

Title: Amendment to the National Minimum Wage regulations 2020 IA No: BEIS005(F)-20-LM RPC Reference No: RPC-BEIS-4443(1) Lead department or agency: Department for Business, Energy and Industrial Strategy Other departments or agencies: N/A	Impact Assessment (IA)		
	Date: 03/02/2020		
	Stage: Final		
	Source of intervention: Domestic		
	Type of measure: Secondary legislation		
	Contact for enquiries: Sophie.evans@beis.gov.uk		
Summary: Intervention and Options			RPC Opinion: Green

Cost of Preferred (or more likely) Option (in 2016 prices)			
Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status
-5.5	-1364.7	205.6	616.7

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, with an aim to reach 60% of median earnings by 2020, which it will meet as a result of this year's uprating. The Low Pay Commission (LPC) has made recommendations to Government on the NLW and NMW rates that should apply from April 2020.

What are the policy objectives and the intended effects?

The objective of the NMW is to maximise the wages of low paid workers under the age of 25 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. This year's increase to the NLW will mean that the NLW will meet its 2020 target. 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 2020. The independent LPC makes recommendations on the NMW to Government, consulting extensively and undertaking substantial analysis. Details are contained in its autumn 2019 report.

The Government has considered two options this year:

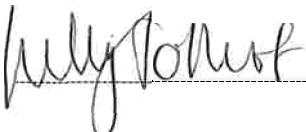
0. Do nothing - maintain current NMW/NLW rates and system
1. Implement the LPC recommended rate increases (preferred option)

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, and that the NLW reaches its target of 60% of median earnings.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 11/2020

Does implementation go beyond minimum EU requirements?		N/A		
Is this measure likely to impact on trade and investment?		N/A		
Does this measure comply with our international trade and investment obligations, including those arising under WTO agreements, UK free trade agreements, and UK Investment Treaties?		N/A		
Are any of these organisations in scope?	Micro Yes	Small Yes	Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)		Traded: n/a		Non-traded: n/a

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, Kelly Tolhurst:  Date: 28/1/2020

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 3	Net Benefit (Present Value (PV)) (£m)		
			Low: -2.7	High: -6.4	Best Estimate: -6.4

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	2.7	345.2	1035.0
High	6.4	713.1	2125.4
Best Estimate	6.4	561.8	1680.6

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 £1.7 billion. This includes transition costs (£6.4m) and an increased labour cost to employers of £1.7 billion (£0.7bn direct impacts and £1.0bn indirect impacts). This is a transfer with a neutral net economic impact. It is made up of £1.4bn of increased wages for employees, and £0.3bn of increased non-wage labour costs, which are mainly employer pensions and national insurance contributions.

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, however they acknowledge that this has not materialised).

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	345.2	1032.3
High	0	713.1	2119.0
Best Estimate	0	561.8	1674.2

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

Our best estimate of the overall benefits is for a total benefit to employees and the Exchequer of £1.7bn. This is a transfer from employers with a neutral net impact. Employees benefit from £1.4bn of increased wages, while employees and the Exchequer benefit from £0.3bn of non-wage labour benefits, predominantly consisting of pension and National Insurance contributions. Using HMT Green Book methodology for distributional analysis, the total benefit to workers could increase up to £2.0bn.

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, increased consumption, multiplier effects or marginal propensity to consume).

Key assumptions/sensitivities/risks

Discount rate (%)

3.50%

The key assumption is on the counterfactual for how wages would change in the absence of minimum wage rises. We use a methodology recommended by independent experts (NIESR) and approved by labour market experts. For the value of the suitable counterfactual, we believe that LPC's recommendation of spillovers reaching the 30th percentile to be the most appropriate. This is the lowest point in the distribution where we find workers to no longer be impacted by the minimum wage (directly or indirectly).

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 241.3	Benefits: 0	Net: 241.3	
			£616.7m

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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 recommendations¹ in full and they will come into force on 1st April 2020, 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 their 2019 report². This IA does not consider a scenario where the NMW/NLW is completely removed as, **in the hypothetical absence of an NMW/NLW uprating, the current minimum wage rates would remain legally binding**. Therefore, a counterfactual scenario where the wages of the lowest paid are reduced does not apply and is out of scope of this IA.
4. This IA is a marginal appraisal, as appropriate for the purpose of this document. The Low Pay Commission continuously evaluate the impact of the NMW/NLW, as summarised in their annual Autumn Reports. Their assessment of the impact of the rates, and the state of the wider economy, are factored into the rates that they then proposed for the following year. This Impact Assessment utilises the findings from their latest report. The LPC will undertake an assessment of the impact of the proposed 2020 minimum wage rates in Autumn 2020, which we welcome as a key contribution to the evidence base, and we will consider any relevant findings from their assessment into future Impact Assessments.

Background to the Impact Assessment

Policy Context

5. 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 describes the theoretical rationale for intervention.
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 NLW seeks to ensure low paid workers aged 25 and over are fairly rewarded for their contribution to the economy. 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.

¹<https://www.gov.uk/government/publications/national-living-wage-and-national-minimum-wage-government-response-to-the-low-pay-commissions-autumn-2019-recommendations>

²<https://www.gov.uk/government/publications/low-pay-commission-report-2019>

7. The National Minimum Wage was introduced in 1999 to protect low-paid workers from 'extreme low pay'³ whereby certain employers in the absence of government intervention may pay unacceptably low wages. 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 with exploitative levels of pay. When updating the NMW, the LPC is asked to recommend the rates such that they do not damage the employment prospects of younger workers.
8. The youth labour market is much more sensitive to economic shocks and young people can be exposed to longer-term scarring effects⁴ 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. As raised in the LPC Youth Rates report⁵, 'young people enter the labour market with relatively limited experience and few skills, and so have lower productivity while they learn the job. In addition, employers may need to provide additional training. Any minimum wage structure needs to recognise the lower productivity and higher training costs of less experienced workers. Failure to do so could mean that some employers are unwilling to give young people those critical first opportunities'. 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).
9. 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 good quality training.
10. The LPC also make a recommendation 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 NLW/NMW. Accommodation is the only benefit-in-kind that can count towards either the NLW or 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.
11. As the decision on the appropriate 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 LPC also commission external research to better inform them of the impacts of minimum wage policy. The evidence, research and data collected and produced by the LPC have been used to inform this IA.

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

⁴ Bell D & Blanchflower D, 2011, Young people and the great recession, *Oxford Review of Economic Policy*, 27 (2), pp. 241-267

⁵ <https://www.gov.uk/government/publications/a-review-of-the-youth-rates-of-the-national-minimum-wage>

Rationale for continued intervention

12. The economy and labour market today are markedly different to that of the late 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 near record highs), lower unionisation (from 30% of employees in unions in 1999 to 23.4% in 2018) and rates of 'extreme low pay have essentially fallen to zero'⁶. Indeed, ONS indicate that low pay in the UK has fallen to 16.2% in 2019, the lowest levels seen since the data series began in 1997⁷
13. These changes to the labour market have occurred in parallel with annual upratings of the NMW and the introduction of the NLW.
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 an NMW rate that does not damage the employment prospects of low paid workers.
15. 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. This will be the fourth annual uprating of the NLW, with the rate reaching the 2020 target.

Policy Objective

16. The NMW and NLW set a legal minimum wage floor below which pay should not fall. This ensures protection for low-paid workers, whilst also providing incentives to work and reducing reliance on the State of topping up wages through the benefits system.
17. As mentioned previously, the objective of the NLW has been 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

18. 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 60 written responses to their consultation, with representatives from over 30 organisations attending their oral evidence sessions. They also visited employers, workers and others affected by their recommendations, holding over 70 meetings, across various low-paying sectors and around the UK (ranging from Ayr and Kilmarnock to Manchester and Wigan). Appendix 1 of their 2019 report provides a list of contributors to their consultation. The LPC makes recommendations on the future rates but the final decision on whether to accept them is made by the Government.

⁶Resolution Foundation's Low Pay Britain 2016 report (p16). As a result, the Resolution Foundation have stopped calculating this measure for their latest reports: <http://www.resolutionfoundation.org/app/uploads/2016/10/Low-Pay-Britain-2016.pdf>

⁷ ONS, 2019, Low and High Pay UK.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/lowandhighpayuk/2019>

19. To supplement this stakeholder engagement, BEIS undertook an extensive programme of engagement across the UK to understand the impact of the minimum wage on employers and workers. These findings, alongside the LPC's work and the wider economic context, enable us to understand how the proposed rates may impact businesses and are summarised below:

- Very few businesses stated that they reduced employment as a consequence of the NLW increasing. This is in-line with findings from employer surveys and the latest econometric evidence, that is further summarised in Annex C (this has started to identify some evidence of a small negative impact on the employment retention of part-time women).
- The responses did vary across sectors and regions – for example, employers in Northern Ireland stated that reduction in working hours was limited, however this was the most common response among respondents to the Association of Convenience Store's member survey. While the macro picture suggests that employers have not reduced employment on a large scale in response to the NLW, we will continue to monitor these trends and adjust the assumptions and costs assessed in this document.
- As noted by the LPC in their engagement, where employment effects have been stated by isolated stakeholders, it is rare that the NLW is the only factor in such decisions.
- Employer representatives told us that firms have predominantly absorbed the additional costs, with an increasing number of firms suggesting a squeezing of pay differentials – this latter finding is one of interest and is considered later in this IA. Analysis of the latest earnings data suggests that this squeezing of differentials will be something to monitor in the future.
- Worker representatives highlighted the positive impact of the National Living Wage to date, in increasing the earnings of the lowest paid at a faster rate than seen previously (however did stress the need to go further).

20. 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 NMW/NLW upratings. Detailed discussion of this can be found in 2017's IA⁸. Annex H outlines the extensive work that has been carried out in ensuring that the methodology used in this Impact Assessment is fit for purpose, as identified by the RPC in their rating last year.

- In 2017, we commissioned the National Institute of Economic and Social Research (NIESR) to research the most appropriate counterfactual for us to employ in this and future impact assessments (this is discussed in greater detail in our 2018 IA⁹, with the full report published in 2018¹⁰).
- In 2018, following some comments from the RPC regarding NIESR's findings, we undertook further engagement with labour market academics to scrutinise our counterfactual methodology further. Summarised in greater detail in our 2019 IA¹¹, we once more found broad consensus for our approach, providing us with validation to proceed this year. In particular, the 'catch-up' concept (whereby we estimate the cost of the uprating by considering the point at which our counterfactual catches up to the minimum wage rate) was agreed to be the most appropriate method to assess the impact of the uprating.

⁸ [Amendment to the NMW regulations 2017 Impact Assessment](#)

⁹ [Amendment to the NMW regulations 2018 Impact Assessment](#)

¹⁰ <https://www.niesr.ac.uk/publications/national-minimum-wage-and-national-living-wage-impact-assessment-counterfactual>

¹¹ [Amendment to the NMW regulations 2019 Impact Assessment](#)

Additionally, most respondents disagreed that wage growth at the bottom of the pay distribution would be at, or close to zero, in the absence of a minimum wage uprating. There was agreement that an average uniform growth rate for all minimum wage workers should be used.

21. Where alternative proposals have been put forward, we have traditionally made efforts to consider this (see 2019 IA). We continue this in this IA, with Box 1 (pg.16) providing consideration of using an ARIMA model to assist our estimation of wage growth, while Annex D once more considers a shadow-wage curve. Furthermore, we continue to undertake an extensive exercise of sensitivity analysis to understand the impact of our assumptions.
22. Additionally, to ensure that our methodology has not been bypassed by developments in the academic community, we liaised with the Secretariat to the independent Low Pay Commission, to identify if alternative methods to estimate the counterfactual had arisen. This, in addition to our own desk-based research and our academic work supporting the Dube Review (A Government-commissioned, independent review into minimum wages looking to enhance the evidence base on minimum wages by considering the impacts seen internationally), have led us to conclude that our current approach is not outdated by the literature. We will continue to monitor this going forwards – especially if the NLW and NMW rates are to increase at a faster rate (compared to historic increases).

Options Identification

23. 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 2020

Option 0: Do nothing

24. 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.
25. This option would not achieve the policy objectives of the NMW and NLW rates. We believe that minimum wage workers would not see their pay increase relative to the middle of the pay distribution.

Option 1: Implement the LPC recommended rate recommendations

26. The LPC rate recommendations for April 2020, as outlined in their report, are as follows:

Table 1: Low Pay Commission NMW/NLW rate recommendations for April 2020

	LPC recommendation	Current rate	Annual percent increase
National Living Wage rate	£8.72	£8.21	6.2%
21-24 year old rate	£8.20	£7.70	6.5%
18-20 year old rate	£6.45	£6.15	4.9%
16-17 year old rate	£4.55	£4.35	4.6%
Apprentice rate	£4.15	£3.90	6.4%
Accommodation offset (day rate)	£8.20	£7.55	8.6%

27. The LPC has extensively outlined in their 2019 report¹² the analysis, consultation and subsequent rationale behind its recommendations for the NLW and NMW rates which should apply from April 2020. 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 2020.

Prospects for the economy

28. As previously mentioned, 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 latest economic outlook at Spring Statement 2019 due to no Budget in Autumn, based on the Office of Budget Responsibility's latest economic and fiscal outlook¹³. This short section of the IA summarises the macroeconomic assessment carried out by the LPC.

29. Despite GDP growth continuing to be modest, the labour market remained strong in the first half of 2019 and generated much stronger growth in employment than had been forecast. Employment levels and rates were at record highs while unemployment levels and rates continued to fall back to figures not seen since the early 1970s. There have been increasing numbers of full-time and permanent employees, though a large share of the recent growth is from self-employment.

30. While still strong, the latest labour market data (covering the period up to August/September 2019) show some signs of softening. Employment fell for the first time in two years and the fall in vacancies suggests slowing demand for staff. Survey data showed the lowest rate of vacancy growth since January 2012, particularly from smaller employers.

31. The labour market has been strong over several years, but it is only in the last eighteen months that this seems to have fed through into an improvement in earnings growth. Earnings were expected to pick up but have done so more strongly than anticipated. This improvement in earnings relative to forecasts has implications for the path of the NLW, which is now a higher figure than projected in the LPC's 2018 Report. In addition, with inflation falling back slightly faster than forecast, there have been sustained increases in real wages since the start of 2018 with real average wage growth in mid-2019 close to the pre-financial crisis trend. However, real average wages remain just below their 2008 levels.

32. The LPC also concluded that, with output having slowed and the labour market continuing to generate jobs, productivity growth measured per worker and per job has also been relatively

¹² <https://www.gov.uk/government/publications/low-pay-commission-report-2019>

¹³ The Spring Statement 2019 documents are available at: <https://www.gov.uk/government/news/spring-statement-2019-what-you-need-to-know>

stagnant. Levels of productivity have been flat over the last two years and are only around 2 per cent higher than in 2008. Productivity growth remains poor by historical and international standards.

