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The impacts of changes to the NMW, including NLW, on household incomes

Report for the Low Pay Commission

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Executive Summary

This report explores how various NLW/NMW scenarios would affect household income and consumption, by evaluating household labour supply and consumption decisions. By integrating NIESR's household-level analysis within a regional macro-econometric model, we are able to capture dynamic effects and develop household level projections that are aligned with macroeconomic models.

We considered nine scenarios in total – each a combination of one of three NLW scenarios and one of three scenarios for the 18-20 Year Old Rate. The three NLW scenarios were: i) a low scenario which maintained the real value of the NLW; ii) a continuation of current policy scenario which maintained the bite of the NLW at two-thirds of median earnings; and iii) a high scenario in which the bite increased to 70 per cent of median earnings by 2029. The three youth scenarios were: i) gradual alignment of the 18-20 Year Old Rate with the NLW by 2029; ii) reducing the age of eligibility for the NLW one year at a time between 2027 and 2029; and iii) immediately reducing the age of eligibility for the NLW in 2026.

We found that minimum wage households are located right across the household income distribution. This means that different households respond to minimum wage increases in different ways. Generally speaking, we find only small reductions in labour supply as a result of the increase in the minimum wage, which we attribute to the income effects of a minimum wage increase, although it could also be a result of constraints on labour demand imposed by the macroeconomic model.

For lower income minimum wage households, an increase to the minimum wage provides a relatively larger increase to their total household income. This translates to larger increases in consumption. However, our analysis finds that low-income households are more likely to engage in precautionary savings, so the increase in consumption is not as large as the increase in income for low-income households. In contrast, NLW households in the middle of the household income distribution see similar increases to consumption as income.

We are also able to show the differential response of different household types. Couple households generally see a smaller effect on their overall income, which is likely due to the fact that one member of the couple may be a minimum wage worker while the other is not. However, the increase to their income brought about by the minimum wage is reflected in a similar increase in the household's consumption. In contrast, single-adult households, while benefitting from larger increases to their household income, are more likely to engage in precautionary savings – their consumption does not increase by as much as their income.

Finally, we evaluated the various policy paths specified in each scenario. We find that maintaining the current policy results in noticeably higher income and consumption for minimum wage households than an alternative policy that only maintains the real value of the NLW. However, the results suggest the difference between maintaining a bite of two-thirds median hourly earnings and increasing the bite to 70 per cent is minimal. Of the youth path scenarios, immediately reducing the age of eligibility for the NLW to 18 produces the largest increase in income and consumption for NLW households, although the benefits of this scenario are likely concentrated in households with 18-20 year olds.

Although we find that minimum wage increases produce noticeable increases in income and consumption for the minimum wage households, the impacts are much smaller from an overall macroeconomic perspective. This is because minimum wage increases affect a minority of households, and the macroeconomic environment limits the transmission of minimum wage increases across the wider distribution.

Introduction

In NIESR's previous submission to the LPC (NIESR, 2023), we found that the rise in the National Minimum Wage (NMW) and National Living Wage (NLW) in 2022 and 2023 not only increased the income and consumption of households but also led to higher labour-market participation and lower unemployment. These effects applied above all to households in the second income decile.

In the present project, we extend this analysis to examine the impact of further headline increases in the NMW and NLW on household incomes in the United Kingdom. Our focus is on household finances, particularly income, but also consumption and savings, as well as impacts on labour market outcomes and taxes and benefits. The research pursues three main objectives.

First, we aim to achieve an accurate placement of NMW and NLW workers, and their households, within the income distribution. Rather than relying on simplified assumptions, we draw on the UK Wealth and Assets Survey from 2017-18, combined with supplementary data sources, to construct a more precise representation of benefit units across the income distribution.

Second, we simulate individuals over time to assess the counterfactual effects of alternative policy trajectories. The LPC provided three possible paths for the evolution of the NLW and NMW, alongside three potential alignment scenarios for the NMW applicable to 18-20 year olds, yielding a total of fifteen scenarios. This allows us to explore the implications of different policy combinations for household incomes and labour market outcomes.

Third, we integrate spatial and behavioural heterogeneity through the combined use of our regional model NiReMS and our household-level model LINDA (Bhattacharjee et al., 2024). This framework employs dynamic microsimulation aligned with regional macroeconomic projections to capture spatial variation. It models both income and substitution effects while incorporating improved representation of labour market behaviour and the complex interactions between wages, taxes and benefits.

Finally, we differentiate impacts across socio-demographic groups. As demonstrated by Cribb et al. (2021), the effects of minimum wage changes vary substantially by household type. Our modelling framework allows us to capture these important heterogeneities with greater precision, thereby providing a more nuanced understanding of how changes in the NMW and NLW affect different groups within the population.

The rest of this report is as follows. Section 1 provides a short literature review on the employment and income effects of minimum wages. Section 2 sets out in detail the model and discusses the data we use. Section 3 presents the results of our simulation. Section 4 discusses the limitations of our analysis and Section 5 offers some concluding thoughts.

1. Literature Review

Minimum wages once in place are commonly used as a tool to reduce the discrepancy between low and median wages by setting a specific target, as is the case in the UK where the ambition has been for minimum wages to reach two-thirds of median wages. From the outset, it is clear that the introduction of minimum wages requires an accurate measurement of the wage distribution to set National Minimum Wage (NMW) rates and develop an understanding of how this interacts with the individuals and hence households further up the wage distribution. Dickens and Manning (2004) find that the introduction of the NMW in April 1999 had a significant impact on the wage distribution as 6-7 per cent of all workers benefitted directly, raising the pay of around 1.3 million workers by about 15 per cent on average.

Most studies in the literature focus on the employment effects of the minimum wage. For example, Bryan et al. (2013) find that job retention elasticity estimates are mostly positive but the results are not statistically significant. Using multiple datasets (LFS, BHPS, NES), they find no significant disemployment effects across various specifications. Similarly, Dolton et al. (2015) conduct spatial analysis using geographical variation in minimum wage bite. There is no discernible effect of the NMW introduction or its uprating on employment but their analysis shows how more naïve estimation may have revealed the various widely different positive and negative effects found in some of the earlier literature. Hafner et al. (2017) find no significant adverse employment effect of the NMW in the UK. The employment elasticity of -0.0097 means that a 10 per cent increase in the NMW reduces employment by 0.09 per cent. There is no evidence of publication selection bias. At the same time, estimates for different sub-groups suggest some relatively larger adverse employment effects for some labour market groups, such as part-time employees (cf. Machin et al., 2003; Hafner et al., 2017).

However, according to Brewer et al. (2019), the data are consistent with both large negative and small positive employment impacts, while difference-in-difference (DiD) designs present significant challenges in conducting inference appropriately, which means that much of the existing research has likely under-stated the statistical imprecision of its key parameter estimates. All of which "casts doubt on the consensus that the UK NMW does not harm employment" (Brewer et al., 2019: 23).

