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A comparative assessment of minimum wage employment in Europe

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A COMPARATIVE ASSESSMENT OF MINIMUM WAGE EMPLOYMENT IN EUROPE

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ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

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This report has been accepted for publication by the Institute, which does not itself take institutional policy positions. All ESRI Research Series reports are peer reviewed prior to publication. The author(s) are solely responsible for the content and the views expressed.

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EXECUTIVE SUMMARY

This study provides a comparative analysis of minimum wage employment in Ireland, relative to a selection of other European countries where a minimum wage is operational. We assess Ireland's position across a number of minimum wage dimensions, including the incidence of minimum wage employment, the relative magnitude of the minimum wage rate, the profile of the typical minimum wage employee, and levels of job satisfaction and poverty risk.

Currently, 21 of the 27 EU member states, along with the United Kingdom, have a statutory minimum wage. The minimum wage rate in Ireland, in nominal terms, is the second highest of the 22 countries, after Luxembourg. However, in purchasing-power standard terms, the Irish minimum wage is just the seventh highest, behind Luxembourg, Germany, the Netherlands, Belgium, the United Kingdom and France.

Using data for 2017 and 2018, we estimate that 9.6 per cent of employees in Ireland were paid the minimum wage. Countries with a relatively high incidence of minimum wage employment include Portugal (15.6 per cent), Germany (15.1 per cent), Poland (14.8 per cent), Hungary (14.2 per cent), Spain (14.0 per cent), United Kingdom (13.6 per cent), Luxembourg (13.0 per cent) and Estonia (10.7 per cent). The incidence is low in Belgium (1.7 per cent), Netherlands (2.6 per cent) and Greece (4.5 per cent).

With regard to the characteristics of minimum wage workers, in all countries, except Latvia, age is a strong predictor of minimum wage status. In Ireland, employees aged above 29 years are five to eight percentage points less likely to be on the minimum wage relative to those under 29 years. In terms of gender, Ireland and the Netherlands are the only two countries where there is no statistically significant difference in the likelihood of minimum wage employment between men and women. For other countries, women are between one and six percentage points more likely to be on the minimum wage than men, controlling for other factors.

In most countries (9 out of 14), non-nationals are more likely to be on the minimum wage than nationals. Estimates range from one percentage point in Belgium to nine percentage points in Estonia and Spain. Non-nationals in Ireland are three percentage points more likely to be minimum wage employees than Irish nationals. Education is also a significant factor in all countries. In Ireland, for example, tertiary-educated employees are eight percentage points less likely to be on the minimum wage compared to those with lower secondary (or less) education.

In all countries, working in accommodation and food and/or wholesale and retail increases the likelihood of earning the minimum wage. This type of sectoral evidence is particularly important in light of the Covid-19 pandemic. Public health measures across Europe, and the world, have led to business closures, with accommodation, food, and retail being hit particularly hard. Therefore, minimum wage employees are likely to suffer disproportionately from job losses arising from the pandemic. Ireland is notable in this regard, as 43 per cent of minimum wage workers are employed in these two sectors, which is higher than in any of the other 13 countries studied. Therefore, our analysis suggests that minimum wage workers in Ireland may be more susceptible to negative employment outcomes due to Covid-19 public health measures compared to minimum wage workers in other countries.

Being on a permanent contract is associated with a lower probability of minimum wage employment in all countries except Ireland, while being a part-time employee is associated with a higher probability of minimum wage employment in all countries except Belgium and Luxembourg.

Lower job satisfaction among minimum wage employees compared to non-minimum wage employees may indicate that such jobs are viewed as suboptimal by workers across one or more dimensions. The average job satisfaction among minimum wage employees is lower than among higher-paid employees in all countries. After controlling for other factors including age, gender, nationality, education level, sector and contract type, most (9 out of 14) countries show that minimum wage employees are less likely to be satisfied in their job compared to higher-paid workers. The estimates range from less than five percentage points in Estonia and Portugal, to approximately ten percentage points in Ireland, Belgium, Hungary and Latvia.

Previous research has shown that minimum wage increases may have a limited impact on alleviating household poverty. Rather than being heavily concentrated in low-income households, minimum wage workers in Ireland are spread across the income distribution, often in high-income households. Our analysis shows that just 11.4 per cent of minimum wage workers in Ireland are at risk of poverty. This is the lowest poverty rate of minimum wage workers among all countries studied. Therefore, subsequent increases to the minimum wage in Ireland will target a relatively small share of workers in low-income households. This is consistent with the Low Pay Commission's assessment of the minimum wage as a 'blunt instrument' for tackling household poverty. However, the poverty rate among minimum wage employees is relatively high in other countries, including the Netherlands (46%), Luxembourg (41%), Spain (35%) and Estonia (35%). In such

countries, minimum wage increases may be more effective at alleviating poverty as they will target a greater share of workers in low-income households.

CHAPTER 1: INTRODUCTION

Understanding the characteristics of minimum wage employees is important, as it provides information to policymakers on the type of workers that will be most affected by minimum wage changes. Our report indicates that 9.6 per cent of workers in Ireland are minimum wage employees, with the incidence being higher in countries such as Portugal (15.6%), Germany (15.1%) and Poland (14.8%), and lower in Belgium (1.7%), the Netherlands (2.6%) and Greece (4.5%). Certain groups in the population may be more susceptible to minimum wage employment, or low pay in general, and therefore minimum wage policy may be a tool to mitigate wage differentials between certain groups. This could relate, for example, to differences in wages between non-nationals compared to native workers, the low-educated compared to those with a higher level of education, or the wages of women compared to men. If a large proportion of minimum wage employees are located in households at risk of poverty, minimum wage increases could help reduce the incidence of household poverty.

The type of comparative analysis undertaken in this paper is timely in light of the EU Minimum Wage Initiative, which proposes a legal instrument to ensure that every worker in the European Union has a fair minimum wage by 2024.[1] In 2020, the European Commission began first-stage consultations with social partners across Europe. The reactions are quite mixed. While the initiative has been greeted positively by some, it has been viewed with scepticism and open resistance by other countries, in particular the Nordic countries (Eurofound, 2020). Nordic countries argue that the introduction of a statutory minimum wage would challenge existing arrangements on the grounds that a reasonable threshold is already set which is the result of negotiations between trade unions and employers' associations, rather than minimum wage legislation (Furåker, 2020). In light of the proposed EU-wide policy on minimum wages, it is important to understand the similarities and differences of minimum wage employees across countries. Our paper represents a significant first step in that direction.

Previous work by Maître, McGuinness and Redmond (2017) used SILC data to study the characteristics of minimum wage employees in Ireland in 2013 and 2014. They found that non-Irish nationals, women, young workers and those with lower education levels were more likely to be earning the minimum wage compared to Irish nationals, men, older workers and those with high levels of education

[1] See https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf

respectively. Maître, McGuinness and Redmond (2017) also looked at poverty risk and found that 17 per cent of minimum wage employees belonged to households at risk of poverty, compared to 3 per cent of non-minimum wage employees.[2] However, while minimum wage employees were found to be more likely to be at risk of poverty compared to other employees, these findings show that the vast majority (83 per cent) of minimum wage employees are not in households at risk of poverty. This is consistent with other evidence showing that a large number of minimum wage employees are located in high-income households (Logue and Callan, 2016; Redmond et al., 2020).

This study builds on the work of Maître, McGuinness and Redmond (2017) by providing a comparative analysis of the characteristics of minimum wage employees in Ireland, relative to a selection of other European countries where a minimum wage is operational. We use data from the European Union Statistics on Income and Living Conditions (EU-SILC) to compare Ireland to 12 other EU countries plus the United Kingdom. We select a group of high-income countries that are most comparable to Ireland, namely the eight countries with the highest minimum wage rates: Ireland (IE), Belgium (BE), Germany (DE), Spain (ES), France (FR), Luxembourg (LU), the Netherlands (NL) and the United Kingdom (UK). We also select some of the lower-wage countries –Estonia (EE), Greece (EL), Hungary (HU), Latvia (LV), Poland (PL) and Portugal (PT). Our analysis also includes a comparison of the risk of poverty among minimum wage employees across Europe.

An additional novel feature of our paper is that we also examine job satisfaction among minimum wage workers, in comparison to workers who are not on the minimum wage. In related work, Bossler and Broszeit (2017) examine the effect of an increase in the minimum wage on the job satisfaction of affected minimum wage workers in Germany. They find that the minimum wage increase was associated with higher job satisfaction, which is driven primarily by greater satisfaction with higher pay. The difference between Bossler and Broszeit (2017) and our study is that we are comparing the job satisfaction of minimum wage workers to non-minimum wage workers at a point in time, whereas Bossler and Broszeit (2017) compare the job satisfaction of minimum wage workers before and after a minimum wage increase.

We find that, in 12 of the 14 countries studied, women are statistically significantly more likely than men to be on the minimum wage. Ireland and the Netherlands are the only two countries where there is no gender effect. While there are some

[2] At risk of poverty is defined as household income below 60 per cent of median equivalised household income. The equivalised income is the household income divided by the household equivalence scale. We use the OECD-modified equivalence scale, giving a weight of 1 to the first adult, 0.5 for each subsequent adult (aged over 16) and 0.3 for each child.

exceptions, in general we find that minimum wage workers across Europe tend to be younger and less well-educated, are more likely to work part-time and more likely to be non-nationals. Our analysis shows that, in every country, working in accommodation and food and/or wholesale and retail increases the likelihood of earning the minimum wage. This type of sectoral evidence is particularly important in light of the Covid-19 pandemic. Public health measures across Europe, and the world, have led to business closures, with accommodation, food, wholesale and retail being hit particularly hard. Therefore, minimum wage employees are likely to suffer disproportionately from job losses (Redmond, 2020). We compare the poverty rate of minimum wage employees across countries and find that, at 11.4 per cent, Ireland has the lowest poverty rate of minimum wage workers among all countries.

Regarding job satisfaction, we find that in most (9 out of 14) countries, minimum wage employees are statistically significantly less likely to be satisfied in their job compared to higher-paid workers, after controlling for a range of other characteristics. The estimates range from less than five percentage points in Estonia and Portugal, to approximately ten percentage points in Ireland, Belgium and Hungary. There is no statistically significant impact of minimum wage employment on job satisfaction in Germany, Spain, France, the Netherlands and the United Kingdom.