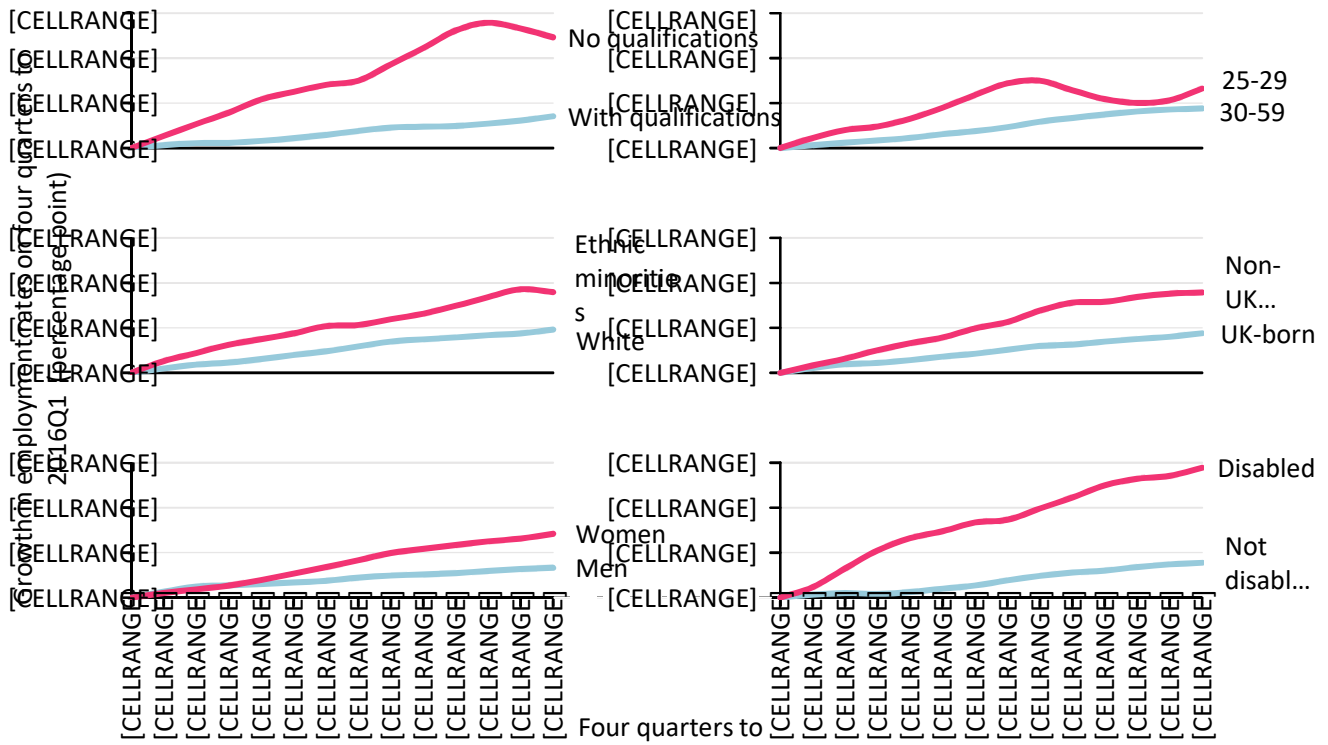
Table 2: Forecasts of selected economic variables

	2019			2020		
	OBR	BoE	HMT average	OBR	BoE	HMT average
GDP	1.6%	1.8%	1.5%	1.4%	1.3%	1.6%
Employment growth	0.8%	0.5%	0.4%	0.5%	0.5%	0.5%
Unemployment rate	3.7%	3.9%	4.1%	4.1%	4.0%	4.1%
Average earnings	2.5%	3.3%	2.9%	3.0%	3.5%	3.1%
Inflation	2.0%	2.2%	2.1%	1.9%	2.0%	2.1%
<i>Sources</i>	<i>a: OBR EFO, March 2019</i> <i>b: Bank of England November 2019 Inflation Report</i> <i>c: HMT, Average of Independent Forecasts, December 2019 release</i>					

The National Living Wage

33. Influenced by the economic performance summarised above, the LPC has judged that the NLW should hit its target of 60% of median earnings in 2020. As with previous years, the LPC's engagement with stakeholders suggested that employers have coped better with NLW increases than they originally anticipated, aided in their planning by having sight of indicative future rates for the NLW (possibly due to its aimed target).
34. Overall, the NLW has increased pay at the lower end of the labour market without harming employment (employment effects are discussed further in paragraphs 114 to 122). The increase in the NLW directly raised pay for around 1.6 million workers in 2019. Since 2015, the NLW has had a clear impact on pay and earnings, with hourly pay for the lowest paid growing significantly faster than for other workers. However, the picture changed slightly in the year to April 2019, with hourly wages growing as strongly as the NLW across the bottom two-fifths of the pay distribution. This faster pay growth resulted from firms deciding to protect pay differentials, changing workforce structures or competing with other employers on pay.
35. The LPC's analysis shows that the employment rate of workers aged 25+ increased between 2018 and 2019 (0.4ppts for men and 0.6ppts 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, ethnic minorities, low skilled, disabled workers, non-UK born) has also continued to improve (Figure 1 below). A fuller analysis on the impacts of the NLW on protected characteristics can be found in Annex G.

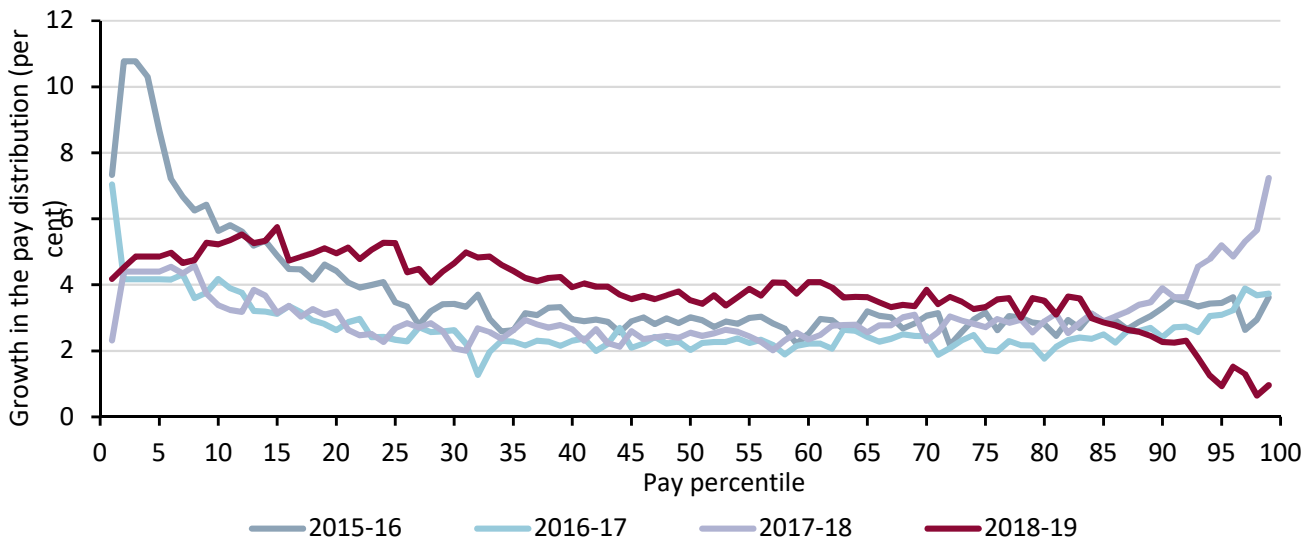
Figure 1: Change in employment rates for those aged 25 and over, by personal characteristics, UK, 2016-2019



Source: LPC estimates using LFS Microdata, population weights, quarterly, four quarter moving average, UK, Q2 2015-Q2 2019.

36. Median hourly pay growth for employees aged 25+ and not in the first year of their apprenticeship grew by 3.6% between 2018 and 2019 – a much faster increase than seen last year (2.5%). Interestingly, pay growth in 2019 peaked at the 15th percentile, whereas in all of the previous three years pay growth decreased between the bottom 5 per cent (who are covered by the NLW) and the median. The increase in 2019’s NLW was faster than the increase at the median, therefore raising pay for workers at the bottom end of the hourly pay distribution. Figure 2 shown below illustrates hourly wage growth across the wage distribution for workers aged 25 or older.

Figure 2: Percentage growth in the hourly wage distribution for workers aged 25 and over, UK, 2015-2019



Source: LPC estimates using ASHE 2010 methodology, standard weights, UK, 2015-2019.
 Note: Data exclude first year apprentices.

The National Minimum Wage

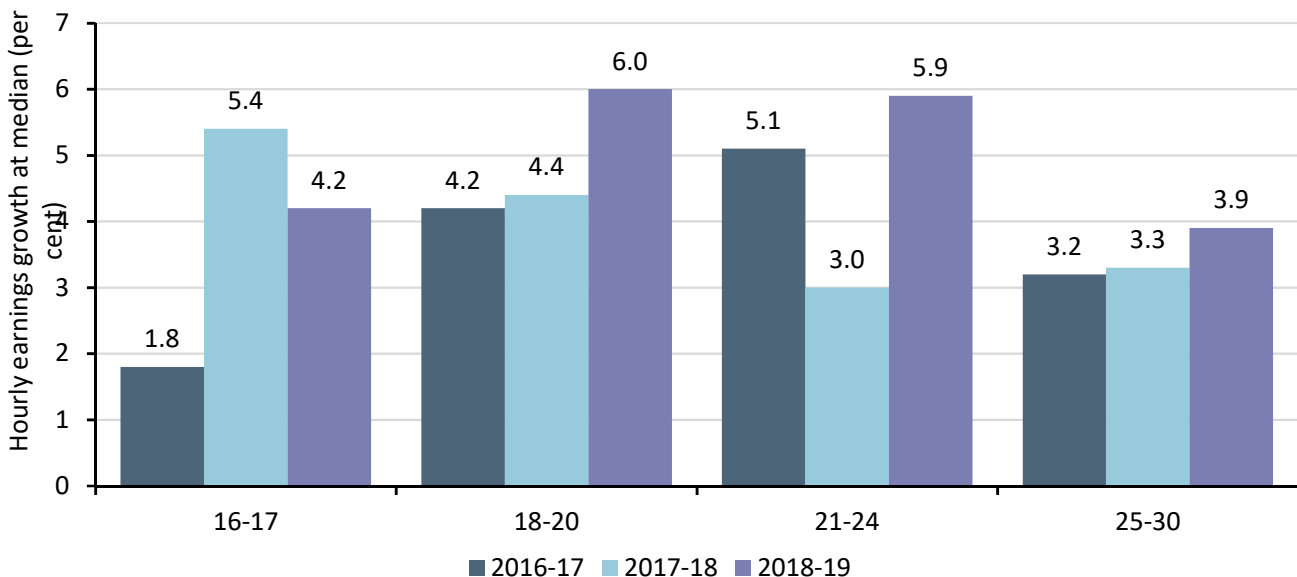
37. The overall picture for young people is one of stable employment coupled with robust growth in young people’s pay, which has been the strongest for several years. However, in some areas, labour market conditions have started to soften slightly. Some of the LPC’s reasons for their recommended rates, at the time of their deliberations, are:

- The labour market position of young people has continued to improve, with falling unemployment and rising employment since 2011. However, there are signs that this is beginning to slow, with a slight increase in unemployment among 18-20 year olds not in full-time education in the last year and numbers of 18-24 year olds not in education, employment or training remaining high.
- There is evidence of a shift, albeit slight, of young workers away from low-paying occupations. This could suggest that young people have a relatively strong position in a tight labour market and are able to choose to work in jobs with higher levels of pay.
- The number of 21-24 year old workers paid at the rate for their age has fallen substantially. In 2014, 12 per cent of 21-24 year olds were paid the NMW, but since the introduction of the NLW this has halved to 6 per cent, as many employers have chosen to pay the NLW to all workers aged 21 and over.
- Because pay growth has outstripped the increases in their respective minimum wages, the “bite”¹⁴ has fallen for all three age groups, including in the low-paying sectors.
- Coverage and underpayment of the youth rates have also declined in the last year. Employers do often pay between the relevant minimum wage and the rate above.
- Research has tended to find that younger workers (those younger than 21, for example) are more vulnerable to negative impacts, an effect which may be related to the high proportion of them in part-time employment.
- The labour market for under 21s has not changed as significantly in the period since the introduction of the NMW, suggesting that the original rationale for a main minimum wage rate starting from 21 still holds.

¹⁴ The “bite” is a term used to represent the minimum wage as a proportion of a chosen point in the wage distribution. This usually corresponds to a percentage of the median and forms the basis of the target for the National Living Wage (60% of median earnings by 2020, subject to sustained earnings).

38. For the 21-24 year old rate, the Government is therefore planning to implement the LPC's recommendation of £8.20. This is a 6.5% increase (or 50 pence).
39. For 18-20 year olds, this group saw rapid growth in earnings of around 6% however the employment position softened slightly. Therefore, the LPC has recommended an increase of 4.9% (or 30 pence) to £6.45.
40. For 16-17 year olds, the LPC recommended a rate of £4.55, which is a 4.6% increase on last year's rate (or 20 pence). The LPC comment that this remains the most vulnerable age group in the labour market due to their relative lack of experience and that their priority remains ensuring a successful transition from education into the world of work.

Figure 3: Hourly earnings growth at the median, by age, UK, 2016-2019



Source: LPC estimates using ASHE, standard weights, including those not on adult rates of pay, excluding apprentices, UK, 2016-19.

The Apprentice NMW

41. Although the apprenticeship programme and numbers of starts are more stable than in recent years, it remains challenging to unpick the effects of the Apprentice Rate. The Apprentice Pay Survey (APS), shows relatively healthy levels of pay for most groups, and stakeholders asked by the LPC in most sectors say the rate is not a primary factor in decisions over recruiting apprentices.
42. However, it is clear that the rate is still the main driver for the pay of 16-18 year old apprentices, for whom coverage of the rate is over 35 per cent in their first year. Apprenticeship starts among this group have continued to gradually decline, although there is no evidence that this is linked to pay, and APS shows their pay growth as relatively healthy. For older apprentices – particularly those aged 21 and over – coverage of the Apprentice Rate is significantly lower. As stated by the LPC, employers continue to make use of the lower pay floor in the first year of the apprenticeship by setting wages in between the Apprentice Rate and the age-related NMW rates.

43. The LPC have heard from several stakeholders that there is room for the Apprentice Rate to increase. Consequently, the LPC recommend an increase in the Apprenticeship NMW to £4.15 (a 6.4% increase).

Accommodation offset

44. There is limited data available on how many employers use the Accommodation Offset and therefore the LPC use stakeholder engagement to understand the impact of recent increases. The sectors most likely to use it are agriculture and horticulture, and to a lesser degree, the hotel sector, particularly in rural locations.
45. The rationale for recent increases in the rate has been to encourage the provision of higher-quality accommodation, and the NFU, the Association of Labour Providers and UK Hospitality welcomed these increases. In the LPC's survey, the NFU found that 31 per cent of horticulture farms made use of the offset. For other farm types, the proportion was smaller – for example 8% for poultry farms. They noted that these proportions had fallen in recent years. Of those using the offset, 51 per cent felt the current rate was sufficient. This corroborates with findings from the LPC's stakeholder visits to employers on farms who welcomed the increases in the offset.
46. Since 2013 the LPC's long term aim has been to match the Accommodation Offset with the 21-24 Year Old Rate as long as that rate is rising in real terms so that the accommodation rate better reflects the cost of providing accommodation. Last year the LPC went further, stating an ambition to close this gap over two years, with 2020 being the final year. To that end, they have recommended an increase of 8.6 per cent, or 65 pence, to £8.20. This is equal to the 21-24 year old rate.

Approach to the Appraisal: Wage Bill Impacts

Counterfactual

Finding the counterfactual

47. The core assumption in our analysis is the counterfactual: The profile of the counterfactual is both a function of i) the wage level low paid workers would receive in the absence of the policy; and ii) the wage growth they would have experienced over the course of the minimum wage uprating. The true counterfactual is unobservable and given the NLW and NMW are universally applicable across the UK; there is no pure control group to compare the policy intervention against.
48. There are multiple approaches that have previously been considered to estimate the counterfactual – see Annex H for a list of previous work done on this subject. Because of its intrinsic nature, none can be proven or falsified i.e. we rely on making normative economic statements. Moreover, the actual cost to business/benefit to workers can vary between zero and infinity, whereby the wages of those impacted by the NMW/NLW could alternatively grow at an equal rate to the size of the uprating or experience zero wage growth, respectively.
49. As previously found by NIESR, it is not possible to prove or disprove the choice of counterfactual, as no new information could ever become available on the 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 most recent approach, as suggested by NIESR's research, has now received two 'green' fit-for-purpose ratings.

Counterfactual for this IA

50. The counterfactual in this IA continues to be underpinned by research undertaken by NIESR. Alongside their report, the 2018 and 2019 Impact Assessments fully summarise the approach, which was identified as fit for purpose last year by the RPC. Respondents to our previous questionnaire agreed that using the latest ASHE wage distribution as the starting point for the counterfactual was appropriate.

Table 3: Options for quarterly nominal wage growth assumptions

<i>Period covered in LFS (Labour Force Survey)</i>	<i>Quarterly growth rate at the 30th percentile (nominal)</i>	<i>Annualised growth rate at the 30th percentile (nominal)</i>
2001-2018 (Long term average)	0.78%	3.16%
2001-2007 (Pre-crisis period)	0.93%	3.82%
2010-2018 (Post-crisis period)	0.66%	2.67%
2016-2018 (Short term average)	1.09%	4.44%

51. 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. NIESR's 2017 report state that 'This choice will inevitably involve judgement on the current state of the business cycle, informed by independent forecasts of key institutions' (p74).
52. As per the LPC's 2019 report, the economy is seeing increasing wage growth, with employment at near record highs, although this is starting to slow down. In addition, the OBR are predicting low GDP growth over the coming years with 'a roughly 50-50 chance of a recession in any five-year period'. As noted by the LPC, 'the UK's economic growth prospects will depend on the strength of the global economy, the value of sterling, the extent to which uncertainty remains about our future relationship with the EU and its consequences for other trading relationships, business confidence' and a myriad of other factors. This is emphasised by the OBR in their Spring 2019 statement where they try to forecast future GDP growth and find 'a roughly one-in-five chance of the economy shrinking in calendar year 2020. And a similar probability of growth exceeding 2½ per cent – closer to the average pre-crisis growth rate'.
53. This, compounded with the large changes to wage growth that we've seen in recent years (from quarterly growth of 0.66% between 2010-2018 to quarterly growth of 1.09% in 2016-2018), requires us to take a more nuanced approach than in previous years, with regards to the most appropriate time-frame to choose from the options in Table 3. For this Impact Assessment, we observe that wage growth has been improving and hence believe that the counterfactual should be higher than the post-crisis period growth rate that was chosen last year. However, given the amount of uncertainty in the economy over the coming few years, we are also conscious that the short term average growth rate could be too optimistic.
54. To help factor in some of the uncertainty, we compare the past observed growth rates with independent forecasts of future wage growth. OBR predicts an annualised growth rate of 3.16% (between 2020-2024) and HMT Panel estimates 3.28% for average earnings growth between 2020 and 2023. This is equivalent to a quarterly growth rate of between 0.78-0.81%. These forecasts compare to recent wage growth of 2.7% in 2017/18, 2.9% in 2018/19 and a predicted 3.0% for 2019/20. Due to large uncertainty over wage growth in future years, we corroborate these different sources of data and believe it is best to use the long-term average growth rate of 0.78% for our best-case scenario. While we judge that our chosen rate best reflects the business cycle that the UK is currently in (and may be in over the course of the appraisal period for this Impact Assessment), we undertake sensitivity analysis using growth rates to form a high

and low cost scenario. For example, using the post-crisis growth rate of 0.66% results in a higher cost, and using the short term average of 1.09% results in a lower cost.