Fewer studies have explored the impacts of the minimum wage across the wage distribution and the subsequent implications for household income. A few exceptions are Dube (2019a) who reviews international evidence on the impact of minimum wages on earnings and household incomes in the UK, US and Germany, among others, finding a median own-wage employment elasticity (OWE) of -0.16 across 48 estimates. OWE denotes the ratio of the percentage change in employment for affected workers, divided

by the percentage change in the average wage for affected workers. For broad worker groups, the median OWE is near zero (-0.04). Generally, there are small employment effects, with price adjustments as the primary margin, while minimum wages significantly increase the earnings of low paid workers. Cenzig et al. (2019) investigate the impact of minimum wages on earnings and household incomes in the US, and Giupponi et al. (2024) examine the effects of the NLW on household income in the UK for the period 2015-2019.

In light of the literature, it is clear that minimum wages and household income present a complex relationship. First, there is the question of the position of minimum wage workers in the household income distribution and the proportion of household income that comes from their wages. Second, as a worker's income rises, their tax obligation might increase, or benefits entitlements might decrease. This implies that the rise in net family income for certain workers may be significantly less than the increase in their gross income. Giupponi et al. (2024) find that the greatest income gains from the minimum wage are concentrated in the middle of the household income distribution, where households with at least one minimum wage worker are most likely to be found and where marginal tax rates are significantly lower than at the bottom of the distribution. However, when considered proportionally, the impact is similar for both the lowest-income households and those in the middle of the distribution.

As the living standards of the poorest 40 per cent of UK households declined sharply following the pandemic and the cost-of-living crisis, substantial uplifts in the NMW and the NLW since 2023 provided some support to low-income households (NIESR 2024 and 2025). While these effects were largely marginal in aggregate terms, they have important distributional consequences. In particular, the impact in terms of effects on income of these successive rises was largely concentrated on households in the bottom two deciles of the income distribution. For these households in the bottom fifth of the population, there were positive impacts upon income. NIESR previously documented the initial impact of the rise in the NLW and the NMW in 2023 in our submission to the Low Pay Commission (NIESR, 2023).

2. Overview of the data and model

Data

We use the Wealth and Assets Survey (WAS) to obtain a representative sample of UK households. We do so because dynamic programming methods project savings and employment behaviour using a grid of assets as a state variable rather than relying on a reduced form wage process. Cash-in-hand (liquid assets plus current income) serves as the critical state variable for consumption decisions. In this regard we follow van de Ven (2017) in taking wealth survey as the basis for our households.

The choice of more granular wealth data has consequences on the results. For example, Tedeschi et al. (2013) compare results from a wealth-based life-cycle model and a wage-based Keynesian consumption rule. They find that the life-cycle framework produces different wealth and income inequalities. Galiana and Wilner (2024) note that wealth is more concentrated than labour income which in turn can lead to different conclusions, especially when projecting across time.

There is a clear trade-off between wage-based and wealth-based approaches. Wealth-based approaches better capture precautionary savings, buffer-stock behaviour, retirement adequacy through capital income, and wealth inequality dynamics. However, the cost of the approach is additional computational burden from the dynamic programming needed, and the limited sources of data on wealth. Wage-based approaches offer better data quality through administrative records, lower computational requirements, and easier estimation. However, they miss capital income sources, cannot model savings responses to policy, and could underestimate inequality since wealth is more concentrated than wages.

The primary survey for UK wealth information is the WAS, which has 8 waves of data on UK household wealth, with the latest wave 8 collected between 2020 and 2022. However, waves 7 and 8 have been affected by COVID: when lockdown was declared on 17 March 2020, the ONS paused all face-to-face interviewing and implemented telephone-only data collections across its surveys (ONS, 2021). Wave 8 was conducted entirely via telephone interviewing making a complete departure from the traditional face-to-face methodology used in waves before COVID. Because of this "data are more uncertain because of data-collection mode changes, sample coverage and additional non-response".

The survey questionnaire was shortened during Wave 8 "to reduce respondent burden and impact of change on response quality", according to ONS methodology documentation. This reduction in content, while pragmatic for maintaining any data collection during pandemic conditions, inherently limits the analytical utility of waves 7 and 8, which were collected during COVID, for detailed household finance research. Property wealth estimates across all regions carry heightened uncertainty because self-

valuation methodology becomes particularly problematic when respondents must provide valuations over the telephone without visual aids or the ability to consult documents easily.

Perhaps the most consequential methodological adaptation was the complete redesign of the weighting scheme to address pandemic-induced sample bias. Wave 8 data exhibited severe under-representation of renters and over-representation of owner-occupiers, particularly outright owners. These problems with Wave 8 have led the Office for Statistics Regulation to suspend the WAS accreditation status (Office for Statistics Regulation, 2025).

Wave 6 (2016-2018) of WAS represents the last fully intact survey round before pandemic-induced structural breaks compromised data quality through mode changes, response rate collapse, and systematic non-response bias. Wave 6 maintained full face-to-face interviewing throughout its 24-month fieldwork period and has a 63 per cent response rate with complete questionnaire administration. Furthermore, longitudinal comparability enables Wave 6 to be meaningfully compared with earlier WAS waves (Waves 1-5) without structural break concerns, allowing us to use previous rounds of WAS to obtain transition probabilities.

We select Wave 6 specifically because it represents the last complete survey round before the pandemic induced structural break in data collection. Projecting forward from this stable pre-pandemic baseline avoids pandemic-induced confounding effects. To tackle household structures evolving over time, we rely on microsimulation to account for demographic change through transition probabilities estimated from the longitudinal WAS data. These probabilities capture household formation and dissolution, childbearing, and migration.

Model

The model used for this analysis is the microsimulation model of Bhattacharjee et al. (2024). This framework combines three distinct models. First, a spatial econometric model captures regional macroeconomic dynamics and inter-regional spillovers. Second, a life-cycle model grounded in utility maximisation determines optimal household consumption-saving and labour supply choices. The regional dimension helps with modelling minimum wage effects as there are differences in industrial composition and wage dynamics across the UK regions. The spatial model helps with this by decomposing wage and labour market projections into the 12 ITL1 regions of the UK, allowing us to capture heterogeneity that stems from the spatial dimension. In essence, the regional model introduces heterogeneity in the demand side of the model. Third, a dynamic microsimulation model ties these components together, simulating heterogeneous households forward through time whilst ensuring alignment with regional macroeconomic projections. In this way we can draw inference on heterogenous agents

without macroeconomic paths deviating too far from projections. Figure 1 shows how the three models connect.

