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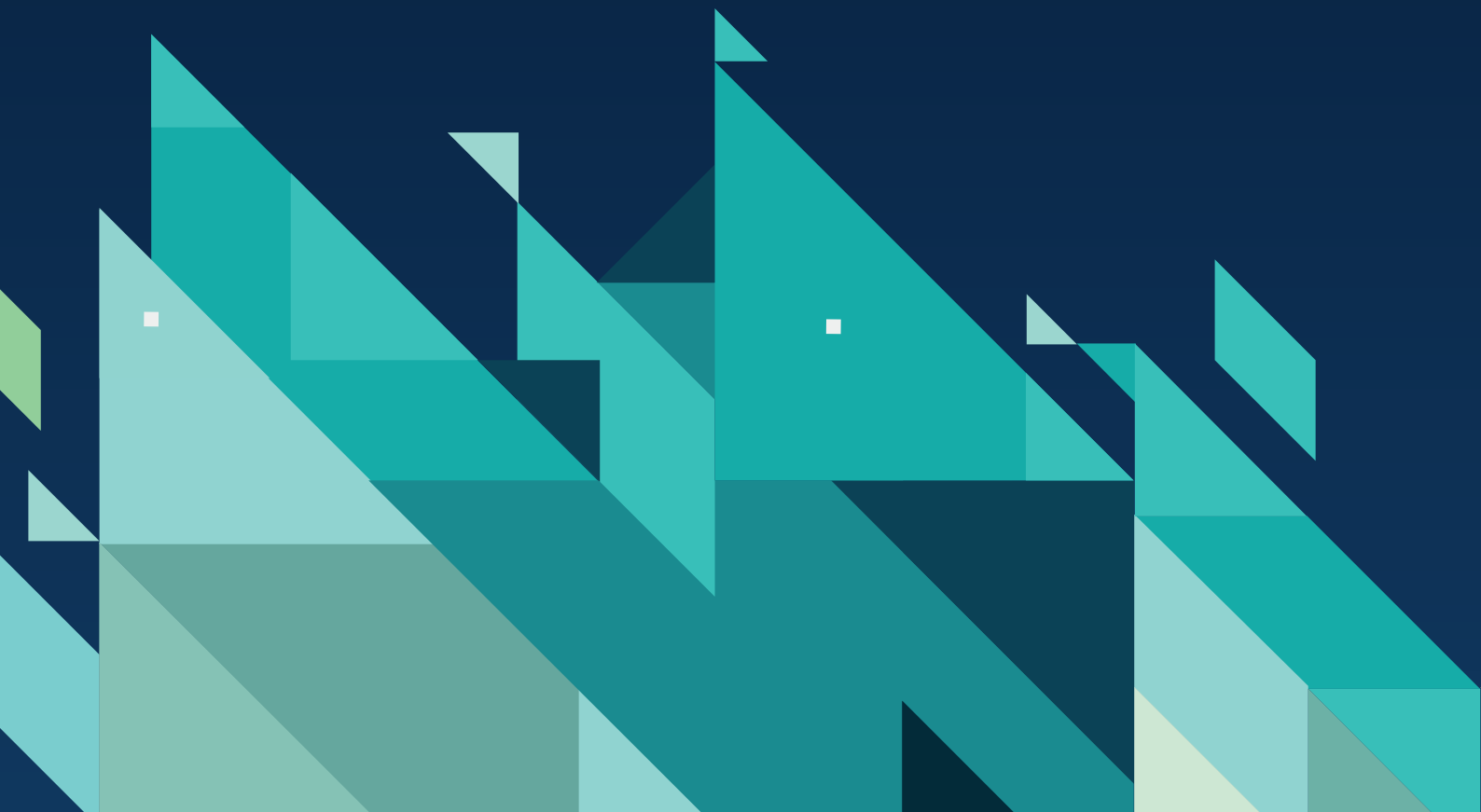
# The impact of a minimum wage increase on employment: evidence from Ireland

PAUL REDMOND, LORCAN KELLY, HUGH CREATON



# THE IMPACT OF A MINIMUM WAGE INCREASE ON EMPLOYMENT: EVIDENCE FROM IRELAND

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# ABBREVIATIONS

| | |
|---|---|
| CSO | Central Statistics Office |
| LFS | Labour Force Survey |

# EXECUTIVE SUMMARY

The minimum wage in Ireland increased every year from 2016 to 2025. We investigate whether these minimum wage increases led to a higher likelihood of minimum wage employees becoming unemployed or inactive. To do this, we implement a difference-in-differences methodology that compares the changes in employment outcomes of minimum wage employees to higher-paid employees up to six months following a minimum wage change.

We find no evidence that recent minimum wage increases in Ireland increased the likelihood of minimum wage employees losing their jobs. While minimum wage employees are generally more likely to enter non-employment than higher-paid workers, the likelihood of this happening did not increase following increases to the minimum wage. Furthermore, no pattern emerges with respect to the magnitude of the minimum wage increase. In some years, the minimum wage increase was relatively large, while in other years it was small. However, larger minimum wage increases over this period did not coincide with a higher likelihood of minimum wage employees entering non-employment.

In addition to the full 'adult' minimum wage rate, employees aged under 20 can earn an age-based, sub-minimum youth wage. This means that young minimum wage employees can 'age into' a higher minimum wage band. For example, an employee aged 18 is entitled to 80 per cent of the full adult minimum wage rate. Upon turning 19, they are entitled to 90 per cent of the full rate, and upon turning 20, they are entitled to the full adult minimum wage rate. We also exploit this feature of Irish minimum wage policy to evaluate the causal effect of 'ageing into' a higher minimum wage band. To do this, we implement a difference-in-differences methodology that compares the outcomes of sub-minimum youth wage employees that experience a birthday (i.e. whose age changes from one quarter to the next) to sub-minimum youth wage employees whose age stays the same.

We find that, on average, young workers that 'age into' a higher minimum wage band did not experience an increased likelihood of job loss in the quarter directly following their birthday. When looking at differences over time, there is some evidence of job loss in the earlier time period (2016–2020); during this period, sub-minimum youth wage employees that experienced a birthday from one quarter to the next were 15 percentage points more likely to enter non-employment than sub-minimum youth wage employees whose age stayed the same. However, a caveat is that this result is based on a relatively small sample size. For the later years (2021–2025), there was no statistically significant impact.

Note that there are several potential channels of adjustment by employers following a minimum wage increase. One potential adjustment, which is the focus of this study, is the possibility that employers lay off existing minimum wage workers. Other channels of adjustment relate to reductions in hiring new staff, reductions in hours, a reduction in profits or an increase in prices. While several previous studies have found reductions in hours following a minimum wage increase in Ireland, the remaining channels of adjustment for Irish firms remain relatively under-researched, primarily due to data constraints. Nonetheless, these channels of adjustment present a very useful avenue for future research on Irish minimum wage policy.

# CHAPTER 1
# Introduction

The question of whether minimum wage increases impact employment has received substantial attention in the labour economics literature, and in public discourse. Despite this, there remains a lack of consensus on the issue. Some studies find negative employment effects following a minimum wage increase, while others do not (see Wolfson and Belman, 2019; Dube, 2019; Belman et al., 2015; and Neumark and Shirley, 2022 for reviews of the minimum wage literature). The lack of consensus among existing research may, to some degree, reflect differences in the focus, design and methodologies used by researchers. For example, economic conditions, employment protection laws and the magnitude of minimum wage increases can differ markedly across countries, and even over time within the same country. Furthermore, differences in the type of data available to researchers can impact results (Neumark and Shirley, 2022). This makes it difficult to draw concrete conclusions from existing research, especially when making cross-country comparisons. The lack of consensus in existing research necessitates continued evaluation of minimum wage increases, with particular attention being paid to issues such as the magnitude of minimum wage increases and the nuances of the policy environment.

The issue of minimum wage policy in Ireland is particularly salient. In November 2022, the Irish government announced its intention to move from a National Minimum Wage to a 'living wage', set at 60 per cent of gross median earnings. The move to a living wage mirrors similar policy objectives set by other European economies and aligns with reporting requirements under the EU Directive on Adequate Minimum Wages (European Commission, 2020). Importantly, this policy approach has led to substantial variation in the magnitude of minimum wage increases in recent years. For example, in 2017, the minimum wage was increased by just 1 per cent, compared to 12 per cent in 2024. It is, therefore, important to evaluate whether minimum wage increases of varying magnitudes lead to different employment impacts for low-paid workers.

Another aspect of minimum wage policy that receives attention from both academics and policymakers is the area of age-based sub-minimum youth wage rates. Age-based youth wages are specific minimum wage rates for younger workers, which are typically set at a lower proportion of the statutory minimum wage. In Ireland, age-based youth wages exist for employees aged under 20 (see Redmond et al., 2023 for details on sub-minimum wages in Ireland). Employees can 'age into' a higher youth wage. For example, upon turning 19, an employee's wage entitlement increases from 80 to 90 per cent of the full adult minimum wage. A key question, therefore, relates to whether employees are more likely to enter non-employment upon 'ageing into' a higher youth wage band.

In this report, we examine the employment impacts of these two aspects of minimum wage policy in Ireland. First, we evaluate the impacts of annual increases to the statutory minimum wage between 2016 and 2025. Using data from the Irish Labour Force Survey (LFS), we employ a difference-in-differences estimation approach to estimate the causal impact of annual minimum wage increases on employment among low-paid workers. Our findings indicate that minimum wage increases during this period did not cause a higher likelihood of minimum wage employees losing their jobs. While minimum wage employees are generally more likely to enter non-employment than higher-paid workers from one quarter to the next, the likelihood of this happening did not increase following increases to the minimum wage.

Second, we examine the impact of sub-minimum youth wage increases on employment. To do this, we exploit age-based cutoffs in sub-minimum youth wage rates, leveraging timing variation in workers' birthdays to estimate causal effects on employment. Specifically, we compare employment outcomes between sub-minimum youth wage employees who experience a birthday between two quarters in the data, to sub-minimum youth wage employees who do not, allowing us to exploit exogenous wage variation due to age-based cutoffs. This approach enables us to examine the impact of 'ageing into' a higher minimum wage band. On average, from 2016 to 2025, we do not find evidence of a higher probability of job loss for employees that 'age into' higher wage bands, relative to those whose age remains unchanged.