55. 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. In the past, NIESR have recommended the spillover rate to be 20%, however in their 2017 report stated, 'In future years, as the NLW may begin to cover a greater (or smaller) percentage of the workforce, the extent of spillovers might change'. Using LPC's recommendation, we have chosen the spillover rate to be 30%. Further detail is found in paragraphs 70-76.
56. This approach was agreed to be 'simple and transparent' by some respondents to our questionnaire last year. A proposed alternative was hypothesised, to use an estimated structural model, Autoregressive Integrated Moving Average (ARIMA) modelling, however the academic who stated this went on to say that was a much worse proposition as they believed that such a model would require arbitrary assumptions, which would be "open to discussion and political manipulation".
57. We also undertake additional sensitivity analysis by adjusting our assumption of where the indirect effects of the minimum wage stop. We acknowledge that this sensitivity may not be backed empirically or by theory, (as we use the rate at the point where spillovers from the minimum wage no longer materialise, which the data shows to be the 30th percentile), however it does illustrate the potential magnitude of this assumption.
58. NIESR also specifically tested whether wages in low wage occupations which were affected by the NLW's introduction had been growing historically at a slower rate. If this were the case, then applying the average growth of the counterfactual for these groups would result in the counterfactual adjusting to minimum wage upratings too quickly potentially underestimating costs. Their modelling led them to conclude that using an average uniform growth rate is suitable because there was 'no significant evidence for differential growth in the data' (p. 79) across occupations and time. Consequently, we have used average uniform growth rates (as shown in Table 3).

Box 1: Autoregressive Integrated Moving Average (ARIMA) modelling

Last year, all academics that we consulted on the counterfactual methodology agreed with our assumption. One academic proposed a potential alternative proposal which was to use a more sophisticated forecasting model (specifically suggesting an Autoregressive Integrated Moving Average model, or ARIMA).

An ARIMA average model is a form of regression analysis that gauges the strength of one dependent variable relative to other changing variables. It has multiple components:

- Autoregression (AR) refers to a model that shows a changing variable that regresses on its own lagged, or prior, values.
- Integrated (I) represents the differencing of raw observations to allow for the time series to become stationary, i.e., data values are replaced by the difference between the data values and the previous values.
- Moving average (MA) incorporates the dependency between an observation and a residual error from a moving average model applied to lagged observations.

The academic in question argued that assuming a constant rate implied that wage growth follows a random walk, which they believed to be unlikely. Once weighed against the other

responses, we believe that integrating an ARIMA model for our analysis is not proportionate nor appropriate at this time, hence we continue with NIESR's proposal. An ARIMA model only uses past rates, whereas we consider both past growth rates with a wholistic assessment of various sources of evidence (including independent forecasts) to judge where the economy currently lies in the business cycle.

While ARIMA models are said to have a solid underlying theory, the difficulties in interpreting coefficients and the danger of "overfitting" trends (and the inflexibility to predict series with turning points, such as in year-on-year wage growth) has informed our decision to not move to an ARIMA model.

59. 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. This method was endorsed in the responses we received from labour market academics in our questionnaire last year.
60. Finally, NIESR recommended 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). We therefore maintain this method, applying the uniform counterfactual growth rate to the existing wage distribution. Using past counterfactuals and old data/forecasts will result in forecast accuracy issues (as associated with longer-term forecasts) and potential bias due to asymmetries arising from forecast errors. Pages 50-54 of the NIESR report explains these issues in further detail.
61. 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 2017's IA.
62. 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 21.78% to account for these additional costs. This figure comes from Eurostat analysis for April 2019. NIESR have previously voiced concerns that 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). Conversely, they do note that future auto-enrolment of pensions won't be included in this uplift. We continue to use the 21.78% uplift here, as we conservatively assume that any overestimates are likely to be balanced against potential underestimates.

Summary

63. The counterfactual is, by its very nature, unobservable. Previous findings from NIESR, where they have deployed advanced econometric techniques to attempt to estimate the counterfactual growth rate, found these models to have low predictive power. Since we are in a world of normative economics rather than positive economics, NIESR made a judgement of what the available evidence dictates is the most suitable counterfactual, and it is one that we have continued to follow here.
64. Of the growth rates presented in Table 3, we have used the long term average growth rate as our best case estimate as this best represented a rate of growth akin to where we believe the

economy to currently lie in the business cycle, and corroborates with our analysis of independent forecasts.

65. Based on the available evidence, NIESR believe this approach of utilising a 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 a shadow wage curve argument that workers at the bottom of the distribution will experience the lowest wage growth (see Annex D for a fuller description), although as above this cannot be proven or rejected.
66. Annex H lists all the previous work we have done on the counterfactual and, as was done last year, we have implemented the recommendations of independent experts, due to the possible contentious nature of this counterfactual. We acknowledge that alternative approaches may exist (for example, the LPC use median earnings for their counterfactual when estimating future coverage, and RPC's proposed shadow wage curve). Indeed, previous NMW IAs have used slight variations in the counterfactual 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. As stated by the LPC (para 4.42, 2019 report), "Econometric analysis is better at identifying a counterfactual... than the other methods that [the LPC] use". As such, we believe that using NIESR's method is better than using the median earnings growth, hence we continue to utilise NIESR's approach.

Appraisal period

67. 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.
68. We estimate that it will take the NLW and the Apprentice rate 8 quarters for our counterfactual to "catch-up" with the corresponding minimum wage. Given the smaller increase in the 18-20 year old and 16-17 year old rates, it will only take 7 and 6 quarters respectively for the counterfactual to catch up. The appraisal period for the 21-24 NMW rate is the longest at 9 quarters due to the slightly larger increase to the rate of 6.5%.
69. As part of our sensitivity analysis, our low-cost estimate, whereby the counterfactual growth rate assumption is higher than 0.78%, the catch-up time will be shorter (for example, it takes the NLW six quarters for our counterfactual to "catch-up"). Therefore, the cost will be smaller than in our best-case scenario. This also holds true if we use HMT Panel forecasts of median wage growth as a further sensitivity. Conversely, in our high cost scenario, the appraisal period will be longer (for the NLW, it takes 10 quarters for our counterfactual to "catch-up")

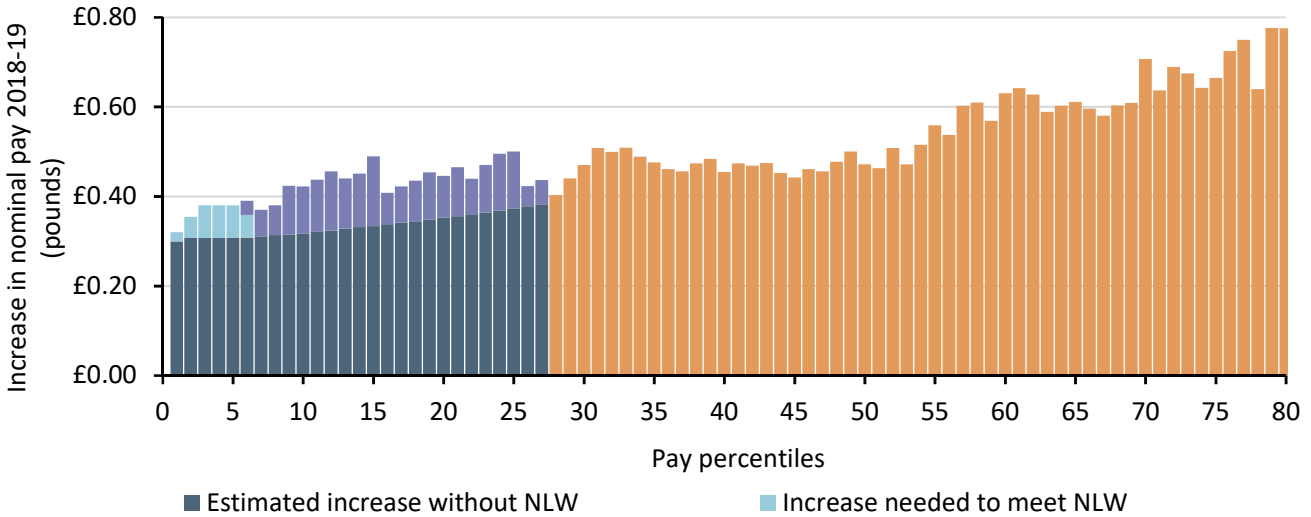
Spillovers

70. 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 either i) give pay rises to those paid above but near the new minimum wage; and/or ii) 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, maintaining a high employee morale.

71. In the past we have used evidence from NIESR and LPC to assume that spillovers last between the 20th and the 25th percentile of the earnings distribution, with the effect dissipating towards the upper end of that range.
72. There has been lots of research in this area, including Avram and Harkness (2019) examining the effects of the NLW on wage spillovers. The authors find significant spillovers up to the 30th percentile, after examining the potential effects at the 5th, 10th, 15th, 20th, 30th and 50th percentiles. The researchers found evidence of significant spillover effects, with peaks at the 15th and 20th percentiles. The models suggested that growth was similar across all quantiles they examined, apart from the 30th and 50th percentiles in some specifications.
73. Figure 4 below, from the LPC's 2019 report shows the estimated effect due to spillovers in 2018-2019. In the absence of the NLW, employees at the bottom of the wage distribution may have expected to have received hourly pay increases of 30 pence (dark blue bars), however they actually received an increase of 32 to 37 pence per hour. Unlike in previous years of the NLW, when pay growth was highest with those on the NLW and then decreased afterwards, in 2019 pay growth was higher just above the NLW, as shown in Figure 4. Previously it has therefore been easier to spot the percentile where spillovers dropped off, whereas this year, as per Figure 5, the point at which spillovers stop is harder to observe and could be anything from the 0-45th percentile (although based upon the NLW only directly affecting up to the 7th percentile and past year's spillover effects being estimated between 20-25th percentile, it is highly unlikely that the spillover effect has suddenly jumped to the 45th percentile).
74. Due to the uncertainty in finding the point in the wage distribution where spillovers end, we conservatively have decided to use the LPC's evidence and find that the spillovers extend to the 25th-30th percentile, but no further. As a sensitivity, we examine the effects to the total cost figure by amending this spillover assumption. In the event that spillovers only reach the 25th percentile, we find that the total cost would decrease to £1,490 million. Conversely, if spillovers were assumed to reach the 35th percentile, the total cost would increase to £1,912 million.
75. Using evidence from the LPC's consultation, one of the reasons for this changing impact on the wage distribution was suggested to be the changing context over the last 12 months, with a tightening labour market leading to faster pay growth across the distribution. Additionally, unlike previous years, some stakeholder employers reduced the differentials between staff levels. It was suggested that this could be due to labour shortages pushing up wages or companies changing their pay structures.

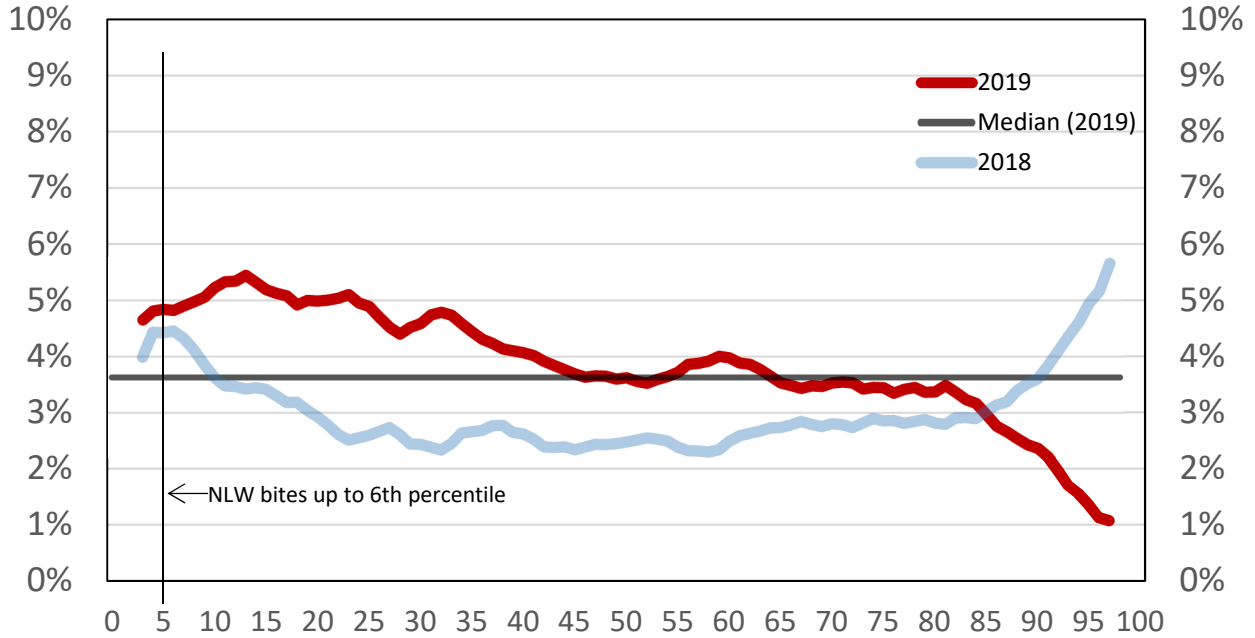
Figure 4: Increase in the hourly wage distribution, including spillovers, for workers aged 25 and over, UK, 2018-19



Source: LPC estimates using ASHE 2010 methodology, standard weights, UK, 2018-2019.
 Note: Data exclude first year apprentices.

76. As a further piece of validating evidence, we analyse the percentage increases in nominal pay across the wage distribution (Figure 5). This descriptive method also finds that pay growth first drops below the growth observed by the lowest paid at the 30th percentile, which may crudely indicate the area of the distribution which is no longer affected by the NLW.

Figure 5: Percentage change in basic hourly pay at each percentile, employees aged 25+, 5 percentile rolling average, UK, 2017-2018



Source: BEIS analysis of ASHE 2019, hourly pay

Direct and indirect effects

77. To estimate the impacts of the NLW and NMW on the earnings distribution, we use the Annual Survey of Hours and Earnings (ASHE), from 2019, to conduct wage distribution analysis for each of the rates.

78. 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. Of the firms that responded to the CIPD’s LMO survey, around 30% had reduced pay differentials.
79. 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 argued in previous IAs, 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 in 2017 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.

Approach to the Appraisal: Non-wage Bill Impacts

Transition costs

80. The concept of annual minimum wage increases is fully embedded in the UK labour market; they have occurred regularly for the last 20 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 has a stated ambition to rise to 60% of median earnings by 2020¹⁵. This awareness is, in part, thanks to extensive communications campaigns in the lead up to past NMW/NLW upratings, which will run once more for the April 2020’s rates.
81. 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 104-107.

Non-compliance

82. In line with previous Better Regulation guidance¹⁶, 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.
83. 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

¹⁵ <https://www.gov.uk/government/publications/low-pay-commission-report-2019>

¹⁶ <https://www.gov.uk/government/publications/better-regulation-framework>

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.

84. 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. 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 2019 (estimated 424,000 workers) were excluded from our estimates¹⁷, this would reduce the total cost to £1.43 billion.

Data Quality

85. 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.

86. With regards to appraising the Apprentice NMW, ASHE data includes information on apprentices specifically (around 2,000 apprentices surveyed per year). An alternative data source, 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, when estimating coverage and bite of the NMW/NLW rates.

87. To calculate the quarterly counterfactual growth rate NIESR used the LFS which is a quarterly household survey. 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. We continue to use the LFS for the specific analysis on the counterfactual growth rate, with some mitigation of this risk provided by using the 'hrrate' variable rather than 'hourpay'¹⁸ - the latter is a derived variable and is considered less reliable.

Appraisal of Impacts: Monetised Impacts

Coverage

88. 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 2019, and we apply our counterfactual growth rate to forecast coverage in April 2020 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.

89. We estimate that 2.4 million workers will be covered by the incoming NMW/NLW rates. This includes private and voluntary sector workers and public sector workers. Table 4 contains our estimates of coverage as well as the LPC's projections, as set out in their 2019 report¹⁹. Our

¹⁷ Paragraph 143 states that according to ASHE 2019, there were 424,000 jobs with pay less than the NMW/NLW rates held by employees aged 16 and over.

¹⁸ '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.

¹⁹ <https://www.gov.uk/government/publications/low-pay-commission-report-2019>

numbers differ to those presented by the LPC in their report. This is due to the different counterfactuals that we utilise, with the LPC using average earnings growth as the counterfactual. As stated by the LPC (para 4.42, 2019 report), “Econometric analysis is better at identifying a counterfactual... than the other methods that [the LPC] use”.