Figure 1: Flowchart of methodology
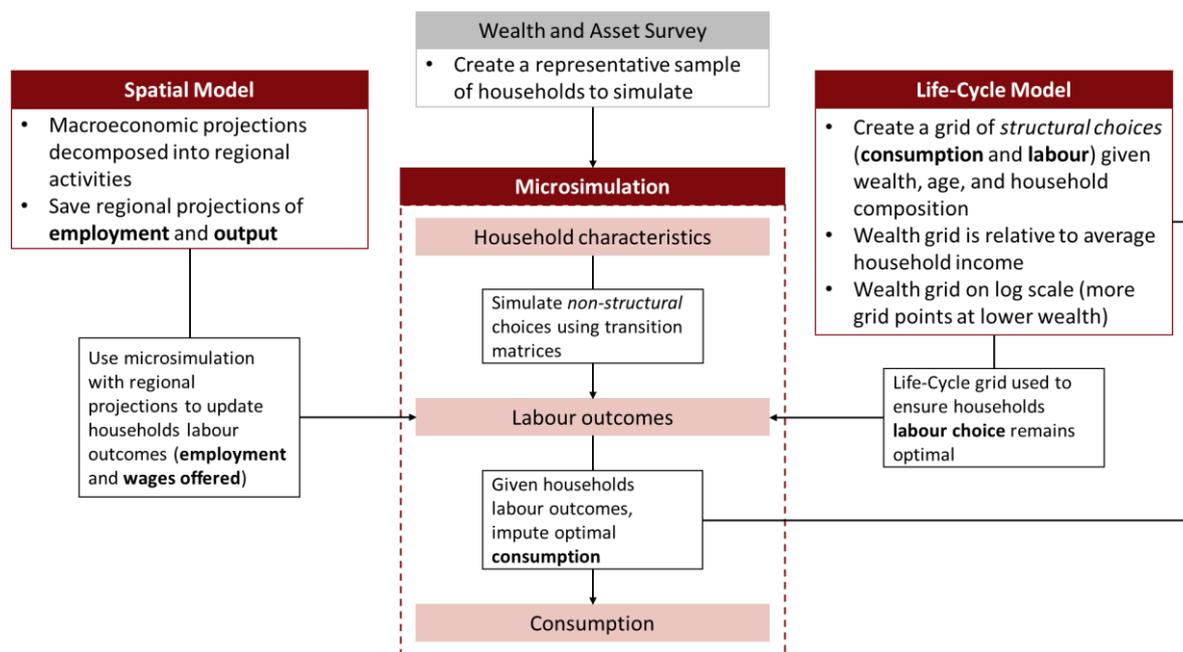
Before microsimulation starts, we first create a representative sample of UK households from round 6 of the UK Wealth and Asset Survey (WAS). After a representative sample of households is obtained, the microsimulation starts. In each simulated period, the household's characteristics are modelled using transition probabilities and reduced form models of the economy with spatial links. These characteristics include the region in which the household lives, the sector each household member works in, child-bearing, household formation and household dissolution. Beyond these characteristics households optimise the amount of time they work and the amount they consume based on the life cycle model ensuring household decisions are intertemporally optimal. The demand side of the labour market outcomes are determined by regional and sectoral projected paths.

The reason for guiding the microsimulation with macroeconomic projections is that household outcomes are not just influenced by micro incentives, but also the constraints the macroeconomy imposes. In the model households choose how much labour hours they wish to provide to market activities, but the macroeconomic projections determine what proportion of households find employment. A consequence of this, is that while inactivity is a choice made by the household, unemployment is not a choice and wholly determined by the macroeconomic outlook.

In the remainder of this section, we provide more details about certain aspects of the model, specifically the utility function of the life-cycle model, the labour-market

matching process, and the role of the spatial model. We will conclude this section by discussing the implications for firm behaviour.

Utility function:

Figure 1 shows how the life-cycle model determines households labour supply and consumption decisions. As such, it is a key component in the microsimulation model. An important part of this block is the utility function, which captures the trade-offs between consumption, leisure, and labour supply across the household lifecycle. In our model, the utility function is a non-separable Constant Elasticity of Substitution (CES) utility function shown below:

$$u\left(\frac{C}{m}, L\right) = \frac{1}{1-\gamma}\left[\left(\left(\frac{C}{1+0.5n+0.3m}\right)^{1-\frac{1}{\epsilon}} + \alpha^{\frac{1}{\epsilon}}\left[(1-L_1)^{1-\frac{1}{\epsilon}} + I_{n>1}(1-L_2)^{1-\frac{1}{\epsilon}}\right]\right)^{\frac{1}{1-\epsilon}}\right]^{1-\gamma}$$

$$- I_{n>1}I_{L_2>0}I_{\frac{C}{1+0.5n+0.3m}>C_{min}} (2L_2)$$

Where C represents household consumption, m denotes the number of dependent children in the household, L_i represents the labour supply of the ith earner respectively, and $I_{x>y}$ is an indicator function. The function accounts for multiple earners in the household. The function includes an additional cost term that applies to second earner labour supply when equivalised consumption exceeds 80% of average labour income. This term is included as not all dual earner households require market participation from both earners to maintain an adequate standard of living.

Intuitively, this term captures the fixed costs associated with second earner labour market participation, such as childcare expenses, commuting costs, and the opportunity cost of foregone household production. The term activates only when three conditions are met simultaneously: the household has a second potential earner, that earner is actively working, and the household's equivalised consumption already exceeds the minimum threshold. This threshold is set at 80% of average labour income, which is sufficiently high that it does not penalise households in or near poverty who may require dual incomes to meet basic needs. While a smooth, gradually increasing function offers greater flexibility, it requires additional parameters to calibrate and estimate. The indicator function provides a parsimonious representation that captures observed non-convexities in second earner labour supply decisions documented in the literature on female labour force participation (Blundell et al., 2000; Attanasio et al., 2008; Blundell et al., 2016).

The parameters of the utility function are largely taken from van de Ven (2017). The relative risk aversion parameter (γ) is set at 1.55 for both singles and couples (van de Ven, 2017; sensitivity analysis for dynamic programming is beyond the scope of this paper).

This parameter governs the curvature of the utility function with respect to consumption and determines the extent to which households smooth consumption over time.

The parameter governing intertemporal elasticity of substitution (ϵ) is set at 0.6 for both household types. This parameter captures the willingness of households to substitute consumption between periods in response to changes in the interest rate or other factors affecting the return to saving.

The parameter for the utility price of leisure (α) is set at 2.2 for singles and 1.034 for couples. This parameter determines the relative valuation of leisure time versus consumption. The substantially higher value for singles reflects the greater utility they are assumed to derive from leisure relative to couples, all else being equal.

The discount factor (β) is set at 0.97 for singles and 0.95 for couples. The discount factor determines how much weight households place on future utility relative to current utility. The discount factor for couples was higher than used by van de Ven (2017) in order to obtain smoother policy functions for labour supply of the second earner.

