Contribution to the Department of Business, Energy and Industrial Strategy (BEIS) Engagement with Academics on the National Minimum Wage (NMW) Counterfactual

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Impact assessment of the NMW and NLW upratings

- The impact assessment aims to inform the government's response to recommendations on uprating the NMW and NLW from the Low Pay Commission.
    - There is a specific proposal from the Low Pay Commission to uprate the NMW and/or the NLW from its current level to £X per hour.
    - The government needs to take a decision on whether to adopt that proposal.
    - The impact assessment by BEIS informs the government's decision by assessing the impact of the proposed uprating on the cost to business and expressing this as an intuitive statistic.
    - The metric to express the impact assessment is as a "catch-up" time. This is the time (in quarters) that it would take wages of the lowest paid workers (who are currently earning the NMW/NLW) to grow to the level that is being proposed as the uprated NMW/NLW.
- The impact assessment is based on a counterfactual of "what would happen to the wages of the lowest paid workers if the NMW/NLW uprating did not happen."
    - The counterfactual is "marginal": the question is what would happen to the wages of these workers if the proposed minimum wage uprating did not happen, but the NMW/NLW remained in place at its current level.
- The proposal is to use wage growth "at the lowest percentile of the wage distribution that is not affected by minimum wage spillovers" as the counterfactual wage growth of the lowest paid workers.
    - Using the estimated model in Dickens, Manning and Butcher (2012), NIESR estimates the "no spillovers" point to be the 15th percentile.
    - Based on (other) model estimates and conversations with experts, NIESR recommends using "historical average quarterly wage growth" at the 20th percentile.
- "NIESR recommended we use a uniform (i.e. the same for all quarters) counterfactual growth rate for all workers affected by all the NMW/NLW rates."
    - The same wage growth rate is applied to all quarters in the counterfactual forecast.
    - The same wage growth rate is applied to all workers affected by the minimum wage that is relevant to them.

- NIESR recommends to "adapt the counterfactual wage growth to the business cycle outlook when deciding which historical period of wage growth to use".
  - The specific recommendation includes two steps: (1) "assess available forecasts (e.g. BoE, OBR, IMF) to judge where in the business cycles the economy is likely to be over the appraisal period", and (2) choose the historical period of wage growth correspondingly.
  - To facilitate implementing this recommendation, NIESR "proposed three different time periods covering different parts of the business cycle".

1. **a) Do you agree that the 'catch-up' concept for estimating the impact of the NMW/NLW uprating, is the most appropriate methodology to appraise the minimum wage?**
   - Disagree

   b) Please provide further details on your answer above.

   c) If you disagree / strongly disagree, what do you believe is a more appropriate methodology? Please provide details.

We agree that it is important to summarize the impact assessment into an intuitive statistic. However, we are confused why the cost to business is expressed in units of time rather than units of money, and we believe that the catch-up time may give a misleading picture of the cost to business. The reason is that catch-up time measures *how long* businesses must pay these workers above their market value, but not by *how much*. As a first-order approximation, the per-worker cost to business of a proposed uprating will be proportional to the catch-up time *squared*, rather than to the catch-up time.

For simplicity, let us assume, consistent with the proposed methodology, that wage growth of workers affected by the minimum wage is the same across workers and constant over time. Assume that counterfactual wage growth is 0.68% per quarter. Consider two proposals: (1) uprating the minimum wage by 5.4%, or (2) uprating the minimum wage by 2.7% and again by 2.7% after one year. The catch-up time is 4 quarters for a 2.7% uprating and 8 quarters for a 5.4% uprating, so the total catch-up time for both proposals is the same (8 quarters). However, the cost to business of the first proposal is clearly much larger, because businesses will "overpay" workers by much more in the first year after the uprating.

The per-worker cost to business equals one half times the size of the uprating (which is the average amount by which affected workers are "overpaid") times the catch-up time. Since the catch-up time is proportional to the size of the uprating (under the assumption of constant wage growth), the per-worker cost is proportional to the catch-up time squared.

Finally, note that the total cost to business will depend not only on the per-worker cost of the uprating, but also on the number of workers that are affected, which itself will depend on the size of the uprating as well.

2. **a) We use the latest ASHE wage distribution as the starting point for the counterfactual. Do you agree with this approach?**
    - Agree

    b) Please provide further details on your answer above.

    c) If you disagree / strongly disagree, what counterfactual 'wage distribution' do you believe is most suitable to use as a starting point, and how do you suggest we measure/capture this? Please provide details.

    The ASHE seems the appropriate dataset for this purpose. Since the data are employer-reported, the number of observations is larger than in the Labour Force Survey, and noise is likely to be less.

3. **a) We use the lowest percentile in the wage distribution where there are no spillovers from NMW/NLW as a proxy for counterfactual wage growth of minimum wage workers. Do you agree with this approach?**
    - Strongly agree

    b) Please provide further details on your answer above.

    c) If you disagree / strongly disagree, what do you believe is a more suitable proxy for counterfactual wage growth? Please give details.