90. 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. As an example, we can now compare forecasted coverage for 2019’s NLW/NMW uprating (as found in our 2019 IA and those provided by the LPC) against actual coverage found in ASHE 2019. We estimated that 2.1 million people were going to be covered in 2019, while the LPC estimated that 2.8 million people will be on the NMW/NLW in April 2019. However, both of these forecasts differ to the “actual” figure found in ASHE 2019, of 2.0 million workers. This may suggest that our 2019 IA’s total cost estimate was an overestimate for the April 2019 uprating in the minimum wage rates.

Table 4: Breakdown of coverage across different NMW/NLW rates, April 2020

	<i>Proposed rate</i>	<i>BEIS projected coverage (assuming our best estimate for the counterfactual)²⁰</i>	<i>LPC projected coverage (assuming average earnings growth)</i>
NLW (25+)	£8.72	2,003,000	2,376,000
21-24 NMW	£8.20	201,000	220,000
18-20 NMW	£6.45	120,000	130,000
16-17 NMW	£4.55	35,000	38,000
Apprentice NMW	£4.15	37,000	37,000
Total number of workers affected		2,396,000	2,801,000

Best estimate: labour costs

91. As discussed previously, our best cost estimate is based on a quarterly counterfactual growth rate of 0.78%. In this scenario the total cost to employers from implementing the LPC rate recommendations, and thus complying with the incoming legislation, is **£1.7 billion**. 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 £1.4 billion in increased wages and £0.3 billion in additional employer NICs and pension contributions. Tables 5,6 and 7 provide a further breakdown, in constant prices.

92. The total benefits to workers and the exchequer are estimated to be **£1.7 billion** – the same value as the total labour costs.

93. HMT Green Book states that “when assessing costs and benefits of different options, it may be necessary or desirable to “weight” these costs and benefits, depending on which groups in society they fall on”. This is based on the principle of the diminishing marginal utility of income, whereby the value on an additional pound of income is higher for a low-income recipient and lower for a high-income recipient.

94. If we were to crudely apply Green Book’s estimate of the marginal utility of income (1.3, based on a review of international evidence), this would suggest that the benefits would be £2.0 billion.

²⁰ Estimates the number of people who are directly likely to benefit. If indirectly affected workers are also included, the overall coverage figure increases to over 8 million.

However, we acknowledge that this marginal utility factor of 1.3 may not be applicable to the group that we believe will benefit from the proposed uprating, with different segments of this group likely to have varying marginal utilities. Furthermore, the uplift factor is the marginal utility of income for the median person/household. We believe that this would be a conservative estimate, as beneficiaries from the upratings will be in the bottom half of the distribution.

Table 5: Total labour costs in the best cost estimate:

Best Estimate	Year 1			Year 2			Year 3			Total
	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	£1,003.08	£218.47	£1,221.55	£249.42	£54.32	£303.75	£0.00	£0.00	£0.00	£1,525.29
Main	£79.56	£17.33	£96.89	£19.34	£4.21	£23.56	£0.15	£0.03	£0.18	£120.63
Development	£17.27	£3.76	£21.04	£2.21	£0.48	£2.69	£0.00	£0.00	£0.00	£23.73
Youth	£2.12	£0.46	£2.58	£0.23	£0.05	£0.28	£0.00	£0.00	£0.00	£2.86
Apprentice	£8.80	£1.92	£10.72	£1.85	£0.40	£2.25	£0.00	£0.00	£0.00	£12.97
Total	£1,110.84	£241.94	£1,352.78	£273.05	£59.47	£332.52	£0.15	£0.03	£0.18	£1,685.48

Table 6: Direct labour costs in the best cost estimate:

Best Estimate	Year 1			Year 2			Year 3			Total
	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	£468.69	£102.08	£570.77	£59.95	£13.06	£73.00	£0.00	£0.00	£0.00	£643.77
Main	£46.60	£10.15	£56.74	£6.58	£1.43	£8.02	£0.04	£0.01	£0.05	£64.81
Development	£8.97	£1.95	£10.93	£0.71	£0.16	£0.87	£0.00	£0.00	£0.00	£11.80
Youth	£1.11	£0.24	£1.35	£0.08	£0.02	£0.10	£0.00	£0.00	£0.00	£1.45
Apprentice	£5.98	£1.30	£7.28	£0.78	£0.17	£0.95	£0.00	£0.00	£0.00	£8.23
Total	£531.34	£115.73	£647.07	£68.10	£14.83	£82.94	£0.04	£0.01	£0.05	£730.06

Table 7: Indirect labour costs in the best cost estimate:

Best Estimate	Year 1			Year 2			Year 3			Total
	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	£534.39	£116.39	£650.78	£189.48	£41.27	£230.74	£0.00	£0.00	£0.00	£881.52
Main	£32.97	£7.18	£40.15	£12.76	£2.78	£15.54	£0.11	£0.02	£0.13	£55.82
Development	£8.30	£1.81	£10.11	£1.49	£0.33	£1.82	£0.00	£0.00	£0.00	£11.93
Youth	£1.01	£0.22	£1.23	£0.15	£0.03	£0.18	£0.00	£0.00	£0.00	£1.41
Apprentice	£2.82	£0.61	£3.44	£1.07	£0.23	£1.30	£0.00	£0.00	£0.00	£4.73
Total	£579.49	£126.21	£705.71	£204.95	£44.64	£249.58	£0.11	£0.02	£0.13	£955.42

High estimate: labour costs

95. We reproduce the analysis with a different counterfactual growth rate for our low cost scenario. Here, we assume that growth will continue at the same level between 2010 and 2018. The quarterly counterfactual growth rate corresponding to this is 0.66%. Given the counterfactual ‘catches up’ slower than in our central estimate, the cost to business and benefit to workers is higher than our best-case scenario above.

96. Overall our high cost estimate of the total labour costs is **£2.1 billion**. This is split into wage bill impacts of £1.8 billion and non-wage impacts of £0.4 billion (numbers may not sum due to rounding). Tables 8,9 and 10 provide a further breakdown, in constant prices.

97. We believe that using this rate would not be appropriate – as outlined in NIESR’s report and last year, the rate would not appropriately reflect the business cycle that the economy currently is in. The justification for this is in more detail in paragraphs 51-54.

Table 8: Total labour costs in the high-cost estimate:

High Cost	Year 1			Year 2			Year 3			Total
	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	£1,167.99	£254.39	£1,422.38	£387.43	£84.38	£471.81	£30.64	£6.67	£37.32	£1,931.51
Main	£93.78	£20.43	£114.21	£30.91	£6.73	£37.65	£3.29	£0.72	£4.01	£155.86
Development	£21.53	£4.69	£26.22	£4.10	£0.89	£4.99	£0.00	£0.00	£0.00	£31.21
Youth	£2.63	£0.57	£3.20	£0.45	£0.10	£0.55	£0.00	£0.00	£0.00	£3.75
Apprentice	£10.48	£2.28	£12.77	£3.19	£0.69	£3.88	£0.29	£0.06	£0.35	£17.00
Total	£1,296.42	£282.36	£1,578.78	£426.08	£92.80	£518.88	£34.22	£7.45	£41.68	£2,139.33

Table 9: Direct labour costs in the high-cost estimate:

High Cost	Year 1			Year 2			Year 3			Total
	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	£606.96	£132.20	£739.15	£122.68	£26.72	£149.40	£6.97	£1.52	£8.48	£897.04
Main	£59.04	£12.86	£71.90	£13.63	£2.97	£16.60	£1.05	£0.23	£1.28	£89.78
Development	£12.71	£2.77	£15.48	£1.45	£0.32	£1.77	£0.00	£0.00	£0.00	£17.25
Youth	£1.54	£0.34	£1.88	£0.17	£0.04	£0.21	£0.00	£0.00	£0.00	£2.09
Apprentice	£7.50	£1.63	£9.14	£1.73	£0.38	£2.10	£0.11	£0.02	£0.14	£11.38
Total	£687.75	£149.79	£837.55	£139.66	£30.42	£170.08	£8.13	£1.77	£9.90	£1,017.53

Table 10: Indirect labour costs in the high-cost estimate:

High Cost	Year 1			Year 2			Year 3			Total
	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	£561.03	£122.19	£683.23	£264.75	£57.66	£322.41	£23.68	£5.16	£28.84	£1,034.47
Main	£34.74	£7.57	£42.31	£17.29	£3.76	£21.05	£2.24	£0.49	£2.73	£66.08
Development	£8.82	£1.92	£10.74	£2.64	£0.58	£3.22	£0.00	£0.00	£0.00	£13.96
Youth	£1.09	£0.24	£1.32	£0.28	£0.06	£0.34	£0.00	£0.00	£0.00	£1.66
Apprentice	£2.98	£0.65	£3.63	£1.46	£0.32	£1.78	£0.17	£0.04	£0.21	£5.62
Total	£608.66	£132.57	£741.23	£286.41	£62.38	£348.80	£26.09	£5.68	£31.77	£1,121.80

Low cost estimate: labour costs

98. We reproduce the analysis with a different counterfactual growth rate for our low cost scenario. Here, we assume that growth will continue at the same level between 2016 and 2018. The quarterly counterfactual growth rate corresponding to this is 1.09%. 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.

99. Overall our low cost estimate of the total labour costs is **£1.0 billion**. This is split into wage bill impacts of £0.8 billion and non-wage impacts of £0.2 billion (numbers may not sum due to rounding). Tables 11, 12 and 13 provide a further breakdown, in constant prices.

100. We believe that using this rate would not be appropriate – as outlined in NIESR's report and last year, the rate would not appropriately reflect the business cycle that the economy currently is in.

Table 11: Total labour costs in the low-cost estimate:

Low Cost	Year 1			Year 2			Year 3			Total
	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	£699.38	£152.33	£851.71	£73.87	£16.09	£89.96	£0.00	£0.00	£0.00	£941.67
Main	£52.31	£11.39	£63.71	£5.87	£1.28	£7.15	£0.00	£0.00	£0.00	£70.86
Development	£11.24	£2.45	£13.68	£0.31	£0.07	£0.37	£0.00	£0.00	£0.00	£14.06
Youth	£1.34	£0.29	£1.63	£0.01	£0.00	£0.02	£0.00	£0.00	£0.00	£1.65
Apprentice	£5.53	£1.20	£6.73	£0.56	£0.12	£0.68	£0.00	£0.00	£0.00	£7.41
Total	£769.80	£167.66	£937.47	£80.62	£17.56	£98.18	£0.00	£0.00	£0.00	£1,035.65

Table 12: Direct labour costs in the low-cost estimate:

Low Cost	Year 1			Year 2			Year 3			Total
	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	£231.83	£50.49	£282.32	£14.53	£3.16	£17.69	£0.00	£0.00	£0.00	£300.01
Main	£23.54	£5.13	£28.67	£1.62	£0.35	£1.98	£0.00	£0.00	£0.00	£30.65
Development	£4.04	£0.88	£4.92	£0.07	£0.02	£0.09	£0.00	£0.00	£0.00	£5.01
Youth	£0.44	£0.10	£0.54	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.54
Apprentice	£3.05	£0.66	£3.72	£0.21	£0.05	£0.25	£0.00	£0.00	£0.00	£3.97
Total	£262.91	£57.26	£320.17	£16.43	£3.58	£20.01	£0.00	£0.00	£0.00	£340.18

Table 13: Indirect labour costs in the low-cost estimate:

Low Cost	Year 1			Year 2			Year 3			Total
	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	£467.55	£101.83	£569.38	£59.34	£12.93	£72.27	£0.00	£0.00	£0.00	£641.65
Main	£28.77	£6.27	£35.04	£4.25	£0.92	£5.17	£0.00	£0.00	£0.00	£40.21
Development	£7.19	£1.57	£8.76	£0.23	£0.05	£0.29	£0.00	£0.00	£0.00	£9.05
Youth	£0.90	£0.20	£1.10	£0.01	£0.00	£0.01	£0.00	£0.00	£0.00	£1.11
Apprentice	£2.48	£0.54	£3.02	£0.35	£0.08	£0.43	£0.00	£0.00	£0.00	£3.44
Total	£506.89	£110.40	£617.30	£64.19	£13.98	£78.17	£0.00	£0.00	£0.00	£695.46

Transition costs

101. 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 51% are affected by the NMW/NLW. This is similar to that found by the Federation of Small Businesses, who found that half of micro businesses and all small and medium-sized businesses had been affected by what it classed as 'social policy-related costs', which include the NMW/NLW. Moreover BEIS' Small Business Survey 2016²¹ (page 105) found that 54% of SME employers to be unaffected by the NLW, meaning 46% are affected (=100%-54%).

102. Naturally coverage will vary across sectors, and some representative organisations representing employers in specific low paid sectors found higher proportions. These latest surveys are in line with estimates used in last year's IA (46% - 52%).

103. Consequently, in this IA we take a range between 46% and 51% of employers who are affected by the proposed increase in the NMW/NLW. Using the 2019 Business Population

²¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/624580/small-business-survey-2016-sme-employers.pdf

Estimates (BPE)²², we estimate that between 1,103,000 and 1,295,000 employers will be affected by the changes to the minimum wage.

Familiarisation costs

104. 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 the 2017 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.
105. We have previously assumed 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 the average duration of visits to the National Minimum Wage landing page on Gov.uk (~ 4 minutes) and the length of calls that Acas received regarding NMW/NLW issues (~ 5 minutes).
106. However, we are conscious that the minimum wage rates for 2020 were announced at a later-than-normal date (i.e. at the end of December, rather than November/Autumn fiscal event). The Government has responded to numerous correspondence cases on the matter and aimed to keep businesses sighted of developments as much as possible. We will also be undertaking an extensive communications campaign to ensure businesses are appropriately ready for the April 2020 upratings. Despite this activity, we have taken a conservative approach to increase the familiarisation time in our best and high cost estimates (doubling the time taken to 10 minutes), to account for this adjustment. We continue to use 5 minutes in our low-cost estimate. This increase in the length of familiarisation time aims to capture instances where employers would want to double-check the appropriate rates as a consequence of the slight delay in announcement.
107. To calculate the burden, we estimate the opportunity cost of a HR Manager/ Director’s²³ time by using the median hourly pay from ASHE 2019, uplifted for non-wage labour costs of 21.78%. Applying this to our estimate of businesses affected equates to a **one-off familiarisation cost of between £2.7m and £6.4m**. The former is our low-cost estimate, whilst the latter is our best cost estimate. This estimate has not been adjusted to take into account the familiarisation cost to the public sector, which would be negligible considering that there are only 12,535 enterprises in this sector in the UK (according to a snapshot of the Inter Departmental Business Register taken by the ONS in March 2017), and it constitutes a small proportion of total costs incurred by businesses.

Implementation costs

108. The NMW and NLW continue to follow the same cycle as last year. Using qualitative evidence from NIESR’s 2017 report, we found that ‘adjustments to comply with these rates had minimal implications for administrative resources because pay was adjusted annually in any

²² <https://www.gov.uk/government/statistics/business-population-estimates-2019>

²³ <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashtable14> (Table 14.5a, SOC 1135)

case' (p. 37). Consequently, we believe that there is a negligible, if any, additional burden as a result of the changes to this legislation.

109. 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

110. 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 E.
111. Using the IA Calculator, we estimate that the equivalent annual direct impact on business is net £241.3 million (over maximum appraisal period of three years). These are based on our best case scenario.

Appraisal of Impacts: Non-monetised Impacts

112. 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, such as broader impacts on the macroeconomy and potential fiscal implications.

Macroeconomic Impacts

113. As part of their evaluation of the impact of the NMW/NLW, the LPC state the impact of the previous uprating to the NLW/NMW (chapters 2 and 3). Below we summarise this and supporting evidence that identifies broader second/third-order impacts that the proposed 2019 uprating may have. We have also summarised the most recent academic literature on possible impacts of the minimum wages in Annex C.

Employment

114. 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.
115. Due to the LPC's remit, we do not expect there to be any significant 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.
116. As discussed in the LPC report, preliminary findings indicate that despite GDP continuing to be modest, the labour market remained strong in the first half of 2019 and there has been little evidence of any negative employment effects arising from the NLW. Employment levels and rates were at record highs while unemployment levels and rates continued to fall back to figures not seen since the early 1970s.