This utility function is nested inside a value function for the dynamic programming problem, where households maximise expected lifetime utility subject to budget constraints and labour market outcomes. The solution to this dynamic programming problem yields a policy function that maps households state space (assets, demographics, and wages offered) to optimal consumption and labour supply choices. Importantly the policy functions are computed relative to average earnings in each period, which allows them to be reused across simulation years without re-computation. This approach trades off some precision for computational tractability, with the approximation becoming less accurate at higher wealth levels where grid points are sparser.

Labour market matching

The way in which macro environment affects household outcomes is through the labour market, specifically hiring and firing decisions. Regional employment targets are obtained by taking the current regional employment levels and multiplying them by the growth rates projected by the spatial model. The microsimulation model then takes the amount of employees the model projects and adjusts individuals' employment status through a probabilistic hiring/firing process. This procedure is done until the number of employees matches the target for the region.

Employment in the model is differentiated along three dimensions: region, sector, and hours intensity (full-time versus part-time). However, within each region-sector-hours cell, jobs are treated as homogeneous. Skills and occupational heterogeneity only enter the model indirectly through the earnings equation where wage offers are influenced by individual characteristics.

The life-cycle model yields a continuous L_i, which we discretise into full-time and part-time. We refer to the discretised labour supply as $L_{d,i}$. Without discretisation, small changes in labour supply would affect disposable income, which would alter optimal asset accumulation, which would in turn feed back into labour supply decisions. To distinguish between part-time and full-time employees the cutoff for the continuous L_i is 0.3. This threshold was selected to match the observed split between full-time and part-time workers in the WAS data.

The probability that an unemployed individual is hired is determined by the individuals labour supply L_i, obtained from the life cycle model. Higher values of L_i indicate greater 'effort' in the labour market. For unemployed individuals, we interpret this optimal labour supply as reflecting labour search intensity. This is a modelling simplification: rather than explicitly modelling job search behaviour, we assume that individuals who would supply more labour conditional on having employment also exhibit greater effort in securing employment. In this way the life-cycle model's labour supply decision serves as a reduced-form proxy for job search intensity. Firing is the opposite, where lower L_i leads to a higher probability of being fired. To ensure that labour market downturns do not result in only part time employees being let go, the probability of being fired is determined by the individuals relative optimal labour supply. Dismissals are stochastic, governed by sectoral and regional projections, with an individual whose relative optimal labour supply being lower is more likely to be fired than an individual with higher relative optimal labour supply. Specifically, for part-time employees labour supply is bounded by 0 (where the individual becomes inactive) and 0.3. If L_i is larger than 0.3, then the individual will transition to full-time employment.

In this setup unemployed individuals are distinguished from inactive individuals by their optimal labour supply choice: the unemployed have $L_i > 0$ but are not employed due to the hiring and firing mechanism, whilst inactive individuals have $L_i = 0$, indicating they do not wish to participate in the labour market given their current circumstances.

This approach embeds both household preferences and firm constraints into the employment determination process. Households choose their desired labour supply based on their utility function, assets, and wage offers. Firms then hire and fire to meet aggregate employment targets, but the probability of any individual being hired or fired depends on their labour supply choice.

Once an individual transitions from unemployment to employment, we assign the worker to one of ten sectors in the WAS. The sectoral assignment of new hires is governed by the National Institute Sectoral Economic Model (NiSEM) projections. Sectors experiencing higher growth have elevated probabilities of hiring additional workers, whilst declining sectors face higher probabilities of dismissing current employees. To determine the wages offered for the individual we use a reduced-form Mincer-type earnings equation estimated on region and individual household characteristics within sectors. If the pool

of potential hires is exhausted (which can occur with small sample sizes), the microsimulation creates a copy of an existing household working in the relevant sector.

By integrating the sectoral projections, we ensure that sectoral composition of employment in the microsimulation tracks the projected changes in the macroeconomy. Furthermore, we allow employed individuals to transition between sectors. The sectoral transition probabilities are taken from the WAS (which includes a question on which industry individuals work in), which are then weighted by the sectoral growth rates to account for the expansion (and contraction) of industries.

Role of spatial model

The spatial model decomposes UK economic projections of the National Institute Global Econometric Model (NiGEM) into the 12 ITL1 regions of the UK (9 regions of England and the 3 devolved nations). In this way we obtain region specific projections for employment, and wages. The spatial model ensures that household-level trajectories remain consistent with credible macroeconomic forecasts whilst allowing for heterogeneous regional impacts of shocks and policies.

As Figure 1 highlights, the integration of the spatial model into the microsimulation model occurs through the labour market, specifically with an employment matching and wage adjustment mechanism. The regions in the model are connected through a spatial econometric structure that underlies the regional projections. The spatial model captures inter-regional spillovers in economic activity. This means that wage and employment growth in one region influences outcomes in other regions connected through the spatial weight matrix. The regional employment projections determine the hiring and firing probabilities, and regional wage growth informs how wages in the regions of the microsimulation will adjust. This creates a framework where outcomes for a household are based not just on their ideal life-cycle decisions but also constrained by the macroeconomic projections.

Aligning wages between the microsimulation and spatial model is challenging, because changes in wages trigger households to re-optimise their labour supply, which feeds back into average wages. To tackle this, we distinguish between wage offers and obtained wages and align microsimulation averages to wage offers. Specifically, we define the following relationship: obtained $wages_i = wage\ offer_i \times L_{d,i} \times \kappa_i$ where κ is a deterministic hump-shaped function reflecting earnings over lifetime (calibrated to UK data), $L_{d,i}$ is discretised labour supply for individual i (of household h). When an agent starts a new job they are assigned a κ_i that is determined by their age. Importantly, κ_i is not updated automatically and is uprated (or downrated) as an individual is promoted (or demoted). After every promotion/demotion the household reoptimizes their labour choices. Promotion and demotion in the model refers to adjustments to an individual's position on the age-earnings profile, captured by κ_j. A promotion is an upwards shift in

this profile, while demotion represents a downward shift. These transitions are triggered stochastically. The probability of promotion is higher for individuals working in sectors that are expanding, and for individuals whose κ_j is below what it would be based on their age. When an individual is promoted/demoted the household re-optimises its labour supply and consumption decisions given the new earnings. Importantly, these adjustments affect obtained wages but not the underlying wage offer.

This distinction between wage offers and obtained wages is important, as promotion does not impact wage offers, i.e. promotion/demotion induced household choices have no impact on the policy function. A consequence of this is that we only need to re-optimise the households' choices where the agent is promoted/demoted, and not all households in the sample. This makes the linking of microsimulation with macroeconomic paths tractable and allows us to optimise households in each region sequentially, speeding up computation time and lessening computation burden.

Note that perfect alignment of wages is computationally intensive: small changes to κ_i can push the average wage far from the projected macro path, leading to further optimisation. As such rather than exact wage path matching, we allow for some error in the wage matching. We set this error band to be around 2.5% of annual wages. As such the regional projections act more as guidance to the microsimulation.

