitable method to appraise the impacts of NMW/NLW upratings. As the NLW continues to increase we will need

to remain vigilant for new evidence that could impact our modelling approach, for example robust evidence of negative employment effects may be an indicator we should monitor to inform the validity and extent of this approach.

145. Putting this aside, in the remainder of this annex we consider one rudimentary way of practically representing the shadow wage curve framework. As explained in box 1, whilst this is an attractive framework conceptually, NIESR's evidence does not necessarily suggest the theory holds in practice or whether the counterfactual wage level is different from what is observed in the wage data. Moreover the empirical evidence does not suggest that those at the bottom of the wage distribution would necessarily see the lowest wage growth in the absence of the NLW/NLW uprating.

## **Constructing a 'shadow wage distribution'**

146. Given that the minimum wage has been in force since 1999 we cannot observe the shadow wage distribution. We would expect that all points on the shadow wage distribution would see some change over time, reflecting underlying trends in wage inequality which in turn would be driven by labour market and exogenous factors (for example technological progress and underlying labour market trends, explained in box 1). In theory, these changes in the shadow wage distribution over time should be reflected in the counterfactual when considering the wage impacts of minimum wage upratings. As such, the profile of the counterfactual will be a function of the shape of the shadow wage distribution and the wage growth that would tend to happen at each point of the distribution.

147. Under this framework, for jobs on the shadow wage distribution hypothetically paid below the current minimum wage rate, the current rate is theoretically still 'binding' on these jobs. And as long as the current rate remains binding, the additional wage costs/benefits would be counted as direct costs/benefits under the better regulation framework. With respect to a minimum wage uprating; all else equal (specifically wage growth), jobs on the shadow wage distribution below the current minimum wage will take more time to grow sufficiently to equal the incoming rate and therefore for these jobs the costs and benefits will endure for a longer period of time.

## **Challenges**

148. Applying this framework means overcoming several significant analytical challenges, given that the shadow wage distribution can never be observed. In order to estimate a shadow wage distribution, some base wage distribution must be used. Any effects from the minimum wage will be present in any wage distribution from 1999 onwards. One option is to use pre-minimum wage data. However, there are a number of reasons why this may not be appropriate. These are discussed in NIESR's counterfactual research report (p. 11). In summary:

- There is significant uncertainty over whether a wage distribution from 20 years ago is an appropriate input to a model seeking to estimate impacts for 2018 onwards.

- There are significant reasons to believe that the shape and evolution of the (shadow) wage distribution would have been considerably different to trends observed pre-1999. Specifically:
  - Considerable changes to the population and labour supply (number and composition).
  - Considerable changes to labour market institutions, including trends in unionisation and individual employment rights. Many of these would have impacted on participation and wage setting.
  - Wider structural economic changes, for example significant innovations (e.g. process automation) which would affect how labour and capital are substituted.
  - Societal changes, for example consumer transparency which would increase societal pressure to increase wages (the voluntary 'Living Wage' campaign for example).
- Projecting a wage distribution from 1998 would require forecasting over a long time horizon. NIESR explain in their report (pp. 56-57) how the uncertainty associated with forecasting is magnified as the time horizon grows – almost 20 years in this instance.