The remainder of this report is structured as follows. In Chapter 2, we provide an overview of the related literature. In Chapter 3, we discuss minimum wage policy in Ireland. In Chapter 4, we describe the data and present summary statistics relating to minimum wage workers. In Chapter 5, we discuss our difference-in-differences identification strategy. Chapter 6 shows our results and Chapter 7 concludes.

# CHAPTER 2
# Related literature

## 2.1 MINIMUM WAGES AND EMPLOYMENT

The impact of minimum wages on employment has received considerable attention in the labour economics literature. Some studies find that minimum wages lead to negative employment effects for low-paid workers (see, e.g., Clemens and Strain, 2021; and Lordan and Neumark, 2018) while others find little to no impact (see, e.g., Cengiz et al., 2019; Dustmann et al., 2022). Researchers have conducted reviews of the available evidence to try and synthesise findings from the existing literature. However, these can also produce conflicting findings. For example, Dube (2019) finds that the impacts of minimum wage increases tend to have muted effects on low-paid employment, while Neumark and Shirley (2022) find that most US studies report negative impacts of minimum wages on employment, with stronger effects for teenagers and young adults.

The closest work to ours is Stewart (2004), who examines the impact of the introduction of the UK minimum wage on the probability of subsequent employment among affected workers. He finds no statistically significant adverse employment effects. Our empirical approach is similar to that used by Stewart (2004). Low-paid workers that are impacted by minimum wage policy are followed over time and compared to slightly higher-paid workers that are not directly impacted by minimum wage changes. These groups form the basis of a difference-in-differences estimator that compares the outcomes of the higher-paid group to those of the lower-paid group. In the case of Stewart (2004), the focus is on the introduction of the UK minimum wage, whereas we study the impact of an increase in the Irish minimum wage.

Reductions in employment following a minimum wage increase, should they exist, could be due to either a reduction in hiring, or due to employers laying off existing staff. Gopalan et al. (2021) find that, for the US, negative employment effects arise due to a reduction in hiring as opposed to existing workers losing their jobs. Similarly, Kudlyak et al. (2025) use job vacancy data to show that minimum wage increases lead to a reduction in vacancies for low-paid jobs.

In Ireland, previous studies have examined the impacts of both the introduction of the minimum wage and minimum wage increases. O'Neill et al. (2006) examine the impacts of the introduction of the statutory minimum wage in Ireland (in 2000) on employment. They find that firms that relied on low-paid labour were not differentially impacted by the policy change, when compared to firms that were not reliant on low-paid labour. More recent work has focused on the impact of minimum wage increases on hours worked. Redmond and McGuinness (2025)

find that increases in the minimum wage led to reductions in hours worked, with the effects being strongest in the industry and accommodation and food sectors.

There is also a growing body of international evidence to suggest that employers respond to minimum wage increases through non-employment channels (see Clemens, 2021). For example, an increased minimum wage may result in price pass-through, in which the increased costs of labour are passed directly to the consumer through higher prices (Harasztosi and Lindner, 2019). In addition, employers may reduce non-cash compensation (e.g. insurance or pensions) in order to offset increased labour costs (Clemens et al., 2018).

## 2.2 AGE-BASED YOUTH WAGES

The international literature specifically focusing on age-based youth wages is more limited. Some studies examine the impact of increases in youth wage rates on employment. For example, Van Bezooijen et al. (2024) find that an increase in sub-minimum youth wages in the Netherlands did not result in reductions in either employment or hours worked. Dayioglu et al. (2022) show that the abolition of age-based youth wages in Turkey (i.e. a de facto sub-minimum youth wage increase) reduced employment among young males. Hyslop and Stillman (2007) show that an increase in the youth minimum wage in New Zealand did not result in substantial reductions in employment for young workers.

Other studies exploit age-based cutoffs within youth wage rates to evaluate the impact of exogenous wage increases on the employment of young workers. Kreiner et al. (2020) finds that turning 18 – triggering a 40 per cent minimum wage increase – led to a 33 per cent drop in employment and a 45 per cent reduction in hours worked among 18-year-olds in Denmark. In the Netherlands, Kabátek (2021) finds that employers are more likely to lay off young workers in the three months preceding their birthday, upon which their wage entitlements would increase.

While there are no existing studies examining employment effects associated with age-based sub-minimum youth wages in Ireland, Redmond et al. (2023) examine the incidence of sub-minimum wage employment. They find that approximately 0.7 per cent of all employees from 2016 to 2022 were paid an age-based sub-minimum youth wage. Furthermore, just under a quarter of young workers who were eligible for age-based youth wage rates (i.e. those aged between 15 and 19 years of age) were paid a youth wage rate between 2016 and 2022, with the remaining cohort being paid at or above the statutory minimum wage.

It is important to note that the provision of age-based youth wage rates could also influence the employment outcomes of ‘full-rate’ minimum wage workers. For example, where lower, age-based wages exist for younger workers, and the wage gap between sub-minimum and minimum wage rates is sufficiently large,

employers may substitute full-rate minimum wage workers for younger, sub-minimum wage workers. Yannelis (2014) finds that the introduction of a youth minimum wage in Greece – representing a de facto decrease in minimum wages for younger workers – led to reductions in hiring of older workers, with younger workers being hired in their place.

# CHAPTER 3
# Policy context

## 3.1 MINIMUM WAGE POLICY IN IRELAND

A statutory minimum wage was first introduced in Ireland in 2000. The minimum wage was initially set at a rate of €5.58 (£4.40) per hour and increased regularly up until 2007, at which point it stood at €8.65 per hour. Coinciding with the onset of the Global Financial Crisis in 2008, there followed several years during which the minimum wage was not increased, so that the minimum wage in 2015 was the same as it had been in 2008 (€8.65 per hour). Against the backdrop of economic recovery, the Irish Low Pay Commission was established in 2015 and tasked with providing yearly recommendations to the Irish government on what the minimum wage should be. Following recommendations from the Low Pay Commission, the minimum wage increased to €9.15 per hour on 1 January 2016. Since then, the minimum wage has undergone annual increases, with each increase generally taking effect on 1 January each year.[1] As of 2025, the minimum wage stands at €13.50 per hour, which is 56 per cent higher in nominal terms than the rate that existed when the Low Pay Commission was established in 2015.

Table 3.1 reports the annual minimum wage rates from 2015 to 2025. It also shows the average rate of inflation for that year, along with the inflation adjusted minimum wage increase as well as average wage growth within the labour market.[2] For most years, the minimum wage increase was higher than the inflation rate, with the exceptions being 2021 and 2022. The largest minimum wage increase, in both nominal and real (inflation adjusted) terms occurred in 2024. In January 2024, the minimum wage increased from €11.30 per hour to €12.70 per hour, equating to a 12.4 per cent nominal increase, and 10.1 per cent real (inflation adjusted) increase.

1 There was one exception in 2020, where the minimum wage increase took effect on 1 February 2020.

2 This is based on the average annual consumer price index rate of inflation published yearly by the Central Statistics Office. See, for example, www.cso.ie/en/releasesandpublications/ep/p-cpi/consumerpriceindexdecember2025.

**TABLE 3.1 MINIMUM WAGE RATES, IRELAND (2015–2025)**

| Year | Minimum wage rate (€) | Minimum wage increase (%) | Inflation (%) | Inflation adjusted minimum wage change (%) | Average hourly wage growth (%) |
|---|---|---|---|---|---|
| 2015 | €8.65 | -- | -- | -- | -- |
| 2016 | €9.15 | 5.8% | 0.0% | 5.8% | 1.1% |
| 2017 | €9.25 | 1.1% | 0.4% | 0.7% | 0.6% |
| 2018 | €9.55 | 3.2% | 0.5% | 2.7% | 3.1% |
| 2019 | €9.80 | 2.6% | 0.9% | 1.7% | 2.8% |
| 2020 | €10.10 | 3.1% | -0.3% | 3.4% | 2.9% |
| 2021 | €10.20 | 1.0% | 2.4% | -1.4% | 8.4% |
| 2022 | €10.50 | 2.9% | 7.8% | -4.5% | 2.3% |
| 2023 | €11.30 | 7.6% | 6.3% | 1.2% | 3.9% |
| 2024 | €12.70 | 12.4% | 2.1% | 10.1% | 4.9% |
| 2025 | €13.50 | 6.3% | 2.2% | 4.0% | 6.3% |

*Sources:* Low Pay Commission and Central Statistics Office, Authors' Calculations.
*Notes:* Inflation relates to the annual average CPI inflation for that year, published by the CSO. Average hourly wage growth refers to year-on-year hourly wage growth between quarter 1 and quarter 1. For example, the 1.1% in 2016 is the growth in wages comparing quarter 1 of 2016 to quarter 1 of 2015, sourced from EHECS data, published by the CSO.

Irish minimum wage policy also provides for age-based, sub-minimum youth wage rates.[3] Since 2019, Irish legislation states that an employee aged below 18 is entitled to 70 per cent of the full adult minimum wage, an employee aged 18 to 80 per cent, and an employee aged 19 to 90 per cent.[4] The legislation for sub-minimum wage rates for 18- and 19-year-olds was different prior to 2019, as they were linked with employment experience. Specifically, legislation stated that an employee in their first year of employment upon turning 18 was entitled to 80 per cent of the full rate. An employee in their second year of employment upon turning 18 was entitled to 90 per cent of the full rate. Note that the implications of this change in legislation in 2019 for young workers is limited in that, although specified differently in legislation, youth wage rates existed in much the same way pre- and post-2019 for those aged less than 20.