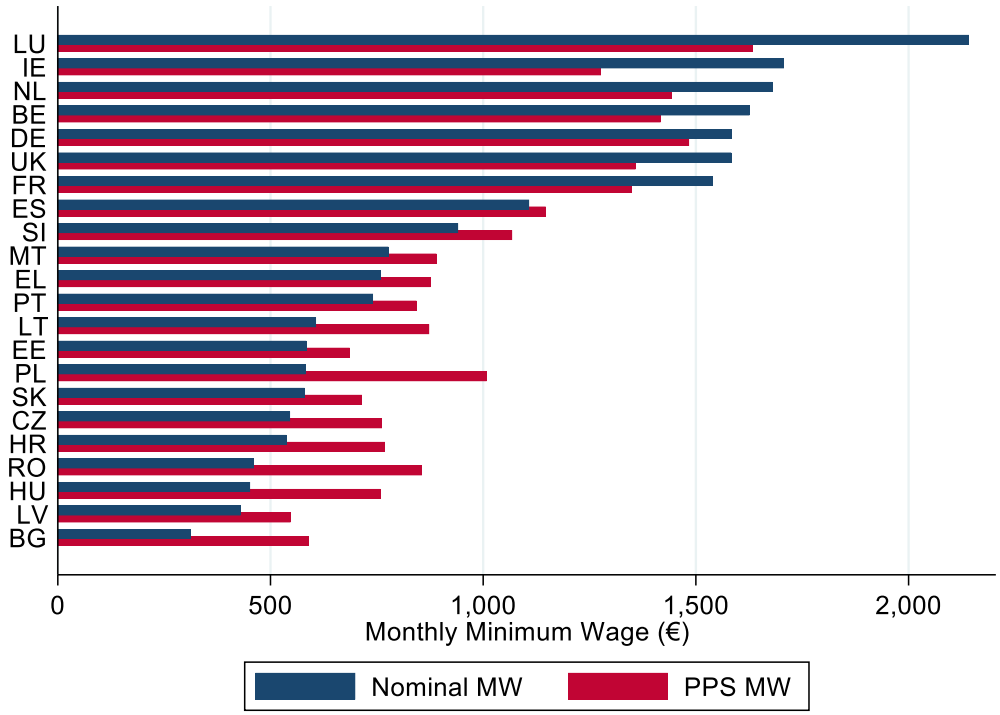
The remainder of the paper is organised as follows. In Section 2, we provide an overview of minimum wage policy in Europe, including the differing country-level procedures involved in setting minimum wages, a comparison of minimum wage rates, and the incidence of minimum wage employment. Section 3 outlines our strategy for identifying minimum wage workers using EU-SILC data, and presents comparative descriptive statistics on the characteristics of minimum wage employees. In Section 4 we carry out a comparative econometric analysis, profiling the key characteristics of minimum wage employees in European countries, and examine the extent to which minimum wage employees are likely to be more at risk of poverty and lower job satisfaction. Section 5 concludes.

CHAPTER 2: MINIMUM WAGES IN EUROPE

Currently, 21 of the 27 EU member states, along with the United Kingdom, have a statutory minimum wage (Eurostat, 2020; Eurofound, 2019; Eurofound, 2020). Figure 1 shows the minimum wage rates across the EU using data from Eurostat (2020). The minimum wage is represented as a monthly wage for all countries. However, certain countries, including Ireland, the United Kingdom and Germany specify their minimum wage in terms of an hourly rate (Eurofound, 2016). For these countries, Eurostat (2020) calculates the analogous monthly rate by scaling the hourly rate upwards using the usual average full-time hours worked in the country. For example, the hourly minimum wage rate in 2020 in Ireland is €10.10 per hour. Eurostat (2020) scales this up to a monthly minimum wage using the formula *(hourly rate x 39 hours x 52 weeks) / 12*, to get €1,706.90. Expressing all minimum wages in monthly terms allows for a straightforward comparison across countries.

In addition to showing the nominal minimum wage rates, Figure 1 also shows gross minimum wages that take into account different price levels across countries. Eurostat (2020) does this by applying purchasing power parities (PPP) adjustments for household expenditure to arrive at a purchasing power standard (PPS) minimum wage rate. The minimum wage rate in Ireland, in nominal terms, is the second highest of the 22 countries, after Luxembourg. However, in PPS terms, the Irish minimum wage is just the seventh highest, behind Luxembourg, Germany, the Netherlands, Belgium, the United Kingdom and France. Therefore, while at first glance the minimum wage rate in Ireland appears high, once the cost of living is taken into account, it is lower than in six other countries.

FIGURE 1 MINIMUM WAGE RATES IN THE EU (2020)



Source: Eurostat (online data code: earn_mw_cur)

Note: In the analysis that follows, we focus on Ireland (IE), Luxembourg (LU), Netherlands (NL), Belgium (BE), Germany (DE), United Kingdom (UK), France (FR), Spain (ES), Greece (EL), Portugal (PT), Estonia (EE), Poland (PL), Hungary (HU) and Latvia (LV).

CHAPTER 3: DATA

3.1 DATASET AND BACKGROUND ON COUNTRIES

We use the EU-SILC data to study, in detail, minimum wage employees in 14 countries. The EU-SILC is coordinated and released by the statistical office of the European Union (Eurostat) and entered into force in 2004. The EU-SILC collects comparable cross-sectional and longitudinal data on income, poverty, social exclusion and living conditions across all EU countries. The selection of countries we consider in this paper includes the top eight countries in terms of both nominal and PPS minimum wages shown in Figure 1: Ireland (IE), Belgium (BE), Germany (DE), Spain (ES), France (FR), Luxembourg (LU), the Netherlands (NL) and the United Kingdom (UK), as well as a selection of some of the lower-wage countries: Estonia (EE), Greece (EL), Hungary (HU), Latvia (LV), Poland (PL) and Portugal (PT). Given the focus on these countries, it is useful to provide a brief overview of how minimum wages are set in each country and highlight some of the country-level nuances associated with minimum wage policy in Europe. We draw on the yearly reviews of minimum wages in Europe published by Eurofound (see Eurofound, 2019 and 2020), which provide a very useful and comprehensive overview of minimum wage policies in each country.

First, for Ireland, a Low Pay Commission (LPC) established in 2015 was tasked with providing yearly recommendations to the Irish Government on the appropriate minimum wage rate, using an evidence-based approach. The stated aim of the LPC is to set a minimum wage that is fair and sustainable. In that regard, the minimum wage should assist as many low-paid workers as possible without creating adverse consequences for employment or competitiveness (Low Pay Commission, 2019). When the LPC was established in 2015, the Irish minimum wage rate stood at €8.65 per hour, with no increases since 2007. Following recommendations from the LPC, there have been yearly increases in the Irish minimum wage, which now stands at €10.20 per hour (as of 2021).[3] Other countries that take a similar approach to Ireland – i.e. using expert committees or minimum wage commissions to provide advice on minimum wage rates – include the United Kingdom (since 1999), France (since 2009), Germany (since 2015) and Greece (since 2018).

Several countries use predetermined rules or formulae for setting minimum wage rates. In the Netherlands and Luxembourg, the minimum wage is adjusted based on changes in average wages.[4] Belgium uses a pre-agreed formula where minimum wages are based on changes to the cost of living. Several essential products and

[3] For a list of the historic rates for Ireland, see https://www.gov.ie/en/publication/9463f6-historic-nmw-rates/
[4] However, in Luxembourg in 2020, only an indexation to the cost of living was made.

services are monitored and, if their price exceeds a certain level, the cost of living is seen as more expensive and the minimum wage is adjusted. Belgium also uses a seniority allowance based on every year of service with an employer. As of 2020, this amounted to the basic minimum wage rate plus 3.8 per cent for every year of service. Estonia also uses a rule-based methodology, agreed between social partners in 2017, that is based on productivity and economic growth, while there is also a stipulation that minimum wages should be 40 per cent of the average wage.

Other countries rely on regular social partnership consultation in setting a minimum wage. In Portugal, the government prepares a proposal and consults the social partners on it. This was also the case in previous years in Spain. However, in 2020, in order to establish better social dialogue, the Spanish government consulted the social partners before a proposal was formed. Hungary and Latvia set minimum wages through tripartite social partnership agreements. In Poland, the latest round of social partnership talks on the minimum wage failed to reach agreement. This led to the government unilaterally setting the minimum wage in 2019, which ended up being above the trade union's proposed minimum wage rate.

3.2 IDENTIFYING MINIMUM WAGE EMPLOYEES

The EU-SILC data contain information on total yearly employment income. To identify minimum wage employees, we focus on individuals who have been working for at least 12 months prior to the survey. We divide their yearly income by 52 to get an estimate of their weekly employment income. We then divide this by their usual weekly hours worked to get an estimate of their hourly pay. A person is defined as a minimum wage worker if their hourly employment earnings are less than or equal to 105 per cent of the hourly minimum wage rate.[5] While countries including Ireland, the United Kingdom and Germany legislate for an hourly minimum wage rate, most other European countries typically express minimum wage rates as monthly rates of pay (Eurofound, 2016). We convert the monthly rates to hourly rates by dividing the monthly minimum wage rate in a country by the average number of usual weekly hours worked in that country.[6]

The fact that we condition on individuals who have been working for at least 12 months may have implications for the representativeness of our sample of minimum wage employees. However, the potential implications are not clear. On

[5] Allowing a +5 per cent margin in allocating minimum wage workers is consistent with previous work by Maître, McGuinness and Redmond (2017). In Appendix A we show the monthly and hourly wage rates across countries for 2017, alongside the hourly minimum wage rates at the 1.05 cut-off.

[6] We use Eurostat data on average number of usual weekly hours worked in main job (lfsa_ewhun2). See https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_ewhun2&lang=en

the one hand, the sample of minimum wage employees who have been in continuous employment for one year could be seen as a 'privileged' group with access to employment on a more permanent or long-term basis. On the other hand, given that the minimum wage is often a temporary stepping-stone to higher pay (Redmond et al., 2018), the 12-month restriction could capture more disadvantaged workers who are facing longer-term low-paid employment. However, our examination of the characteristics of the minimum wage sample is consistent with other work that does not rely on the 12-month restriction. For example, they are younger, have lower education levels and are more likely to be non-nationals. Furthermore, as we are taking the same approach across all countries, the 12-month restriction will not affect the cross-country comparisons.

Given the nature of the data, there is likely to be some degree of imprecision, as the procedure for identifying minimum wage workers assumes that a person's usual hours worked remained relatively constant throughout the previous 12 months. However, we show that our calculated incidence of minimum wage employment in Ireland is similar to the incidence of minimum wage employment using Irish Labour Force Survey (LFS) data. Moreover, our approach has some previous support in the literature. Eurofound (2019) takes a similar approach to ours, using total annual employment income as a basis for identifying minimum wage employees. The Eurofound (2019) estimates of the incidence of minimum wage employment across Europe therefore provide a useful comparison for our results. We show that our estimates are broadly in line with the Eurofound (2019) estimates.

For most countries, yearly income in the EU-SILC data relates to income in the previous calendar year. Therefore, we use the minimum wage rate in the previous year. For example, when using the 2017 EU-SILC data, we apply the 2016 minimum wage rate when identifying minimum wage workers. However, the definition of yearly income is different for Ireland compared to other countries, as total yearly income relates to the 12 months prior to the date of interview. Therefore, while we use the 2016 minimum wage rate, the 2017 SILC data for Ireland will capture income spanning both 2016 and 2017, depending on when the person was interviewed. During this period, the minimum wage in Ireland did not change substantially (€9.15 in 2016 versus €9.25 in 2017) and therefore this should not significantly affect our results. Likewise, for the 2018 EU-SILC data, while we apply the 2017 minimum wage, the yearly income reference period spans both 2017 and 2018.[7] While yearly income is available for all countries, a smaller subset of countries (including Ireland) have data on current monthly employment income. Therefore, as a robustness test, we also compute the incidence of minimum wage employment using monthly income for Ireland and compare it to our other

[7] In 2018, the minimum wage in Ireland increased from €9.25 per hour to €9.55 per hour.

measure that uses yearly income. We find that the two estimates are similar.