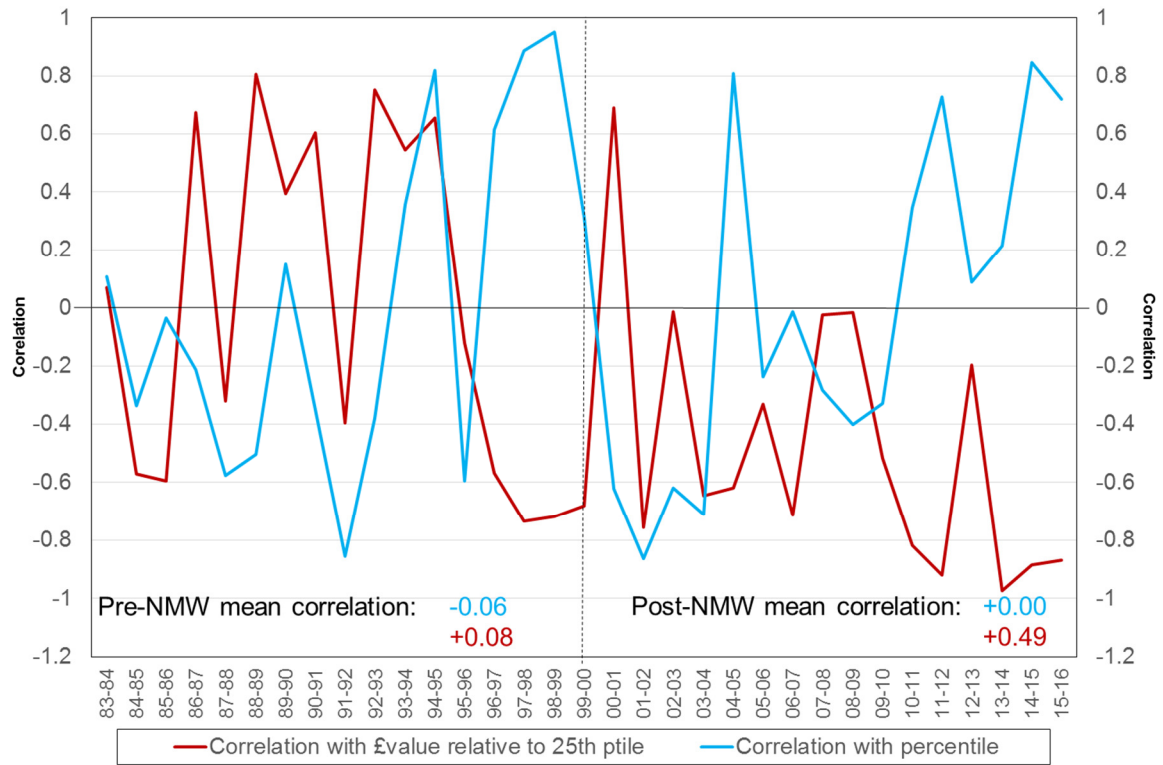
## Approach

149. Despite the limitations outlined above, below we undertake calculations to suggest the order of magnitude of costs and benefits if an approach to model a shadow wage distribution were based on pre-minimum wage data. To do this we have taken the April 1998 distribution of hourly earnings excluding overtime for workers aged 25+ and projected this forward using the percentage increase at the 20th percentile in each year between 1998 and 2017. To forecast beyond 2017 we have applied the growth rate recommended by NIESR and used as our best estimate in this IA (average quarterly growth at the 20th percentile between 2011 and 2016).

### Box 2: Inputs and assumptions

- For the approach below we have used the 1998 wage distribution from ASHE/NES. This is the most recent year of data from before the introduction of the minimum wage in 1999. It is possible that employers may have sought to pre-empt the introduction of the minimum wage by increasing wages of the lowest paid in 1998. It is not possible to adjust for this potential anticipation effect.
- Our key assumption is that percentiles 1 to 19 of the wage distribution would grow at the same rate as the 20<sup>th</sup> percentile. This mirrors the approach recommended by NIESR for this impact assessment, and is supported by the evidence in box 1.
- In theory, we should estimate the point of the distribution at which the 'ripple effect' of the minimum wage stops for each year and use growth of the percentile just above. However, we do not have estimates of this for every minimum wage uprating.
- NIESR's analysis suggests that growth at the 20<sup>th</sup> percentile is an unbiased proxy for growth experienced by the lowest paid segment of the wage distribution. In particular, "the estimated counterfactual sometimes implies higher and sometimes lower wage growth rates than at the 20<sup>th</sup> percentile" (p. 83). In addition, the chart below suggests that before the introduction of the minimum wage, neither the ranking of the percentile point (i.e. 1 through 25) nor the relative £value of the percentile point relative to the 25<sup>th</sup> percentile £value were correlated with the growth rate at that percentile. This changed following the introduction of the minimum wage.

**Figure 9: Correlation between relative position of percentile and the growth at the percentile, age 25+**

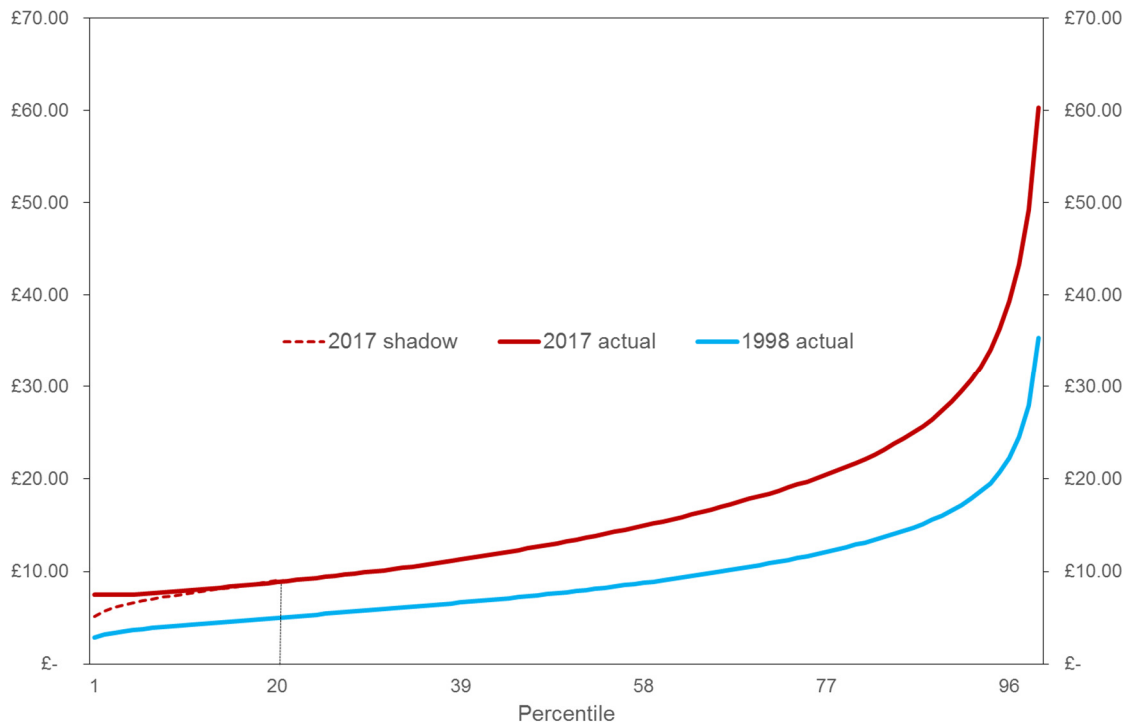


Source: BEIS analysis of New Earnings Survey Panel Data 1980-2016. Hourly earnings excluding overtime (HEXO).

**Results**

150. Figure 10 shows the outcome of the approach described above and compares the resulting shadow wage distribution with the original 1998 distribution and the actual 2017 distribution. From the 20<sup>th</sup> percentile upwards the 2017 shadow and actual distributions are identical by design.