An example is useful to illustrate this point. Consider a person pre-2019 that got a job on their 17th birthday and was paid 70 per cent of the full rate. Upon turning 18, they would be entitled to 80 per cent of the full rate, as they would enter their first year of (post-18 years of age) employment. Upon turning 19, they would enter their second year of (post-18 years of age) employment and would therefore be entitled to 90 per cent of the full wage rate following their 19th birthday. Upon

[3] In recent years, there has been a lot of policy debate surrounding sub-minimum youth wage rates. In 2023, Ireland was found to be in breach of its obligations under the Revised European Social Charter, relating to 'the right to a fair remuneration', because its sub-minimum youth rates could not ensure an adequate standard of living for young people. The EU Directive on Adequate Minimum Wages also stresses that the use of sub-minimum rates should be in pursuit of a legitimate aim and respect the principles of proportionality and non-discrimination. In 2024, the Irish Low Pay Commission recommended the abolition of sub-minimum youth wage rates.

[4] The relevant legislation is the National Minimum Wage Act, 2000. See www.irishstatutebook.ie/eli/2000/act/5/enacted/en/html.

turning 20, they would then be entitled to the full minimum wage rate. However, as the pre-2019 legislation was based on experience rather than simply age, the implications for those aged over 20 were more substantive. For example, prior to 2019, a person aged over 20 could be paid 80 per cent of the full minimum wage rate if it was their first year of employment since turning 18. However, post-2019, somebody over 20 years of age could not be paid less than the national minimum wage, irrespective of experience.

Irish minimum wage legislation also exempts certain categories of workers from having to be paid a minimum wage. This includes those employed by a close relative, apprentices, and prisoners engaged in non-commercial activity (see Redmond et al., 2023 for a detailed review of sub-minimum wage rates in Ireland).

# CHAPTER 4
# Data and descriptive statistics

We use data from the Irish Labour Force Survey (LFS) between 2016 and 2025. The LFS is administered quarterly by the Central Statistics Office (CSO) and is the official source for measures of employment and unemployment in Ireland.[5] To identify minimum wage workers, we exploit a unique feature of the Irish LFS data – Ireland is the only European country with a direct minimum wage question in its Labour Force Survey. Specifically, respondents are asked if they earn below, exactly or above the prevailing adult minimum wage using the following question:

> The National Minimum Wage is € [national minimum wage] per hour. Are your gross hourly earnings excluding bonuses, overtime and allowances:
>
> 1. Less than € [national minimum wage] per hour
> 2. Exactly € [national minimum wage] per hour
> 3. More than € [national minimum wage] per hour

As it is a household survey, the LFS captures information on every household member. However, only one member of the household is interviewed. Therefore, that person provides information about themselves and also other household members (so-called proxy responses). Of the minimum wage employees captured by the minimum wage question in the LFS data from 2016 to 2025 (those that answer 1. or 2. to the question above), approximately 40 per cent participated directly in the survey, while participation for the other 60 per cent was via another household member.

For respondents that indicate they are paid below the national minimum wage rate, there is an additional question that asks why this is the case:

> Do you earn less than € [national minimum wage] per hour because you are:
>
> 1. On an age-based rate that is aged 19 or younger
> 2. Employed by an immediate relative including spouse or siblings or parents or grandparents
> 3. Participating in an apprenticeship programme
> 4. Other reason (please specify)

[5] The results presented in this report are based on analysis of strictly controlled Research Microdata Files provided by the Central Statistics Office (CSO). The CSO does not take any responsibility for the views expressed or the outputs generated from this research.

As detailed in Chapter 3, there were some changes to the sub-minimum wage criteria in 2019. Essentially, in 2019, the employment experience component of sub-minimum youth wages was abolished, which simplified the youth wage rates. A practical implication of the policy change is that pre-2019, employees in the survey data could indicate they were on a sub-minimum wage for reasons of limited work experience. Specifically, employees in the LFS data could indicate that they were on a sub-minimum wage because it was their 'first job over the age of 18'. However, an 18-year-old that gives this reason in the pre-2019 data, and who has at least one year of work experience, is essentially on a de facto sub-minimum youth wage, as when they turn 19, they are entitled to an increase in the sub-minimum rate (from 80 to 90 per cent). Likewise, a 19-year-old with at least two years of experience in the pre-2019 period was entitled to the full minimum wage rate when they turned 20. As such, these workers face the same conditions (in terms of sub-minimum wage entitlements) as 18- and 19-year-olds post-2019 policy change, and are therefore considered as sub-minimum youth wage employees for the purpose of our analysis.

The LFS data, therefore, allows us to identify employees that are paid the full national minimum wage, as well as identify employees that are paid a sub-minimum youth wage. We show the incidence of minimum wage and sub-minimum youth wage employment over time in Figure 4.1. In 2016, approximately 9 per cent of all employees were minimum wage workers. From 2017 to 2024, the incidence has fluctuated within the range of approximately 6 to 7 per cent. As we do not have the full year of data for 2025, that year is not included in the graph. However, the incidence of minimum wage employment for the first two quarters of 2025 is higher than all previous years, at over 9 per cent. Note that the number of employees in Ireland has been growing over time. For example, in 2017, there were approximately 1.9 million employees, compared to 2.4 million in 2024.[6] Therefore, even though the incidence of full-rate minimum wage employment in 2017 and 2024 was similar, at roughly 7 per cent of all employees, the number of minimum wage employees increased from approximately 140,000 employees in 2017 to 170,000 employees in 2024.

From 2016 to 2020, approximately half of a per cent of all employees were on a sub-minimum youth wage.[7] However, in recent years, the incidence of sub-minimum youth wage employment has increased. In 2023 and 2024, it was approximately one per cent of all employees, which represents a doubling in the incidence when compared to 2019 and 2020. In terms of employee numbers,

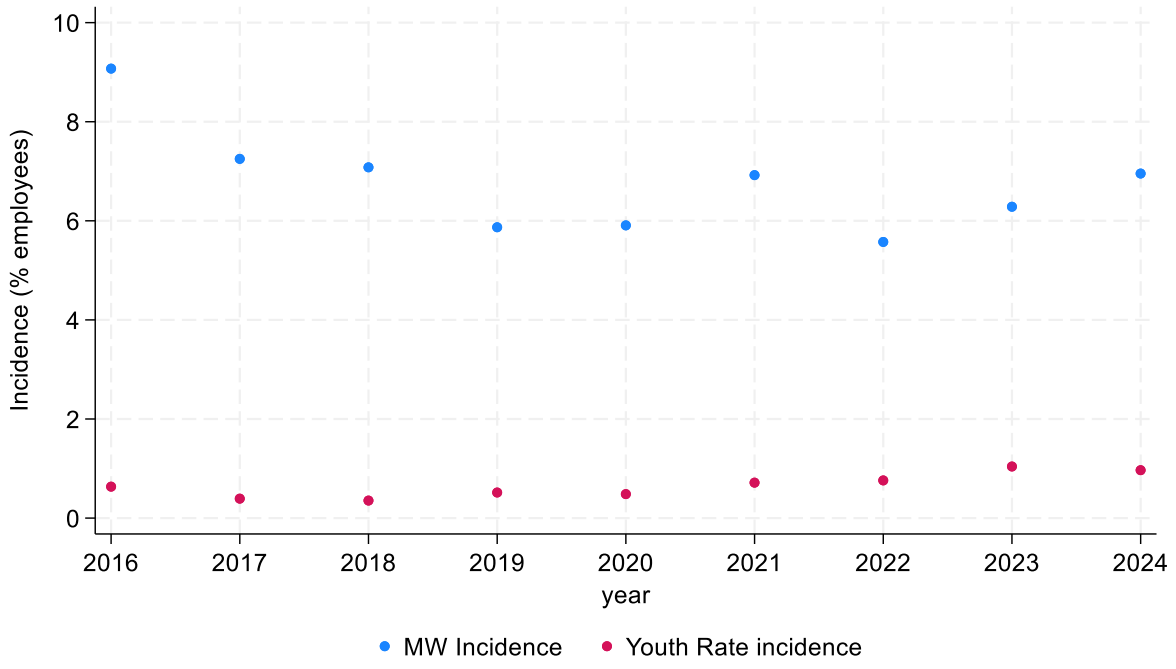
6 As measured in quarter 4 of each year. See www.cso.ie/en/releasesandpublications/er/lfs/labourforcesurveylfsquarter42017/.

7 As noted by Redmond et al. (2023), sub-minimum youth rates were not commonly used in Ireland, as most young workers that were eligible for a sub-minimum youth rate tended to be paid either the full minimum wage rate or higher by their employers.

this indicates that approximately 24,000 employees earned a sub-minimum youth wage in 2024.

The increase in the incidence of sub-minimum youth wage employment becomes more apparent when conditioning on the group of young employees that could potentially be paid a sub-minimum youth wage. In Appendix Figure A.1, we show the percentage of employees aged less than 20 years that have earned a sub-minimum youth wage over time. In 2019, for example, just under 20 per cent of employees in this age range were earning a sub-minimum youth rate. However, by 2024, this had increased to 26 per cent, and had increased further to 30 per cent in the first half of 2025.

**FIGURE 4.1 INCIDENCE OF MINIMUM WAGE AND SUB-MINIMUM YOUTH WAGE EMPLOYMENT IN IRELAND (2016–2024)**




*Source:* Irish Labour Force Survey. Authors' calculations.
*Notes:* Figure 4.1 plots the percentage of all employees that are paid the full adult national minimum wage, and the percentage of all employees that earn a sub-minimum youth wage.

In Table 4.1, we show the characteristics of employees earning sub-minimum youth wages (column (1)), full-rate minimum wage employees (column (2)), as well as non-minimum wage (higher-paid) employees (column (3)). There are some notable differences even when comparing sub-minimum youth wage employees to full-rate minimum wage employees. For example, 57 per cent of sub-minimum youth wage employees have temporary contracts, compared to 26 per cent for full minimum wage employees. Over 90 per cent of youth wage employees work part-

time compared to 60 per cent of full minimum wage employees. These differences reflect the different age profiles among both groups. The average age of sub-minimum youth wage employees is 17, compared to 31 for full minimum wage workers. Therefore, most youth wage employees are likely to be still in secondary school, and we would expect them to have higher rates of part-time and temporary employment.