3.3 THE INCIDENCE OF MINIMUM WAGE EMPLOYMENT

Table 1 below shows the incidence of minimum wage employment across countries, defined as the percentage of employees aged 18 to 65 earning on or below 105 per cent of the minimum wage. As we are pooling two years of EU-SILC data in order to achieve a greater sample size and increase the precision of the estimates, the time period relates to 2016 and 2017.[8] For Ireland, we calculate the incidence of minimum wage employment for this period at 9.6 per cent. We can compare our estimates with other estimates of minimum wage incidence for Ireland that use an alternative data source. In 2016, a question was added to the Irish Labour Force Survey (LFS) to directly identify minimum wage employees. The average incidence of minimum wage employment over the same period using the LFS data was 9.1 per cent (McGuinness et al., 2020), which is close to our EU-SILC estimate.[9]

As Ireland contains data on current monthly income, we can also use this measure to calculate the incidence of minimum wage employment and compare this to our measure using annual income. However, when using current monthly income, there is no time lag in the reporting period. Therefore, when using 2017 data, we use the 2017 minimum wage rate (as opposed to the 2016 minimum wage rate with the yearly income measure). Likewise, for the 2018 data, we take the 2018 minimum wage rate (as opposed to the 2017 minimum wage rate using the yearly income measure). The calculated incidence of minimum wage employment using this measure is 10.6 per cent. While it is close to our baseline incidence of 9.6 per cent (using yearly income), it is slightly higher. However, the 9.6 per cent relates to the incidence in 2016 and 2017, whereas the 10.6 per cent relates to the incidence in 2017 and 2018. Therefore, the estimate of 10.6 per cent is based on a higher minimum wage, which increased from €9.25 per hour to €9.55 per hour in 2018. Overall, our approach to estimating the incidence of minimum wage employment appears to be relatively consistent across alternative measures.

Countries with a relatively high incidence of minimum wage employment include Portugal (15.6%), Germany (15.1%), Poland (14.8%), Hungary (14.2%), Spain (14.0%), United Kingdom (13.6%), Luxembourg (13.0%) and Estonia (10.7%). The incidence is low in Belgium (1.7%), the Netherlands (2.6%) and Greece (4.5%).

[8] We pool 2017 and 2018 EU-SILC data. However, the incidence relates to 2016 and 2017 due to the one-year lag in the income reference period, as explained in Section 2.1.

[9] The minimum wage question is specific to Irish data only; thus we cannot use LFS data for the purposes of our cross-country analysis.

TABLE 1 INCIDENCE OF MINIMUM WAGE EMPLOYMENT ACROSS COUNTRIES (%), EU-SILC 2017 & 2018

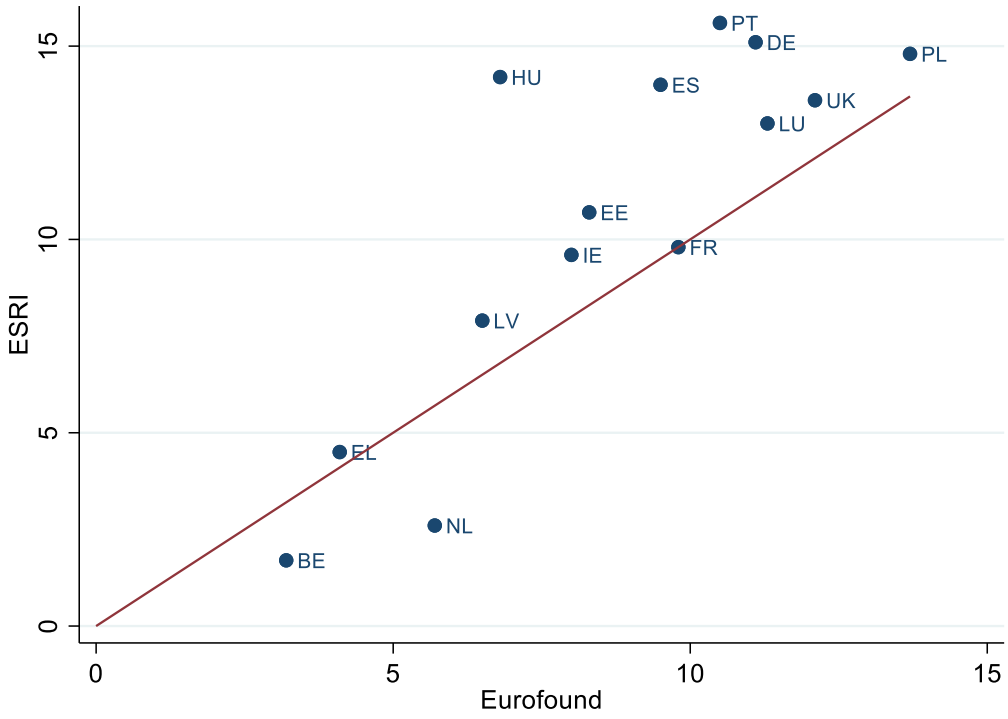
Country	Minimum wage
Portugal	15.6%
Germany	15.1%
Poland	14.8%
Hungary	14.2%
Spain	14.0%
United Kingdom	13.6%
Luxembourg	13.0%
Estonia	10.7%
France	9.8%
Ireland	**9.6%**
Latvia	7.9%
Greece	4.5%
Netherlands	2.6%
Belgium	1.7%

Note: Based on authors' calculations using EU-SILC UDB Data for 2017 and 2018, version of 20/03/2020. The incidence of minimum wage employment is defined as the percentage of employees aged 18 to 65 earning on or below 105 per cent of the minimum wage.

In Figures 2A and 2B, we graph our estimates of minimum wage incidence across European countries compared to the Eurofound (2019) estimates. While our estimates of the incidence of minimum wage employment relate to 2016 and 2017, the Eurofound estimates relate to 2016 only.[10] We add a 45-degree line to the graph. If a country lies directly on the line, this indicates that the ESRI and Eurofound estimates match exactly. If a country lies above the red line, this indicates that the ESRI estimates are higher than the Eurofound estimates, while below the red line indicates the ESRI estimates are lower than the Eurofound estimates. Eurofound (2019) uses two minimum wage thresholds. In Figure 2A, the Eurofound incidence of minimum wage employment is defined as the percentage of workers earning on or below the minimum wage. Our estimates are based on workers earning on or below 105 per cent of the minimum wage; therefore, we would expect our (ESRI) estimates to be slightly higher. Figure 2A confirms this; while the magnitudes are similar, the ESRI estimates are slightly higher. In Figure 2B, the Eurofound incidences are based on workers earning on or below 110 per cent of the minimum wage. Therefore, the Eurofound estimates, in general, are slightly higher than the ESRI estimates. However, both Figures 2A and 2B show that our estimates are broadly in line with the Eurofound (2019) estimates of the incidence of minimum wage employment across countries.

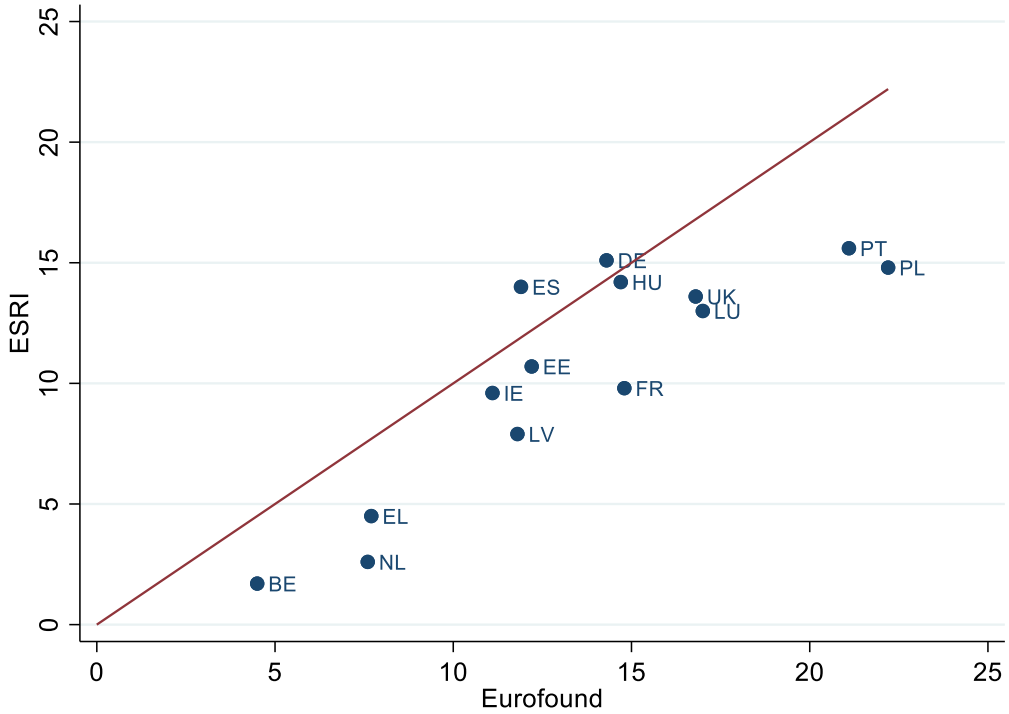
[10] That is, Eurofound (2019) uses 2017 EU-SILC data in which the income variable relates to 2016.

FIGURE 2A ESRI AND EUROFOUND ESTIMATES OF INCIDENCE OF MINIMUM WAGE EMPLOYMENT (%)



Note: The Eurofound estimates categorise minimum wage workers as those earning on or less than the minimum wage. The ESRI estimates refer to those earning less than 105% of the minimum wage.

FIGURE 2B: ESRI AND EUROFOUND ESTIMATES OF INCIDENCE OF MINIMUM WAGE EMPLOYMENT (%)



Notes: The Eurofound estimates categorise minimum wage workers as those earning on or below 110% of the minimum wage. The ESRI estimates refer to those earning less than 105% of the minimum wage.

3.4 THE COMPOSITION OF MINIMUM WAGE EMPLOYEES

In Table 2, we show the composition of minimum wage employment across a wide range of socio-economic characteristics, including gender, age, nationality, education status and level, sector, hours of work, contract type, and full-time/part-time status. We also show the percentage of minimum wage employees who are at risk of poverty, defined as household income below 60 per cent of median equivalised income. In Table 3, we show the composition of all employees across the same socio-economic characteristics. This is required to aid interpretation of Table 2. For example, we may observe that in a certain country a high percentage of minimum wage employees are in the youngest age bracket. However, it may be the case that, generally, a high percentage of all employees in that country fall into this age bracket, and therefore the minimum wage demographics may reflect patterns in the general population as opposed to minimum wage workers only.

Cross-country differences emerge relating to gender. In Ireland, Luxembourg, Spain, Greece, Estonia and Hungary, approximately half of all minimum wage employees are women. However, there is a disproportionately high representation of women on the minimum wage across a number of other countries including the Netherlands (71%), Latvia (61%), France (61%), Belgium (60%), Germany (59%), Portugal (59%) and the UK (59%). This is despite a roughly equal split between men and women among all employees in each country (see Table 3).

Minimum wage employment tends to be concentrated among young employees across all countries. However, several countries appear to have a relatively large number of older minimum wage employees. In Germany, Estonia, France, Hungary, Latvia, Portugal and the UK, at least 25 per cent of minimum wage workers are aged 50 or over. This compares to just 13 per cent in Ireland. At 41 per cent, Ireland has the highest percentage of minimum wage workers in the 18–29 age category. While Ireland has a younger population than other European countries, the general pattern of employment based on age (as shown in Table 3) does not fully account for these age discrepancies in minimum wage employment.

The percentage of minimum wage employees that are non-nationals varies considerably, in line with the general pattern of non-national employment in Europe. In Luxembourg, 71 per cent of minimum wage employees are non-nationals, which is the highest among all countries. At 49 per cent, Luxembourg also has by far the highest share of non-nationals among all employees. In Ireland, 20 per cent of minimum wage employees are non-nationals. However, at 13 per cent, Ireland also has one of the highest shares of non-nationals among all employees. Nonetheless, non-Irish nationals are disproportionately represented among minimum wage employees in Ireland. In Hungary, Poland and Portugal, less than five per cent of minimum wage employees are non-nationals, which reflects their relatively low share of non-national employees generally (Table 3).