**Figure 10: distribution of hourly earnings (exc. Overtime), 1998, 2017 and estimated 'shadow wage distribution'**



Source: BEIS analysis of Annual Survey of Hours and Earnings and New Earnings Survey. Hourly earnings excluding over time (HEXO), weighted by Calwght.

151. As outlined above, in order for the above distribution to be an accurate reflection of the *true* shadow wage distribution there would have had to have been no significant changes to underlying wage inequality over the previous 20 years. This is unlikely given some of the significant shifts in the labour market in the last 20 years (population changes, automation and technology, changes to employment law, improved transparency on business practices etc.)

152. Projecting the shadow wage distribution forwards gives an indication of when in the future percentiles of the distribution below the current minimum wage level might ‘catch-up’ with that level based on our assumed growth rate under this framework. The 2017 £7.50 NLW rate cuts in around the 10<sup>th</sup> percentile of the 2017 shadow wage distribution. In the actual 2017 distribution the NLW cuts in around the 5<sup>th</sup> percentile.

### Potential application

153. Our main IA wage cost/benefit model applies a uniform counterfactual growth rate applied to the most recent wage distribution to produce a counterfactual wage distribution. The direct wage costs are then the sum of the difference between the value of the incoming minimum wage level and the wage levels in the counterfactual wage distribution which are below the incoming rate. As mentioned elsewhere in this IA, we conduct marginal appraisals of minimum wage upratings and under this approach no worker can earn less than the current minimum wage for the purposes of the appraisal. However, under the framework mentioned above, if the shadow wage *level* for some jobs is below the current minimum wage, this could potentially lower the *growth* they would experience in the counterfactual. In terms of practically estimating costs /benefits, some percentiles of the segment of the wage distribution

affected by the incoming minimum wage rate would grow at zero percent until they ‘caught up’ with the current minimum wage rate before then growing to meet the incoming rate.

154. On the balance of evidence, NIESR believe that their proposed approach to modelling the wage costs of the NLW/NMW, which we implement in this IA, is an appropriate and unbiased method for appraising the impact of the NMW/NLW uprating. However, one way of applying the analysis discussed in this annex is to apply the average length of time taken for the 10 percentiles valued below the current minimum wage in the shadow wage distribution to catch up with the current minimum wage level to a portion of the percentiles affected by the incoming minimum wage rate in the actual 2017 wage distribution. Our analysis suggests this is around 4 years for the incoming NLW rate, but could potentially differ for the other rates.
155. We can assume that this approach should be applied at most to the jobs paid exactly at (and below) the current minimum wage level in the actual 2017 wage distribution because this is the segment of the distribution which might be most affected by minimum wage increases. In reality there could be a number of reasons why this may not be the case – for example there is evidence, supported by NIESR’s research and mentioned elsewhere in this IA, that the minimum wage also has a strong anchoring effect on wage setting, which would mean previous upratings potentially distort the market wage outcome for jobs above the current rate.
156. In summary, box 3 depicts an equation for calculating the total direct wage impacts using this approach.

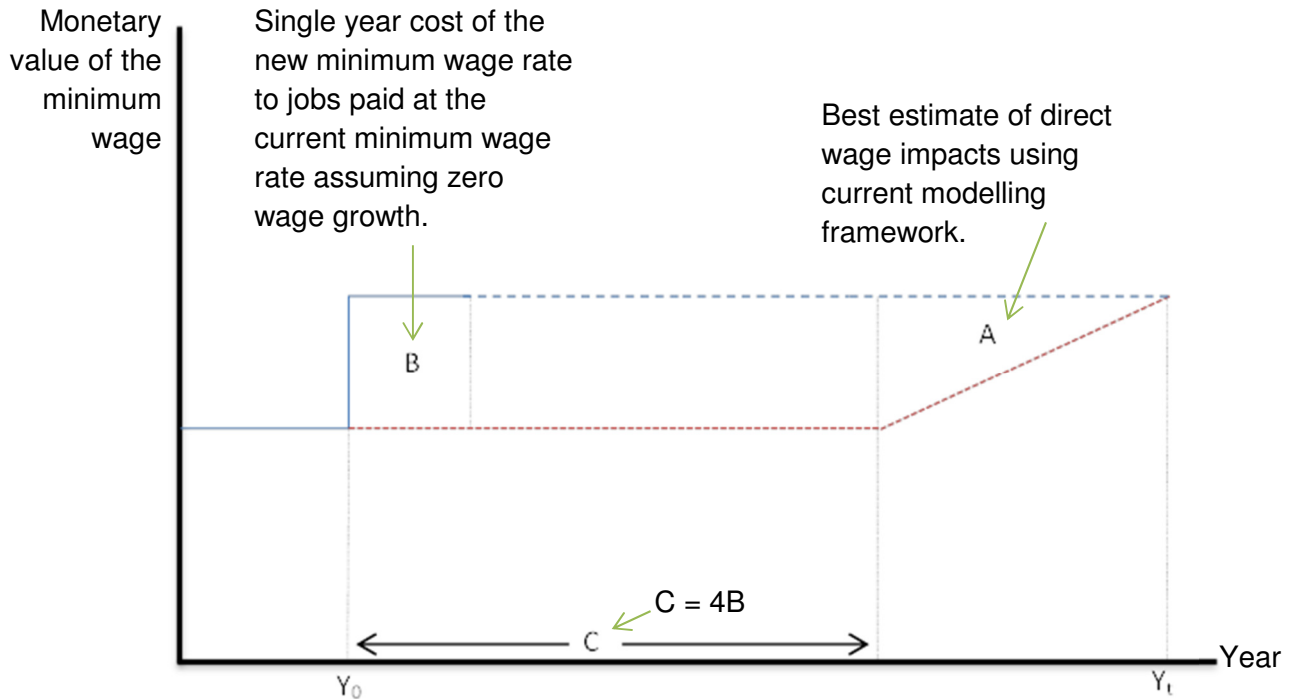
### **Box 3: Calculation of the counterfactual using the shadow wage curve method**

157.