**TABLE 4.1 CHARACTERISTICS OF EMPLOYEES: MINIMUM WAGE, YOUTH WAGE, AND HIGHER-PAID (2016–2025)**

| Characteristics | (1) Youth wage rate employees | (2) Minimum wage employees | (3) Higher-paid employees |
|---|---|---|---|
| Age (years) | 17 (N=3,115) | 32 (N=27,813) | 43 (N=396,746) |
| Male | 44% (N=3,115) | 43% (N=27,813) | 50% (N=396,746) |
| Temporary contract | 58% (N=3,063) | 28% (N=27,428) | 6% (N=395,570) |
| Part time | 93% (N=3,115) | 62% (N=27,813) | 18% (N=396,745) |
| Small firm | 27% (N=2,969) | 31% (N=25,885) | 16% (N=382,278) |
| Employed at quarter t+1 | 75% (N=1,440) | 89% (N=12,587) | 97% (N=199,816) |
| Employed at quarter t+2 | 67% (N=884) | 85% (N=7,672) | 96% (N=128,607) |
| | | | |
| **Sector** | | | |
| Retail | 35% (N=3,111) | 26% (N=27,766) | 8% (N=396,120) |
| Accommodation and food | 39% (N=3,111) | 27% (N=27,766) | 5% (N=396,120) |
| Other | 27% (N=3,111) | 48% (N=27,766) | 86% (N=396,120) |
| | | | |
| **Educational attainment** | | | |
| Upper secondary | 23% (N=3,107) | N/A | N/A |
| Post-secondary | N/A | 18% (N=27,146) | 59% (N=389,713) |

*Source:* Irish Labour Force Survey Data. Authors' calculations.
*Notes:* Given the age profile of youth wage rate employees, the education variable captures the percentage of employees with at least an upper secondary level education, as virtually none of these employees have completed post-secondary education given their young age. For the other employees (minimum wage and higher-paid), we show the percentage of employees with a post-secondary education. Age relates to mean age (in years). Statistics are based on data from quarter 2 of 2016 to quarter 2 of 2025.

When looking at educational attainment, we use different measures for youth wage employees versus the other two groups. Due to the age profile, there are

virtually no sub-minimum youth wage employees that have completed post-secondary education. Therefore, we report the percentage of sub-minimum youth wage employees whose highest educational attainment is upper secondary education or above (24 per cent). For minimum wage and higher-paid employees, we show the percentage that completed post-secondary education of some form (20 per cent for minimum wage employees compared to almost 60 per cent for higher-paid workers). The descriptive statistics in Table 4.1 also show that higher-paid workers are far less likely to hold temporary contracts, work part time and work in small firms compared to minimum wage workers. Higher-paid workers are also far less likely to work in retail or accommodation and food.

There is a panel component to the LFS data, which allows us to follow respondents over time to examine whether they stay in employment for multiple quarters. Households are followed for up to five quarters. Each quarter, 20 per cent of the sample are dropped, or 'rotated out', of the panel. This 20 per cent refers only to the design of the rotating panel; there may also be attrition due to households not completing the full five quarters for other reasons. The corresponding statistics in Table 4.1 show that, on average, minimum wage workers are less likely to stay in employment than higher-paid workers. Specifically, 75 per cent of sub-minimum youth wage employees are still in employment in the following quarter, compared to 89 per cent of full-rate minimum wage workers and 97 per cent of higher-paid workers. When we look at the employment status of respondents two quarters into the future, just 67 per cent of sub-minimum youth wage employees remain employed, compared to 85 per cent of full-rate minimum wage workers and 96 per cent of higher-paid workers.

While the direct minimum wage question allows us to identify minimum wage and non-minimum wage employees, it does not tell us whether the non-minimum wage employees are high- or low-paid workers. For a subsample of employees, however, we can draw on linked administrative earnings data that is taken from official tax records. This is available for approximately 60 per cent of the LFS respondents. By combining this data with the direct minimum wage question, we can isolate non-minimum wage workers that are still relatively low-paid. Specifically, we have information on the gross earnings for a given quarter, as well as the number of weeks the person worked in the quarter. This allows us to calculate weekly earnings, which we can then combine with usual hours worked to estimate an employee's hourly earnings. This is useful as it allows us to carry out robustness tests in which we restrict the control group to those on relatively low earnings to make them more comparable with the treatment group. A limitation of this approach, however, is that it places further restrictions on the sample size. Furthermore, measurement error in either the earnings data or hours data can lead to misclassification (see Redmond et al., 2025). Nonetheless, as we show in Chapter 6, this analysis provides a useful robustness test to compare to the baseline results.

# CHAPTER 5
# Methodology

We estimate the causal impact of annual minimum wage increases using a difference-in-differences approach. Minimum wages were increased on 1 January each year from 2016 to 2025.[8] Treatment is based on minimum wage status in the quarter before the minimum wage increase. Therefore, individuals who were on minimum wage in quarter 4 of a given year are the treatment group, while those earning above minimum wage in quarter 4 are the control group. We follow the same individuals in the treatment and control groups between quarters to evaluate whether treatment workers were more likely to transition to unemployment or inactivity following the minimum wage increase, relative to control group workers. To do this, we estimate the following probit model,

$$\Pr(Employed_{it} = 1 \mid X_{it}) = \phi(\beta_0 + \beta_1 Treated_{\text{it}} + \beta_2 X'_{it} + \gamma_t + \epsilon_{it}) \qquad (1)$$

where $Employed_{it}$ is a binary variable that equals one if employee $i$ was employed in both quarter 4 (pre-minimum wage increase) and quarter 1 (post-minimum wage increase). It equals zero if employee $i$ was employed in quarter 4 but was unemployed or inactive in quarter 1. Our main independent variable of interest is the binary variable ($Treated_{it}$), which denotes treatment (1) or control (0) group assignment. The main coefficient of interest ($\beta_1$) captures differences in the likelihood of transitioning to either unemployment or inactivity between treated and control units in Q1 (i.e. post-treatment). The vector $X'_{it}$ denotes a set of covariates including age, gender, education level, lagged sector, lagged job tenure, lagged part-time status, lagged firm size and lagged contract type (temporary versus permanent). Note that we include lags for the firm specific characteristics because all individuals were employed in quarter 4, but some are not employed in quarter 1. We include year dummy variables, $\gamma_t$, and $\epsilon_{it}$ is the error term. When reporting results from our probit estimation, we report the average marginal effects.

Causal identification in equation (1) is based on the assumption that, in the absence of a minimum wage increase, the change in outcomes among the treated group would have been the same as the change in outcomes among the control group. However, this may not be the case. Even in the absence of a minimum wage change, the treated group that consists of lower-paid workers may be more likely to transition to non-employment than the higher-paid control group. We can use placebo periods to test whether this is the case. For example, we follow the treatment and control groups during periods when the minimum wage did not

[8] There was one exception in 2020, where the minimum wage increase took effect on 1 February 2020.

change – from quarter 2 to quarter 3 and from quarter 3 to quarter 4. If we were to observe a difference in employment transitions among the treated and control group during the treatment period (quarter 4 to quarter 1), and we also observed a similar effect during placebo periods, then we cannot attribute the quarter 4 to quarter 1 effect as being caused by the minimum wage change.

Equation (1) allows us to implement our difference-in-differences analysis using a standard probit model by allowing the dependent variable to capture *changes* in outcomes. By construction, all individuals in the treatment and control groups were in employment in the quarter before the minimum wage increase (quarter 4). This means that there is no pre-treatment difference in employment status between treated and control units. Given the initial difference between treated and control units is zero by design, the difference-in-differences is simply zero minus the difference in employment status between treated and control units at the post-treatment period (or just the difference post-treatment), which is captured by the marginal effect implied by the coefficient $\beta_1$. It is useful to illustrate this with a hypothetical example. Suppose we are examining the impact of the 2024 minimum wage increase and are therefore following treated and control employees from quarter 4 2023 to quarter 1 2024. All employees were employed in Q4 of 2023. If 90 per cent of control group employees, and 80 per cent of treatment group employees, remained employed in Q1 of 2024, then the marginal effect of treatment implied by the coefficient $\beta_1$ would be -0.10. That is, the hypothetical treatment effect illustrated in this example would indicate that employees in the treated group were 10 percentage points less likely to remain in employment, relative to the control group, following the minimum wage increase.

The difference-in-differences specification in equation (1) resembles a standard 2x2 difference-in-differences framework, as we are comparing one pre-treatment and one post-treatment period. While the longitudinal component of the LFS follows individuals for up to five quarters, we cannot utilise the full panel due to sample size restrictions. To begin with, our treatment group of minimum wage workers already focuses on a small subsample of the employed population of workers. Sample sizes are further restricted by following individuals over time, as roughly 20 per cent of respondents rotate out of the panel each quarter. While this means we do not have pre-treatment periods for the same individuals to test for parallel pre-treatment trends, we can employ placebo tests that serve the same purpose. That is, we use the same setup as equation (1) and follow a panel of individuals from quarter 3 to quarter 4, during which time the minimum wage was unchanged. If we observe a similar coefficient on the *Treated* variable in the placebo period as in the treated period, then this suggests that the finding in the treated period cannot be interpreted as causal evidence. We also do the same using a panel of individuals from quarter 2 to quarter 3, giving us two pre-treatment placebo periods for each minimum wage increase.

While our baseline specification will capture minimum wage impacts that appear immediately after the minimum wage change, it is possible that employment effects could take longer to materialise. Therefore, we also examine employment outcomes two quarters following the minimum wage increase, by comparing quarter 4 to quarter 2 for the treatment and control groups. As noted above, however, extending the panel results in a smaller sample of individuals.