Regarding the level of education achieved, Ireland has the highest-educated workforce among all countries studied. Of all employees in Ireland, 56 per cent are educated to post-secondary or tertiary level (Table 3). At 46 per cent, Ireland also has the highest percentage of highly educated minimum wage employees (Table 2). However, across all countries, the majority of minimum wage employees are educated to upper secondary level or below. We also show the percentage of employees that indicate they are currently 'in education'. However, caution is called for when interpreting these statistics. As we are conditioning on employees who have been in 12 months of continuous employment, full-time students working part-time minimum wage jobs may be under-represented in our sample, as they may be likely to move in and out of employment over a 12-month period.

In most countries, over 90 per cent of minimum wage employees are not in education. An exception is Germany, where 25 per cent of minimum wage workers are in education. In Ireland, the UK and Belgium there is also a relatively high proportion of minimum wage employees that indicate they are in education, averaging between 10 and 12.4 per cent. Looking at Table 3, we can also observe that Ireland has the highest percentage of employees in education, at 8 per cent, with the UK second at 6 per cent.

Approximately 43 per cent of all minimum wage employees in Ireland are in two sectors: wholesale & retail, and accommodation & food. The concentration of minimum wage employees in these two sectors in Ireland is higher than in any other country in the sample. When we consider *all* employees (Table 3), the concentration of employment in these two sectors in Ireland does not appear to be inordinately large. Greece, Spain and Portugal have a higher percentage of employees in these two sectors compared to Ireland.

Therefore, Ireland does appear to have a disproportionate number of minimum wage employees in these two sectors, compared to other countries. This has potential implications in light of the public health measures taken in response to the Covid-19 pandemic, resulting in widespread business closures which have been heavily concentrated in the wholesale, retail, accommodation and food sectors. Our analysis suggests that minimum wage workers in Ireland may be more susceptible to negative employment outcomes due to the public health measures compared to minimum wage workers in other countries.

Minimum wage employees generally work fewer hours than other employees. In Ireland, the UK and Germany, approximately 40 per cent of minimum wage employees work fewer than 35 hours per week. However, in other countries, including Estonia, Hungary, Latvia, Poland and Portugal, just 10 per cent, or less, of minimum wage employees work fewer than 35 hours per week. However, these countries also have a relatively low rate of low-hours and part-time employment generally (see Table 3). In the Netherlands, on the other hand, almost three-quarters of minimum wage employees work less than 35 hours per week. The Netherlands also has the highest rate of low-hours work in general; just over half of all employees work in excess of 35 hours per week, compared to approximately 80 per cent in most other countries.

Finally, Table 2 shows the poverty rate among minimum wage employees. As the risk of poverty is calculated based on the median household income of each country, it allows for direct comparison across countries. At 11 per cent, Ireland has the lowest poverty rate of minimum wage workers among all countries. It is also relatively low in Poland, at 15 per cent. The poverty rate among minimum wage employees is relatively high in other countries, including the Netherlands (46%), Luxembourg (41%), Spain (35%) and Estonia (35%).

TABLE 2 COMPOSITION OF MINIMUM WAGE EMPLOYEES AGED 18 TO 65 (%), EU-SILC 2017 & 2018

	BE	DE	EE	EL	ES	FR	HU	IE	LU	LV	NL	PL	PT	UK
Gender														
Male	40.4	41.4	50.4	50.7	48.5	38.9	48.1	49.8	50.1	38.8	29.4	45.3	41.0	41.4
Female	59.6	58.6	49.6	49.4	51.5	61.1	51.9	50.2	49.9	61.2	70.6	54.7	59.0	58.6
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Age group														
18 to 29	38.4	35.6	22.3	32.0	27.9	31.9	16.4	41.3	26.4	17.9	31.4	24.3	20.8	36.7
30 to 39	23.1	17.5	22.9	33.9	30.5	20.8	16.4	29.7	30.0	19.7	29.6	28.6	25.8	18.7
40 to 49	18.6	19.0	22.6	20.0	22.3	21.4	32.2	15.6	25.2	27.0	21.4	22.9	26.6	19.6
50 to 59	15.3	20.9	22.4	12.8	15.4	21.4	26.8	9.8	16.6	23.1	14.6	20.4	21.2	18.1
60+	4.6	7.0	9.8	1.3	3.8	4.5	8.1	3.5	1.8	12.2	3.0	3.9	5.6	6.8
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Nationality														
National	74.9	83.9	79.0	72.3	78.8	91.6	99.2	79.6	29.1	83.4	81.8	99.5	97.0	89.3
Non-national	25.1	16.1	21.0	27.7	21.2	8.5	0.8	20.4	70.9	16.6	18.2	0.5	3.0	10.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Education Status														
In education	10.0	24.6	2.3	3.1	4.1	6.9	0.9	11.5	4.2	2.1	2.1	3.6	1.3	12.4
Not in education	90.0	76.4	97.7	96.9	95.9	93.1	99.1	88.5	95.8	97.9	97.9	96.4	98.7	87.6
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Education Level														
Lower secondary or below	26.2	28.7	15.4	25.9	44.9	28.9	31.7	18.1	53.0	13.7	22.4	8.9	64.4	24.4
Upper secondary	41.4	49.1	52.3	41.2	28.3	48.4	53.3	36.4	34.2	60.3	53.2	71.1	24.3	45.2
Post-secondary and tertiary	32.4	22.2	32.4	32.9	26.8	22.8	15.0	45.5	12.8	26.1	24.5	20.1	11.3	30.5
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

NACE sector[11]														
Agriculture and industry	13.6	20.6	35.4	21.3	26.7	19.2	31.6	22.7	15.8	34.9	5.5	38.1	30.1	13.6
Wholesale and retail	13.2	19.7	14.8	25.6	15.2	10.2	9.8	22.7	14.8	19.1	16.1	21.2	15.2	21.0
Accommodation and food	16.6	8.4	7.2	17.1	13.7	7.5	3.4	20.7	16.4	7.1	12.2	5.1	14.7	12.8
Health and social work	17.3	15.1	3.6	3.9	6.1	29.8	5.6	11.4	10.8	6.3	22.2	5.9	9.9	14.0
Public admin and defence	22.6	8.5	10.5	7.0	7.6	13.1	35.0	3.0	9.0	9.2	9.6	9.0	6.7	14.1
Other	16.7	27.7	28.6	25.1	30.8	20.3	14.6	19.5	33.3	23.4	34.4	20.7	23.5	24.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Hours worked per week														
1–19 hrs	9.3	21.4	1.7	5.3	4.5	6.4	0.3	11.7	2.5	1.5	24.2	1.1	2.0	17.6
20–34.9 hrs	23.7	20.0	8.5	21.6	15.7	21.8	4.8	28.0	11.9	7.5	48.9	5.4	7.2	25.5
35 hrs+	67.1	58.6	89.8	73.1	79.9	71.8	94.9	60.3	85.6	91.0	26.9	93.6	90.8	56.9
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Contract type														
Permanent job /work contract of unlimited duration	66.4	67.4	98.5	59.8	53.9	67.1	68.7	90.5	81.8	98.6	70.7	62.8	76.0	96.1
Temporary job/work contract of limited duration	33.6	32.6	1.5	40.2	46.1	32.9	31.3	9.5	18.2	1.4	29.3	37.2	24.0	3.9
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Work status														
Full-time	62.2	57.0	89.5	75.9	80.7	66.7	95.9	68.0	81.6	90.9	27.3	93.1	92.0	59.9
Part-time	37.8	43.0	10.5	24.1	19.3	33.3	4.1	32.0	18.4	9.0	72.7	6.9	8.0	40.1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
At risk of poverty	29.4	25.9	34.6	26.4	34.5	23.0	28.6	11.4	41.4	25.5	46.0	15.0	19.7	23.1

Source: EU-SILC UDB Data for 2017-2018, version of 20/03/2020.

[11] Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) is the abbreviation for classifying economic activities, issued by the European Commission.

TABLE 3 COMPOSITION OF ALL EMPLOYEES AGED 18 TO 65 (%), EU-SILC 2017 & 2018

	BE	DE	EE	EL	ES	FR	HU	IE	LU	LV	NL	PL	PT	UK
Gender														
Male	50.2	49.4	49.5	49.1	49.9	49.4	49.1	49.5	49.7	48.2	50.2	49.7	48.2	49.7
Female	49.8	50.7	50.5	50.9	50.1	50.6	51.0	50.5	50.3	51.8	49.8	50.3	51.8	50.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age group														
18 to 29	23.0	20.3	22.6	18.7	18.5	24.3	21.2	21.9	22.5	21.7	24.0	22.2	20.4	23.0
30 to 39	20.8	20.3	22.6	21.7	21.5	19.9	17.8	22.7	22.8	21.7	19.3	24.3	20.5	22.2
40 to 49	21.3	21.0	21.7	24.5	26.6	21.9	23.6	22.6	22.5	21.7	21.8	20.7	24.3	21.4
50 to 59	23.3	25.3	20.9	23.4	22.7	20.0	23.0	22.2	21.5	22.8	23.2	19.7	22.8	22.1
60+	11.6	13.1	12.1	11.8	10.7	13.8	14.4	10.6	10.6	12.1	11.7	13.1	12.1	11.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nationality														
National	87.9	86.4	86.9	92.6	90.2	93.9	99.4	86.9	51.4	86.7	96.0	99.6	98.2	89.7
Non-national	12.1	13.6	13.1	7.4	9.8	6.1	0.6	13.1	48.6	13.3	4.1	0.4	1.8	10.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education Status														
In education	2.7	5.7	2.8	2.2	3.2	2.2	1.7	8.3	1.5	4.0	6.0	2.9	2.1	7.0
Not in education	97.3	94.3	97.2	97.8	96.8	97.8	98.3	91.7	98.5	96.0	94.0	97.1	97.9	93.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education Level														
Lower secondary or below	22.8	15.8	11.7	23.5	38.6	19.9	18.0	18.3	28.6	12.1	19.2	10.3	51.5	21.0
Upper secondary	36.5	42.1	42.1	39.1	26.1	45.6	52.1	25.8	38.1	48.2	41.7	60.4	25.8	34.9
Post-secondary and tertiary	40.7	42.2	46.3	37.4	35.3	34.6	29.9	55.9	33.4	39.7	39.1	29.2	22.7	44.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NACE sector														
Agriculture and industry	21.4	26.1	33.2	26.0	25.4	25.9	36.3	22.0	14.5	29.9	16.0	42.8	29.7	19.1
Wholesale and retail	11.0	13.1	13.5	18.5	14.9	11.8	10.7	14.1	8.7	14.7	12.1	14.0	14.4	12.8
Accommodation and food	3.2	3.2	3.8	9.9	7.4	3.9	3.9	7.1	5.2	3.0	3.1	2.2	7.0	4.9
Health and social work	14.9	14.4	5.5	5.6	8.4	16.7	6.9	13.2	10.4	6.1	18.8	5.9	9.7	13.9
Public admin and defence	22.0	16.1	15.7	18.7	15.8	16.9	20.1	14.3	21.5	17.2	16.3	14.4	15.9	17.6
Other	27.5	27.1	28.3	21.4	28.1	24.8	22.2	29.4	39.8	29.2	33.7	20.7	23.3	31.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Hours worked per week														
1–19 hrs	6.8	8.4	2.0	2.7	3.0	4.0	0.8	10.2	2.2	1.8	9.0	1.1	1.7	10.3
20–34.9 hrs	21.1	17.8	8.7	15.3	11.4	14.4	5.4	20.4	13.9	6.8	36.8	7.1	5.8	18.9
35 hrs+	72.1	73.8	89.2	82.0	85.6	81.6	93.8	69.5	83.9	91.4	54.2	91.9	92.6	70.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Contract type														
Permanent job/work contract of unlimited duration	86.5	82.7	96.4	73.8	63.8	80.5	86.6	91.3	89.0	99.5	81.8	72.0	78.2	94.9
Temporary job/work contract of limited duration	13.5	17.3	3.6	26.2	36.2	19.6	13.4	8.7	11.0	0.5	18.3	28.0	21.8	5.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Work status														
Full-time	70.9	71.3	91.7	90.3	87.2	82.4	95.5	75.8	81.5	94.7	55.0	94.5	94.6	75.9
Part-time	29.1	28.7	8.3	9.7	12.8	17.6	4.5	24.2	18.5	5.3	45.1	5.5	5.4	24.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: EU-SILC UDB Data for 2017-2018, version of 20/03/2020.