<i>A: BEIS best estimate of direct wage impacts using current modelling framework</i>		
	+	
<i>B: Single year cost of the new minimum wage rate to jobs paid at the current minimum wage rate assuming zero wage growth over the year</i>	×	<i>C: 4 years</i>



**Figure 11: Diagrammatical depiction of box 3**



158. *B* for the NLW is estimated as follows:

- 1.4m jobs x 25 mean weekly hours x 33p minimum wage uplift x 52.14 weeks

Combining with *C* gives a cost of around £2.6bn. This would then be added to our best estimate using our preferred modelling framework outlined above. Testing this same approach using lower percentiles of the wage distribution (i.e. assuming that the minimum wage ripple effect was lower) gives lower estimates; £2.2bn assuming the 15<sup>th</sup> percentile, £1.7bn assuming the 10<sup>th</sup> percentile and £900m assuming the 5<sup>th</sup> percentile.

159. It's important to emphasise that we do not believe this approach will accurately estimate the true cost to business/benefit to workers for the reasons outlined above and explained by NIESR in their report (section 4.3) and boxes 1 and 2 in their report provide evidence why the shadow wage curve framework may not necessarily hold. Specifically, whilst the framework cannot be falsified, NIESR's research did not uncover positive evidence supporting this approach.

## **Annex C: Public/Private/Voluntary sector cost breakdown**

160. This annex breaks down our best and low cost scenario estimates of costs by public, private and voluntary sectors. We have done this by estimating the proportion of public, private and voluntary sector workers who are projected to be affected by each of the rates in April 2018, using ASHE 2017, and then applied these proportions to the total costs estimated previously in the impact assessment.

161. When calculating the EANDCB we combine the private and voluntary sectors. The proportion of workers who we expect to work in these sectors for the NLW is 96%, whilst for the 21-24, 18-20, 16-17 and Apprentices NMW rates the proportions are 97%, 96%, 100%<sup>15</sup> and 92% respectively.

### **Public sector (£m)**

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£6.2	£1.2	£8.5	£1.7	<b>£17.6</b>
Main (21-24)	£0.7	£0.1	£0.4	£0.1	<b>£1.3</b>
Development (18 - 20)	£0.9	£0.2	£0.3	£0.1	<b>£1.5</b>
Youth (16 - 17)	£0.0	£0.0	£0.0	£0.0	<b>£0.0</b>
Apprentice	£0.3	£0.05	£0.1	£0.03	<b>£0.5</b>
<b>Total</b>	<b>£8.1</b>	<b>£1.6</b>	<b>£9.4</b>	<b>£1.9</b>	<b>£20.9</b>

Low estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£2.8	£0.5	£6.3	£1.2	<b>£10.9</b>
Main (21-24)	£0.3	£0.1	£0.3	£0.1	<b>£0.8</b>
Development (18 - 20)	£0.5	£0.1	£0.2	£0.0	<b>£0.9</b>
Youth (16 - 17)	£0.0	£0.0	£0.0	£0.0	<b>£0.0</b>
Apprentice	£0.1	£0.02	£0.1	£0.02	<b>£0.3</b>
<b>Total</b>	<b>£3.7</b>	<b>£0.7</b>	<b>£7.0</b>	<b>£1.4</b>	<b>£12.8</b>

<sup>15</sup> It is likely there are some minimum wage workers in the public sector who will be affected by this proposal; however our analysis is based on ASHE which is subject to sampling errors. Without knowing the true figure we use 100% as the only evidence we have,

## Private sector (£m)

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£157.5	£31.1	£215.5	£42.5	<b>£446.6</b>
Main (21-24)	£20.4	£4.0	£13.3	£2.6	<b>£40.3</b>
Development (18 - 20)	£18.8	£3.7	£6.5	£1.3	<b>£30.2</b>
Youth (16 - 17)	£0.4	£0.1	£0.6	£0.1	<b>£1.2</b>
Apprentice	£2.7	£0.5	£1.4	£0.3	<b>£4.9</b>
<b>Total</b>	<b>£199.6</b>	<b>£39.4</b>	<b>£237.3</b>	<b>£46.8</b>	<b>£523.1</b>

Low estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£70.4	£13.9	£160.3	£31.6	<b>£276.2</b>
Main (21-24)	£9.5	£1.9	£9.4	£1.9	<b>£22.6</b>
Development (18 - 20)	£10.6	£2.1	£4.6	£0.9	<b>£18.3</b>
Youth (16 - 17)	£0.1	£0.0	£0.4	£0.1	<b>£0.6</b>
Apprentice	£1.2	£0.2	£1.1	£0.2	<b>£2.7</b>
<b>Total</b>	<b>£91.7</b>	<b>£18.1</b>	<b>£175.9</b>	<b>£34.7</b>	<b>£320.4</b>

## Voluntary sector (£m)

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£10.3	£2.0	£14.1	£2.8	<b>£29.2</b>
Main (21-24)	£1.4	£0.3	£0.9	£0.2	<b>£2.7</b>
Development (18 - 20)	£0.9	£0.2	£0.3	£0.1	<b>£1.4</b>
Youth (16 - 17)	£0.0	£0.0	£0.0	£0.0	<b>£0.0</b>
Apprentice	£0.2	£0.0	£0.1	£0.0	<b>£0.4</b>
<b>Total</b>	<b>£12.8</b>	<b>£2.5</b>	<b>£15.4</b>	<b>£3.0</b>	<b>£33.7</b>