## 5.1 SUB-MINIMUM YOUTH WAGE EMPLOYEES

We use a similar difference-in-differences setup to estimate the effect of 'ageing into' a higher sub-minimum youth wage rate. Upon turning 18, respondents move from being entitled to 70 per cent of the full minimum wage rate to 80 per cent of the full rate. Upon turning 19, they are entitled to 90 per cent of the full rate, and upon turning 20 they are entitled to the full adult minimum wage. As such, our treatment assignment is based on the respondent's birthday. Specifically, the treatment group consists of respondents who fulfil three conditions: 1) they are aged between 18 and 20 in the current quarter, 2) they earned a sub-minimum youth wage in the previous quarter and 3) their birthday occurred between the previous quarter and the current quarter. Our control group consists of respondents in the same age group who were also employed on a sub-minimum youth wage in the previous quarter but did not have a birthday between the previous and current quarters. As such, the treatment and control groups are identical, apart from the fact that the treated respondents exogenously experienced a birthday, thereby making them entitled to a higher minimum wage.

As before, our difference-in-differences framework can be estimated using a probit model. Specifically, we estimate,

$$\Pr(Employed_{it} = 1 \mid X_{it}) = \phi(\beta_0 + \beta_1 Birthday_{it} + \beta_2 X'_{it} + \gamma_t + \epsilon_{it}) \quad (2)$$

where $Birthday_{it}$ is now the treatment variable, equal to one if the respondent experienced a change in their age between the two quarters and zero if they did not. The coefficient associated with $Birthday_{it}$ ($\beta_1$) therefore captures the causal impact on employment of ageing into a higher minimum wage. The other variables in equation (2) are defined in the same way as equation (1).

As discussed in detail in Chapter 3, there was a policy change in 2019 that impacted sub-minimum youth wages. The pre-2019 policy included an experience component. However, the age discontinuities pre- and post-2019 are the same, provided that we account for employment experience. Specifically, we ensure that, pre-2019, those in the treatment group that go from age 18 to age 19 have at least one year of employment experience. This ensures that, upon turning 19, their sub-minimum youth wage entitlement increases. Likewise, we ensure that, pre-2019, those in the treatment group that go from age 19 to 20 have at least two years

of employment experience, so that their wage entitlement increases when they turn 20.

There are strengths and limitations to the analysis that focuses on employees ageing into a higher minimum wage. The main strength is that we have a very strong control group – that is, the control group are set up in a way that is identical to the treatment group with the only difference being that the treatment group exogenously experienced a birthday. Apart from that, both groups are in the same narrow age range and were both on a sub-minimum youth wage in the previous quarter. The limitation relates to sample size. The three criteria used to construct the treatment group impose strong requirements on the data, and therefore the resulting sample size is necessarily limited. Nonetheless, by pooling years and including year dummies, we can get an average causal effect. In addition, while our sample sizes do not allow for estimation of individual year effects, we do estimate separate impacts for two time periods: pre-COVID-19 and post-COVID-19.

# CHAPTER 6
# Results

## 6.1 BASELINE DIFFERENCE-IN-DIFFERENCES RESULTS

In Table 6.1, we report the results from estimating equation (1) using treatment and control employees that are defined based on the LFS minimum wage question. The results in column (1) of Table 6.1 indicate that minimum wage employees are 1.5 percentage points less likely to be in employment in the quarter following a minimum wage increase, compared to higher-paid employees. However, this alone cannot be taken as causal evidence of a minimum wage change on employment. The results in columns (2) and (3) indicate that minimum wage employees experienced similar employment transitions during quarters when the minimum wage was not increased. The estimated impacts in the placebo quarters, of approximately 2 percentage points, are actually slightly higher than the estimated impact for the treatment quarters. These results suggest that the transition to non-employment for minimum wage workers after a minimum wage increase is no greater than the transition to non-employment that are generally experienced by minimum wage workers from one quarter to the next.

There may be seasonal effects associated with the treatment quarters. One concern may be that the quarter 4 to quarter 1 time period contains short-term low-paid workers that enter employment for the Christmas period only. To address this, we check whether our results are robust to conditioning on employees that have been in employment with their employer for at least three months at the time we observe them as minimum wage workers. For example, this means that for our treated group, we exclude those employees that entered employment after October of a given year. This would rule out short-term employees that enter just before the Christmas period. The results are robust to this restriction and are similar to the patterns observed in Table 6.1.[9]

These types of employment transitions, in which minimum wage employees generally tend to experience more employment volatility than higher-paid workers, has been found in previous studies (see Redmond et al., 2026; Jones et al., 2007; Even and Macpherson, 2003; Smith and Vavrichek, 1992). Minimum wage roles may be fundamentally different to other low-paid roles. These differences may lead to greater employment volatility that persists even after conditioning on a range of potentially important explanatory variables.

[9] The average marginal effects corresponding to the 'DiD estimates' in Table 6.1 are: Treatment Q4–Q1 (-0.012***); Placebo Q3–Q4 (-0.020***); Placebo Q2–Q3 (-0.019***). Furthermore, in Appendix Table A.1 we show that there is no systematic difference in the characteristics of minimum wage employees in the treated and placebo periods.

We estimate separate difference-in-differences models for each individual year, as well as placebo estimates corresponding to that year, and plot the results in Figure 6.1.[10] The first thing to note is that, as with the pooled estimates, the placebo estimates are not statistically significantly different from the treated estimates.[11] Furthermore, it is notable that no clear relationship emerges between the magnitude of the estimated treatment effect and the size of the corresponding minimum wage increase. If minimum wage increases were causing low-paid workers to move to non-employment, then one would expect the magnitude of such transitions to increase in line with the magnitude of the minimum wage increase. However, as shown in Figure 6.1, the estimated transitions from 2017 to 2022, when minimum wage increases were comparatively small, are of a similar magnitude to years when the minimum wage increases were higher (e.g. 2023 to 2025). This, along with the placebo results, further reinforces our finding that minimum wage increases did not appear to cause significant short-term transitions to non-employment for low-paid workers.

10 For brevity, we plot one placebo estimate – the quarter 3 to quarter 4 transition that occurs prior to the minimum wage change in quarter 1. The other placebo estimates are of a similar magnitude.

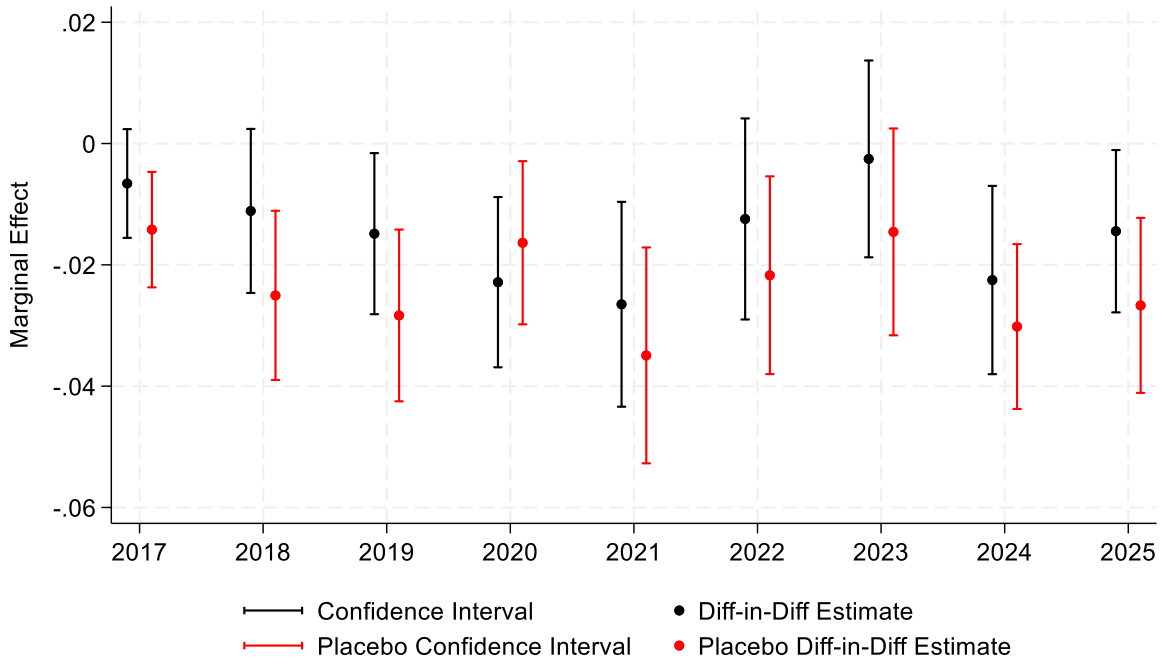
11 While the confidence intervals in Figure 6.1 imply that the estimates are not statistically significantly different, the p-values associated with the hypothesis test that the placebo and treatment effects are equal across years are as follows: 2017 (p 0.25); 2018 (p 0.16); 2019 (p 0.17); 2020 (p 0.51); 2021 (p 0.50); 2022 (p 0.43); 2023 (p 0.32); 2024 (p 0.47); 2025 (p 0.22).

**TABLE 6.1 DIFFERENCE-IN-DIFFERENCES ESTIMATES (TREATMENT AND PLACEBO PERIODS) – AVERAGE MARGINAL EFFECTS**

| | (1) | (2) | (3) |
|---|---|---|---|
| **Variables** | **Treatment Q4–Q1** | **Placebo Q3–Q4** | **Placebo Q2–Q3** |
| DiD estimate | -0.0145*** | -0.0234*** | -0.0232*** |
| | (0.00236) | (0.00240) | (0.00265) |
| Age | -0.000114* | 0.000107 | -0.000274*** |
| | (6.20e-05) | (6.67e-05) | (7.04e-05) |
| Male | -0.00265* | -0.000574 | 0.00420** |
| | (0.00154) | (0.00159) | (0.00174) |
| $Tenure_{t-1}$ | 1.79e-05** | 3.06e-06 | 2.78e-05*** |
| | (7.36e-06) | (7.74e-06) | (8.40e-06) |
| $Temporary\ contract_{t-1}$ | -0.0398*** | -0.0537*** | -0.0535*** |
| | (0.00211) | (0.00219) | (0.00240) |
| $Part\ time_{t-1}$ | -0.0241*** | -0.0167*** | -0.0193*** |
| University degree/PhD | (0.00180) | (0.00189) | (0.00203) |
| $Small\ firm_{t-1}$ | -0.00668*** | -0.00473** | -0.00647*** |
| | (0.00177) | (0.00188) | (0.00202) |
| | | | |
| **$Sector_{t-1}$ (ref: other)** | | | |
| Accommodation and food | -0.0189*** | -0.0124*** | -0.00925*** |
| | (0.00252) | (0.00260) | (0.00304) |
| Retail | -0.00713*** | 0.00892*** | 0.00155 |
| | (0.00228) | (0.00265) | (0.00282) |
| | | | |
| **Education (ref: upper secondary non-tertiary)** | | | |
| Post-secondary, non-tertiary | 0.00864*** | 0.0165*** | 0.00810*** |
| | (0.00252) | (0.00257) | (0.00282) |
| Tertiary | 0.0165*** | 0.0196*** | 0.0136*** |
| | (0.00183) | (0.00196) | (0.00208) |
| | | | |
| Observations | 53,429 | 51,624 | 44,426 |

*Source:* Irish Labour Force Survey.
*Note:* Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Average marginal effects are reported.