    While the choice of a specific percentile as "the lowest that is not affected by the minimum wage" is always somewhat arbitrary, the approach is simple and transparent. The alternative would be to use an estimated structural model, which is much worse. Any structural model requires assumptions, which are to some extent arbitrary and therefore open to discussion and political manipulation.

    The choice of the 20%-tile seems reasonable, and the choice is well justified in the NIESR report. The ripple effects of the minimum wage affect wage growth of workers paid well above the minimum wage, and using workers who are affected by the minimum wage to estimate counterfactual wage growth will underestimate counterfactual wage growth, because these workers see their market wages grow less (because they are already paid above their market value).

    As a minor improvement, we suggest it may be better to use a range of percentiles rather than a particular percentile, e.g. average wage growth in the 20-25%-tile of the distribution. The advantage is that this will increase sample size and reduce noise.

    In addition, it may be worth looking at data for other countries, to help identify the correct threshold. Ripple effects of the minimum wage will depend on the size of the uprating, and are likely to be dynamic, initially affecting only the lower quantiles of

the wage distribution, but over time propagating to higher quantiles as well, see Harasztosi and Lindner (2018).

4. **a) Are you familiar with the regression model used in Butcher et al. (2012) to evaluate the impact of the NMW at different points of the earnings distribution?**
   - Not very familiar

   bi) If you are familiar with this model used in Butcher et al. (2012), do you believe NIESR's application of the model to identify where spillovers are present in the wage distribution is a suitable way to detect where the 'ripple effect' from the NMW/NLW stops?
   - Yes

   bii) If no, why do you say that?

   From a casual reading of the paper and the NIESR report, the model seems appropriate for the purpose, and NIESR's application of it correct.

5. **a) NIESR recommended an *average* uniform growth rate (i.e. the same in every quarter) for all minimum wage workers. Do you believe this is a sensible approach for estimating the impact of NMW/NLW upratings?**
   - Yes / No

   b) Please provide further details on your answer above.
   c) If no, what approach do you believe would be more suitable? For example, would a business cycle approach be appropriate? Please provide further details.

   There are at least three different aspects to this question.

   First, counterfactual wage growth is assumed to be the same across different minimum wage workers. While we believe there is substantial confusion in the proposed methodology on this point (see our response to the question 6 below), we also feel that any other assumption would be arbitrary and therefore open to manipulation. We therefore agree that it is sensible to assume a single counterfactual growth rate across all affected workers.

   Second, counterfactual wage growth is assumed to be the same in all quarters going forward, until the market value of affected workers "catches up" with the proposed uprated minimum wage level. Again, we believe that, while clearly unrealistic, this assumption is probably better than the available alternative, which would require additional assumptions and would therefore be more arbitrary and open to manipulation. It is important to note that this assumption does *not* imply that we would expect wage growth to be constant over e.g. 7 quarters. The catch-up time is just a way to summarise the (cost to business of the) proposed uprating, and it makes most sense to construct that summary measure under a constant growth rate. A correct interpretation of the catch-up time should be how long it would take the market value of affected workers to catch up with the proposed minimum wage uprating *at current levels of wage growth*. As a minor suggestion for improvement: If

wage growth is assumed to be constant, then why not use annual wage growth from the ASHE instead of quarterly wage growth from the LFS?

Third, counterfactual wage growth is assumed to be the same across different stages of the business cycle, although the proposed methodology includes an attempt to "adapt the counterfactual wage growth to the business cycle outlook when deciding which historical period of wage growth to use". We find the proposed method rather confusing on this topic, see question 8 below for more detail.

6. **a) To what extent do you agree with the statement 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'*?
    *   Tend to agree
    b) Please provide reasons for your answer.

First, in answer to the question: Workers at the bottom of the pay distribution earn the minimum wage. This minimum wage is set by the government at a level that is higher than the market wage for these workers. Therefore, workers at the bottom of the distribution are likely to earn more than their market value (to the firm). As productivity grows, the market value of these workers would increase, alongside the market value of all other workers. However, since their wage is already higher than their market value, their wage would not necessarily be increased in response.

This argument relies heavily on the existence of a minimum wage. In the absence of a minimum wage, all workers, including those at the bottom of the distribution, would be a paid a wage that is equal to or at least related to their market value. In this case, there is no reason to believe that wage growth at the bottom of the pay distribution would be any less than elsewhere in the distribution. Wages of all workers would reflect productivity, at least to some extent. Productivity increases with technological progress. In recent decades, technological progress has often been biased towards high-skilled workers, whose wages are higher up in the pay distribution, but there is no reason to believe that this is always the case, and in fact in the past the opposite has been true as well, see Balleer and van Rens 2013 (in particular the discussion in the Conclusions section).

We found there was some confusion in the description of the proposed methodology regarding this issue. We believe the confusion probably derives from the choice to base the impact assessment on a "marginal" counterfactual, and we would like to take this opportunity to try and clarify this point.