Firm behaviour implications

The framework treats each region-sector pair as a distinct labour market segment, creating what amounts to $R \times K$ separate labour demand schedules, where K represents number of sectors and R represents regions. A feature of this approach is that labour demand in each region-sector cell is determined exogenously by the spatial (and sectoral) model rather than emerging from firm-level optimisation. Specifically, firms in the model do not explicitly choose employment levels (by equating marginal product of labour to wages offered). Instead, the spatial (and to a lesser extent sectoral model) generate employment growth projections for each region based on macroeconomic fundamentals that include output, productivity, consumption, and inter-regional spillovers.

The advantage of this approach is that it embeds the employment trajectories within a macroeconomic model that accounts for general equilibrium effects. However, for the microsimulation block this exogenous specification of labour demand means that employment elasticities are determined by the structure (and parameters) of the spatial model rather than by firm behaviour.

3. Results

Who benefits from minimum wage increases?

First, we place minimum wage workers and their households across the distribution of all households in the UK, both in terms of income and household composition (Figure 2). Next, using a combination of NIESR models, we simulate various NLW scenarios out to 2029/30 to evaluate the impact on household income and consumption, as well as labour supply. We look at the impact on households in aggregate, on NLW households and on various household types.

As mentioned, our modelling is based on data from the UK Wealth and Assets Survey. To recap: this is a large nationally representative longitudinal survey containing detailed information on individual and household incomes and assets, as well as detailed socio-economic and demographic characteristics of households. While this facilitates modelling individual and household incomes and benefits in very great detail, the dataset does not contain information on hours worked, hence wage rates cannot be directly inferred. We use dynamic microsimulation to allow households (and constituent individuals) to optimally make consumption/savings and labour/leisure choices over their lifetime. This provides information on hours worked, which together with wage incomes allow us to infer on (average) wage rates, which in turn enable modelling the impact of changes to minimum wages and alignment. Then, close alignment of the placement of minimum wage workers in the population as reflected in other comparator work (see below) reflect the adequacy of our modelling approach.

We consider three different scenarios for raising the NMW:

- a low scenario which maintained the real value of the NLW;
- a continuation of current policy scenario which maintained the bite of the NLW at two-thirds of median earnings;
- a high scenario in which the bite increased to 70 per cent of median earnings by 2029

We also consider three scenarios of aligning minimum wages of 18-20 year old workers with the NLW:

- gradual alignment of the 18-20 Year Old Rate with the NLW by 2029;
- reducing the age of eligibility for the NLW one year at a time between 2027 and 2029; and
- immediately reducing the age of eligibility for the NLW in 2026.

This provides 9 different combinations of rate and eligibility scenarios as well as the above 6 scenarios, totally 15 scenarios for modelling. Note that we hold the median wage for those aged 21 and over as fixed, and not reducing with reduced eligibility age.

Figure 2: Placement of households with NMW/NLW across the income deciles
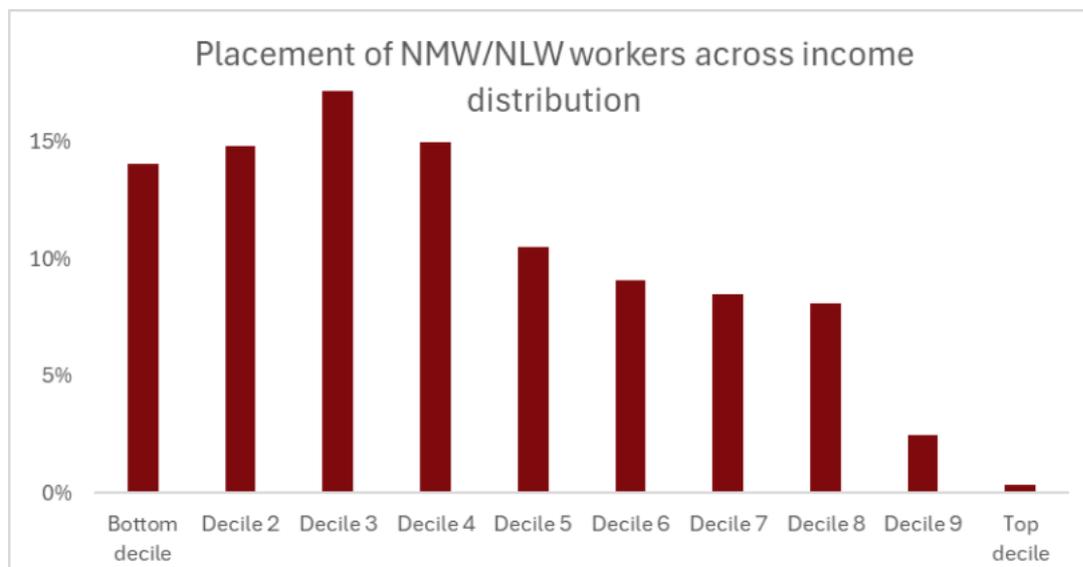
Source: NIESR/LINDA

The evidence presented in Figure 2 shows, as expected, that minimum wage workers are predominantly concentrated in lower income deciles, with approximately 61 per cent located in the bottom four deciles by household disposable income and peak exposure occurring in the third decile at 17 per cent. This distribution pattern aligns with both Cribb et al. (2021), who found 18.9 per cent of minimum wage workers in the 2-3 times poverty line range, and Arranz and Garcia-Serrano (2025), who reported that around 60 per cent of minimum wage households belong to the three lowest income deciles. From a theoretical perspective, this concentration reflects the conventional human capital model prediction that workers with lower productivity characteristics, often proxied by education, experience, and/or skills, will sort into lower-paying jobs and consequently appear in lower income households.

However, the presence of minimum wage workers in higher income deciles, up to the eighth decile, reflects household composition effects. One potential explanation is that many minimum wage workers are secondary earners in dual-income households where their partner earns substantially more. Income sorting is not necessarily a strong component of household formation. Thus, low-wage workers often live in middle-income households through marriage or cohabitation. This aligns with previous evidence, for example in Neumark et al. (2005) and Joyce and Waters (2019), highlighting a substantial proportion of low-wage workers in high-income families.

Moreover, the extent to which NMW/NLW workers are distributed across the deciles is notable, particularly the observation that NMW/NLW workers are present in benefit units going up to the 8th decile. The reason for this is that NMW/NLW earners often inhabit dual-

earning households (benefit units). Specifically, the second earner in a household might be more willing to work at (or near) the minimum wage because of other household responsibilities, such as childcare. These households may have relatively high total income owing to the primary earner's wages yet still contain a minimum wage worker. Cribb et al. (2021) document a similar pattern, noting that the mapping from individual wages to household incomes is mediated by the earnings of other household members.