Low estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£4.6	£0.9	£10.5	£2.1	<b>£18.1</b>
Main (21-24)	£0.6	£0.1	£0.6	£0.1	<b>£1.5</b>
Development (18 - 20)	£0.5	£0.1	£0.2	£0.0	<b>£0.8</b>
Youth (16 - 17)	£0.0	£0.0	£0.0	£0.0	<b>£0.0</b>
Apprentice	£0.1	£0.0	£0.1	£0.0	<b>£0.2</b>
<b>Total</b>	<b>£5.8</b>	<b>£1.2</b>	<b>£11.4</b>	<b>£2.3</b>	<b>£20.7</b>

## **Annex D: Coverage of the NMW/NLW (April 2018) by low paying sector and region**

162. The tables below list coverage of the NLW and the NMW rates by region and low paying sector, as defined by the RPC. As mentioned in paragraph 80, the choice of counterfactual assumption is crucial for determining coverage in April 2018. The figures below are based on our central scenario of 0.68% quarterly counterfactual wage growth. Using our high and low scenario assumptions will result in significantly different coverage estimates. Note figures may not sum due to sampling variability and rounding.

	<b><i>Coverage of all NLW and NMW rates - projected number of workers paid at or below in April 2018</i></b>	
	<b>NLW</b>	<b>NMW rates</b>
North East	78,000	22,000
North West	205,000	57,000
Yorkshire & Humber	156,000	34,000
East Midlands	142,000	29,000
West Midlands	172,000	41,000
South West	127,000	32,000
East	138,000	36,000
London	166,000	17,000
South East	164,000	34,000
Wales	81,000	20,000
Scotland	117,000	31,000
Northern Ireland	80,000	26,000
<b>Total</b>	<b>1,630,000</b>	<b>380,000</b>

	<b><i>Coverage of all NLW and NMW rates - projected number of workers paid at or below in April 2017</i></b>	
	<b>NLW</b>	<b>NMW rates</b>
Agriculture	18,000	5,000
Food processing	69,000	5,000
Textiles	9,000	400
Retail	313,000	77,000
Hospitality	250,000	107,000
Security and enforcement	16,000	500
Cleaning and maintenance	247,000	8,000
Social care	85,000	10,000
Childcare	51,000	19,000
Leisure	21,000	15,000
Hair and Beauty	27,000	16,000
Office work	49,000	13,000
Non-food processing	45,000	6,000
Storage	64,000	7,000
Transport	65,000	9,000
Call centres	5,000	700
Non-low paying sectors	294,000	83,000
<b>Total</b>	<b>1,630,000</b>	<b>380,000</b>

## **Annex E: Specific Impact tests**

### **Equality Analysis**

163. Under the Equality Act 2010 the Department for Business, Energy and Industrial Strategy, as a public authority, is legally obligated to have due regard to equality issues when making policy decisions. Specifically the Public Sector Equality Duty (PSED) sets out:
- Eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act;
  - Advance equality of opportunity between people who share a protected characteristic and those who do not; and
  - Foster good relations between people who share a protected characteristic and those who do not.
164. The protected characteristics consist of nine groups: age, race, gender, disability, religion or belief, sexual orientation, gender reassignment, pregnancy and maternity, marriage and civil partnership.
165. This Equality Analysis considers the potential equality impacts of the National Minimum Wage and National Living Wage upratings.
166. The increase in the NMW and NLW have universal coverage for workers aged 16 and over working in all sectors and regions of the United Kingdom. The policy aims to protect workers and all employers are legally obliged to pay at least the statutory minimum hourly rate.

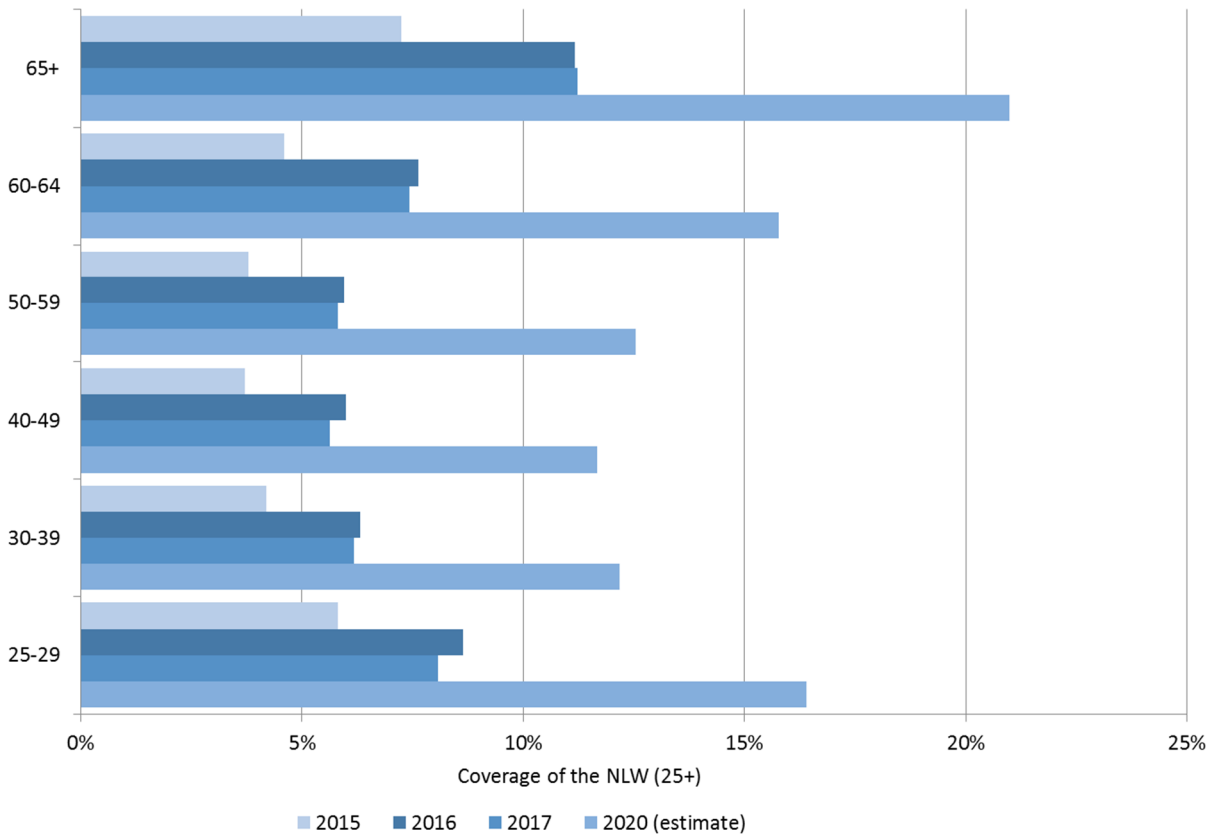
### **Estimating pay rates by personal characteristics**