**FIGURE 6.1 DIFFERENCE-IN-DIFFERENCES ESTIMATES BY YEAR (TREATMENT AND PLACEBO ESTIMATES)**




*Source:* Irish Labour Force Survey.
*Notes:* Point estimates relate to average marginal effects. 95 per cent confidence intervals are shown.

An additional consideration when interpreting the results relates to potential pre-emptive or anticipatory effects. Minimum wage increases are generally announced in October (quarter 4) and implemented the following January (quarter 1). It is possible that some employers could reduce their workforce when the announcement happens, instead of waiting for the actual increase in January. The implication is that the placebo analysis for quarter 4 would partially pick up anticipatory causal effects of the minimum wage increase. However, this does not seem to be the case. To demonstrate this, we can take the example of the 2017 minimum wage increase, which was the smallest minimum wage increase in the sample. In January 2017, the minimum wage increased by only 10 cents per hour, from €9.15 to €9.25 (or 1 per cent).[12] This is the closest we have to no minimum wage increase in the study period. However, the placebo period for quarter 3 of 2016 to quarter 4 of 2016 still shows transitions to non-employment of a similar magnitude to other periods. With such a small minimum wage increase occurring in quarter 1 of 2017, it is less likely that the quarter 4 placebo estimates for 2016 would be picking up causal anticipatory effects. We can go further by comparing this placebo estimate from quarter 3 to quarter 4 of 2016, to the actual treatment estimate for the year which saw the largest minimum wage increase. This occurred

[12] There was also a 10 cent increase in January 2021, but that is complicated by COVID-19. As such, we focus on the 10 cent increase from January 2017.

in January 2024, when the minimum wage increased from €11.30 to €12.70 per hour (12 per cent increase). However, there is no statistically significant difference between the estimated treatment effect for the largest minimum wage increase and the estimated placebo effect preceding the smallest minimum wage increase.

## 6.2 ALTERNATIVE CONTROL GROUP

There are two main caveats associated with the results in Table 6.1. First, as treatment assignment is based only on the yes/no minimum wage question, the control group contains all non-minimum wage employees irrespective of whether their hourly wages are low or high. Very high-paid workers are likely to be quite different from minimum wage employees and therefore removing them from the analysis would make the treatment and control groups more comparable. To do this, we utilise the fact that, from 2019, the LFS data includes administrative earnings. While previous work has highlighted some potential issues with precisely identifying minimum wage workers using administrative wage data (see Redmond et al., 2025), it is nonetheless useful to use the administrative earnings data to restrict the control group to ensure that it does not contain very high-paid workers. Specifically, we restrict the control group to employees whose hourly wage is not more than 15 per cent higher than the prevailing minimum wage.

The second issue relates to the fact that the binary nature of the minimum wage question may lead to misclassification of control group workers who, in quarter 4, earned more than the old minimum wage but less than the new (quarter 1) minimum wage. For example, in January 2017 the minimum wage increased from €9.15 to €9.25. Employees earning more than €9.15 but less than €9.25 in quarter 4 of 2016 are directly impacted by the policy as their wages will have to increase to at least the new minimum wage. However, the classification based on the question alone would include these employees as control group workers, as we are using the minimum wage question from quarter 4 of 2016. This issue becomes more pronounced with larger minimum wage increases, as the gap between the old and new minimum wage rates becomes larger and leads to more misclassification. We address this by removing from the control group any employee whose calculated hourly wage was between the old and new minimum wage and reclassifying them to the treatment group.[13]

Note that the administrative earnings data is only available from 2019 onwards, compared to 2016 for the direct question. Furthermore, administrative earnings information is only available for approximately 60 per cent of employees. This means that there are roughly 40 per cent of respondents for which we have no hourly wage information and are therefore excluded from the control group.

[13] As shown in Appendix Table A.2, the treatment and control groups using this alternative treatment assignment procedure are more similar in terms of their observable characteristics, compared to the baseline treatment and control groups that uses the binary minimum wage question.

These factors combined lead to a smaller sample size compared to the baseline estimates.

The results from estimating equation (1) using the alternative treatment and control groups are shown in Table 6.2. Column (1) of Table 6.2 shows that minimum wage employees are approximately 4 percentage points more likely than control group employees to move to non-employment in the quarter following a minimum wage increase. However, as with our baseline estimates, the estimated impacts during the two placebo periods are of a similar, and slightly higher, magnitude. The results in columns (2) and (3) show that minimum wage workers are approximately 5 percentage points more likely to move to non-employment than higher-paid workers in quarters where the minimum wage did not increase.

**TABLE 6.2 DIFFERENCE-IN-DIFFERENCES ESTIMATES USING ALTERNATIVE TREATMENT ASSIGNMENT (TREATMENT AND PLACEBO PERIODS) – AVERAGE MARGINAL EFFECTS**

| | (1) | (2) | (3) |
|---|---|---|---|
| **Variables** | **Treatment Q4–Q1** | **Placebo Q3–Q4** | **Placebo Q2–Q3** |
| DiD estimate | -0.0446*** | -0.0475*** | -0.0471*** |
| | (0.0115) | (0.0131) | (0.0127) |
| Age | 0.000670** | 0.00129*** | -0.000197 |
| | (0.000298) | (0.000344) | (0.000318) |
| Male | -0.00707 | -0.00437 | 0.0202** |
| | (0.00760) | (0.00819) | (0.00849) |
| $Tenure_{t-1}$ | -2.07e-05 | 0.000147** | 0.000149** |
| | (5.34e-05) | (7.19e-05) | (6.09e-05) |
| $Temporary\ contract_{t-1}$ | -0.0715*** | -0.121*** | -0.102*** |
| | (0.00847) | (0.00880) | (0.00929) |
| $Part\ time_{t-1}$ | -0.0409*** | -0.0122 | -0.0209** |
| | (0.00854) | (0.00912) | (0.00914) |
| $Small\ firm_{t-1}$ | -0.00895 | -0.00811 | 0.00155 |
| | (0.00801) | (0.00864) | (0.00877) |
| | | | |
| **$Sector_{t-1}$ (ref: other)** | | | |
| Accommodation and food | -0.0187* | 0.00785 | 0.0126 |
| | (0.00968) | (0.0103) | (0.0111) |
| Retail | 0.00564 | 0.0644*** | 0.0333*** |
| | (0.00960) | (0.0112) | (0.0110) |
| | | | |
| **Education (ref: upper secondary non-tertiary)** | | | |
| Post-secondary, non-tertiary | 0.00136 | 0.0518*** | 0.0367*** |
| | (0.0111) | (0.0114) | (0.0112) |
| Tertiary | 0.0121 | 0.0543*** | 0.0297*** |
| | (0.00939) | (0.00962) | (0.00972) |
| | | | |
| Observations | 5,982 | 5,909 | 5,290 |

*Source:* Irish Labour Force Survey.
*Note:* Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Average marginal effects are reported.

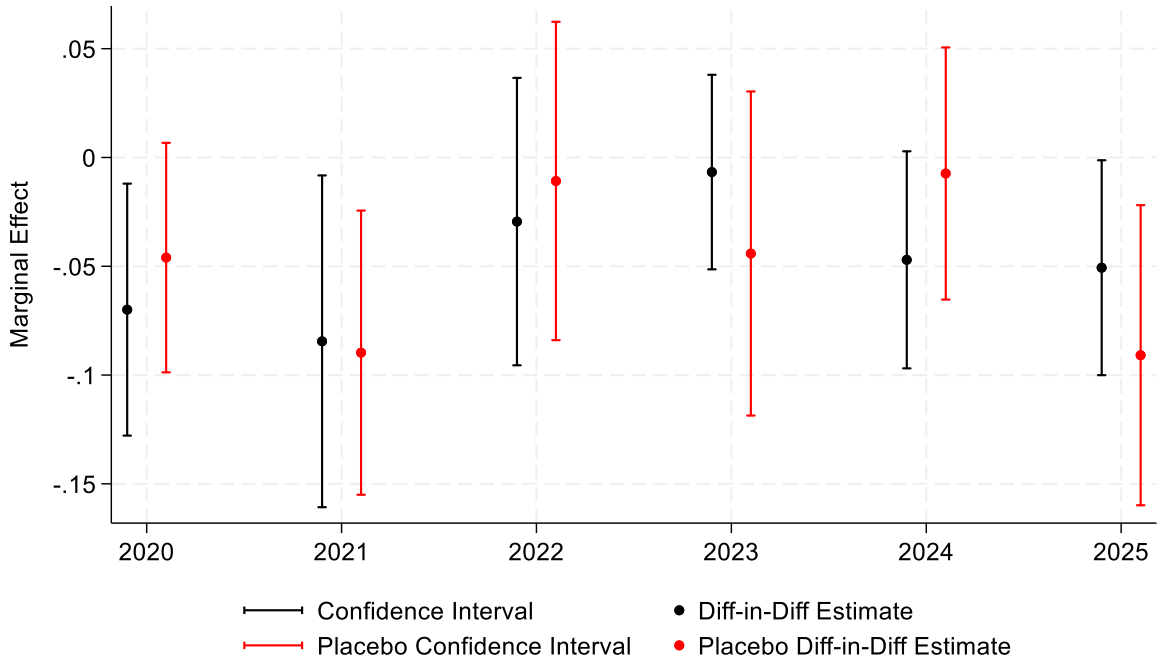
In Figure 6.2, we plot separate estimates for each of the yearly minimum wage increases using the administrative wage restriction described above. As administrative wage data became available in 2019, our first treatment quarter is quarter 1 of 2020. Again, the placebo effects are not statistically significantly different from the treatment effects.[14]