117. In the Spring 2019 forecast, OBR announced that the unemployment rate of 4.0% is the lowest rate since 1975 and they forecast it will remain near historic lows over the next five years. Alongside this, wages are increasing at their fastest pace in over a decade, and are forecast to continue growing faster than inflation, which means more money in people's pockets. However, there wasn't an Autumn Budget, and in this time, the labour market has started to soften.
118. The OBR have previously reflected that there is limited evidence that previous increases in the NMW and NLW have had a significant impact on employment. They postulate that this is because some low-wage workers have little choice who to work for and their employers can exploit their market power to keep wages low. However, there appears to be some inconsistency in this particular argument, as the policy intervention aims to tackle this market power at the very bottom.
119. Some sectors feel particularly exposed, particularly in the social care, convenience and wholesale sectors. Research commissioned by the LPC, in addition to their extensive stakeholder engagement, found that the NLW does not currently point to significant employment effects. For example, the TUC argued that 'there is no sense that previous minimum wage increases have reduced employment in the low-paying sectors.' As mentioned in paragraphs 157-158, it is part of the LPC's remit to monitor, evaluate and review the effect of the rates on employment.
120. Other impacts on employment have also been posited in the RPC's 2019 opinion. For example, the minimum wage may have an impact on staff churn/turnover. Empirical evidence of this effect is limited, while stakeholders have offered differing views – the CBI told the LPC that reducing pay differentials (where used by some firms to mitigate with the increasing NLW/NMW) can have a potential negative effect on staff turnover; whereas the Living Wage foundation argued strongly that high pay could have a positive effect.
121. As discussed in paras 70-76, the spillover effect seen in 2019 was higher than in previous years. However, as also heard in ours and the LPC's consultations with stakeholders, firms are looking to reduce pay differentials – employer representatives consequently suggest that these narrowing differentials were in some cases decreasing incentives to progress, as individuals were unwilling to take on additional responsibilities for relatively small uplifts in pay.
122. We consequently look to the academic literature, most notably Avram and Harkness (2019), who find that around half of minimum wage workers transition into employment paid above the minimum wage within a year. Of these, four fifths progress to jobs that paid less than 2/3rds of median earnings (low paid employment), with the remaining fifth moving into jobs that paid more than 2/3rds of median earnings (high-paid employment).

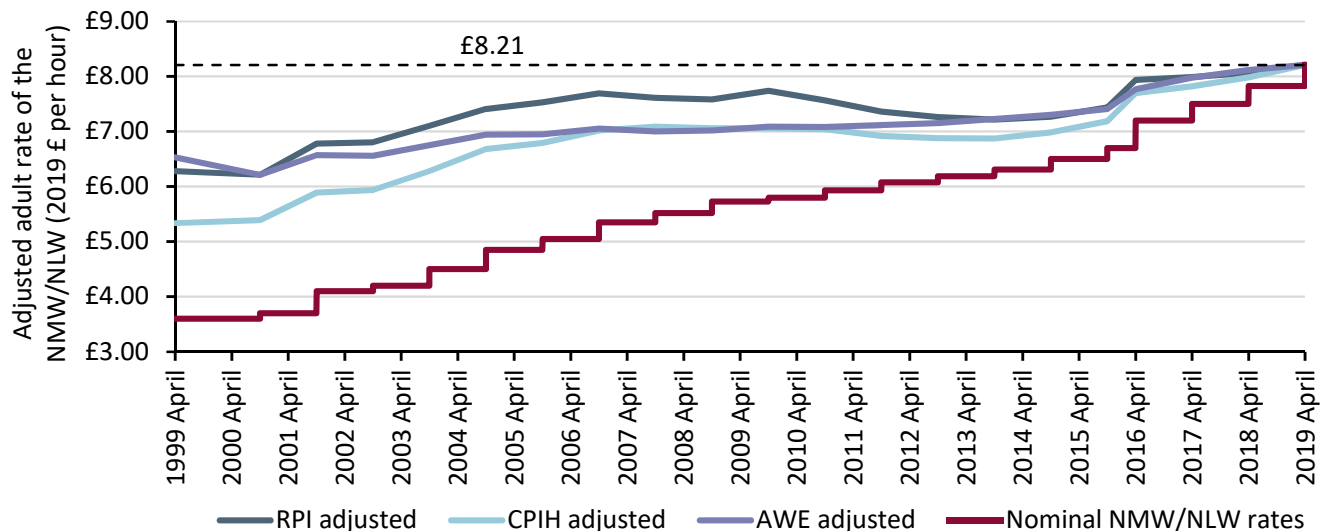
Prices

123. 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.
124. In LPC's consultation, there were more reports of employers using price rises to offset the cost of the NLW compared with previous years. Raising prices was the most common planned response in business surveys from both the British Chamber of Commerce (BCC) and the Confederation of British Industry (CBI). In the latter's survey, the proportion of respondents affected by the NLW who planned to raise prices grew from 21% in 2017 to 33% in 2018.

125. Many stakeholders note to the LPC that raising prices is not always possible in price-taking or highly competitive sectors. For example, internationally facing firms, and those directly affected by Government funding such as childcare and social care. This is due to their limited pricing power.

126. Figure 6 shows the increases in the NLW since its introduction in 2016 have pushed the main minimum wage rate to its highest ever level in real and relative terms. The NLW is currently around 14 per cent higher in real (CPIH-adjusted) terms than the pre-NLW maximum reached in October 2007. Using the RPI definition of inflation, the real increase from the pre-NLW maximum (in October 2009) is 6 per cent. The real value of the minimum wage has increased by 53 per cent since its introduction in April 1999.

Figure 6: Real and relative values of the NMW/NLW, UK, 1999-2019



Source: Source: LPC estimates based on ONS data: AEI including bonuses (LNMQ) 1999-2000, AWE total pay (KAB9) 1999-2019, CPI (D7BT) 1999-2018, and RPI (CHAW) 1999-2018, quarterly, seasonally adjusted (AEI and AWE only), UK (GB for AEI and AWE).

Note: The AWE series began in January 2000 and the AEI series ended in July 2010. Our earnings series is estimated using AEI (including bonuses) from April 1999-January 2000 and AWE (total pay) from January 2000-April 2019.

127. Theoretically, as outlined in box 1 of our 2015 IA, and in our 2018 IA, the real product wage is perhaps more relevant to employers as it is the wage relative to the price of the products they sell. 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.

Productivity

128. The increase in the NMW/NLW is universal for all workers of the same age and workers cannot be paid below the pay floor that the NMW/NLW provides. It may be argued that it is unlikely that increases to the NLW would give rise to a widespread increase in labour productivity, as might be predicted by the efficiency wage theory at an individual firm level.

129. 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.

130. Evidence from the CIPD's 2019 Labour Market Outlook suggests that 24% of firms respond to the NLW by improving productivity. When looking at SMEs, however, this fell to 19%, compared with 29% for large employers. In the FSB's survey, only 12% of respondents reported raising productivity in the last year.
131. Looking at specific ways employers have raised productivity, the CIPD found that some firms focused on increasing worker effort (23% of private sector firms affected by the NLW and 30% in the public sector). Respondents also reported giving staff extra tasks (25%), requiring more flexibility on hours (23%), tightening restrictions on absenteeism (9%) and increasing the pace of work or raising performance standards (14%). More encouragingly, the CIPD found that 21% have sought to build on the morale boost of higher pay by trying to improve motivation and 18% have improved business practices.

Box 2: Automation

There is some anecdotal evidence that large employers are turning to automation, however attributing this to the NLW is not immediately obvious, and the consequence for jobs is unclear. Evidence provided to the LPC suggests that the move to automation varies by sector, with some being much further away from utilising it than others. Both the CBI (with regards to manufacturers) and the BRC have stated that their members are interested in automation. However, for convenience stores, automation was said to be further away. Lordan (2018) found that increases in the minimum wage led to small decreases in the employment and hours of workers in automatable jobs, with the effects largest in manufacturing. However, Lordan also noted that in the past, jobs lost to automation have been more than replaced by new jobs. The World Economic Forum also took the view that there is no real consensus about the scale, pace and nature of the impact of automation. It estimated that between 10-30% of UK jobs could be at high risk of automation by 2030, however, that automation can act as a complement to labour, enabling workers to upskill, achieve better-quality work and become more productive. The World Economic Forum estimate that robots will displace 75 million jobs globally by 2022 but create 133 million new ones – a “net positive”. Future work by Riley et al. will examine the effects on employers' productivity and capital intensity, following qualitative research with ten low-paying employers. We will look to incorporate their findings into our future assessments.

132. Overall the economy has seen poor productivity growth over the past decade as a result of output not increasing as much as the strong labour market. However, despite this, some of the lower paying sectors such as textiles and clothing, and retail, have seen productivity grow faster than the pay growth.

Other macroeconomic impacts

133. 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.

134. 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. Academic literature has also attempted to do this, which we summarise in Annex C.

135. Overall, LPC find the impact of the policy on macroeconomic factors such as employment to be benign in almost all cases. They found that some stakeholders mentioned several channels to dissipate the impacts of the policy such as raising prices and increasing productivity and investment. However, economic studies did not back this theory up. This could in part be due to difficulties in discerning changes to profits and prices in official data. The LPC will continue to monitor this.

Fiscal impacts

136. In 2015 the OBR estimated that the total effect on net borrowing of introducing the NLW would be -£0.2 billion in 2020-21, with reductions in tax credits and housing benefits being offset by forecasted higher unemployment and lower profits. Their estimates are shown below in Table 14 (as taken from Table B.3 of the OBR's July 2015 EFO)

Table 14: OBR estimates of the effects on net borrowing from introducing the NLW, July 2015

	£ billion				
	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
Total effect on net borrowing	0.0	-0.1	-0.1	-0.2	-0.2

Source: OBR Economic and Fiscal Outlook July 2015, table B.3 (pp.209)²⁴

137. The OBR note significant modelling uncertainties regarding these estimates. In particular, a series of challenging assumptions were made 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 full in Annex B of the July 2015 Economic and Fiscal Outlook.

138. The OBR made their own assumption of an appropriate counterfactual of what minimum wages would have been in the absence of the NLW. The complexities of this led the OBR to assume 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

²⁴ http://budgetresponsibility.org.uk/docs/dlm_uploads/July-2015-EFO-234224.pdf

earnings. This simpler counterfactual is similar to the counterfactual we used in 2017's IA, as well as that used by the LPC and the Resolution Foundation.

139. In terms of exchequer impacts, the OBR set out a number of channels through which public finances would be affected, including:

- Increases in income tax and NICs;
- Reduced income-related benefit spending, particularly tax credits and housing benefit;
- Changes to the price level will affect the uprating of tax thresholds and benefits, and payments on index-linked gilts;
- Higher average earnings growth will feed through to the basic state pension via the triple lock on uprating, with a smaller effect on pension credit;
- Higher unemployment will lead to higher spending on Jobseeker's Allowance and associated housing benefit;
- Increased VAT and excise duties receipts through higher household consumption;
- Changes in profits and investment would feed through to corporation tax receipts

There may also be other indirect effects on the economy that go on to affect receipts and spending (for example through house prices).

140. The OBR have now revised their NLW forecasts through to 2020. The cash amount of the NLW, and the baseline counterfactual wage, have both decreased compared to 2015 estimates, due to lower average hourly earnings. Despite these decreases, we still expect the OBR's work to be a good guide to the broad scale and nature of the exchequer impacts.

141. 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 and stated in the OBR's report – some of which will be third or fourth round effects of the direct impact of the proposed increases in the NMW/NLW.

142. However, while our estimates of non-wage labour costs used in this IA (on both direct and indirect wage impacts) include a range of costs, they 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 - a proportion of NIC receipts are paid into the National Insurance Fund and go towards the state pension.

143. Moreover, we have estimated the wage costs on public sector employers. A fuller depiction of this is provided in Annex E, but in summary 5% of the total cost in this IA is estimated to be borne by public sector employers; in present value terms, this is equivalent to be £67.2m over the appraisal period in our best case scenario, however only £11.7m is a direct cost as a result of the proposed NMW/NLW rates. The remaining £55.5m 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

144. Her Majesty's Revenue and Customs (HMRC) enforce the NLW/NMW on behalf of the Government. HMRC responds to 100% of worker complaints and also conducts proactive, targeted enforcement of at-risk employers. HMRC also carry out awareness-raising activity to prevent non-compliance in the first place and therefore reduce the need for enforcement action. If HMRC investigate an employer that is breaking the NMW law and issues a Notice of Underpayment (NoU) containing details of the underpayments, the period to which they relate,

and the workers affected. Once issued with an NoU, the employer will have to pay back the arrears owed to workers, face a financial penalty, and can be publicly named and shamed under the NMW Naming scheme, unless it successfully appeals against the NoU. Generally, a broad base of analysis suggests that non-compliance is mostly through mistake, not malice.

145. In April 2019, ASHE estimates there were 424,000 jobs with pay less than the NMW/NLW rates held by employees aged 16 and over. This equates to 1.5% of all 16+ UK employee jobs. This is a 17,000 decrease from the 2018 ASHE, where 1.6% of all jobs held by employees were paid below the Minimum Wage.
146. It is possible that as the NLW continues to rise, 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. Furthermore, weighting issues identified by the ONS in ASHE has led to a revision of 2017 estimates for those being underpaid the NMW/NLW. We therefore do not feel making such assumptions at this time would be sensible.
147. 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 2018/19 the Government has:
- Increased the enforcement budget to £27.4 million in 2018/19 up from £26.3 million in 2017/18, and twice as much as 2015/16's budget (£13 million).
 - Launched a £1.1 million campaign in April 2019 to encourage eligible workers to check their pay and act if they are underpaid
 - Through HMRC, utilised sector specific guidance and innovative techniques to nudge employers towards compliance. Around 1.4 million texts were to apprentices and to recipients of Working Tax Credits, two populations known to be at risk of underpayment of Minimum Wage.
 - Identified a record £24.4 million in arrears, benefitting over 220,000 workers.
148. The additional Exchequer expenditure on enforcement is not a direct result of the LPC recommendations for the April 2020 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

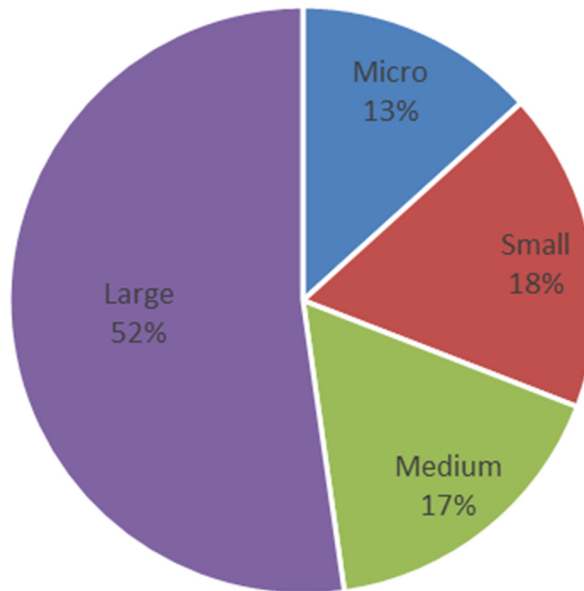
149. Table 15 contains our estimates of projected coverage of workers on the NMW/NLW at the start of our appraisal period (April 2020) and our best estimate of the total costs corresponding to each business size, over the course of the appraisal period.

Table 15: Coverage of NMW/NLW workers by business size, Q2 2020

Business size	Micro		Small		Medium		Large	
	Coverage	Total Cost (£m)	Coverage	Total Cost (£m)	Coverage	Total Cost (£m)	Coverage	Total Cost (£m)
NLW (25+)	373,000	£ 161.2	373,000	£ 211.9	306,000	£ 211.4	949,000	£ 673.1
Main (21 - 24)	34,000	£ 15.3	47,000	£ 22.8	32,000	£ 18.1	88,000	£ 42.1
Others	41,000	£ 8.3	62,000	£ 10.2	28,000	£ 4.4	57,000	£ 9.2
Total	447,000	£184.7	482,000	£244.9	366,000	£233.9	1,094,000	£724.4

Source: BEIS calculations using ASHE 2019. 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 7: Total Cost by business size pie chart



150. As the pie chart above shows, we expect 31% of the costs of this policy to be borne by small and micro businesses. According to ASHE 2019, 22% of workers are employed in small and micro businesses. Therefore, relative to the UK average proportion of small and micro businesses, 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 150-152 explain why it is not feasible to exempt these businesses.

151. The FSB found that half of micro businesses and all small and medium-sized businesses had been affected by what it classed as ‘social policy-related costs’, which include the NMW/NLW as well as National Insurance and pension auto-enrolment. However, it is notable that over the period studied, costs increased less overall in key low-paying sectors. Wholesale and retail saw a 10 per cent increase (all since 2015) while transportation and storage, and accommodation and food services saw little increase. This suggests that there have been some offsetting tax and regulatory savings for these sectors.

The possibility of exempting small and micro businesses

152. 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 significant proportion 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.
153. 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 several 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.
154. The annual NMW/NLW increases are fully embedded in the UK labour market with rate changes being made for over 20 years. The majority of employers are aware of the increasing minimum wage, in particular the NLW, with good knowledge among businesses that the rates had changed in April (the Government communication campaigns suggest that as high as 92% of employers were aware of the NLW). 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, rates are pre-announced 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. Government have also put in additional measures such as reducing business rates with reforms announced since 2016 which help to further mitigate these costs to small and micro businesses. Additionally, small and micro businesses will benefit from being exempt from the Apprentice Levy as only firms with a pay bill over £3 million each year need to pay it, which amounts to under 2% of all businesses in the UK.

Specific Impact Tests

Equalities impact and Family Test

155. 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 G. 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 we have found no evidence of the potential for any negative impacts. There is emerging evidence that the employment outcomes of part-time women are beginning to be affected. We will monitor this in future years.

Sector impact

156. Low-pay sectors will be impacted disproportionately by the NMW/NLW rate increases. Annex F 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

157. The changes to the NMW and NLW regulations will be made through secondary legislation and will come into force on 1st April 2020.