167. Our statistical information is sourced from Annual Survey of Hours and Earnings (ASHE) and Labour Force Survey (LFS) data from the Office for National Statistics (ONS). There are two key challenges when analysing the effects of the rate increases on protected groups in the labour market.
- Firstly, ASHE does not include data that enables us to analyse earnings by ethnicity, religion, disability status, marital status, sexual orientation, gender reassignment or pregnancy and maternity.
  - Secondly as set out previously in this IA, pay variables in LFS are less robust than ASHE.
168. The Labour Force Survey does, however, provide information relating to ethnicity, nationality and disability status and earnings. Using an imputation method to boost responses, ONS are able to more accurately report earnings data by personal characteristics. We report these findings in the next section.

## Age

169. Figure 12 shows the estimated coverage of the NMW/NLW in 2015, 2016 and 2017, and forecast coverage in 2020 by age. LPC estimate that coverage of NMW/NLW rates is higher among 25-29 year-olds and workers aged over 60.<sup>16</sup> The share of workers aged 30 and 59 years of age is lower by comparison, however because of the volume of workers in this age range, they account for most of the individuals paid at the minimum wage.

**Figure 12: Coverage of the NMW/NLW by age, UK 2015-2020**



Source: LPC estimates using: ASHE April 2015-17, low pay weights, UK.

170. Analysis conducted by the ONS (see figure 14) shows that in the fourth quarter of 2016, a higher proportion of younger and older workers were paid less than or below NMW/NLW compared with other age groups.<sup>17</sup> There are most likely to be some disproportionate positive impacts felt among younger and older workers as a result of implementing the NMW/NLW rates.

<sup>16</sup> LPC (2017) *National Minimum Wage: Low Pay Commission Report 2017*, Low Pay Commission.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661195/Low\\_Pay\\_Commission\\_2017\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661195/Low_Pay_Commission_2017_report.pdf)

<sup>17</sup> Yuen, W. (2017) *Earnings and low pay: distributions and estimates from the Labour Force Survey*, Office for National Statistics. Available:

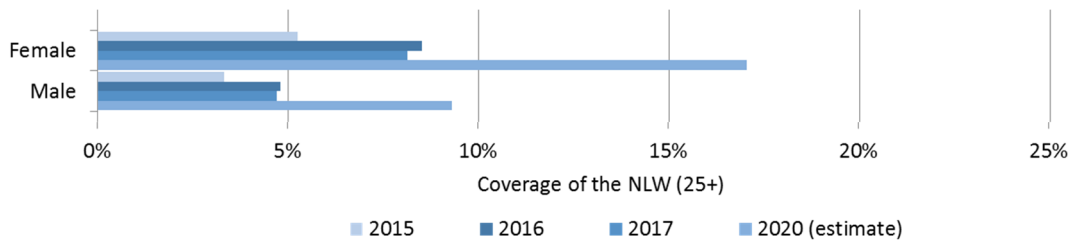
<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/earningsandlowpay/distributionsandestimatesfromthelabourforcesurvey>



## Gender

171. Figure 13 estimates the gender composition of the coverage of the NMW/NLW over time, among other characteristics. Coverage of the NMW/NLW is projected to grow faster among females than males. This disparity is largely due to women being more likely to work in low-paid roles and to work part time.<sup>18</sup>

**Figure 13: Coverage of the NMW/NLW for workers aged 25 and over, by worker and job characteristics, UK 2016-2020**



Source: LPC estimates using: ASHE April 2015-17, low pay weights, UK.

172. ONS analysis (see figure 14) shows that a higher proportion of jobs filled by women in Q4 2016 were paid less than or close to the NMW/NLW. Of all jobs paid less than or close to the NMW/NLW, 67% were filled by women and 33% were filled by men.<sup>19</sup>

173. These findings show that a higher proportion of women than men are expected to benefit from the increases in the NMW/NLW rates, indicating there may be disproportionate positive impacts felt as a result.