Note that this entails a key difference between the lower-end households and medium-decile households lie in their respective composition. To this end, matching the WAS based benefit units to the FRS benefit unit's household composition can help identify the different types of households. Doing so enables a clearer identification of single-earner and young adult households concentrated at the lower end of the income distribution, where minimum wage policy has the most direct poverty-reducing potential. It also enables a clear distinction from dual-earner households in the middle deciles, where intra-household reallocation of labour hours may serve broader objectives such as childcare provision and investment in human capital.

Table 1: Impact of NMW increase on Benefit units which include NMW workers (% increase relative to the baseline of no further rise in NMW beyond 2025)

	Income	Consumption	Labour
Single, no child	41%	29%	-0.5%
Single, 1 child	32%	27%	-0.3%
Single, 2+ child	32%	17%	-0.2%
Couple, no child	7%	11%	-0.2%
Couple, 1 child	12%	13%	-0.4%
Couple, 2+ child	14%	13%	-0.4%
18.2%	**20.0%**	**-0.34%**	

Table 1 presents the marginal impacts on NMW households under the scenario of maintaining the real value of the NMW, with no changes in eligibility rules. This scenario assumes that households perceive minimum wage changes as fully incorporated into permanent income. When looking at the income and consumption impacts on NMW households, we find larger income impacts for single benefit units, with single adults without children experiencing a 41 per cent income increase and single parents seeing gains of 32 per cent. These findings are driven by the fact that such households are more likely to be concentrated at the lower end of the income distribution (Dube, 2019b). Consumption increases are notable but proportionally smaller than income gains, which suggests that such households engage in precautionary savings behaviour.

Dual-earner households exhibit more limited impacts, reflecting their positioning in the middle deciles of the income distribution where the primary earner's income is constrained by macroeconomic dynamics as modelled through the regional projections

(Bhattacharjee et al., 2024). Table 1 also highlights that there are negligible labour supply effects, with less than one hour per week reduction in labour supply on average across households.

We find that single-parent households present an important case. Single parents face a double constraint, that is, they must balance labour market participation with childcare responsibilities, limiting their ability to invest in human capital or pursue higher-paying positions requiring longer hours. This constraint effectively creates a separate labour market segment where single parents may accept lower wages in exchange for employment flexibility, consistent with compensating differentials theory. The findings validate both LPC (2022) results about single parent vulnerability and Gianarelli and Werner's (2022) analysis of how childcare constraints channel single parents toward lower-wage employment. The remaining households are broadly consistent with the overall population composition.

Childcare is the common denominator among households with minimum wage workers. This demonstrates that the bulk of minimum wage workers face structural constraints on enhancing their labour market participation. Consistent with Neumark et al. (2005) and Andrew et al. (2024), who document substantial heterogeneity in labour supply responses across demographic groups, constrained households may respond to minimum wage increases through participation adjustments rather than hours expansion. The amount of labour supplied is determined by labour participation (e.g. part-time to full-time or vice-versa). There is no role for firms in discretising hours offered. The consequence of this is that the conventional income-substitution effects trade-off is less relevant for understanding the labour supply responses of these households.

Specifically, constrained households may respond to minimum wage increases through participation adjustments at the individual level, whereby higher minimum wages enable reduced work hours, or through composition effects whereby other household members adjust their own labour market participation decisions (Gayle et al., 2022; Andrew et al., 2024).[1] The implication is that minimum wage increases are less likely to have an overall impact on the total labour supply of such households, not because workers prefer leisure to income, but because institutional constraints on childcare availability fundamentally circumscribe available work hours.

Table 1 reflects some divergence between rises in income and consumption for benefit units that include NMW workers which is muted when we consider aggregate impacts later on. Potential explanations for the income-consumption divergence can be derived from economic theory. First, the permanent income hypothesis suggests that if workers perceive minimum wage increases as economically vulnerable, for example, due to cost

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[1] In its current form, the model does not look at the substitution vs income effects at the individual level. As such in the text any analysis will pertain to total effects.

of living or inflationary pressures, they may treat them as transitory income shocks warranting savings rather than consumption increases.

Second, precautionary savings theory offers an alternative explanation. If minimum wage workers face higher income volatility or employment uncertainty than other workers, rational economic behaviour would involve building financial buffers when income increases. Rather than treating wage increases as opportunities for immediate consumption, households are prioritising building some financial buffers to insure against potential shocks. However, other factors like employment effects, household composition and work hours play an important role, as well as substantial concentration of minimum wage workers in more higher income households in the UK (Joyce and Waters, 2019). The life-cycle model of consumption strengthens this channel by emphasising consumption smoothing across the lifetime. From this perspective, income gains, such as those perceived in minimum wage increases, may be viewed by households to be temporary rather than permanent against an economic environment of uncertainty.

This feature is particularly exacerbated by our evidence that increased minimum wages counteract against lower benefit payments, particularly in the lowest two deciles of the income distribution. Cribb et al. (2021) note that "almost half of the increase in earnings is clawed back" through benefit withdrawal and higher taxes for households in lower income deciles. Hence, they may induce only modest increases in current consumption, as households distribute their gains across future periods. However, this explanation faces the empirical challenge that minimum wage workers typically face liquidity constraints, limiting their ability to smooth consumption and implying a higher marginal propensity to consume. The divergence from this prediction further supports the precautionary savings and buffer-stock mechanisms as more plausible explanations for the reduced consumption responses to the minimum wage increases. The growth of zero-hour contracts and gig economy employment further reinforces this logic, that is, if wage increases are accompanied by expectations of reduced hours or greater job instability, precautionary savings become a rational response.

Third, the above evidence may be viewed against the context of the recent rise in the savings rate and rising inactivity. One key feature of our modelling work here is the alignment to national macroeconomic aggregates. Hence, while consumption effects reflect recent macroeconomic trends, minimal impact of the modelled scenarios for minimum wages and alignment upon labour market outcomes may be viewed as a positive against the context of higher and rising aggregate inactivity rates.

Closely related to this is the fact that low-income households may target specific asset levels before increasing consumption, particularly if they have experienced periods of significant financial stress. Under this framework, minimum wage increases allow households to move towards target savings levels rather than immediately increasing

consumption. Once households achieve desired financial security, subsequent wage increases might generate larger consumption responses. The life-cycle consumption framework operates through specific wealth grid-based mechanics that influence these results. Income gains translate initially to cash-in-hand asset accumulation. A consequence of this is that households end up prioritising consumption smoothing over immediate expenditure responses.

Additionally, NiReMs employs UK benefit unit definitions wherein individuals form new households at age 18. This structural feature, combined with the model's treatment of firms as exogenous entities, means that macroeconomic feedback effects primarily materialize through shifting the burden of supporting lower-income household consumption from the public sector (through benefits) to the private sector (through wages).