Monitoring and evaluation

158. 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 builds upon 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.
159. A future remit has to be set with the NLW now reaching its target of 60% of median earnings. Professor Arun Dube published an independent report on the impacts of minimum wages, to help inform the UK government's decisions on the remit of the Low Pay Commission beyond 2020²⁵. The Chancellor has also pledged for the NLW to reach two-thirds of median earnings within the next five years, provided economic conditions allow. Further details on this (and the consequent monitoring and evaluation steps for the LPC) will be provided in the LPC's remit for 2020/2021.

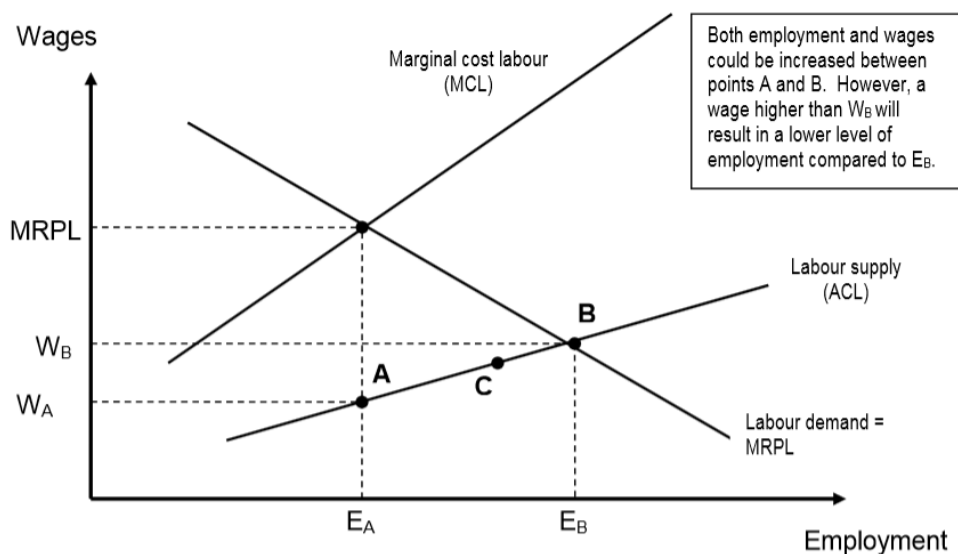
²⁵ <https://www.gov.uk/government/publications/review-of-the-international-evidence-on-the-impacts-of-minimum-wages>

Annex A: Theoretical Rationale for Intervention

160. 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. A monopsony is where there is one firm with complete buying power and many sellers, creating a scenario where exploitation of labour is easier, resulting in a market failure. This can be solved by government intervention through the minimum wage. Monopsony's are more common in sectors that have large set up costs, creating a concentrated market where the firm has the bargaining power, hence allowing monopsonist firms to set a lower wage.

161. 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. 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 of between W_A and W_B can address this market power and bring the market equilibrium closer to the efficient, perfectly competitive outcome – such as point C. A minimum wage of W_B is the point where the highest amount of labour can be employed with the highest wages. Any wage higher than this would reduce the amount of labour and any lower amount would mean a lower wage.

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



162. In practice, evidence suggested to the LPC and that found by NIESR previously indicates that it is unlikely that this stylised pure market structure is representative of competition in low paying sectors today. Certain sectors and locations may share features of a monopsonistic market, in the sense that there are many workers but few employers; however, there is an excess supply of labour resulting in weak bargaining power for employees in low paid sectors. 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.

163. 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: Previous cost estimates from minimum wage upratings

164. This Impact Assessment once more appraises the impact of uprating the National Minimum Wage rates and amending the NMW Act 1998 (via secondary legislation). As set out in paragraphs 3 and 4 of this document, this IA considers the impact of moving away from the current legally binding minimum wage rate.
165. In 2015, the Government announced an ambition for the top minimum wage rate to reach 60% of median earnings by 2020 subject to economic conditions, through the introduction of the National Living Wage in 2016. With this ambition set to the Low Pay Commission in their annual remit, the LPC consequently advised Government on whether economic conditions were being met and what the subsequent year's minimum wage rates should be.
166. The latest set of recommendations from the LPC, and Government's acceptance of them, will result in an NLW that is indeed 60% of median earnings. This impact assessment and the LPC's latest report summarise the evidence of impacts from the introduction (and upratings) of the NLW. To build upon this, the table below summarises the costs to business that each of our Impact Assessments have estimated over the course of the past five years, in the form of the EANDCB.
167. Alongside this, we present the appraisal period of each annual cost figure and the methodology used in those respective IAs. Following the feedback, we have received both from the RPC and the wider academic community, we have continuously refined the methodology used to estimate business impacts. This does mean that the EANDCBs listed below may not be comparable year-on-year.

Table 16: Previous cost estimates from minimum wage upratings and the methodology used (2016-2020)

Year	EANDCB	Appraisal Period	Methodology
2016	£820.97mn	1 year	Single year appraisal period is used intentionally. The counterfactual wage growth is in line with OBR average earnings projections. Spillovers taper down by the 25 th percentile, in line with the OBR methodology.
2017	£131.6mn	2 years	Counterfactual wage growth is taken as a midpoint of the inflation rate and average earnings. Spillovers taper down by the 25 th percentile, in line with the OBR methodology.
2018	£76.6mn	3 years	After taking on board NIESR's research, the counterfactual wage growth is obtained by taking historic wage growth at the first point in the wage distribution which is not affected by the minimum wage. With the help of independent forecasts, we judge where the UK lies on the business cycle to inform over what period we should consider when taking that historic wage growth. The wage growth is the same across all groups. We use

			NIESR's estimate of spillovers to stop by the 20 th percentile.
2019	£151.8mn	2 years	The counterfactual wage growth is obtained by taking historic wage growth at the first point in the wage distribution which is not affected by the minimum wage. With the help of independent forecasts, we judge where the UK lies on the business cycle to inform over what period we should consider when taking that historic wage growth. The wage growth is the same across all groups. We estimate spillovers to end by the 20 th percentile, which is consistent with the LPC.
2020	£205.6mn	3 years	The counterfactual wage growth is obtained by taking historic wage growth at the first point in the wage distribution which is not affected by the minimum wage. With the help of independent forecasts, we judge where the UK lies on the business cycle to inform over what period we should consider when taking that historic wage growth. The wage growth is the same across all groups. We use the LPC's estimate for spillovers to end by the 30 th percentile.

*Note that in 2017, BEIS commissioned NIESR to research the most appropriate counterfactual for us to employ in this and future impact assessments. **The methodology therefore changed significantly in the 2018 IA and has remained consistent since.***

Annex C: Recent Literature

168. We believe the minimum wage to be one of the most studied policies across the world, with much of the UK literature used to inform the findings outlined throughout both this Impact Assessment and previous iterations. This annex summarises recent studies commissioned by the LPC²⁶. We have used both our and the LPC's judgement in taking relevant findings from these studies. An alternative summary of the wider literature can be found in NIESR's 2017 report and is not replicated here.

NIESR (2017/2018) – Aitken et al.

169. This study involved an econometric analysis of ASHE and LFS data, using a difference-in-difference method (i.e. identifies a group directly affected by the NLW and compares effects against a group of workers with similar characteristics that was not affected by the NLW). Aitken et al. (2017) use identify that the introduction of the NLW in April 2016 led to large increases in real wages for NLW workers. Their initial results did not provide conclusive evidence of employment effects as a result of the NLW.

170. Their final report (2018) again did not find conclusive evidence of significant employment (or hours worked) impacts as a consequence of the NLW. They did find that may be some negative effects for workers in the retail sector and for women working part-time, however these findings are sensitive to the specification of models used. They also found that real hourly wages for NLW workers grew by around 4-7 percentage points more than they otherwise would have done, at the time of the NLW's introduction. This effect held true across all regions, and low-paying industries/occupations. They conclude that the NLW has had little adverse impact on overall employment retention so far.

Dube Review (2019)

171. This Government-commissioned, independent review into minimum wages was provided with a remit to enhance the evidence base on minimum wages by considering the impacts seen internationally. Professor Dube found that, using research from USA, UK, Germany, and Hungary, there has so far been little evidence of an increase in the minimum wage influencing employment levels.

172. Most of the evidence he reviewed suggests that employment effects are small across US states which have minimum wages at similar levels to the UK (minima up to around 59 percent of median earnings), and this held in some sub-state counties where the minimum wage is higher than the UK's.

Avram and Harkness (2019)

173. This study assessed the impact of the NLW on earnings and pay differentials. It investigates the effects of increases in the NMW between 2010 and 2015; and the introduction of the NLW and the subsequent 2017 and 2018 upratings. It found evidence of significant spillover effects from the NLW. Pay at the median grew faster in areas with high minimum wage shares, with peaks at the 15th and 20th percentiles.

174. They separately undertook a study assessing the impact of the NLW on the wage progression of minimum wage job holders between 2009 and 2017. They found that, over the

²⁶ Unless stated separately, the studies listed in this annex can be found at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/660515/LPC_research_summary_2017.PDF or in Appendix 2 of the LPC's 2018 report

period under consideration, around half of minimum wage workers transition into higher paid employment in each year. Of these, four fifths progress to jobs that paid less than 2/3rds of median earnings (low paid employment), with the remaining fifth moving into jobs that paid more than 2/3rds of median earnings (high-paid employment).

Capuano, Cockett, Gray and Papoutsaki (2019)

175. This study investigated the impact of the NLW on employment and hours. It considered the impact of the introduction of the National Living Wage in April 2016 and the subsequent upratings in April 2017 and April 2018. It found that the introduction of the NLW increased real pay for the lowest paid faster than for those who were paid slightly above the relevant rate, across all the sub-groups examined, with the exception of part-time men.

Riley, Aitken, Paczos, Davies, Cotton, Boys and Forth (Final results published in 2020)

176. This study examines the impact of the National Living Wage on businesses. This is part of a project that will use CIPD's quarterly Labour Market Outlook survey to identify firms affected by the introduction and subsequent upratings of the NLW. The report found that the different vintages of the survey gave similar proportions of firms (55-57%) in each year saying that the NLW will, or has, increased their pay bill. They also found that 16-19% said that the impact on pay was to a large extent, 21-23% said it was to some extent and 15-18% to a small extent. The impact was slightly higher in larger employers.

Incomes Data Research (2017)

177. This study involved surveying 120 firms across low-paying sectors. By analysing the impact of minimum wage increases in April 2017, they found that the NLW was having a significant impact on pay structures, resulting in a merging of pay grades and a greater use of age-related pay. The majority of firms they surveyed had narrowed pay differentials (potentially suggesting a lower spillover effect), however the study found little evidence of large-scale reductions in other aspects of pay as a consequence of the NLW. They also found that firms looked to increase productivity or raise prices as a means to absorb NLW increases. While they found some evidence of reduced hours worked, they found no change in employment.

Butcher, Dickens, Manning (2012)²⁷

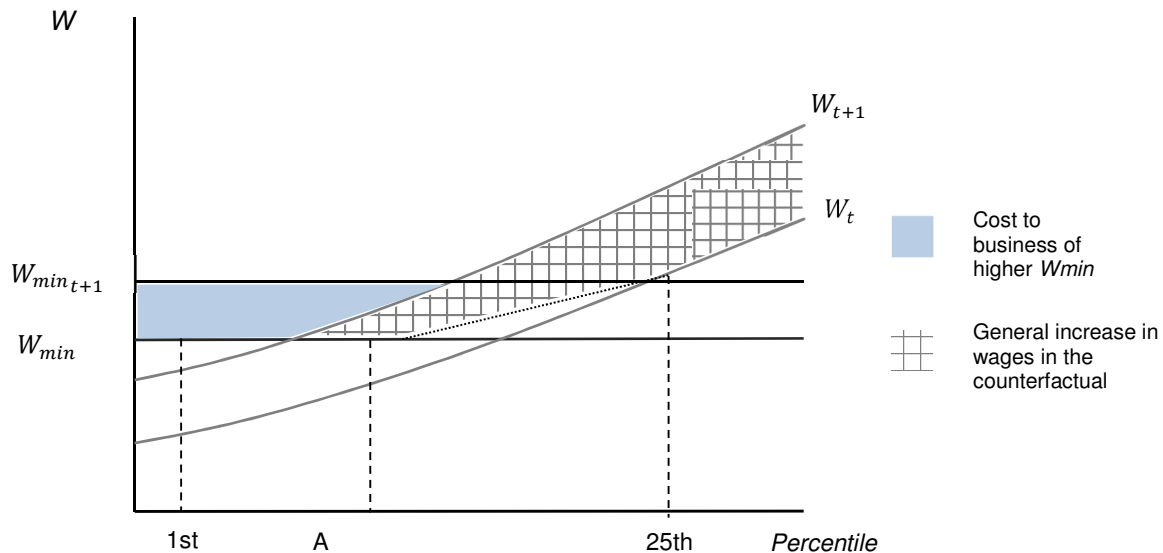
178. This study involved using ASHE data (and its predecessor dataset) to explore the impact of the NMW introduction in 1999. This study found some spillover effects onto higher wage groups. Specifically, they found that those earning up to the 25th percentile of the wage distribution (40% above the level of the minimum wage in 2010) experience an indirect impact from the minimum wage. This finding is considered within NIESR's work on the counterfactual that informs our approach.

²⁷ <http://cep.lse.ac.uk/pubs/download/dp1177.pdf>

Annex D: Shadow wage curve in RPC's proposed counterfactual

179. 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 9 below.

Figure 9: A labour market characterised by market power for low paid workers



180. Figure 9 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} .

181. Under this wage growth assumption (roughly uniform across the shadow distribution in the diagram above), it is suggested that some workers earning the NMW would have counterfactual wage growth of zero (e.g. those at the 1st percentile) in the absence of an uprating, 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 see 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} .

182. **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'.**

183. This cannot be observed because compliance with minimum wage legislation is high. The existence of a shadow wage curve extending below the current minimum wage level cannot be falsified because the counterfactual is unobservable. However, NIESR have previously concluded in their report 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. The majority of academics we have questioned in previous years have disagreed with the premise that 'in the absence of a minimum wage uprating, wage growth at the bottom of the pay distribution would be at, or close to zero'.

184. Additionally, we have not seen any empirical evidence that would suggest zero wage growth (see Box 2, page 71 of NIESR's report). 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. As a construct of the remit that is issued to the LPC, were negative employment effects to materialise, this would be reflected in the recommended rates that they provide to Government, and consequently have a bearing on future decisions made by the Government.

185. It is for these reasons that we do not believe that such a shadow distribution would be an accurate portrayal of the counterfactual, hence why we continue to use the chosen methodology in the main body of the IA. However, in line with analysis undertaken in last year's IA, we consider one rudimentary way of practically representing the shadow wage curve framework. **The estimates provided here are illustrative only.**

Constructing a 'shadow wage distribution'

186. 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). 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 its distribution.