## Disability

174. Further supporting analysis by the ONS shows a greater proportion of employees with a disability (12.3%) were in jobs paid less than or close to the NMW or NLW compared to those without a disability (7.1%).

175. Our findings to date suggest that there are no adverse effects of the proposals on individuals with this protected characteristic. If implemented, there are likely to be disproportionate positive impacts felt among employees as a result of the increase in rates. This is illustrated by the positive change in the employment rates between 2016 and 2017 for certain characteristics in figure 1, earlier in this IA.

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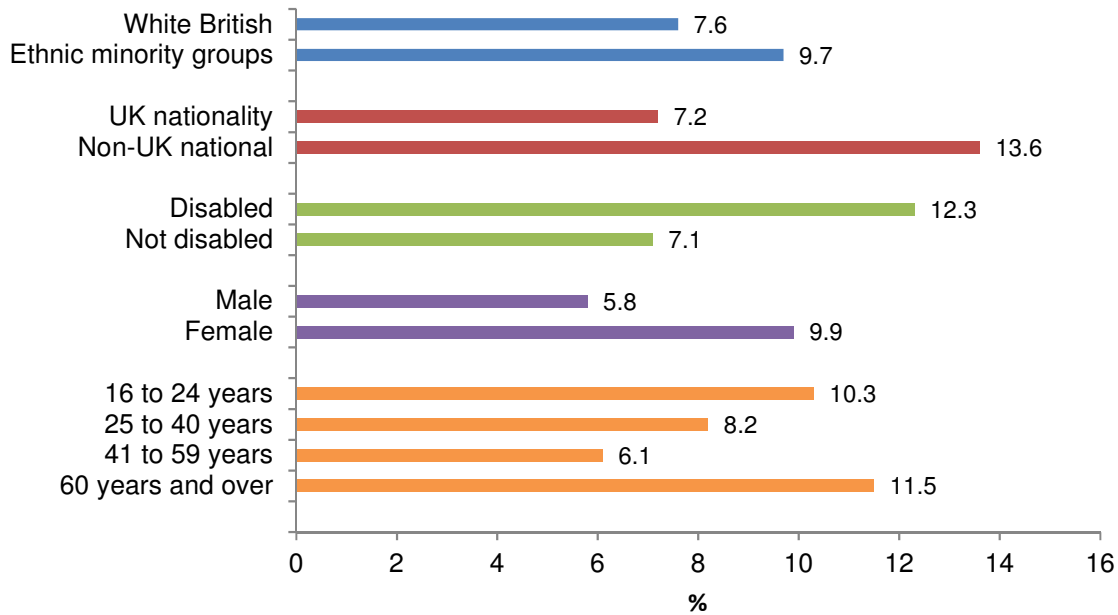
<sup>18</sup> UKCES (2015) *Opportunities and outcomes in education and work: Gender effects*, UK Commission for Employment and Skills, Wath-upon-Deane:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/477360/UKCES\\_Gender\\_Effects.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477360/UKCES_Gender_Effects.pdf)

<sup>19</sup> Yuen, W. (2017) *Earnings and low pay: distributions and estimates from the Labour Force Survey*, Office for National Statistics. Available:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/earningsandlowpay/distributionsandestimatesfromthelabourforcesurvey>

**Figure 14: Proportion of jobs below or within 2% of NMW/NLW: by personal characteristics, Q4 2016**



Source: Office for National Statistics, Labour Force Survey

### Ethnicity

176. Figure 14 shows that in Q4 2016 a greater proportion of employees that identified with an ethnic minority group (9.7%) were employed in jobs paid less than or close to the NMW/NLW compared with white British employees (7.6%). It is important to remember that the aggregation of these figures mask the variability within this group, which is made up of many diverse ethnicities, but unfortunately data limitations do not allow us to do more detailed comparisons. Additionally, non-UK nationals (13.6%) were more likely than UK nationals (7.2%) to be in jobs paid less than or close to the NMW/NLW in the fourth quarter of 2016.
177. Analysis suggests that there are no adverse effects of these proposals on individuals with this protected characteristic, although we cannot do more detailed comparisons within protected characteristics due to data limitations. We consider the impacts of increases in NMW/NLW rates in relation to this protected characteristic to be disproportionately positive.
178. In summary, the evidence suggests that there will be disproportionate positive wage impacts on protected groups as a result of the proposed increase in NMW/NLW, and there is limited evidence of the potential for any negative impacts.
179. The public sector Equality Duty (PSED) requires the Department to have due regard to the need to advance equality of opportunity between people who share a protected characteristic and those who do not.
180. The NMW and NLW policy is designed to have a positive impact on all workers in low paid sectors regardless of their personal characteristics. The NLW is expected to protect the equality of opportunity of those aged under 25. While their opportunity may be impacted by

not receiving the new statutory pay floor that over 25's receive, this is balanced by (i) protecting the employment prospects of younger workers given their tougher labour market conditions and the importance of skills and experience; and (ii) possibly improving the attractiveness of younger workers for employers.

### **Eliminating discrimination and other prohibited conduct**

181. The PSED requires BEIS to have due regard to the need to eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act. The design of the NMW reflects provisions in the Act allowing the rates to vary up to age 25. There is the potential risk of a substitution towards recruitment of workers under the age of 25, however the LPC report states 'there was little evidence of any substitution between older and younger workers and no evidence that hours have changed in response to the NLW' (pp.95). Furthermore, some firms do not use pay structures based on age-related rates (for example 'Emp5' in table 2 on page 31 of the NIESR report), negating risks of increased discriminatory recruitment policies.