In Table 4, we combine the information in Tables 2 and 3 for each characteristic, and show the ratio of the statistics for minimum wage employees over all employees. To illustrate this, take the example of non-nationals in Ireland. Table 2 shows that 20.4 per cent of minimum wage employees are non-Irish nationals and Table 3 tells us that 13.1 per cent of all employees are non-Irish nationals. The corresponding statistic in Table 4 is 1.6 (20.4/13.1). This tells us that there are 1.6 times as many non-Irish nationals among minimum wage employees as there are among all employees. Therefore, for a given characteristic, a score in Table 4 above one indicates that this characteristic is overrepresented among minimum wage employees.

Table 4 shows that in most countries (8 out of 14), women are overrepresented among minimum wage employees (score above one). The overrepresentation of women is highest in the Netherlands, where there are 1.4 times as many women on the minimum wage as there are among the general population of employees. However, in Ireland, Hungary, Greece, Spain, Estonia and Luxembourg, men and women are roughly evenly represented among minimum wage employees. In terms of age, in all countries except Latvia, Hungary, Estonia and Portugal, the 18–29 age group is strongly overrepresented among minimum wage employees. Ireland has the highest relative share of young workers on the minimum wage, closely followed by Germany, Greece and Belgium. Non-nationals are overrepresented among minimum wage workers in all countries except the UK. The Netherlands and Greece have a particularly high relative share of non-nationals among minimum wage workers. Table 4 indicates that in Belgium, Germany, Greece, France, Ireland, Luxemburg, Poland and the UK, people in education are overrepresented among minimum wage employees. Further, it is confirmed that those with lower levels of education, part-time employees, and individuals working in accommodation and food or wholesale and retail are often overrepresented among minimum wage employees across countries.

TABLE 4 RATIO OF MINIMUM WAGE TO ALL EMPLOYEES, EU-SILC 2017 & 2018

	BE	DE	EE	EL	ES	FR	HU	IE	LU	LV	NL	PL	PT	UK
Gender														
Male	0.8	0.8	1.0	1.0	1.0	0.8	1.0	1.0	1.0	0.8	0.6	0.9	0.8	0.8
Female	1.2	1.2	1.0	1.0	1.0	1.2	1.0	1.0	1.0	1.2	1.4	1.1	1.1	1.2
Age group														
18 to 29	1.7	1.8	1.0	1.7	1.5	1.3	0.8	1.9	1.2	0.8	1.3	1.1	1.0	1.6
30 to 39	1.1	0.8	1.0	1.6	1.4	1.0	0.9	1.3	1.3	0.9	1.5	1.2	1.3	0.8
40 to 49	0.9	0.9	1.0	0.8	0.8	1.0	1.4	0.7	1.1	1.2	1.0	1.1	1.1	0.9
50 to 59	0.7	0.8	1.1	0.5	0.7	1.1	1.2	0.4	0.8	1.0	0.6	1.0	0.9	0.8
60+	0.4	0.5	0.8	0.1	0.4	0.3	0.6	0.3	0.2	1.0	0.3	0.3	0.5	0.6
Nationality														
National	0.9	1.0	0.9	0.8	0.9	1.0	1.0	0.9	0.6	1.0	0.9	1.0	1.0	1.0
Non-national	2.1	1.2	1.6	3.8	2.2	1.4	1.3	1.6	1.5	1.2	4.5	1.4	1.6	1.0
Education Status														
In education	3.7	4.3	0.8	1.4	0.8	3.1	0.5	1.4	2.8	0.5	0.3	1.2	0.6	1.8
Not in education	0.9	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Education Level														
Lower secondary or below	1.1	1.8	1.3	1.1	1.2	1.5	1.8	1.0	1.9	1.1	1.2	0.9	1.3	1.2
Upper secondary	1.1	1.2	1.2	1.1	1.1	1.1	1.0	1.4	0.9	1.3	1.3	1.2	0.9	1.3
Post-secondary and tertiary	0.8	0.5	0.7	0.9	0.8	0.7	0.5	0.8	0.4	0.7	0.6	0.7	0.5	0.7
NACE sector														

Agriculture and industry	0.6	0.8	1.1	0.8	1.0	0.7	0.9	1.0	1.1	1.2	0.3	0.9	1.0	0.7
Wholesale and retail	1.2	1.5	1.1	1.4	1.0	0.9	0.9	1.6	1.7	1.3	1.3	1.5	1.1	1.6
Accommodation and food	5.2	2.8	1.9	1.7	1.9	1.9	0.9	2.9	3.2	2.4	4.0	2.3	2.1	2.6
Health and social work	1.2	1.1	0.6	0.7	0.7	1.8	0.8	0.9	1.0	1.0	1.2	1.0	1.0	1.0
Public admin and defence	1.0	0.5	0.7	0.4	0.5	0.8	1.7	0.2	0.4	0.5	0.6	0.6	0.4	0.8
Other	0.6	1.0	1.0	1.2	1.1	0.8	0.7	0.7	0.8	0.8	1.0	1.0	1.0	0.8
Hours worked per week														
1–19 hrs	1.4	2.6	0.8	1.9	1.5	1.6	0.3	1.2	1.2	0.8	2.7	1.0	1.2	1.7
20–34.9 hrs	1.1	1.1	1.0	1.4	1.4	1.5	0.9	1.4	0.9	1.1	1.3	0.8	1.2	1.4
35 hrs+	0.9	0.8	1.0	0.9	0.9	0.9	1.0	0.9	1.0	1.0	0.5	1.0	1.0	0.8
Contract type														
Permanent job/work contract of unlimited duration	0.8	0.8	1.0	0.8	0.8	0.8	0.8	1.0	0.9	1.0	0.9	0.9	1.0	1.0
Temporary job/work contract of limited duration	2.5	2.0	0.4	1.5	1.3	1.7	2.3	1.1	1.7	2.6	1.6	1.3	1.1	0.8
Work status														
Full-time	0.9	0.8	1.0	0.8	0.9	0.8	1.0	0.9	1.0	1.0	0.5	1.0	1.0	0.8
Part-time	1.3	1.5	1.3	2.5	1.5	1.9	0.9	1.3	1.0	1.7	1.6	1.3	1.5	1.7

Source: EU-SILC UDB Data for 2017-2018, version of 20/03/2020.

3.5 INCIDENCE OF MINIMUM WAGE EMPLOYMENT

In Table 5, we show the incidence of minimum wage employment using the same characteristics as before. To understand the difference between the composition (Table 2) and the incidence of minimum wage employment (Table 5), take gender as an example. Table 2 showed that, in Ireland, approximately half of minimum wage employees are men and half are women. Table 5 shows that, in Ireland, 9.4 per cent of all male employees are minimum wage workers, while 9.7 per cent of all female employees are minimum wage workers.

The patterns observed in Table 5 are consistent with those from the composition tables (Tables 2 and 3). While the gender split among minimum wage employees is roughly equal in Ireland, in countries such as the Netherlands, France, Belgium, Germany and the UK, the percentage of women on the minimum wage is higher than the percentage of men on the minimum wage. The statistics in Table 5 provide important additional information that is not apparent when looking at composition alone. For example, Tables 2–4 showed that the overrepresentation of women on the minimum wage is highest in the Netherlands. While this is true, it is also the case that the incidence of minimum wage employment in the Netherlands is the second lowest among all countries; just 1.4 per cent of men and 3.8 per cent of women in the Netherlands are on the minimum wage. The only country with a lower incidence is Belgium, where 1.3 per cent of men and 2.1 per cent of women are on the minimum wage.

With regard to age, the incidence of minimum wage employment is relatively low for older workers in Ireland. For example, just 4 per cent of workers aged 50 to 59 are on the minimum wage in Ireland. Countries with a relatively high percentage of workers aged 50 to 59 on the minimum wage include Poland (15%), Hungary (14 per cent) and Portugal (14 per cent). For all countries, the percentage of non-nationals on the minimum wage is higher than the percentage of nationals on the minimum wage. In Ireland 14 per cent of non-Irish nationals are minimum wage workers, compared to 9 per cent of Irish nationals. Across all countries, the incidence of minimum wage employment is lower for those with higher levels of education. In Ireland, for example, just 6 per cent of employees with post-secondary or tertiary education are on the minimum wage, compared to 15 per cent of employees educated to upper secondary level. Employees working fewer hours and those working in the accommodation and food and wholesale and retail sectors are more likely to be on the minimum wage.

In general, the incidence of minimum wage employment among employees who categorise themselves as 'in education' is higher compared to employees who are not in education. In Ireland, 13 per cent of employees who are also in education

are minimum wage workers, compared to 9 per cent of employees who are not in education.[12] Germany stands out in this regard, with a very high percentage (61%) of employees that are also in education earning on or below the minimum wage. Germany is notable in this regard due to having a high number of low-paid apprentices (OECD, 2018; UK Low Pay Commission, 2013). Moreover, while a minimum wage was introduced in Germany in 2015, apprenticeships were not included. As of 2020, changes have been made to German employment law to legislate for minimum rates of pay for apprentices.

[12] Recall that we are focusing on employees that have been in continuous employment for 12 months.

TABLE 5 INCIDENCE OF MINIMUM WAGE EMPLOYMENT, EU-SILC 2017 & 2018

	BE	DE	EE	EL	ES	FR	HU	IE	LU	LV	NL	PL	PT	UK
Gender														
Male	1.3%	11.6%	10.8%	4.0%	12.7%	7.5%	13.0%	9.4%	11.5%	6.3%	1.4%	13.0%	13.0%	11.0%
Female	2.1%	19.2%	10.7%	5.1%	15.4%	12.1%	15.5%	9.7%	15.0%	9.4%	3.8%	16.7%	18.2%	16.2%
Age group														
18 to 29	4.2%	36.9%	14.1%	13.1%	34.5%	18.3%	16.5%	22.7%	21.8%	8.5%	5.2%	21.5%	23.9%	24.8%
30 to 39	1.4%	11.8%	9.8%	4.8%	15.5%	8.3%	10.8%	10.0%	13.1%	6.2%	2.7%	13.4%	15.0%	10.0%
40 to 49	1.2%	11.0%	9.4%	2.7%	9.3%	6.9%	14.8%	5.8%	10.5%	8.2%	2.1%	12.9%	13.6%	10.9%
50 to 59	1.0%	10.8%	10.6%	2.6%	9.2%	8.4%	13.9%	4.2%	10.2%	7.6%	1.6%	14.5%	14.1%	10.7%
60+	2.5%	13.6%	11.3%	2.1%	11.7%	12.3%	19.5%	5.4%	12.7%	11.4%	1.0%	11.6%	15.7%	12.8%
Nationality														
National	1.4%	14.5%	9.6%	3.5%	12.0%	9.4%	14.2%	8.8%	7.8%	7.5%	2.2%	14.7%	15.4%	13.7%
Non-national	4.3%	19.2%	19.1%	15.8%	34.8%	17.0%	20.0%	13.7%	17.9%	10.6%	14.4%	17.2%	26.0%	14.1%
Education Status														
In education	6.4%	60.5%	8.7%	6.4%	18.2%	30.6%	8.2%	13.1%	36.9%	4.2%	0.9%	18.5%	9.7%	23.8%
Not in education	1.6%	11.2%	10.8%	4.4%	13.8%	9.2%	14.3%	9.2%	12.7%	8.0%	2.6%	14.6%	15.7%	12.6%
Education Level														
Lower secondary or below	3.5%	40.5%	20.2%	10.1%	22.1%	18.9%	38.2%	16.7%	26.0%	15.6%	4.4%	30.8%	22.3%	19.8%
Upper secondary	2.0%	17.5%	13.9%	5.4%	16.2%	11.0%	14.5%	15.0%	11.7%	10.3%	3.5%	18.8%	14.1%	18.9%
Post-secondary and tertiary	1.0%	7.2%	6.8%	2.7%	7.9%	5.3%	5.9%	6.4%	4.5%	4.4%	1.3%	7.4%	6.4%	8.3%