As before, it is useful to identify the best possible placebo quarter which avoids, as much as possible, anticipatory effects. Furthermore, as the administrative wage data is available only from 2019, we must consider a placebo time-period that is not impacted by COVID-19. Accordingly, we focus on the estimated placebo effect from quarter 3 of 2019 to quarter 4 of 2019. Note that in Figure 6.2, this is plotted above the year 2020, as placebo estimates for a given treatment effect correspond to the previous quarters – that is, for the estimated treatment effect from Q4 2019 to Q1 2020, the corresponding placebo relates to Q3 2019 to Q4 2019. This placebo seems suitable as the minimum wage increase that took place in quarter 1 of 2020 was relatively small (€9.80 to €10.10), thereby limiting the likelihood of strong anticipatory effects from quarter 3 to quarter 4 of 2019. Furthermore, this placebo period is also before the COVID-19 pandemic. Notably, the estimated impact from this placebo quarter (-4.6 percentage points) is almost identical to the estimated treatment effect in the quarter following the largest minimum wage increase in 2024 (-4.7 percentage points). Again, this indicates that transitions to non-employment following a minimum wage increase were no larger than general quarter-to-quarter transitions that take place among minimum wage workers relative to higher-paid workers.

Adverse employment effects associated with minimum wage increases may be more likely to materialise, and be more severe, during periods of economic recession (see Clemens and Wither, 2019). Therefore, when interpreting our results, it is important to consider the general economic conditions that existed when the policy changes occurred. Our study period, from 2017 to 2025, was generally characterised by strong economic growth, strong wage growth and low unemployment, albeit interrupted by the COVID-19 pandemic in 2020. Take, for example, the three largest minimum wage increases that occurred from 2023 to 2025. During this period, the average unemployment rate was just 4.5 per cent, and average annual growth in modified domestic demand was 4 per cent (Barrett et al., 2025). While we interpret our results in the context of this relatively strong economic performance, it is possible that similar policy changes could generate different outcomes if enacted during a period of weaker economic performance.

[14] The p-value associated with the hypothesis test that the placebo and treatment effects are equal are as follows: 2020 (p 0.55); 2021 (p 0.92); 2022 (p 0.71); 2023 (p 0.40); 2024 (p 0.31); 2025 (p 0.35).

**FIGURE 6.2 DIFFERENCE-IN-DIFFERENCES ESTIMATES BY YEAR USING ALTERNATIVE TREATMENT ASSIGNMENT (TREATMENT AND PLACEBO ESTIMATES)**




*Source:* Irish Labour Force Survey.
*Notes:* Point estimates relate to average marginal effects. 95 per cent confidence intervals are shown.

## 6.3 LONGER-TERM IMPACTS (TWO QUARTERS)

Although it leads to smaller sample sizes, we estimate our pooled models by following individuals for a longer period of time. Specifically, we focus on the sample of individuals for which we have data for three quarters, including a pre-minimum wage increase quarter and two post-minimum wage increase quarters. As such, we are comparing the employment status of individuals in quarter 4 to quarter 2 and assessing whether these transitions were different for treatment and control workers. The placebo period focuses on individuals that are employed in quarter 2 and examines their transitions to non-employment in quarter 4.

The results are shown in Table 6.3. For both the baseline treatment assignment using the minimum wage question only (columns (1) and (2)), and the alternative treatment assignment that incorporates the administrative earnings data (columns (3) and (4)), the increased likelihood of transitioning to non-employment for minimum wage workers is no higher following a minimum wage increase than it is during a period when the minimum wage is unchanged. The placebo estimates are actually of a larger magnitude than the estimated treatment effects.

**TABLE 6.3 LONGER TERM (TWO QUARTER) DIFFERENCE-IN-DIFFERENCES ESTIMATES (TREATMENT AND PLACEBO PERIODS) – AVERAGE MARGINAL EFFECTS**

| | Baseline treatment assignment (question only) | | Alternative treatment assignment (question and admin earnings) | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| **Variables** | **Treatment Q4–Q2** | **Placebo Q2–Q4** | **Treatment Q4–Q2** | **Placebo Q2–Q4** |
| DiD estimate | -0.0217*** | -0.0351*** | -0.0447*** | -0.0799*** |
| | (0.00395) | (0.00362) | (0.0162) | (0.0171) |
| Age | -0.000370*** | -0.000329*** | 0.000206 | 0.000353 |
| | (9.75e-05) | (9.60e-05) | (0.000431) | (0.000413) |
| Male | -0.000449 | 0.00405* | 0.00625 | 0.0194* |
| | (0.00239) | (0.00235) | (0.0115) | (0.0111) |
| $Tenure_{t-1}$ | 1.71e-05 | 2.58e-06 | -2.64e-05 | 6.21e-05 |
| | (1.09e-05) | (1.05e-05) | (7.38e-05) | (7.04e-05) |
| $Temporary\ contract_{t-1}$ | -0.0523*** | -0.0659*** | -0.0821*** | -0.135*** |
| | (0.00348) | (0.00333) | (0.0130) | (0.0119) |
| $Part\ time_{t-1}$ | -0.0423*** | -0.0283*** | -0.0844*** | -0.0474*** |
| | (0.00278) | (0.00273) | (0.0126) | (0.0120) |
| $Small\ firm_{t-1}$ | -0.0128*** | -0.00638** | -0.0137 | 0.00499 |
| | (0.00273) | (0.00276) | (0.0119) | (0.0117) |
| | | | | |
| **$Sector_{t-1}$ (ref: other)** | | | | |
| Accommodation and food | -0.0335*** | -0.0201*** | -0.0277* | 0.0198 |
| | (0.00403) | (0.00405) | (0.0146) | (0.0147) |
| Retail | -0.00474 | 0.000782 | 0.0303** | 0.0454*** |
| | (0.00373) | (0.00377) | (0.0147) | (0.0143) |
| | | | | |
| **Education (ref: upper secondary non-tertiary)** | | | | |
| Post-secondary, non-tertiary | 0.00958** | 0.0165*** | 0.0229 | 0.0645*** |
| | (0.00386) | (0.00373) | (0.0159) | (0.0144) |
| Tertiary | 0.0227*** | 0.0225*** | 0.0297** | 0.0585*** |
| | (0.00282) | (0.00282) | (0.0139) | (0.0126) |
| | | | | |
| Observations | 35,400 | 31,567 | 3,700 | 3,645 |

*Source:* Irish Labour Force Survey.
*Note:* Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Average marginal effects are reported.

## 6.4 AGEING OUT OF SUB-MINIMUM YOUTH WAGE RATES

In Table 6.4, we show the difference-in-differences estimates that correspond to estimating equation (2). As discussed previously, the main challenge with this estimation procedure relates to relatively small sample sizes due to the precise nature of the treatment and control groups. To preserve sufficiently large sample sizes, we focus on a slightly more parsimonious specification. Our control variables include age, gender, education, and the lagged sector of work. However, unlike the baseline specifications, we do not include part-time status, contract, firm size or

tenure, as due to missing observations, their inclusion would lead to a 10 per cent (approximately) drop in sample size, which in this instance is substantial. We would note, however, that given we are looking at such a select group of workers – those aged 17 to 20 on a sub-minimum youth wage rate – the vast majority are working part time, on temporary contracts and with low tenure.

While we cannot estimate separate effects for each year, again due to small sample sizes, we present estimates for three different time periods. In column (1), we show the average estimated impact of ageing into a higher minimum wage on the probability of job loss for the full pooled sample (2016–2025). In column (2), we show the estimates for the pre-COVID-19 period, defined as 2016 to quarter 1 2020. In column (3), we show the estimates for the post-COVID-19 period, from quarter 2 of 2020 to quarter 2 of 2025.

The difference-in-differences estimate in column (1) of Table 6.4 indicates that, on average over the full sample period (2016–2025), ageing into a higher minimum wage rate did not lead to a higher probability of transitioning to non-employment. However, our estimates in columns (2) and (3) indicate that sub-minimum youth wage employees whose wage entitlements increased (i.e. due to their birthday) experienced employment declines in the early (pre-COVID-19 pandemic) years, but not in the later years.

While it is difficult to precisely disentangle why a negative effect was present in the earlier years but not the later years, there are some plausible explanations based on labour economic theory. The first relates to labour–labour substitution. Employers may become increasingly reliant on sub-minimum wage workers as the minimum wage increases over time. That is, there may be a greater propensity for employers to substitute full-rate minimum wage employees for sub-minimum youth wage employees as the minimum wage goes up. The proportion of the minimum wage that sub-minimum youth wage employees are entitled to stays the same (e.g. 70 per cent for 16–17-year-olds, 80 per cent for 18-year-olds), meaning the nominal difference between the full minimum wage and the sub-minimum wage increases as the minimum wage increases. For example, the nominal difference between the minimum wage and the 18-year-old sub-minimum youth wage rate was €1.91 per hour in 2018, but was €2.54 per hour in 2024. Assuming that the difference in productivity between minimum wage and sub-minimum youth wage employees is constant over time, this makes sub-minimum youth wage employees more attractive to employers, all else being equal. Because of this, employers may be less likely to let sub-minimum youth wage employees go in later years, even if their labour costs increase with their age. There is some descriptive support for this in the data. While the incidence of sub-minimum youth wage employment in Ireland is low, it has been increasing over time. For example, Figure 4.1 showed that the incidence of sub-minimum youth employment in 2024 was approximately double that of 2020 and previous years.

An additional explanation may relate to a tightening of the labour market in certain low-paid sectors. For example, after the COVID-19 pandemic, there were widespread reports of recruitment challenges and staff shortages in the hospitality sector.[15] Therefore, in such circumstances, employers may be less likely to lay off existing staff members, even if the wage that they are entitled to increases.

