

Minimum Wage and Skills: Evidence from Job Vacancy Data

What effect did the large and unexpected increase in the national minimum wage (NMW) have in April 2016? This research examines how an increase in the minimum wage affected firms' hiring decisions regarding workers' education and technical skills.

Using detailed online job postings data in England, the research finds that the minimum wage increase led to a shift in job characteristics, with a decrease in low education and technical skill requirements. This indicates firms' adjustments to higher labour costs through labour-labour and technology-labour substitution.

The research's hypothesis was that firms increase their productivity in response to an increase in their input (here, labour) cost. It found a higher national minimum wage results **in an up-skilling effect – an estimated 11-percentage point decrease in the proportion of non-graduate vacancies and a 21-percentage point decline in the share of low-tech ad.**

The NMW policy aims at protecting low-wage workers living standards. Yet, the increase in NMW translates into higher labour costs for firms hiring workers at the minimum wage rate.

It is therefore important to understand how firms compensate this increase in costs. As detailed in the paper, firms have various channels to do so, but here we explore the mechanism which firms compensate by raising their productivity by hiring more educated workers, or to change their production process to more automated methods.

Low-wage occupations tend to be populated by workers with low levels of education. Therefore, if firms hire more educated workers (often not workers paid at the minimum wage), the population targeted by the policy might be harmed by it. Or in other words, an

increase in the minimum wage, while designed to protect workers in the lower part of the wage distribution, might result in unintended consequences for those same workers.

Using online job vacancy postings to create new insights

The research leverages nearly the universe of online job postings provided by labour market analytics firm Burning Glass Technologies (now called Lightcast), from 2014 to 2019. The level of technical skills and education required for the job advertised is constructed for each ad. The research then exploits the fact that the exposure to the policy varies within occupations across different geographical areas to identify causal effects.

This research is the first to measure the education level of online vacancies using the text of the ad and to analyse in relation to the NMW. Text analysis methods were also used to define the technical skill level of jobs based on the list of skills described. Details of the how researchers identified tech skill using 10,000 distinct keywords can be found in the research paper. It also examines Travel to Work Areas.

The National Minimum Wage Act 1998 established a binding minimum hourly wage across the UK, taking effect on 1 April 1999. It was a flagship policy of the Labour Party during its successful 1997 general election campaign - prior to 1998, there was no national minimum wage. The NMW rate is based on a worker's age, with age bands from apprentice up to up to age 21-22. In April 2016, the act was amended to create a national living wage for workers over 23 and over – to increase workers' pay in low-paid occupations in order to reach a *living wage*. In 2016, the minimum wage rose by 7.5% from £6.70 to £7.20.

Results and recommendations

Due to a forced increase in firms input costs (wage of labour), firms want to increase their productivity, meaning that they want more output (products) for the same amount of input (labour). Because more output sold means more revenue to the firm and helps to compensate the wage increase from the change in the NMW rate.

The research finds that a higher national minimum wage led to a decrease in the share of non-graduate ads and in low levels of technical skills requirements in low and middle skilled occupations.

It recommends that policymakers should be conscious of changes in hiring patterns within occupations as the targeted population might be harmed by policy changes to the NMW as these are aimed at supporting low-income and low-educated people.

Two stylised facts in the data are observed:

1. In local labour markets with a high share of low-wage jobs, firms typically rely on employing low educated workers.
2. In local labour markets where the share of ads below the minimum wage is high, the level of technology is quite low.

Policy recommendations

1. **Support skill development and training programmes** As low-wage occupations tend to have workers with low levels of education, policymakers should focus on promoting skill development and training programs. By enhancing workers' skills, they can increase their employability and potentially mitigate any adverse consequences of minimum wage increases on low-skilled workers.
2. **Monitor the impact on different skill groups** Given the heterogeneous effects of minimum wage increases across skill groups, policymakers should carefully monitor the impact on less skilled workers. It is crucial to ensure that any policy changes do not disproportionately affect the employment opportunities of low-skilled individuals.
3. **Understand the holistic impact** of minimum wage policies can help in designing more effective and inclusive labour market policies.

Overall, these policy recommendations aim to strike a balance between protecting workers against unduly low pay and mitigating unintended consequences that may arise from minimum wage increases, particularly for low-skilled workers.