In a "global" counterfactual exercise, i.e. thinking about wage growth in the complete absence of a minimum wage, things are quite clear. All workers, including those with wages below a proposed minimum wage, earn a wage that is related to their market value, and it makes sense to assume that wage growth is the same for all of these workers. However, in a "marginal" counterfactual, i.e. thinking about wage growth if the proposed minimum wage uprating did not happen, *but a*

minimum wage remains in place at the current level, things become much more complicated, and in particular the assumption that counterfactual wage growth is the same for all workers, or for all workers below a certain threshold, becomes very strenuous.

In a wage distribution with a minimum wage, there is substantial heterogeneity among workers that are affected by the minimum wage (i.e. with wages at or slightly above the minimum wage). Some workers who earn the minimum wage would have earned the same wage in the absence of minimum wage regulation, because their market value is at that level. Other workers who earn the minimum wage have market values that are lower. This second group of workers would earn less in the absence of minimum wage regulation but earn the minimum wage because it is illegal to pay them less.

What happens to wage growth of workers that are affected by the minimum wage? As productivity increases, the market value of all workers goes up. For those workers whose market value was at the minimum wage, their increased productivity should translate into wage growth. However, for workers with market values well below the minimum wage, wage growth would be much lower or even at or close to zero.

We would like to emphasize that we are *not* arguing to change the assumption that counterfactual wage growth is the same for all workers affected by the minimum wage. In fact, we believe, as mentioned in question 5 above, that this assumption is probably the most workable and transparent one. However, we want to point out the confusion that arises because of the "marginal" nature of the counterfactual exercise and make a plea to clarify who exactly are the workers whose counterfactual wage growth we are trying to estimate. Note that this is just a clarification, which should not change the estimation procedure, because in the end counterfactual wage growth of affected workers is estimated from workers that are *not* affected. For these workers, the heterogeneity issue does not arise.

7. **In the absence of the NMW/NLW, what in your view would be the biggest factor firms would anchor pay to? In other words, what would be the strongest determinant of the wage rate for the lowest paid workers in the absence of a UK minimum wage? Please provide evidence to support this view if possible.**

Most of this note was written under the standard assumption in economics that the main determinant of wages is the marginal productivity of workers to a firm. In modern labour market models, wages do not equal the marginal product of labour, but they are still very much related to it (see e.g. Pissarides 2000).

While the assumption that wages are strongly related to productivity is plausible, the evidence for it is not strong. Instead, there is some evidence that the main determinant of wages is workers' job opportunities outside the firm where they are currently employed (see e.g. Hagedorn and Manovskii 2013, Karahan et al. 2017). In

this context, it may be worth pointing out that it is increasingly clear that the relevant comparison for employed workers is with other employed workers at different firms, and that the unemployment rate seems to have little to no effect on the level of wages (Faberman et al. 2018, see also Hall and Milgrom 2008, Hall and Krueger 2012). This is why throughout this note we have tried to use the phrase "market value" rather than "productivity" as the main determinant of wages, and the best answer to the question what firms anchor wages to is probably the slightly unsatisfactory "to the wages their competitors pay".

Finally, there is some evidence that "social norms" or fairness considerations about the intra-firm pay structure are important for wage setting (Gartenberg and Wulf 2017). Unionization matters too, and is associated with a compressed wage distribution (Fortin and Lemieux 1997, Dustmann and Schönberg, 2009). In general, market imperfections, both on the labour and on the goods market affect wages as well (Wong 2018).

8. **Do you have any other comments regarding NIESR's approach and minimum wage counterfactual more broadly? In particular, any thoughts on estimating long-run impacts from previous years' upratings would be welcome.**

The proposed methodology uses past wage growth to forecast (counterfactual) wage growth in the future. Using past data to forecast the future is a standard and sensible approach, but the forecasting method proposed here seems particularly naïve. The proposal is to use historical wage growth as a forecast future counterfactual wage growth. The period of historical wage growth is chosen depending on the business cycle outlook.

Constant wage growth in the future is a good forecast if wage growth (approximately) follows a random walk. We did not find any evidence in the proposal that this is a good assumption. It seems to us that while wages may be close to a random walk, it is unlikely that wage *growth* is (i.e. that wages are integrated to the second order). While the simplicity of this approach is attractive, it seems that a forecasting procedure that is only marginally more complicated, e.g. estimating an ARIMA for wages, may have substantially better forecasting properties than a random walk in growth rates.

A second, and less important, comment relates to the adaptation of the forecast for the stage of the business cycle. The idea is that the BoE/OBR/IMF judge whether the UK economy is in a recession or in an expansion, and that BEIS then chooses a period of historical wage growth in a recent recession or expansion accordingly. The first observation about this procedure is that, while there is some evidence that business cycle fluctuations evolve over three -or recently perhaps two- clearly separated stages, this view is not uncontroversial, and most macroeconomists think of business cycles are more continuous stochastic processes. A second, related, observation is

that this procedure makes the impact assessment very sensitive to the assessment whether the economy is judged to be in a recession or in an expansion, perhaps even opening it to political manipulation. Third, and related to the first point in the previous paragraph, a slightly more sophisticated forecasting procedure that uses a longer period of past data, including both contractions and expansions, would circumvent this problem.

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