**TABLE 6.4 DIFFERENCE-IN-DIFFERENCES ESTIMATES: AGEING OUT OF SUB-MINIMUM YOUTH WAGE RATES – AVERAGE MARGINAL EFFECTS**

| | (1) | (2) | (3) |
|---|---|---|---|
| **Variables** | **Pooled** | **Pre-pandemic** | **Post-pandemic** |
| DiD estimate | -0.0137 | -0.154** | 0.0474 |
| | (0.0405) | (0.0764) | (0.0475) |
| Age | -0.0417 | 0.0517 | -0.0781** |
| | (0.0276) | (0.0505) | (0.0332) |
| Male | 0.00558 | 0.0963* | -0.0294 |
| | (0.0284) | (0.0552) | (0.0329) |
| | | | |
| **Sector$_{t-1}$ (ref: other)** | | | |
| Accommodation and food | 0.0400 | 0.0367 | 0.0450 |
| | (0.0354) | (0.0701) | (0.0408) |
| Retail | 0.122*** | 0.135** | 0.119*** |
| | (0.0363) | (0.0668) | (0.0430) |
| | | | |
| **Education (ref: lower secondary or below)** | | | |
| Upper secondary | 0.127*** | -0.0132 | 0.177*** |
| | (0.0436) | (0.0843) | (0.0514) |
| | | | |
| Observations | 891 | 255 | 636 |

*Source:* Irish Labour Force Survey.
*Note:* Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Average marginal effects are reported.

[15] See Skillnet Ireland (2023).

# CHAPTER 7
# Conclusions

The statutory minimum wage has received substantial attention in public debate in recent years. From 2016 to 2025, there have been yearly increases in the Irish minimum wage, which has risen from €8.65 per hour in 2015 to €13.50 per hour in 2025 (an increase of approximately 56 per cent). The minimum wage increases in recent years (since 2022) have been the largest to date, as government policy has set the target of a living wage, equal to 60 per cent of median income. In light of these policy changes, it is crucial for policymakers to understand whether increases to the minimum wage led to employment losses for low-paid workers. In this report, we used survey and administrative earnings data to examine the causal impact of minimum wage increases on employment using a difference-in-differences methodology.

Our findings indicate that the yearly minimum wage increases during this period did not cause a higher likelihood of minimum wage employees moving to non-employment in the six-month period following the minimum wage increase. While minimum wage employees are generally more likely to enter non-employment than higher-paid workers, the likelihood of this happening did not increase following increases to the minimum wage.

An additional feature of Irish minimum wage policy is the presence of age-based sub-minimum youth wage rates for those aged under 20. This means that young minimum wage employees can 'age into' a higher minimum wage band. For example, an employee aged 18 is entitled to 80 per cent of the full adult minimum wage rate. Upon turning 19, they are entitled to 90 per cent of the full rate, and upon turning 20, they are entitled to the full adult minimum wage rate. We exploit this age-based variation to examine the causal effect of 'ageing into' a higher minimum wage band. We find that, on average, young workers that 'age into' a higher minimum wage band did not experience an increased likelihood of job loss in the quarter directly following their birthday. However, there is weak evidence of varying impacts over time. In the pre-pandemic period, there is evidence of increased job losses for sub-minimum youth wage employees that age into a higher minimum wage band. However, an important caveat is that these findings for the pre-pandemic period are based on small sample sizes. From 2021 to 2025, we detect no statistically significant impact.

While we cannot precisely identify the reasons for different effects over time, it is possible that there could be greater substitution towards sub-minimum youth wage employees as the minimum wage gets higher. If sub-minimum youth wage employees are, to some degree, substitutes for full-rate adult minimum wage

employees, then employers may become increasingly reliant on sub-minimum youth wage employees to reduce their wage bill as the minimum wage goes up, thereby creating strong incentives to retain such workers. An additional explanation may relate to a tightening of the labour market in certain low-paid sectors following the COVID-19 pandemic. In the presence of recruitment challenges and staff shortages in the hospitality sector, employers may be incentivised to retain younger staff members, even in the presence of increased wage entitlements. Recent years have seen an increase in the incidence of sub-minimum youth wage employment. In 2019, for example, just under 20 per cent of employees aged under 20 were earning a sub-minimum youth wage. However, by 2024, this had increased to 26 per cent.

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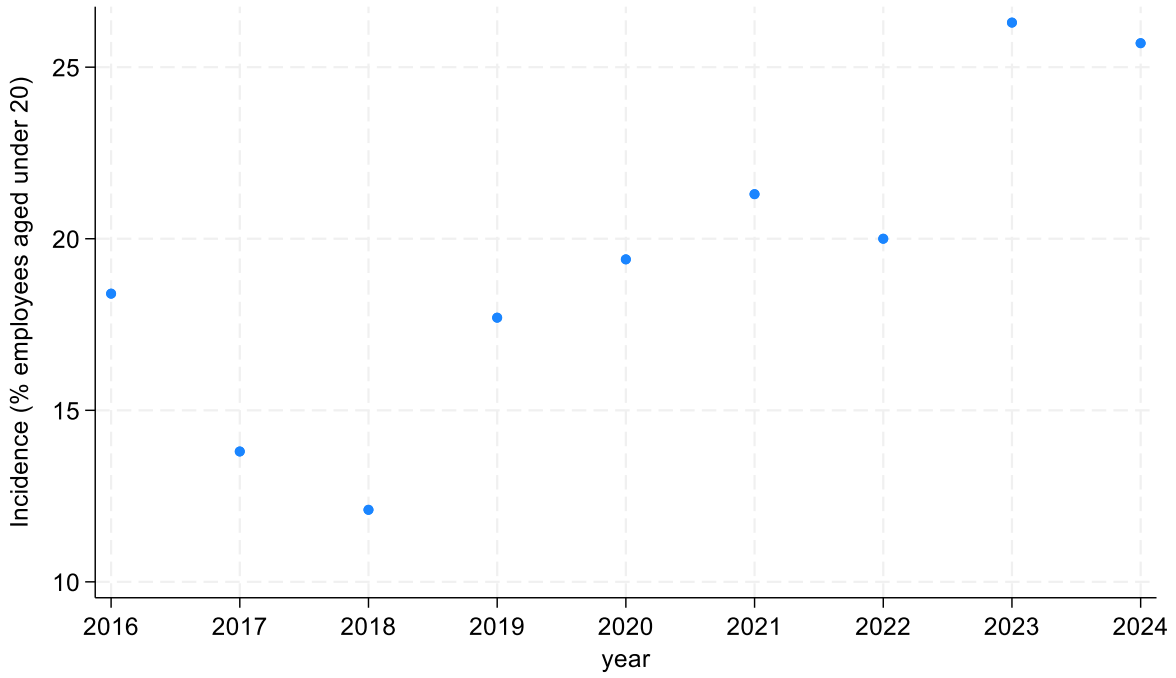
# APPENDIX

**FIGURE A.1 INCIDENCE OF SUB-MINIMUM YOUTH WAGE EMPLOYMENT AMONG EMPLOYEES AGED UNDER 20 YEARS IN IRELAND (2016–2024)**




*Source:* Irish Labour Force Survey. Authors' calculations.
*Notes:* Figure A.1 plots the percentage of young employees (aged under 20) that are paid a sub-minimum youth wage.

## TABLE A.1 CHARACTERISTICS OF MINIMUM WAGE EMPLOYEES IN THE TREATED AND PLACEBO PERIODS (2016–2025)

| Characteristics | (1) Treated (Q4–Q1) | (2) Placebo (Q2–Q3) | (3) Placebo (Q3–Q4) |
|---|---|---|---|
| Age | 31.4 | 31.9 | 30.5 |
| Male | 45% | 45% | 46% |
| Temporary contract | 28% | 27% | 28% |
| Part time | 63% | 59% | 62% |
| Small firm | 32% | 34% | 33% |
| Employed at quarter t+1 | 86% | 85% | 82% |
| Employed at quarter t+2 | 83% | 82% | 81% |
| | | | |
| **Sector** | | | |
| Retail | 26% | 25% | 26% |
| Accommodation and food | 24% | 23% | 24% |
| Other | 50% | 52% | 50% |
| | | | |
| **Educational attainment** | | | |
| Post-secondary | 16% | 18% | 16% |

*Source:* Irish Labour Force Survey Data. Authors' calculations.
*Notes:* Table A.1 shows the average characteristics of minimum wage employees that are used in the difference-in-differences estimation across the treated and placebo time periods.

## TABLE A.2 CHARACTERISTICS OF TREATED AND CONTROL GROUPS: BASELINE (QUESTION ONLY) AND ALTERNATIVE (ADMIN DATA) TREATMENT ASSIGNMENT CRITERIA

| Characteristics | (1) Treated | (2) Control | (3) Treated | (4) Control |
|---|---|---|---|---|
| | BASELINE GROUPS | | ALTERNATIVE GROUPS | |
| Age (years) | 31.4 | 43.9 | 34.2 | 41.3 |
| Male | 45% | 49% | 44% | 42% |
| Temporary contract | 28% | 5% | 23% | 9% |
| Part time | 63% | 18% | 56% | 33% |
| Small firm | 32% | 17% | 32% | 29% |
| Employed at quarter t+1 | 86% | 96% | 86% | 90% |
| | | | | |
| **Sector** | | | | |
| Retail | 26% | 8% | 23% | 19% |
| Accommodation and food | 24% | 4% | 21% | 12% |
| Other | 50% | 88% | 56% | 69% |
| | | | | |
| **Educational attainment** | | | | |
| Post-secondary | 16% | 58% | 20% | 33% |

*Source:* Irish Labour Force Survey Data. Authors' calculations.
*Notes:* Table A.2 shows the average characteristics of treated and control employees that are used in the difference-in-differences estimation. Columns (1) and (2) show the characteristics of treated and control employees using the baseline (minimum wage question only) criteria. Columns (3) and (4) show the characteristics of the treated and control employees using the alternative criteria, that incorporates the administrative wage data.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