187. 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

188. 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, a base wage distribution of some form 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 several 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 2019 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 – over 20 years in this instance.
- Furthermore, NIESR find that the impact of forecast errors is asymmetric – estimates of counterfactual wage growth that are too low lead to larger overestimates of the costs to business than vice versa, as the period it would take for the counterfactual to catch up to incoming levels would be prolonged (the RPC’s proposed method exacerbate the issue to a greater extent than if the counterfactual is reset each year)

Approach

189. 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 was based on pre-minimum wage data. To do this:

- We first take the April 1998 distribution of hourly earnings excluding overtime for workers aged 25+. (Due to data constraints and simplifying modelling assumptions, this group includes apprentices, who would otherwise be eligible to a lower minimum wage)
- We then project this distribution forward for the years through to 2019. We use the percentage increase at the 30th percentile (the percentile where we assume spillovers to go up to in 2019), in each year between 1998 and 2019.
- To forecast beyond 2019, we have applied the counterfactual growth rate used as our best estimate in this IA of 0.781%. **It is important to note that this growth rate is lower than that which NMW/NLW workers actually experienced due to the minimum wage upratings.**

Box 3: Inputs and assumptions

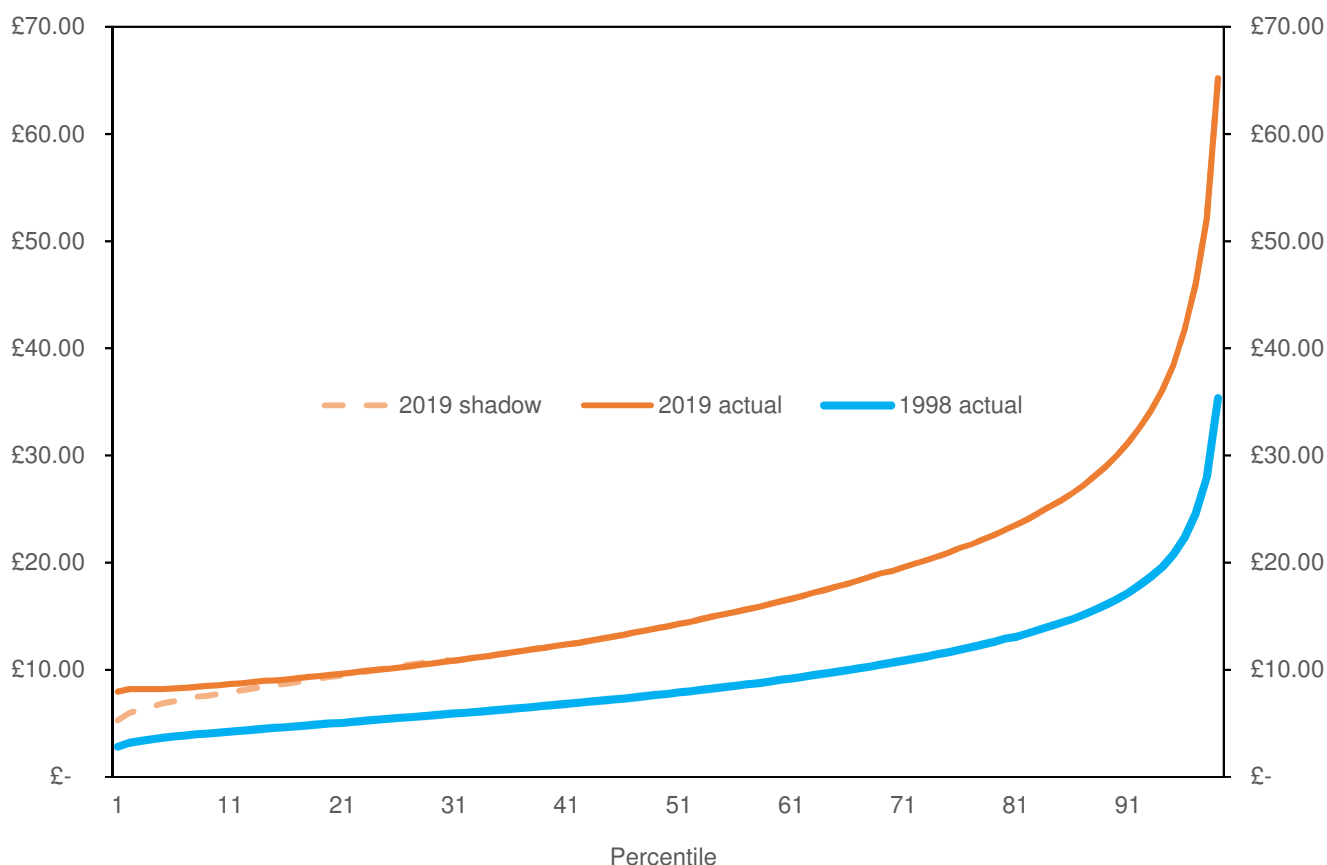
- For the approach below we have used the 1998 wage distribution from ASHE/NES. This is the most recent year of data from before the introduction of the minimum wage in 1999. It is possible that employers may have sought to pre-empt the introduction of the minimum wage by increasing wages of the lowest paid in 1998. It is not possible to adjust for this potential anticipation effect.
- Our key assumption is that percentiles 1 to 29 of the wage distribution would grow at the same rate as the 30th percentile. We choose the 30th percentile as this is akin to the point where we assume spillover effects from the 2019 minimum wage increase went up to (see paras 70-76). This is a different assumption to that done in last year’s IA, where we assumed percentile 1 to 19 of the wage distribution would grow at the same rate as the 20th percentile. This naturally results in a very different figure to that produced last year – we also present figures using the previous assumption (i.e. to the 20th percentile) for comparability.
- **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.

Results

190. 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 2019 distribution. From the 30th percentile upwards the 2018 shadow and actual distributions are identical by design. For reference, the 2019 £8.21 NLW rate cuts in around the 13th percentile of the 2019 shadow wage distribution. In the actual 2018 distribution the NLW hits at around the 5th percentile.

Figure 10: Distribution of hourly earnings (exc. Overtime), UK, workers 25+; 1998, 2019 and estimated 'shadow wage distribution'



Source: BEIS analysis of Annual Survey of Hours and Earnings and New Earnings Survey. Hourly earnings excluding overtime (HEXO)

191. As outlined above and in previous IAs, 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 21 years. This is unlikely given some of the significant shifts in the labour market in the last 21 years (population changes, automation and technology, changes to employment law, improved transparency on business practices etc.)

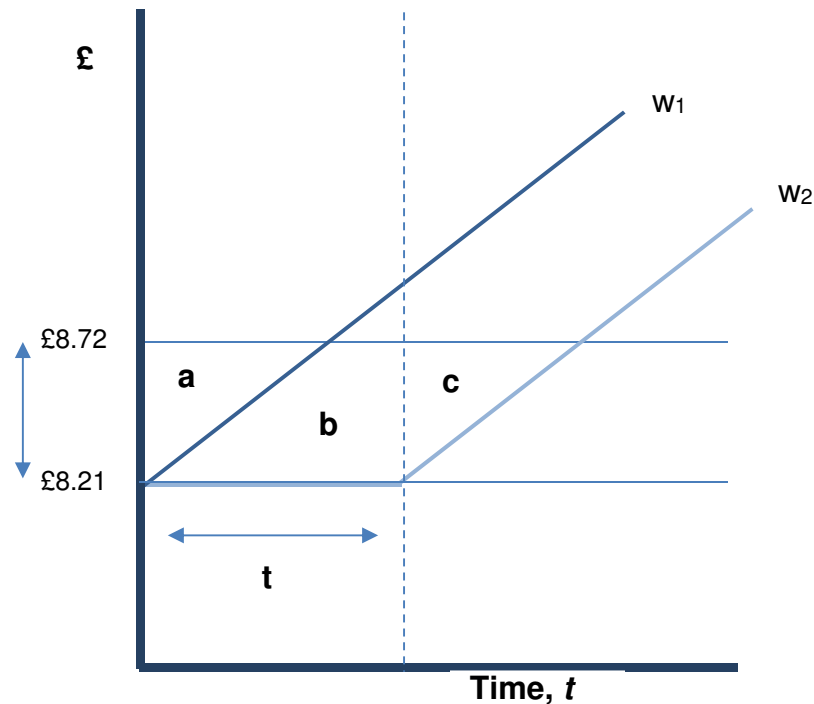
192. Projecting the shadow wage distribution forwards gives an indication of when, in the future, percentiles of the distribution below the current minimum wage level might 'catch-up' with that level based on our assumed growth rate under this framework.

Potential application

193. 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 (i.e. a lower level may influence the growth rate).
194. 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 for some period of time, before growing above zero percent until they 'caught up' with the current minimum wage rate before then growing to meet the incoming rate.
195. As previously mentioned in this IA, both NIESR and the majority of academics that we have consulted believe that the approach to modelling the wage costs of the NLW/NMW implemented 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 described below. **This is a highly stylised example, used to illustrate the theory, and should be treated as such – the assumptions here can be argued to be unrealistic:**
- a) take the average length of time taken for those earning below the proposed minimum wage (£8.72) in the shadow wage distribution (estimated to be those up to the 15th percentile) to catch up to £8.72 [we estimate this to be 5.6 years for the NLW, however this will vary across other rates]²⁸. This effectively solves for *t* in Figure 11.

²⁸ We estimate after how many years each percentile on the shadow wage distribution would reach £8.72. This naturally varies across the percentiles, decreasing in time the higher up we go along the wage distribution. For example, it would take 9 years (from 2019) for someone at the fifth percentile of the shadow wage distribution to reach £8.72. Similarly, it would take someone at the 10th percentile 4 years. We take an average of the number of years, across each of the affected percentiles, to obtain a singular estimate of the length of time that counterfactual wages may grow at zero for.

Figure 11: Crude illustration of wage distribution experiencing zero wage growth for period ^t²⁹



- b) assume that this length of time corresponds to how long those at the bottom of the wage distribution would earn zero wage growth. Here, “those at the bottom of the wage distribution” is defined as those workers who we estimate would be directly covered by the NLW. We use the shadow wage distribution to inform the value of t , to avoid using an arbitrary length of time as an assumption for the period of zero wage growth.
- c) we consequently assume that these workers, who would otherwise experience zero wage growth in this counterfactual scenario, would now benefit from the proposed uplift in minimum wage (£8.72 - £8.21 = 51p per hour worked) over the course of those 5.6 years.

196. We crudely estimate a cost to business by taking the number of people affected by the NLW increase (2.0m in our best case scenario shown in the main body of this IA) and multiply this by the minimum wage uplift (£8.72 - £8.21 = 51p) over the course of the 5.6 years. This is equivalent to summing areas a and b (where b is the area between the two wage distributions and the current and incoming minimum wage rates).

197. Following the 5.6 years, those workers would then experience wage growth, to catch-up with the minimum wage. We therefore add the cost estimated in our best-case scenario to provide an estimated cost to business of £9.2 billion (i.e. = $a + b + c$). 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.

198. It is important to note that this cost is not directly comparable to previous attempts to identify costs arising from a shadow wage counterfactual (as in last year’s IA), as we have altered assumptions regarding counterfactual wage growth (both backward and forward looking) and those regarding the number of people affected. This stylised example illustrates the maximum

²⁹ In this diagram: a corresponds to our preferred approach of appraisal (where the counterfactual growth is estimated as W_1). For the purpose of this modelling $a = c$. W_2 is the alternative counterfactual, which assumes a period of zero wage growth, for length t . b corresponds to the remaining area between the new and old minimum wages.

cost that this methodology would estimate – as suggested above, even in the event that some workers would experience zero wage growth in the absence of a minimum wage, it is highly unlikely for such a large proportion of the wage distribution would experience zero wage growth.

199. **It's important to stress 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, NIESR's research did not uncover positive evidence supporting this approach.

Annex E: Public/Private/Voluntary sector cost breakdown

200. This annex breaks down our best, highest 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 2020, using ASHE 2019, and then applied these proportions to the total costs estimated previously in the impact assessment.

201. When calculating the EANDCB we combine the private and voluntary sectors. The proportion of workers who we expect to be affected in these sectors for the NLW is 95%, whilst for the 21-24, 18-20, 16-17 and Apprentices NMW rates the proportions are 98%, 99%, 99% and 89% respectively. Please note that these values are presented in constant prices, with figures rounded to two decimal places.

Public sector (£m)

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£25.76	£5.61	£35.27	£7.68	£74.32
Main (21-24)	£1.30	£0.28	£1.12	£0.24	£2.94
Development (18 - 20)	£0.10	£0.02	£0.10	£0.02	£0.25
Youth (16 - 17)	£0.01	£0.00	£0.01	£0.00	£0.03
Apprentice	£0.75	£0.16	£0.43	£0.09	£1.43
Total	£27.91	£6.08	£36.93	£8.04	£78.97

High Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£37.75	£8.22	£43.53	£9.48	£98.99
Main (21-24)	£2.10	£0.46	£1.54	£0.34	£4.43
Development (18 - 20)	£0.15	£0.03	£0.12	£0.03	£0.32
Youth (16 - 17)	£0.02	£0.00	£0.01	£0.00	£0.04
Apprentice	£1.04	£0.23	£0.51	£0.11	£1.89
Total	£41.05	£8.94	£45.72	£9.96	£105.67

Low Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£10.13	£2.21	£21.66	£4.72	£38.71
Main (21-24)	£0.59	£0.13	£0.78	£0.17	£1.67
Development (18 - 20)	£0.10	£0.02	£0.18	£0.04	£0.33
Youth (16 - 17)	£0.01	£0.00	£0.03	£0.01	£0.05
Apprentice	£0.38	£0.08	£0.33	£0.07	£0.86
Total	£11.21	£2.44	£22.97	£5.00	£41.62

Private sector (£m)

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£467.44	£101.81	£640.07	£139.41	£1,348.73
Main (21-24)	£48.88	£10.65	£42.10	£9.17	£110.79
Development (18 - 20)	£9.19	£2.00	£9.29	£2.02	£22.51
Youth (16 - 17)	£1.13	£0.25	£1.10	£0.24	£2.71
Apprentice	£5.83	£1.27	£3.36	£0.73	£11.19
Total	£532.47	£115.97	£695.92	£151.57	£1,495.93

High Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£648.99	£141.35	£748.42	£163.01	£1,701.76
Main (21-24)	£67.43	£14.69	£49.63	£10.81	£142.55
Development (18 - 20)	£13.42	£2.92	£10.87	£2.37	£29.58
Youth (16 - 17)	£1.61	£0.35	£1.28	£0.28	£3.53
Apprentice	£8.08	£1.76	£3.99	£0.87	£14.70
Total	£739.53	£161.07	£814.19	£177.33	£1,892.12

Low Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£220.95	£48.12	£472.55	£102.92	£844.55
Main (21-24)	£23.24	£5.06	£30.49	£6.64	£65.44
Development (18 - 20)	£3.85	£0.84	£6.95	£1.51	£13.15
Youth (16 - 17)	£0.41	£0.09	£0.85	£0.19	£1.54
Apprentice	£2.79	£0.61	£2.42	£0.53	£6.35
Total	£251.25	£54.72	£513.27	£111.79	£931.02

Voluntary sector (£m)

Best estimate	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£35.44	£7.72	£48.52	£10.57	£102.24
Main (21-24)	£3.04	£0.66	£2.62	£0.57	£6.90
Development (18 - 20)	£0.40	£0.09	£0.40	£0.09	£0.97
Youth (16 - 17)	£0.05	£0.01	£0.05	£0.01	£0.12
Apprentice	£0.18	£0.04	£0.10	£0.02	£0.34
Total	£39.10	£8.52	£51.70	£11.26	£110.58

High Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£49.87	£10.86	£57.51	£12.53	£130.76
Main (21-24)	£4.20	£0.91	£3.09	£0.67	£8.88
Development (18 - 20)	£0.59	£0.13	£0.48	£0.10	£1.31
Youth (16 - 17)	£0.08	£0.02	£0.07	£0.01	£0.19
Apprentice	£0.22	£0.05	£0.11	£0.02	£0.40
Total	£54.97	£11.97	£61.26	£13.34	£141.53

Low Cost	Direct		Indirect		Total
	Wage Costs	Non-wage Labour Costs	Wage Costs	Non-wage Labour Costs	
NLW (25+)	£15.28	£3.33	£32.68	£7.12	£58.41
Main (21-24)	£1.33	£0.29	£1.74	£0.38	£3.74
Development (18 - 20)	£0.17	£0.04	£0.31	£0.07	£0.58
Youth (16 - 17)	£0.02	£0.00	£0.04	£0.01	£0.07
Apprentice	£0.09	£0.02	£0.08	£0.02	£0.21
Total	£16.89	£3.68	£34.85	£7.59	£63.01

Annex F: Coverage of the NMW/NLW (April 2019) by low paying sector and region

202. The tables below list coverage of the NLW and the NMW rates by region, area and low paying sector, as defined by the RPC. The choice of counterfactual assumption is crucial for determining coverage in April 2020; hence they may differ to the LPC's estimates. The figures below are based on our central scenario of 0.78% 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.

Region	Coverage of all NLW and NMW rates - projected number of workers paid at or below in April 2020	
	NLW	NMW rates
North East	99,000	23,000
North West	252,000	51,000
Yorkshire & Humber	198,000	42,000
East Midlands	182,000	34,000
West Midlands	190,000	41,000
South West	166,000	33,000
East	177,000	32,000
London	187,000	16,000
South East	223,000	36,000
Wales	105,000	19,000
Scotland	137,000	33,000
Northern Ireland	86,000	29,000
Total	2,003,000	389,000

Area	Coverage of all NLW and NMW rates - projected number of workers paid at or below in April 2020	
	NLW	NMW rates
Tees Valley and Durham	46,000	8,000
Northumberland and Tyne and Wear	54,000	15,000
Cumbria	19,000	4,000
Greater Manchester	93,000	17,000
Lancashire	53,000	14,000
Cheshire	35,000	9,000
Merseyside	53,000	7,000
East Yorkshire and Northern Lincolnshire	38,000	6,000
North Yorkshire	29,000	8,000
South Yorkshire	51,000	11,000
West Yorkshire	80,000	18,000
Derbyshire and Nottinghamshire	82,000	16,000
Leicestershire, Rutland and Northamptonshire	68,000	12,000
Lincolnshire	32,000	6,000
Herefordshire, Worcestershire and Warwickshire	44,000	11,000
Shropshire and Staffordshire	57,000	13,000
West Midlands (county)	89,000	16,000
East Anglia	83,000	14,000
Bedfordshire and Hertfordshire	44,000	8,000
Essex	51,000	10,000
Inner London – West	41,000	3,000
Inner London – East	42,000	4,000
Outer London – East and North East	36,000	4,000
Outer London – South	24,000	2,000
Outer London – West and North West	44,000	3,000
Berkshire, Buckinghamshire and Oxfordshire	51,000	7,000
Surrey, East and West Sussex	75,000	11,000
Hampshire and Isle of Wight	47,000	12,000
Kent	50,000	7,000
Gloucestershire, Wiltshire and Bristol/Bath area	73,000	13,000
Dorset and Somerset	35,000	9,000
Cornwall and Isles of Scilly	20,000	3,000
Devon	39,000	9,000
West Wales and The Valleys	64,000	10,000
East Wales	41,000	8,000
North Eastern Scotland	12,000	3,000
Highlands and Islands	12,000	2,000
Eastern Scotland	48,000	12,000
West Central Scotland	40,000	10,000
Southern Scotland	25,000	6,000
Total	2,003,000	389,000

<i>Low paying sector</i>	<i>Coverage of all NLW and NMW rates - projected number of workers paid at or below in April 2020</i>	
	NLW	NMW rates
Agriculture	20,000	3,000
Food processing	69,000	4,000
Textiles	11,000	-
Retail	354,000	87,000
Hospitality	280,000	107,000
Security and enforcement	22,000	1,000
Cleaning and maintenance	282,000	8,000
Social care	132,000	9,000
Childcare	65,000	21,000
Leisure	24,000	16,000
Hair & beauty	28,000	17,000
Office work	68,000	9,000
Non-food processing	61,000	7,000
Storage	87,000	7,000
Transport	77,000	10,000
Call centres	7,000	2,000
Non-low paying sectors	417,000	81,000
Total	2,003,000	389,000

Annex G: Specific Impact tests

Equality Analysis

203. 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.
204. 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.
205. This Equality Analysis considers the potential equality impacts of the National Minimum Wage and National Living Wage upratings.
206. 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.