NACE sector														
Agriculture and industry	1.1%	11.5%	11.2%	5.6%	15.2%	7.4%	11.7%	11.4%	14.2%	9.6%	0.8%	15.1%	15.7%	10.1%
Wholesale and retail	2.2%	22.0%	12.4%	6.3%	15.6%	9.1%	13.2%	14.7%	22.9%	10.3%	3.0%	22.2%	17.9%	21.5%
Accommodation and food	12.8%	44.8%	22.0%	11.8%	31.3%	21.7%	14.3%	28.3%	44.4%	19.9%	13.3%	36.7%	37.5%	35.7%
Health and social work	2.0%	16.3%	6.9%	2.5%	8.9%	17.9%	10.6%	7.4%	14.7%	8.0%	2.7%	12.7%	14.6%	12.8%
Public admin and defence	1.5%	7.7%	6.3%	1.1%	5.5%	6.6%	20.9%	1.8%	4.9%	3.7%	1.2%	7.2%	5.9%	9.7%
Other	1.1%	16.1%	11.8%	4.9%	15.8%	8.1%	9.7%	6.5%	11.1%	6.5%	2.8%	14.3%	16.5%	11.4%
Hours worked per week														
1–19 hrs	2.5%	42.4%	14.9%	10.7%	24.0%	20.4%	7.0%	12.1%	17.9%	12.1%	8.6%	20.0%	25.0%	26.9%
20–34.9 hrs	1.9%	18.5%	16.4%	6.7%	22.0%	16.4%	17.6%	13.5%	12.5%	12.0%	3.8%	16.7%	27.5%	19.8%
35 hrs+	1.6%	11.7%	10.4%	3.9%	12.7%	8.4%	14.1%	8.1%	13.0%	7.6%	1.1%	14.6%	15.0%	10.5%
Contract type														
Permanent job/work contract of unlimited duration	1.1%	11.2%	10.6%	2.1%	9.0%	7.3%	10.5%	8.9%	11.2%	7.5%	1.9%	11.7%	13.0%	12.9%
Temporary job/work contract of limited duration	8.3%	51.5%	21.5%	10.5%	33.9%	27.9%	57.5%	16.9%	38.9%	27.0%	8.8%	26.2%	27.0%	19.0%
Work status														
Full-time	1.4%	11.5%	10.2%	3.7%	12.6%	7.7%	14.0%	8.2%	12.7%	7.5%	1.1%	14.3%	15.0%	10.5%
Part-time	2.5%	25.9%	20.5%	12.1%	25.5%	21.8%	19.8%	14.7%	14.8%	17.8%	4.7%	25.8%	32.6%	23.7%

Source: EU-SILC UDB Data for 2017-2018, version of 20/03/2020.

CHAPTER 4: COMPARATIVE ECONOMETRIC ANALYSIS

While the previous section provided detailed descriptive statistics relating to minimum wage composition and incidence, this section goes further by using econometric techniques to estimate the likelihood of minimum wage employment associated with each characteristic, while holding all other characteristics constant. This will allow us, for example, to estimate the increased incidence of minimum wage employment associated with being female, while controlling for age, nationality, education level, sector, contractual status and part-time employment. We will then investigate the impact of minimum wage employment on job satisfaction and the probability of being at risk of poverty.

4.1 INCIDENCE OF MINIMUM WAGE EMPLOYMENT BY WORKER AND JOB CHARACTERISTICS

Our outcome variable, *MW*, is a binary variable which equals one if the person is a minimum wage employee and zero if a higher-paid employee. We estimate the following probit model,

$$P(MW = 1) = \Phi(\beta_0 + \beta_1 Male + \beta_2 Age + \beta_3 Nationality + \beta_4 Education + \beta_5 Sector + \beta_6 Permanent + \beta_7 PT) \quad (1)$$

where Φ denotes the cumulative normal distribution. The variable *PT* is an indicator of part-time employment; all other variables are as outlined in previous tables. We estimate the probit model for the pooled sample of countries, including country dummies in order to control for any country-specific factors that may influence the probability of minimum wage employment. We also estimate the model separately for each of the 14 countries in our sample.

Table 6 shows the results from the probit model that pools data from all countries and includes country fixed effects.[13] Controlling for other factors, males are three percentage points less likely to be on the minimum wage compared to females. Employees aged 30 years and over are between four and six percentage points less likely to be on the minimum wage compared to those under 30, while non-nationals are five percentage points more likely than nationals to be on the minimum wage. Employees with tertiary education are 10 percentage points less likely to be on the minimum wage relative to employees with lower secondary or below. Finally, part-time workers, employees on temporary contracts and those in the wholesale, retail, accommodation and food sectors are all more likely to be minimum wage employees.

[13] Table 6, and all further tables, show the marginal effects from the probit models.

TABLE 6: PROBIT MODEL (ALL COUNTRIES)

VARIABLES	MIN WAGE
Male	-0.03***
	(0.00)
Age (ref: 18 to 29 years)	
Age 30 to 39	-0.04***
	(0.00)
Age 40 to 49	-0.06***
	(0.00)
Age 50 to 59	-0.06***
	(0.00)
Age 60 to 80	-0.04***
	(0.00)
Non-national	0.05***
	(0.00)
Education level (ref: lower secondary)	
Upper secondary	-0.04***
	(0.00)
Tertiary	-0.10***
	(0.00)
Sector (ref: other)	
Agriculture and industry	-0.01***
	(0.00)
Wholesale and retail	0.01***
	(0.00)
Accommodation and food	0.07***
	(0.00)
Health and social work	-0.00
	(0.00)
Public admin and defence	-0.03***
	(0.00)
Permanent contract	-0.13***
	(0.00)
Part-time	0.05***
	(0.00)
Country fixed effects	Yes
Observations	171,615

Notes: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Data source: EU-SILC UDB 2017-2018, version of 20/03/2020.

Table 7 shows the results from the probit models estimated separately for each country. The first thing to note is that Ireland and the Netherlands are the only two

countries where there is no statistically significant difference in the likelihood of minimum wage employment associated with gender. For other countries, women are between one and six percentage points more likely to be on the minimum wage than men, after controlling for other factors. The result for Ireland is perhaps not surprising, given that Table 5 showed that the risk across gender is very similar, with 9.4 per cent of males and 9.7 per cent of females being minimum wage employees. Maître, McGuinness and Redmond (2017), using 2013 and 2014 SILC data, identified a small but positive and statistically significant gender gap. Our findings suggest that the gender effect seems to have changed over time, with no statistically significant difference between the probability of minimum wage employment for men and women in Ireland. Our findings are in line with statistics taken from the minimum wage question in the Irish Labour Force Survey. Specifically, estimates released by the Central Statistics Office indicate, that in the fourth quarter of 2017, the percentage of men on the minimum wage was 8.5%, which was very close to the statistic of 8.8% for women.[14]

The result for the Netherlands of no statistically significant difference in the likelihood of minimum wage employment between men and women may appear somewhat contradictory to the earlier finding that highlighted the Netherlands as the country with the highest over-representation of women on the minimum wage. However, note that the incidence is low; Table 5 showed that just 1.4 per cent of males and 3.8 per cent of females are on the minimum wage in the Netherlands. Therefore, while there is an overrepresentation of women, the raw gap between men and women is low, at just 2.4 percentage points. Table 7 indicates that this gap disappears once other factors, such as age, education, sector, contract type and part-time status, are controlled for.

It is important to note that some of the explanatory variables in our specification may be correlated. For example, women may be more likely to work in part-time jobs compared to men. If we re-run the analysis for the two countries with no gender effect (Ireland and the Netherlands) and drop the part-time variable from the specification, we detect a small but significant gender effect, indicating that women are approximately one percentage point more likely than men to be minimum wage employees in both countries. Therefore, for Ireland, we observe the same coefficient as in Table 7 (-0.01), but it is statistically significant when part-time status is dropped.

In all countries except Latvia, age is a strong predictor of minimum wage status. In Ireland, employees aged above 29 years are five to eight percentage points less

[14] See Table 3A:
https://www.cso.ie/en/releasesandpublications/er/lfsnmw/lfsnationalminimumwageestimatesq42018/

likely to be on the minimum wage relative to those under 29 years. In the majority of countries (9 out of 14), non-nationals are more likely to be on the minimum wage than nationals, with estimates ranging from one percentage point in Belgium to nine percentage points in Estonia and Spain. Non-nationals in Ireland are three percentage points more likely to be minimum wage employees than Irish nationals. Education level is also a significant factor in all countries. In Ireland, for example, tertiary-educated employees are eight percentage points less likely to be on the minimum wage compared to those with lower secondary (or less) education.

The sector of work, particularly accommodation and food, is a strong predictor of minimum wage employment. Employees in the accommodation food sector are more likely to be on the minimum wage. Estimates range from between one and three percentage points in Belgium, Greece and the Netherlands, to between 13 and 18 percentage points in Ireland, Poland and Luxembourg. Part-time employment status is associated with a higher probability of minimum wage employment in all countries except Belgium and Luxembourg. Being on a permanent contract is associated with a lower probability of minimum wage employment in all countries except Ireland. Again, we note that some of the explanatory variables may be correlated. For example, age and part-time status may be correlated with permanent contract status, which in turn can affect the estimated coefficients. If we drop age and part-time status from the specification, the permanent coefficient in Ireland becomes large and statistically significant (-0.04***).