### **Fostering good relations**

182. The PSED requires to have due regard to the need to foster good relations between people who share a protected characteristic and those who do not. The NMW/NLW has national coverage, paid to all workers of any social characteristic. This should retain the diversity in the workforce; from skills to ethnicity to social background. Workplace relations should remain positive with workers benefiting from a higher wage floor.

### **Family test**

183. We consider the increase in the NMW/NLW rates will provide a net benefit to families, by making work pay. This policy results in a transfer from employers to employees, increasing the wage of the lowest paid.

184. The 4.4% increase in April 2018 to £7.83 from the current NLW of £7.50 will mean a full time minimum wage worker aged over 25 will earn £600 more over the course of the year compared to the current year. The pay rise is identical for a full time worker aged 21-24 on the NMW.

185. Additional analysis done by the IFS estimates similar gains for families with and without children. This policy will positively impact a range of family dynamics at different scales and time periods. Moreover, analysis conducted by Brewer and De Agostini (2017) shows that forecast increases in the NMW and the NLW by 2020-21 will increase net real incomes of minimum wage families by, on average, about 1.5 per cent.<sup>20</sup>

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<sup>20</sup> Brewer, M., P. De Agostini (2017) *The National Minimum Wage, the National Living Wage and the Tax and Benefit System*. Research report for the LPC, Institute for Social and Economic Research: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/661867/BrewerEdAgostiniISERNLWtaxandbenefits\\_FIN\\_AL\\_2017\\_Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/661867/BrewerEdAgostiniISERNLWtaxandbenefits_FIN_AL_2017_Report.pdf)

## **Annex F: Past analysis on the counterfactual**

186. The Department has undertaken a range of research and analysis to inform its judgement on the counterfactual and appraisal approach over the last few years. This is listed below and can be found in detail in previous impact assessments. The RPC has also fed in at various points including commenting on discussion materials and on the research specification:

- Engagement with labour market experts seeking views on how to model an appropriate counterfactual, including whether assumptions of zero wage growth were appropriate.
- Discussions with business representative organisation exploring how the wages of the lowest paid may develop in the absence of a minimum wage uprating.
- Analysis of economy, labour market and wage data to examine underlying trends.
- Descriptive analysis of ASHE microdata to explore different percentiles of the wage distribution as appropriate control groups.
- New longitudinal analysis of ASHE, supplemented by evidence from the Bank of England's Wage Dynamics Survey to explore the wage dynamics of low paid workers between years.
- Examined historic wage distributions to identify trends from before the NMW was introduced.
- Explored the literature, including previous LPC reports.
- Explored sensitivities, including CPI inflation and average earnings growth as a counterfactual, with zero wage growth scenarios considered as a single year.
- Made changes to the approach to determining the appraisal period and revisited previous appraisals to align our approach to this revised methodology.
- Commissioned NIESR to independently recommend an appropriate counterfactual (latest). Including:
  - A literature exploring a range of themes relating to establishing a counterfactual wage distribution.
  - Consultation with labour market and regulatory experts.
  - Structured, in-depth qualitative interviews with employers, employer trade bodies and trade union representatives.
  - An attempted parametric approach to estimating the impacts on the minimum wage on the wage distribution aiming at uncovering the underlying wage distribution.
  - Exploration of within year changes to wages between minimum wage upratings across a pseudo-panel representing low paid jobs.
  - Identifying wage growth at the 20<sup>th</sup> percentile in a pseudo-panel representing low paid jobs (used in this IA).
  - Parallel trends analysis to test for bias in using growth at the 20<sup>th</sup> percentile as a representative counterfactual for the low paid segment of the labour market.

## **Annex G: NIESR/RPC Engagement**

187. Since the background to commissioning the counterfactual research project was largely based on the RPC's critique in previous impact assessments, it was important the RPC was engaged in the process.
188. As mentioned in paragraph 43, the RPC commented on the specification of the research bid during the commissioning process and therefore the RPC were fully aware of the scope of the project.
189. Once NIESR had been commissioned to carry out the research project, as part of their background reading they read past RPC opinions on previous impact assessments to familiarise themselves with the RPC's concerns. NIESR subsequently interviewed a representative from the RPC and secretariat to explore their concerns further to fully understand and capture them in their research and final report.
190. Following the completion of the research, BEIS set up a meeting between the RPC and NIESR in order for NIESR to discuss their recommendation and provide the RPC with the opportunity to ask questions. The RPC were given sight of a draft report in advance of the meeting and then produced a detailed note on the report and meeting.
191. The RPC expressed reservations with the recommended approach as they believe it systematically underestimates the cost to business. Their reasoning for this is based on the 'shadow wage curve' framework whereby they believe NIESR's recommendation based on the 20<sup>th</sup> percentile represents the growth rate for the 'marginal' worker and everyone below this would experience lower wage growth in the absence of a minimum wage uprating.
192. We passed on this note to NIESR and invited them to comment on the RPC's concerns. NIESR subsequently carried out some additional analysis (specifically the common trends analysis and investigating if wage growth is zero/lower at lower segments of the wage distribution) and came to the conclusion that their recommendation is unbiased and does not systematically underestimate the cost to business. In particular, they find that the growth in wages at the 20<sup>th</sup> percentile sometimes over and sometimes under-estimates counterfactual wage growth, therefore there is no systematic bias. They also reiterated certain arguments in their report such as the job composition being different due to technological progress and asymmetries in forecast errors to reinforce their recommendation. For this reason we implemented their recommendation in this impact assessment.
193. NIESR's report can be found on GOV.UK at:  
<https://www.gov.uk/government/publications/national-minimum-wage-evaluation-counterfactual-research>