This saving dynamic also raises questions about household perceptions of income permanence. There is surprisingly little research that addresses whether workers perceive minimum wage increases as permanent income changes or transitory shocks subject to political reversal or inflationary erosion. Chen and Xu (2024) find that in China the minimum wage increases reduced the probability of household transitions into poverty while increasing the probability of transitions out of poverty. This suggests households strategically use wage gains to improve economic security rather than viewing them solely as opportunities for consumption increases. In the UK context, the proliferation of zero-hour contracts may further reinforce precautionary savings motives even when hourly wages increase.

Impact on household income and consumption

Table 2 demonstrates substantial variation in impacts across policy scenarios, particularly when comparing policies targeting age eligibility for the NMW.[2] Comparing across the columns of Table 2, maintaining a two-thirds bite or raising to a 70 per cent bite consistently outperforms the baseline scenario of merely preserving real value, regardless of the age eligibility pathway chosen. This pattern reflects the mechanical reality that more ambitious bite delivers larger wage increases to affected workers.

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[2] A subtle effect of changes in alignment is that, lowering the eligibility age lowers the median wage and therefore the NLW. Our analysis does not take this subtle effect into account, i.e., in calculating the National Living Wage it considers the median wage for those aged 21 and over for the entire period throughout to 2029/30.

Table 2: Different scenarios impact on income and consumption of NMW households

NMW HH Incm/Cons	Maintain real value NLW	Maintain 2/3 bite	Raise to 70% bite	*Marginals*
Rapid rise 18-20 rate to catch up with NLW	14%; 13%	30%; 21%	29%; 21%	24%; 20%
Lower eligibility age gradually to 18	9%; 22%	21%; 35%	22%; 32%	18%; 19%
Lower eligibility age to 18 in 2026	22%; 22%	45%; 31%	43%; 35%	36%; 37%
Marginals	18%; 20%	38%; 32%	36%; 32%	**% change from base**

The youth scenarios do not take account of the fact that lowering the age of eligibility lowers the median wage and therefore the NLW, with the impact estimated to be around 8-10 pence an hour for each year of age reduction. The most striking variation appears across the rows, where lowering the eligibility age to 18 immediately in 2026 generates substantially larger impacts than either the rapid rise scenario for 18-20 year olds (which phases in convergence) or the gradual lowering of the eligibility age. The combination of immediate age eligibility expansion with an ambitious bite target (either two-thirds or 70 per cent) produces income gains of 45 and 43 per cent respectively for affected households, which is almost double the marginal effect of either policy dimension in isolation. Our analysis is based on benefit units, and as such these large effects are partly because people move into separate benefit units at age 18 even if they are living with parents.

The above complementarity arises because younger workers are disproportionately represented among those earning at or near the minimum wage. In addition, these workers tend to reside in households at the lower end of the income distribution where, as Dube (2019b) demonstrates, minimum wage elasticities for poverty reduction are largest.

Furthermore, immediate rather than phased implementation captures the full cohort of affected young workers simultaneously, maximising the reach of the policy. Cribb et al. (2021) find that under-25s experienced large positive spillover effects on wages from the NLW, with employment effects that were broadly neutral or positive, albeit imprecisely estimated due to smaller sample sizes. Stewart (2004) similarly finds that difference-in-differences estimates for youth employment effects of NMW upratings are not statistically significant, with most point estimates being positive rather than negative.

Taken together, these findings suggest that the immediate lowering of age eligibility, when combined with maintaining or increasing the bite, represents an effective policy

configuration for maximising income and consumption gains among minimum wage households.

However, when considering impacts across the total population (Table 3), the effects are substantially more muted, with income changes ranging from 2.5 per cent to 6.7 per cent and consumption changes remaining below 4 per cent across all scenarios. This attenuation reflects the macroeconomic context embedded in the NiReMs framework, wherein projected muted income growth constrains aggregate impacts. Labour demand limits the transmission of minimum wage increases across the wider distribution, consistent with the general equilibrium channels emphasised by Harasztosi and Lindner (2019).

The contrast between Tables 2 and 3 highlights an important policy consideration: while lowering age eligibility combined with maintaining or increasing the bite generates substantial improvements for directly affected households, aggregate distributional impacts remain constrained by broader macroeconomic conditions.

Table 3: Different scenarios impact on income and consumption of total population

All HH Incm/Cons	Maintain real value NLW	Maintain 2/3 bite	Raise to 70% bite	*Marginals*
Rapid rise 18-20 rate to catch up with NLW	**2.7%; 2.6%**	**2.6%; 2.5%**	**2.5%; 2.5%**	**2.6%; 2.6%**
Lower eligibility age gradually to 18	**2.6%; 4%**	**2.5%; 3.8%**	**2.6%; 2.6%**	**2.6%; 3.8%**
Lower eligibility age to 18 in 2026	**3.7%; 2.5%**	**4.7%; 2.4%**	**5.7%; 2.5%**	**6.7%; 2.5%**
Marginals	**2.5%; 2.5%**	**2.5%; 2.6%**	**2.6%; 2.6%**	**% change from base**

Comparison across scenarios

Comparing across the fifteen scenarios, some patterns emerge. Tables 2 and 3 show that interaction between NMW bite and youth pathways produce meaningful variation in outcomes for minimum wage households, but the differences are muted for the total population.

Looking at the NMW bite dimension, we see that maintaining the current policy of two-thirds of median wages, outperforms keeping the real value for all youth alignment scenarios. This aligns with Dube (2019b) who demonstrate that more ambitious targets deliver proportionally larger earnings gains to affected workers. However, our findings show that there are decreasing returns, going from two-thirds bite to 70 per cent leads to smaller gains in income. This effect comes from the labour demand side, as in our underlying macroeconomic model, the higher minimum wages reduce demand for low-wage workers.

The youth alignment dimension shows that immediate lowering of the eligibility age to 18 in 2026 generates the largest income and consumption effects on? NMW households, especially when combined with two-thirds (or 70 per cent) bite. This is on account of younger workers being more likely to be on the NMW, especially for single earner households. The gradual alignment pathway spreads the benefits across multiple cohorts over time, which results in smaller impacts but potentially smoother adjustment for employers.

The interaction between these policy dimensions shows that the two-thirds bite NMW scenarios combined with immediate age eligibility expansion leads to substantial income and consumption gains. Interestingly, the combination of a 70 per cent bite with gradual youth alignment produces lower income and consumption gains, which suggests that the bite dimension cannot fully compensate for delayed youth eligibility. This indicates that policymakers face a choice between these alternative policy configurations.

Looking at the total population, the effects are more muted, with income changes ranging from 2.5 per cent to 6.7 per cent and consumption impact being below 4 per cent. This reflects the macroeconomic constraints embedded in the framework, where projected income growth limits the aggregate impacts. As Harasztosi and Lindner (2019) emphasise, general equilibrium channels constrain the transmission of minimum wage increases across the wider income distribution. The contrast between NMW household impacts and population-wide impacts highlights this. This also highlights that while alternative scenarios generate meaningful differences for directly affected households, the aggregate distributional consequences remain bounded by macroeconomic conditions.