TABLE 7: COUNTRY-LEVEL PROBIT MODEL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Ireland**	**Belgium**	**Germany**	**Estonia**	**Greece**	**Spain**	**France**
Male	-0.01	-0.00*	-0.03***	-0.03***	-0.01***	-0.04***	-0.02***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Age (ref: 18 to 29 years)							
Age 30 to 39	-0.05***	-0.01***	-0.08***	-0.03***	-0.02***	-0.07***	-0.05***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Age 40 to 49	-0.08***	-0.01***	-0.10***	-0.04***	-0.02***	-0.11***	-0.06***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
Age 50 to 59	-0.07***	-0.01***	-0.11***	-0.04***	-0.02***	-0.10***	-0.06***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Age 60 to 80	-0.06***	-0.00	-0.07***	-0.03***	-0.02***	-0.07***	-0.04***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Non-national	0.03***	0.01**	0.02*	0.09***	0.02***	0.09***	0.05***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education Level (ref: lower secondary)							
Upper secondary	-0.03***	-0.00	-0.06***	-0.05***	-0.01***	-0.03***	-0.03***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
Tertiary	-0.08***	-0.01***	-0.16***	-0.11***	-0.02***	-0.08***	-0.08***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Sector (ref: other)							
Agriculture and industry	0.03**	-0.00	-0.02***	-0.02***	-0.00*	-0.02***	-0.01**
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
Wholesale and retail	0.04***	-0.00	0.01**	-0.00	0.01**	-0.01	-0.01
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Accommodation and food	0.13***	0.03**	0.12***	0.08***	0.01*	0.05***	0.06***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.00)	(0.01)	(0.02)
Health and social work	0.01	0.00	-0.01	-0.05***	-0.01**	-0.04***	0.07***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Public admin and defence	-0.03***	0.00	-0.07***	-0.05***	-0.02***	-0.06***	-0.01*
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
Permanent contract	-0.00	-0.04***	-0.23***	-0.12**	-0.04***	-0.17***	-0.14***

	(0.01)	(0.01)	(0.01)	(0.05)	(0.00)	(0.01)	(0.01)
Part-time	0.03***	0.00	0.11***	0.10***	0.01***	0.03***	0.07***
	(0.01)	(0.00)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,197	7,378	17,545	10,393	16,783	17,458	14,527

Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

TABLE 7 CONT'D: COUNTRY-LEVEL PROBIT MODEL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Hungary**	**Luxemb.**	**Latvia**	**Netherl.**	**Poland**	**Portugal**	**UK**
Male	-0.04***	-0.03***	-0.04***	-0.00	-0.06***	-0.06***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Age (ref: 18 to 29 years)							
Age 30 to 39	-0.04***	-0.07***	-0.01	-0.01***	-0.03***	-0.04***	-0.08***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Age 40 to 49	-0.03***	-0.10***	-0.01	-0.01***	-0.05***	-0.06***	-0.08***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Age 50 to 59	-0.02**	-0.10***	-0.00	-0.01***	-0.05***	-0.07***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Age 60 to 80	-0.00	-0.06***	0.02*	-0.01***	-0.05***	-0.06***	-0.07***
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Non-national	0.08	0.07***	0.01	0.04**	0.01	0.03	-0.00
	(0.06)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.01)
Education Level (ref: lower secondary)							
Upper secondary	-0.11***	-0.08***	-0.03***	-0.00**	-0.09***	-0.07***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Tertiary	-0.17***	-0.15***	-0.09***	-0.01***	-0.18***	-0.13***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Sector (ref: other)							
Agriculture and industry	-0.01	-0.03***	0.01*	-0.00*	-0.01	-0.01*	-0.02***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Wholesale and retail	0.02	0.05***	0.03***	0.00	0.04***	0.00	0.03**
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Accommodation and food	0.05*	0.18***	0.06***	0.03**	0.14***	0.07***	0.11***
	(0.03)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Health and social work	0.00	-0.03**	-0.02	-0.00**	-0.01	-0.02***	0.00
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Public admin and defence	0.04***	-0.07***	-0.03***	-0.00***	-0.05***	-0.10***	-0.01
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Permanent contract	-0.35***	-0.24***	-0.22***	-0.02***	-0.10***	-0.13***	-0.05**

	(0.02)	(0.02)	(0.08)	(0.01)	(0.01)	(0.01)	(0.02)
Part-time	0.04**	0.00	0.07***	0.01***	0.05***	0.07***	0.08***
	(0.02)	(0.01)	(0.02)	(0.00)	(0.01)	(0.02)	(0.01)
Observations	9,260	7,392	7,645	8,223	16,930	19,525	12,359

Notes: Standard errors in parentheses . *** p<0.01, ** p<0.05, * p<0.1
Data source: EU-SILC UDB 2017-2018, version of 20/03/2020.

4.2 JOB SATISFACTION

We use a question on job satisfaction in the EU-SILC 2018 data to analyse whether minimum wage employees are more, or less, satisfied with their job compared to higher-paid employees. Job satisfaction is likely to incorporate many factors, including the intrinsic value of the job, working conditions, pay levels, career considerations, etc. This indicator gives us an important insight into the extent to which minimum wage employment represents a constrained choice for some employees. Lower satisfaction among minimum wage employees compared to non-minimum wage employees may indicate that such jobs are viewed as being suboptimal by workers across one or more dimensions. Workers are asked to report their satisfaction with their present job on a scale from 0 (not at all satisfied) to 10 (completely satisfied).[15] From this, we create a binary variable to indicate job satisfaction, which equals one for responses from 6–10 and zero for responses from 0–5.[16]

In Figure 3 below, we show the percentage of minimum wage and higher-paid employees that report being satisfied with their job across the 14 countries in our sample. We see that, in all countries, the percentage of employees that report being satisfied with their job is lower among minimum wage employees compared to higher-paid employees. The gap is particularly large in Greece (21 percentage points) and Hungary (19 pps), while it is low in Germany (2 pps), the UK (3 pps), France and the Netherlands (both 4 pps).

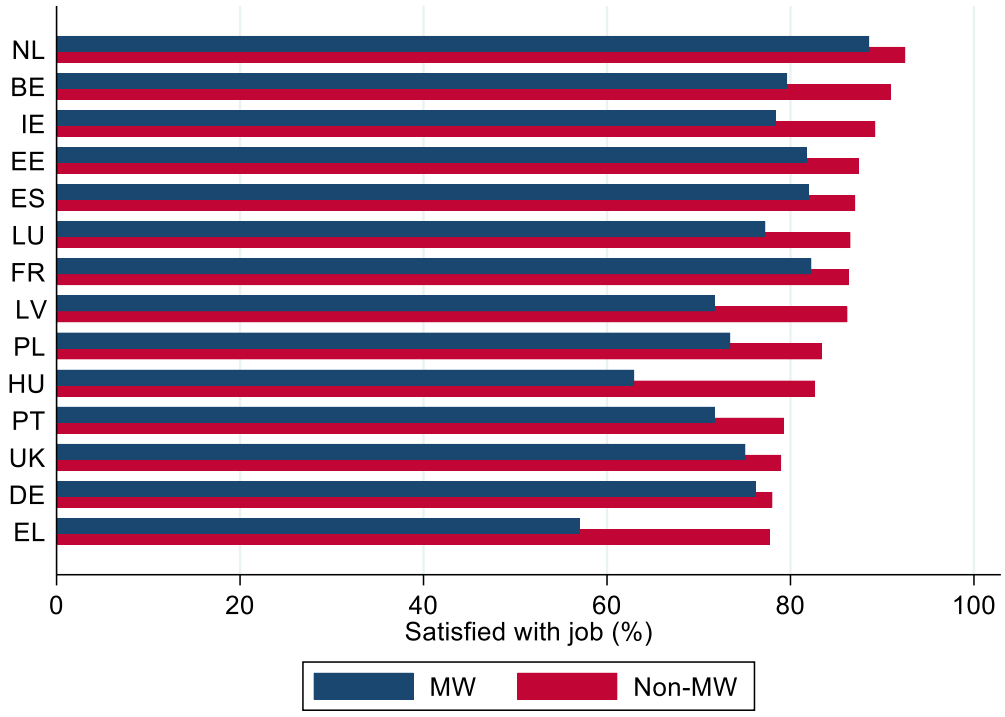
In Ireland, approximately 80 per cent of minimum wage employees are satisfied

[15] Variable PW100T in EU-SILC 2018 data.

[16] The job satisfaction variable contains some missing information, and the extent of this varies across countries. Table B.1 in Appendix B shows the percentage of missing data for each country. Ireland has a relatively high percentage of missing job satisfaction information, at 38%. Table B.2 compares the observable characteristics of employees from all countries that have missing and non-missing job satisfaction information. The characteristics are broadly similar. However, there is a higher percentage of males among those with missing information (59%) compared to those with complete information (48%). When we look specifically at Ireland (Table B.3), we observe the same pattern.

with their job, compared to 89 per cent of higher-paid employees. The gap of 9 percentage points between minimum wage and non-minimum wage employees in Ireland is roughly average; it is the sixth highest gap out of 14 countries. It should be noted that the general job satisfaction rate among all employees in Ireland is relatively high; at 89 per cent, it is the third highest overall job satisfaction rate out of the 14 countries studied.

FIGURE 3: JOB SATISFACTION (%), 2018



Data source: EU-SILC UDB 2018 version of 20/03/2020.

We estimate a probit model to examine the impact of minimum wage status on job satisfaction, controlling for a range of other potentially important covariates. We estimate the following probit model,

$$P(Sat = 1) = \Phi(\beta_0 + \beta_1 MW + \beta_1 Male + \beta_2 Age + \beta_3 Education + \beta_4 Nationality + \beta_5 Sector + \beta_6 Permanent + \beta_7 PT) \quad (2)$$

where *Sat* is the dummy variable indicating job satisfaction. We estimate the model on the pooled data for 14 countries, as well as separately for each country.

Table 8 shows the results for the pooled model, which includes country fixed effects. Being a minimum wage employee is associated with a four percentage-point reduction in the probability of being satisfied with your job, after controlling for other characteristics. Table 8 also reveals that males and young workers (aged

18 to 29 years) are more likely to be satisfied, while non-nationals are two percentage points less likely to be satisfied with their job than native workers. Higher education is associated with greater job satisfaction; those with a tertiary education are five percentage points more likely to be satisfied than those with lower secondary level or below. With regard to sector, employees in the accommodation and food sector have the lowest satisfaction rate, while those in public administration and defence are the most likely to be satisfied with their job. Permanent contract workers and full-time employees are six percentage points and four percentage points, respectively, more likely to be satisfied than temporary contract and part-time workers.

In Table 9 we show the results from the job-satisfaction probit models estimated separately for each of the 14 countries. In most (9 out of 14) countries, minimum wage employees are statistically significantly less likely to be satisfied in their job compared to higher-paid workers. The magnitude of the estimates ranges from less than five percentage points in Estonia and Portugal to approximately ten percentage points in Ireland, Belgium, Latvia and Hungary. The countries where we do not observe a statistically significant impact of minimum wage employment on job satisfaction are Germany, Spain, France, the Netherlands and the UK.

The results for gender are not consistent across countries. While being male is associated with a higher probability of being satisfied in your job in five countries, the remaining nine (including Ireland) show no effect, and while the coefficients are not significant, they have a negative sign in six of the 14 countries. The results for age are also somewhat mixed. In Germany, Estonia, Hungary, Spain, Poland and Portugal, being older is associated with lower job satisfaction. However, in Ireland and France, those aged over 60 are five and seven percentage points, respectively, more likely to be satisfied in their job compared to young workers (aged 18 to 29 years), although in the case of Ireland this finding is only significant at the 10% level. Non-nationals have lower rates of job satisfaction in Belgium, Estonia and the Netherlands, while no statistically significant effect is present in other countries. In the majority of countries (9 of 14), higher education is associated with greater job satisfaction, but there is no effect in Ireland, Germany, Estonia, Netherlands and the UK. The sectoral results show that employment in the accommodation food and/or wholesale and retail sectors are associated with lower job satisfaction in Germany, Greece, Portugal and the UK. Finally, while part-time employment and contractual status have no statistically significant effect in Ireland, having a permanent contract has a positive effect on job satisfaction in five countries, and part-time status is associated with lower satisfaction in seven countries.