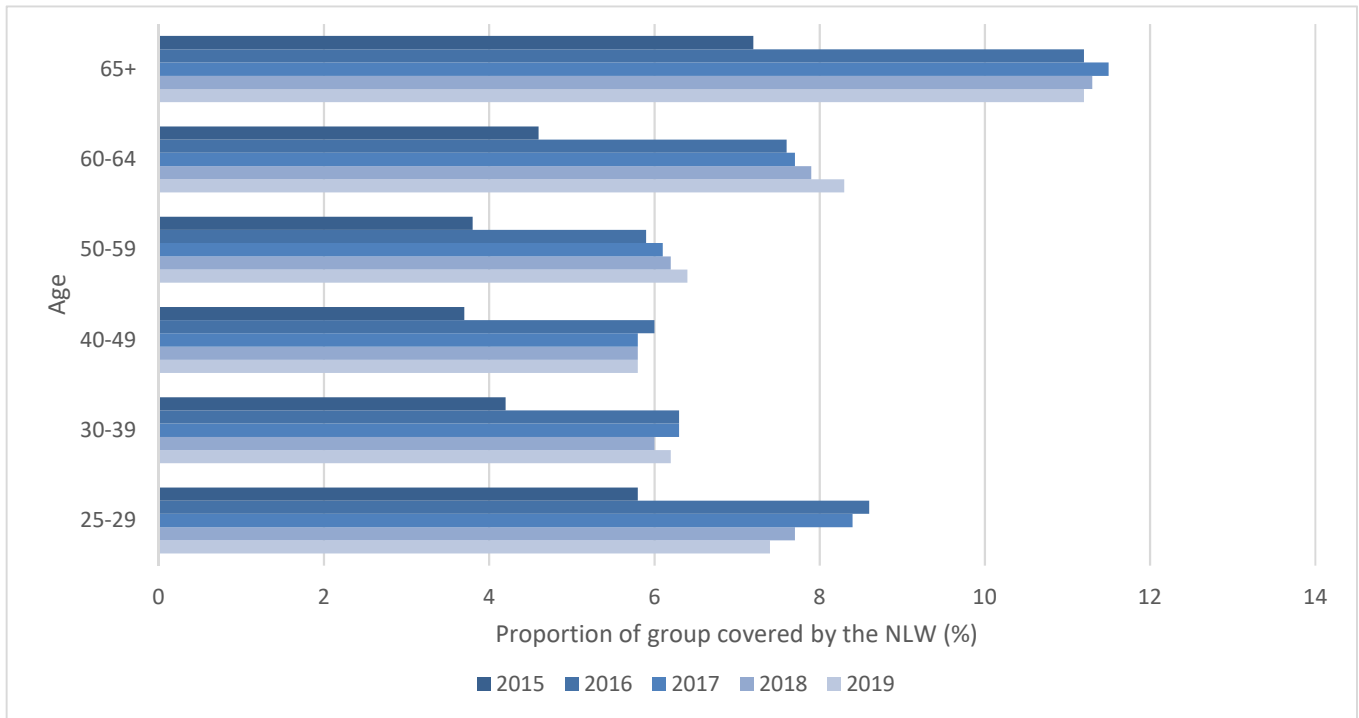
Estimating pay rates by personal characteristics

207. 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.
208. 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 have replicated their findings for the latest quarter of available data and present the findings below.

Age

209. Figure 11 shows the estimated coverage of the NMW/NLW from 2015 to 2019 by age. The LPC estimate that coverage is highest for older workers, with 11.2 per cent of those aged 65 and over paid at the NLW, despite falling slightly since 2018. The share of workers between 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 11: Coverage of the NMW/NLW by age, UK 2015-2019



Source: LPC estimates using ASHE 2010 methodology, low pay weights, UK, April 2015-19. Data excludes first year apprentices

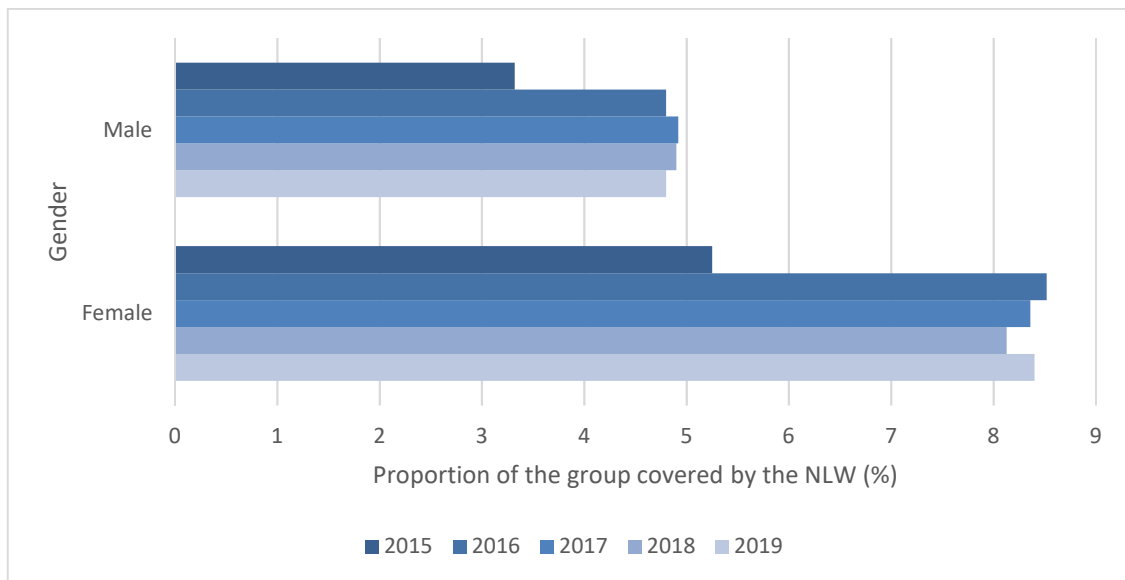
Gender

210. Figure 12 estimates the gender composition of the coverage of the NMW/NLW over time. Coverage of the NMW/NLW is higher for females (8.4%) than for males (4.8%). This disparity is largely due to women being more likely to work in low-paid roles and part-time³⁰.

211. LPC estimates suggest that a higher percentage of all NLW jobs are held by women, showing 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. We have also found no evidence that increases in NMW/NLW rates cause gendered effects on employment. Figure 14 shows that between Q1 2018 and Q1 2019 employment increased at a faster rate for women (0.6%) than for men (0.3%)

Figure 12: Coverage of the NMW/NLW for workers aged 25 and over, by worker and job characteristics, UK, 2015-19

³⁰ ONS (2017) *How do the jobs men and women do affect the gender pay gap?*, Office for National Statistics <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/howdothejobsmenandwomendoaffectthegenderpaygap/2017-10-06>



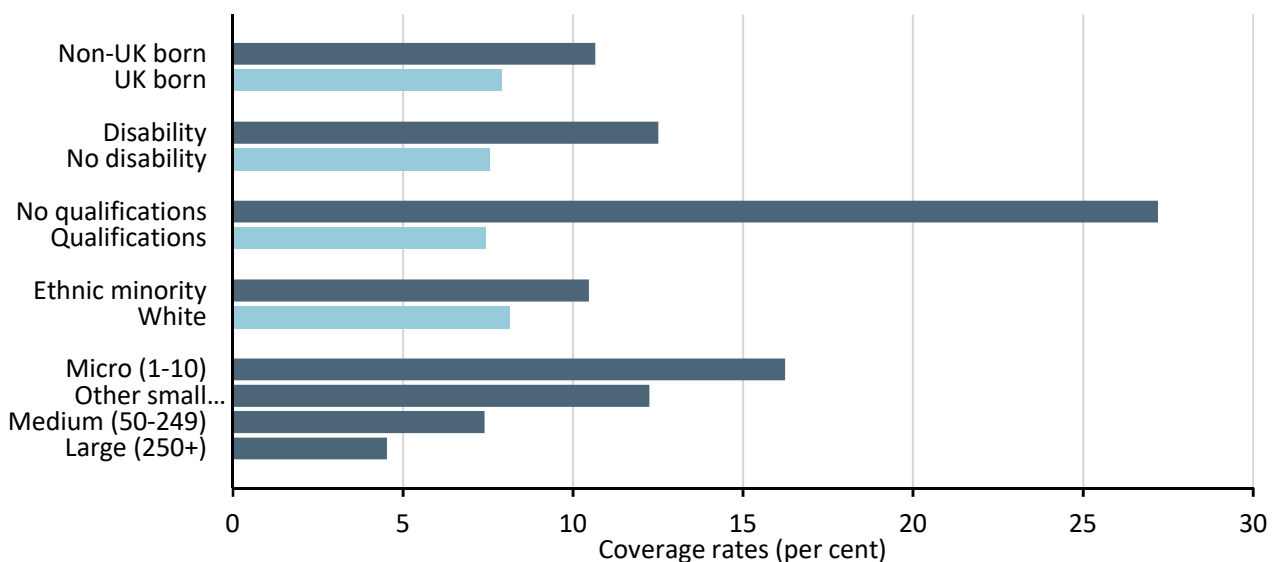
Source: LPC estimates using ASHE 2010 methodology, low pay weights, UK, April 2015-19. Data exclude first year apprentices.

Disability

212. Further supporting analysis by the LPC shows a greater proportion of employees with a disability (12.5%) were in jobs covered by the NMW/NLW compared to those without a disability (7.6%). There is also no evidence of NMW/NLW rates reducing employment for these groups, Figure 14 shows that between Q1 2018 and Q1 2019 the employment rate has risen at a faster rate for those with a disability (1.5%) than for those without (0.5%).

213. These findings suggest that there are no adverse effects of last year's increases in the NMW/NLW rates on individuals with this protected characteristic. If the proposed increases are implemented, there are likely to be disproportionate positive impacts felt among employees with a disability as a result of the increase in rates.

Figure 13: Coverage of the NLW for workers aged 25 and over, by worker characteristic and workplace size, UK, 2018-2019



Source: LPC estimates using LFS microdata, income weights, quarterly, imputed wages, not seasonally adjusted, UK, Q2 2018-Q1 2019.

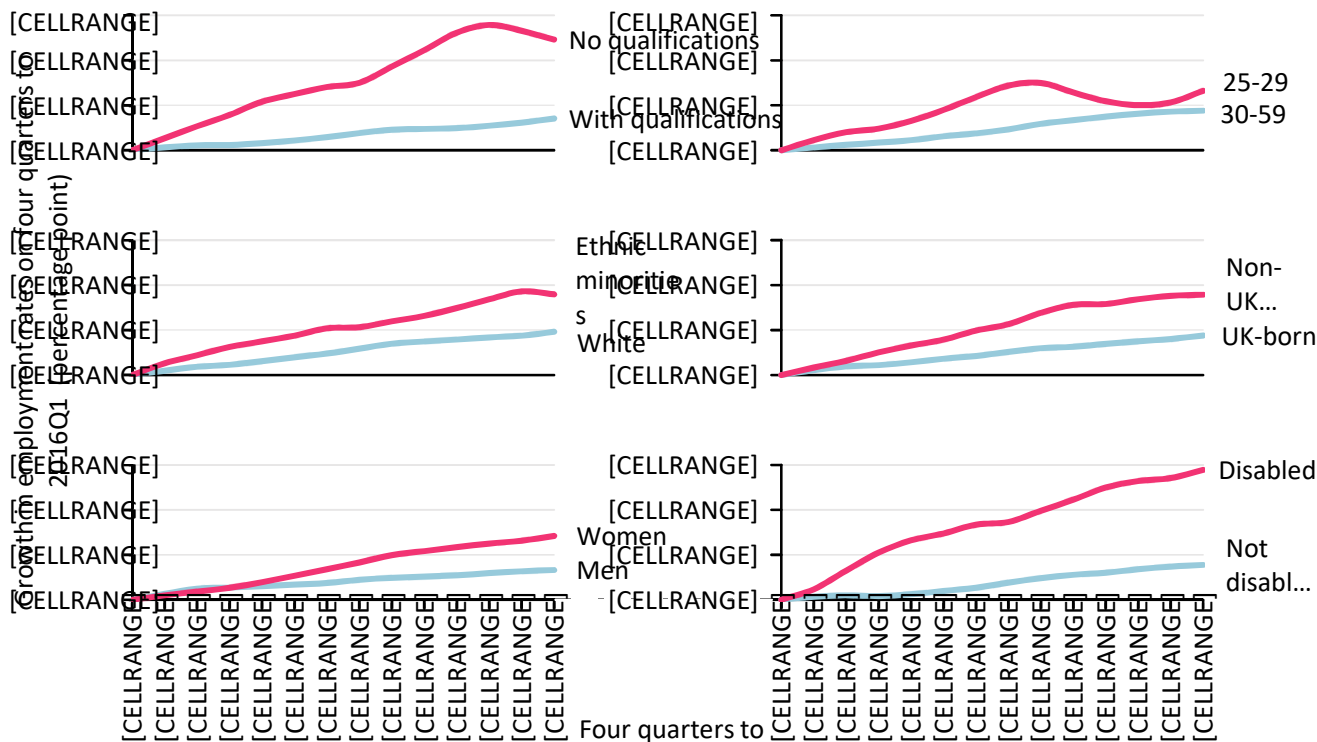
Ethnicity

214. Figure 13 shows that, between Q2 2018 and Q1 2019, a greater proportion of employees who identified with an ethnic minority group (10.5%) were employed in jobs paid less than or close to the NMW/NLW compared with white employees (8.1%). 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, those born outside of the UK (10.7%) were more likely than those born in the UK (7.9%) to be in jobs paid less than or close to the NMW/NLW.

215. Figure 14 estimates that, even with coverage of the NMW/NLW being greater for these groups, between 2018 and 2019 employment has risen at faster rates for ethnic minority groups (1.3%) and those born outside of the UK (0.7%) than for white people (0.4%) and those born in the UK (0.4%).

216. These findings suggest that there are no adverse effects of past increases in NMW/NLW rates on individuals who identified with an ethnic minority group, 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 are likely to be disproportionately positive.

Figure 14: Change in employment rates for those aged 25 and over, by personal characteristics, UK, 2016-2019



Source: LPC estimates using LFS Microdata, population weights, quarterly, four quarter moving average, UK, Q2 2015-Q2 2019.

217. 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 we have found no evidence of the potential for any negative impacts.

218. 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.

219. 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

220. 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. Some firms do not use pay structures based on age-related rates, negating risks of increased discriminatory recruitment policies.

Fostering good relations

221. 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

222. 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.

223. The 6.2% increase in April 2020 from the current NLW of £8.21 to £8.72 will mean a full-time minimum wage worker aged over 25 will earn £799 more over the course of the year compared to the current year.

224. Statistics produced by the ONS (2019) suggest that employment has grown more quickly for single parents and hence the effect of the proposed increases in the NMW/NLW rates is therefore likely to have a disproportionately positive effect on this group. We therefore believe that this policy will have a positive impact on families coping with couple separation.

225. Additionally, 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.³¹

226. Finally, the LPC provide some analysis in Chapter 9 of their 2019 report, highlighting how a married couple household, with two children and only one working parent, would see their weekly income rise in cash terms by £10.73 due to the NLW (assumes 30 hours worked a week). Once adjusting for tax and benefits, assuming the household is in receipt of Universal Credit, the LPC estimate that their after-tax pay would increase by 2.5%. They also find that similar hypothetical households on the 21-24-year-old NMW rate would benefit from the

³¹ 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_FINAL_2017_Report.pdf

proposed uprating, with a weekly income rise in cash terms of £15. We therefore believe that this policy will have a positive impact on family members' ability to play a full role in family life, as well as positively affecting families going through key transitions such as becoming parents.

Annex H: Past analysis on the counterfactual

227. 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.
- 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). This included an extensive literature review, consultation with labour market and regulatory experts and structured in-depth qualitative interviews with employers, employer trade bodies and trade union representatives. Their full report can be found at: <https://www.gov.uk/government/publications/national-minimum-wage-evaluation-counterfactual-research>
- Questionnaire to labour market academic experts on NIESR's findings – further details of this can be found in Annex B and throughout this IA.