Labour supply effects remain negligible across all the scenarios as seen in Table 4. The variation in labour supply responses does not correspond to what we see in the income and consumption channels. This is likely indicative of NMW households not adjusting their total labour hours supplied as a whole. The consistency of small labour supply responses across scenarios provides reassurance that policy choices under consideration do not result in substantially different employment risks.

Impact on labour market participation and outcomes

Table 4: Different scenarios impact on labour hours supplied by Households

HH LABOUR HOURS	Maintain real value NLW	Maintain 2/3 bite	Raise to 70% bite	Marginals
Rapid rise 18-20 rate to catch up with NLW	-0.25%	-0.36%	-0.70%	-0.34%
Lower eligibility age gradually to 18	-0.26%	-0.43%	-0.54%	-0.39%
Lower eligibility age to 18 in 2026	-0.36%	-0.78%	-0.70%	-0.61%
Marginals	-0.34%	-0.59%	-0.54%	% change from base

The labour market analysis shows consistent but negligible negative effects upon labour hours ranging from –0.25 per cent to –0.70 per cent across different scenarios (Table 4). Nevertheless, there is almost no impact upon participation in the labour market. These findings corroborate recent empirical evidence in the literature, including UK analysis by Hafner et al. (2017), which reports no significant aggregate adverse employment effect of the NMW, and an international meta-analysis by Dube (2019a), which shows median employment elasticities of –0.16 for any group, and –0.04 for low-wage workers overall.

Hafner et al. (2017) find that part-time employees may experience more adverse employment effects from minimum wage increases compared to full-time workers, with larger negative impacts on employment retention. However, the aggregate effects remain small across all periods except during the great recession. Similarly, Employment elasticities vary by skill level: Brewer et al. (2019) report that low-skilled groups exhibit larger (more negative) employment elasticities. This heterogeneity is not fully captured in aggregate employment measures, implying that household composition effects could be considerably more varied than overall statistics suggest.

Market structure may mediate employment responses. Azar et al. (2024) demonstrate that in low-concentration labour markets, minimum wage increases produce significantly larger employment decreases compared to more concentrated markets where monopsony power allows firms to absorb wage costs without major employment adjustments. Firm concentration or market structure is not explicitly modelled but these dynamics could enter the model through the regional and sectoral variation of the macroeconomic projections. This is because certain sectors in specific regions exhibit greater degrees of monopsony power than others. More explicit modelling of market concentration effects represents an important direction for future research, particularly given substantial regional variation in UK labour market characteristics.

4. Limitations

The macroeconomic foundations of the NiReMs model give both analytical strengths and limitations that influence the interpretation of results. The model's alignment with macroeconomic projections constrains extreme behavioural responses that might otherwise appear unrealistic, a point supported by Chang and Schorfheide (2024), who provide evidence that macro-to-micro effects typically outweigh micro-to-macro feedback. Nevertheless, this constraint may also dampen legitimate behavioural reactions to substantial policy changes.

The treatment of firms as exogenous constitutes a notable limitation in understanding the full effects of minimum wage changes. Firms respond to wage increases through multiple channels, including technological adoption, price increases, alterations in product mix, changes in non-wage benefits, and market repositioning strategies. The absence of endogenous firm responses implies that the analysis may overlook significant general equilibrium effects, particularly for large minimum wage increases capable of inducing substantial adjustments in business models.

The life-cycle framework's embedded consumption smoothing explains modest household consumption responses but may not fully capture the heterogeneity of real households. Variations in liquidity constraints, planning horizons, and risk preferences shape consumption behaviour, and the model's assumption of optimisation over complete lifetimes may overstate smoothing among households that operate under severe liquidity constraints or with minimal savings.

A limitation of the framework is that employment is treated as homogenous within the region-sector cells once aggregate employment levels are determined. The model does not distinguish between temporary and permanent contracts which is another dimension that drives inequality. While individual earnings heterogeneity is captured through the wage equation, there is no differentiated labour demand schedules across skill levels. This simplification may understate the distributional consequences of minimum wage increases if low-wage workers are concentrated in particular contract types.

5. Conclusions

This paper explores how various NLW/NMW scenarios would affect household income and consumption by evaluating household labour supply and consumption decisions. We considered nine scenarios in total – each a combination of one of three NLW scenarios and one of three scenarios for the 18-20 Year Old Rate.

Our findings are as follows. First, households with minimum wage earners are located right across the income distribution, reaching as far up as the 8th income decile. This is because minimum wage earners often inhabit dual-income households.

Second, increases in income and consumption differ by household type. Minimum wage rises bring about larger increases to income and consumption in single-adult households, which are more likely to be at the lower end of the income distribution. Although consumption increases are larger for single-adult households than couple households, they are proportionally smaller than income gains, suggesting that such households engage in precautionary savings behaviour.

Third, the impacts on dual-earner households are more limited, reflecting their positioning in the middle deciles of the income distribution. However, consumption increases for these households are roughly in line with increases in household income.

Fourth, labour supply effects are minimal across households, amounting to less than one hour per week on average across households.

Fifth, maintaining the current policy position of two-thirds bite results in noticeably greater income and consumption for minimum wage households than an alternative in which the NLW's real value is maintained. However, increasing the bite target to 70 per cent results in little additional income or consumption gain for households. Of the youth scenarios, lowering the age of eligibility for the NLW to 18 in 2026 produces the largest benefit for minimum wage households.

Sixth, while minimum wage increases produce large benefits for minimum wage households, the overall impact on households is more muted. This is because labour demand limits the transmission of minimum wage increases across the wider distribution.

Based on this analysis, the concentration of benefits among single parents and families with children demonstrates that minimum wage policy functions as a well-targeted policy tool. The small employment effects suggest that concerns about significant job losses may be overstated, at least for the range of minimum wage increases typically considered in UK policy discussions.

The findings also suggest that complementary policies could improve minimum wage effectiveness. Given the concentration of minimum wage workers among single parents facing childcare constraints, policies addressing childcare costs or employment

flexibility might enhance the benefits of minimum wage increases. Similarly, if employment volatility concerns drive savings behaviour, policies enhancing job security or unemployment benefits might increase the consumption responsiveness to minimum wage gains.

For policymakers considering minimum wage levels, the analysis suggests that employment concerns should not dominate the policy debate, given consistently small negative effects. Instead, attention should focus on the distributional effectiveness and the long-term benefits of improved household financial stability, even if these benefits accrue through savings rather than immediate consumption increases. The policy choice between different minimum wage approaches may depend more on distributional preferences and administrative considerations than on differential labour market disruption risks.

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