TABLE 8: JOB SATISFACTION (PROBIT MODEL)

VARIABLES	Job Satisfaction
Minimum wage	-0.04***
	(0.01)
Male	0.01***
	(0.00)
Age (ref: 18 to 29 years)	
Age 30 to 39	-0.02***
	(0.01)
Age 40 to 49	-0.02***
	(0.01)
Age 50 to 59	-0.04***
	(0.01)
Age 60 to 80	-0.03***
	(0.01)
Non-national	-0.02***
	(0.01)
Education Level (ref: lower secondary)	
Upper secondary	0.02***
	(0.00)
Tertiary	0.05***
	(0.00)
Sector (ref: other)	
Agriculture and industry	-0.01***
	(0.00)
Wholesale and retail	-0.02***
	(0.01)
Accommodation and food	-0.03***
	(0.01)
Health and social work	0.01***
	(0.00)
Public admin and defence	0.03***
	(0.00)
Permanent contract	0.06***
	(0.01)
Part-time	-0.04***
	(0.00)
Country fixed effects	Yes
Observations	71,827

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Data source: EU-SILC UDB 2018 version of 20/03/2020.

TABLE 9: JOB SATISFACTION BY COUNTRY (PROBIT MODELS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Ireland**	**Belgium**	**Germany**	**Estonia**	**Greece**	**Spain**	**France**
Minimum wage	-0.09**	-0.11*	-0.01	-0.04*	-0.08**	-0.00	-0.03
	(0.04)	(0.06)	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)
Male	-0.02	-0.01	-0.01	-0.01	-0.01	0.02**	0.03***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age (ref: 18 to 29 years)							
Age 30 to 39	-0.01	0.01	-0.05**	0.01	-0.01	-0.02	0.00
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Age 40 to 49	-0.03	-0.02	-0.07***	-0.01	-0.01	-0.03**	-0.00
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Age 50 to 59	-0.01	-0.02	-0.11***	-0.05**	-0.03	-0.04***	0.00
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age 60 to 80	0.05*	-0.02	-0.11***	-0.08***	-0.03	-0.01	0.07***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Non-national	-0.00	-0.04**	0.01	-0.05**	-0.00	-0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)
Education Level (ref: lower secondary)							
Upper secondary	-0.04	0.01	-0.00	0.01	0.07***	-0.00	0.00
	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Tertiary	0.00	0.04***	0.03	0.02	0.12***	0.04***	0.03*
	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Sector (ref: other)							
Agriculture and industry	0.02	0.00	-0.00	0.00	-0.02	0.00	-0.01
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Wholesale and retail	-0.04	-0.00	-0.03**	-0.01	-0.02	-0.01	-0.03
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Accommodation and food	-0.01	0.00	-0.09***	-0.05	-0.07***	-0.01	-0.04
	(0.03)	(0.03)	(0.04)	(0.04)	(0.02)	(0.02)	(0.03)
Health and social work	0.00	-0.00	-0.01	0.01	0.02	0.04***	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Public admin and defence	0.02	0.01	0.04***	0.03*	0.06***	0.09***	0.03**
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Permanent contract	0.03	0.04	0.03	-0.02	0.11***	0.05***	-0.01

	(0.04)	(0.02)	(0.02)	(0.08)	(0.02)	(0.01)	(0.02)
Part-time	-0.02	-0.02	-0.00	-0.04	-0.24***	-0.09***	-0.03**
	(0.02)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)
Observations	1,886	3,372	8,503	3,985	7,999	8,579	5,300

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

TABLE 9 CONT'D: JOB SATISFACTION BY COUNTRY (PROBIT MODELS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Hungary**	**Luxemb.**	**Latvia**	**Netherl.**	**Poland**	**Portugal**	**UK**
Minimum wage	-0.09***	-0.06**	-0.10***	-0.01	-0.06***	-0.03**	-0.02
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Male	0.02	0.00	0.03*	-0.00	0.03***	0.05***	0.00
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age (ref: 18 to 29 years)							
Age 30 to 39	-0.02	-0.00	-0.00	0.01	-0.03	-0.01	-0.01
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Age 40 to 49	-0.04*	-0.01	0.02	0.01	-0.05***	-0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age 50 to 59	-0.09***	-0.01	-0.03	0.01	-0.05**	-0.06**	-0.00
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Age 60 to 80	-0.05	0.04	0.00	-0.01	-0.01	-0.04	-0.01
	(0.03)	(0.04)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
Non-national	-0.01	0.00	-0.02	-0.13***	-0.08	0.01	0.01
	(0.08)	(0.02)	(0.02)	(0.05)	(0.10)	(0.04)	(0.02)
Education (ref: lower secondary)							
Upper secondary	0.07***	0.02	0.03	0.00	0.07***	0.04***	-0.01
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
Tertiary	0.14***	0.06***	0.09***	0.02	0.12***	0.05***	0.01
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
Sector (ref: other)							
Agriculture and industry	-0.03*	0.01	-0.03	0.01	-0.02	-0.06***	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Wholesale and retail	0.00	0.01	-0.02	0.00	0.00	-0.03*	-0.07***
	(0.03)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Accommodation and food	-0.04	-0.04	0.01	-0.03	0.05*	-0.04*	-0.03
	(0.05)	(0.04)	(0.04)	(0.04)	(0.03)	(0.02)	(0.03)
Health and social work	0.01	0.02	0.01	0.02	0.02	-0.02	-0.01
	(0.03)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)
Public admin and defence	-0.01	0.05***	0.03*	-0.00	0.03**	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Permanent contract	0.18***	0.02	0.35**	0.02	0.04***	0.01	0.03
	(0.03)	(0.03)	(0.16)	(0.02)	(0.01)	(0.02)	(0.04)

Part-time	-0.02	-0.03*	-0.07*	-0.01	-0.05**	-0.05	-0.03**
	(0.04)	(0.02)	(0.04)	(0.01)	(0.02)	(0.03)	(0.01)
Observations	3,999	2,659	2,864	3,867	5,967	6,892	5,955

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Data source: EU-SILC UDB 2018 version of 20/03/2020.

4.3 POVERTY RISK

In Section 2.3 (Table 2), we showed descriptive statistics relating to the poverty rate of minimum wage employees. The percentage of minimum wage employees in Ireland that are at risk of poverty was shown to be the lowest of the 14 countries studied. In this section, we use the EU-SILC data for 2017 and 2018 and go beyond descriptive analysis, by modelling the extent to which minimum wage employees are more likely to belong to a household at risk of poverty, while controlling for a range of other factors. This will give us an indication of the relative effectiveness of the minimum wage in combating household poverty. The greater the association between minimum wage employment and poverty, the more effective minimum wage policies will be in terms of raising the income levels of the poorest households. We estimate the following probit model,

$$P(Pov = 1) = \Phi(\beta_0 + \beta_1 MW + \beta_1 Male + \beta_2 Age + \beta_3 Education + \beta_4 Nationality + \beta_5 Sector + \beta_6 Permanent + \beta_7 PT) \quad (3)$$

where *Pov* is a dummy variable indicating whether the employee belongs to a household at risk of poverty, defined as equivalised household income below 60 per cent of median income. We estimate the model on the pooled data for 14 countries, as well as separately for each country.

Results from the pooled model, including all 14 countries, are reported in Table 10 and indicate that, after controlling for other worker and job characteristics, minimum wage employees are 14 percentage points more likely to belong to a household at risk of poverty compared to non-minimum wage employees. Therefore, minimum wage policies across Europe will tend to disproportionately affect poorer households, albeit to a limited extent. Household poverty risk is also found to be positively related to age, migrant status, part-time employment and employment in the wholesale, retail, accommodation and food sectors; conversely, household poverty risk is lower among workers with higher levels of schooling and those with permanent employment contracts.

TABLE 10: POVERTY RISK (PROBIT MODEL)

VARIABLES	Poverty
Minimum wage	0.14***
	(0.00)
Male	0.01***
	(0.00)
Age (ref: 18 to 29 years)	
Age 30 to 39	0.01***
	(0.00)
Age 40 to 49	0.02***
	(0.00)
Age 50 to 59	0.01***
	(0.00)
Age 60 to 80	0.00
	(0.00)
Non-national	0.05***
	(0.00)
Education Level (ref: lower secondary)	
Upper secondary	-0.02***
	(0.00)
Tertiary	-0.05***
	(0.00)
Sector (ref: other)	
Agriculture and industry	0.00
	(0.00)
Wholesale and retail	0.01***
	(0.00)
Accommodation and food	0.01***
	(0.00)
Health and social work	0.00
	(0.00)
Public admin and defence	-0.01***
	(0.00)
Permanent contract	-0.03***
	(0.00)
Part-time	0.07***
	(0.00)
Country fixed-effects	Yes
Observations	171,615

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Data source: EU-SILC UDB 2017-2018, version of 20/03/2020.

The results from the country-specific models are reported in Table 11. The extent to which minimum wage employees have a higher poverty risk ranges from approximately 7 percentage points in Ireland and Greece to over 20 percentage points in Luxembourg, the Netherlands and Estonia. Therefore, while minimum

wage policy will, to a certain degree, target those at risk of poverty, the extent to which this occurs varies substantially across countries. Our results suggest that minimum wage policy in Ireland and Greece may be less effective, compared to other EU countries in the sample, in raising the income levels of the poorest households. These differences may be explained, for example, by the fact that in some countries it is may be more common for individuals to be involved in minimum wage employment, without this necessarily meaning that their household is at risk of poverty. For example, minimum wage employees are often not the main earner in households. This could include younger people in education working part-time jobs, or the spouse of a higher-paid employee who works in a lower-paid, part-time job. Redmond et al. (2021) show that in Ireland minimum wage workers are spread across the income distribution and are often located in high-income households.

TABLE 11: POVERTY RISK BY COUNTRY (PROBIT MODELS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Ireland**	**Belgium**	**Germany**	**Estonia**	**Greece**	**Spain**	**France**
Minimum wage	0.07***	0.15***	0.14***	0.22***	0.08***	0.17***	0.12***
	(0.01)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Male	0.01**	0.01***	0.02***	-0.03***	0.01***	0.01***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age (ref: 18 to 29 years)							
Age 30 to 39	-0.00	0.01	0.03***	0.02**	-0.01***	0.01*	0.01**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Age 40 to 49	0.01**	0.03***	0.01**	0.03***	0.00	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Age 50 to 59	0.01	0.01	0.01*	0.01	-0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Age 60 to 80	0.01	0.02	0.03***	-0.02***	0.00	-0.02**	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Non-national	0.02***	0.04***	0.02**	0.03***	0.06***	0.10***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education Level (ref: lower secondary)							
Upper secondary	-0.01**	-0.02***	-0.02***	-0.02**	-0.01***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Tertiary	-0.01***	-0.05***	-0.04***	-0.05***	-0.05***	-0.05***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Sector (ref: other)							
Agriculture and industry	0.00	-0.02***	-0.01	-0.00	-0.00	-0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Wholesale/retail	0.00	-0.00	0.00	-0.00	0.01**	0.00	0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Accommodation and food	0.01	0.00	0.01	0.02	-0.00	0.03***	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Health and social work	0.01	-0.00	0.01	-0.02**	0.01	-0.01***	0.01
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Public admin and defence	-0.00	-0.01	-0.02***	-0.01**	-0.01*	-0.02***	-0.01*
	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Permanent contract	-0.03***	-0.04***	-0.03***	-0.01	-0.02***	-0.03***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.01)
Part-time	0.07***	0.03***	0.05***	0.06***	0.10***	0.10***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	6,197	7,378	17,545	10,393	16,783	17,458	14,527

TABLE 11 CONT'D: POVERTY RISK BY COUNTRY (PROBIT MODELS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Hungary**	**Luxemb.**	**Latvia**	**Netherl.**	**Poland**	**Portugal**	**UK**
Minimum wage	0.16***	0.20***	0.17***	0.21***	0.12***	0.12***	0.15***
	(0.01)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)	(0.01)
Male	-0.00	0.02***	-0.02***	0.01***	0.01***	0.00	0.01**
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Age (ref: 18 to 29 years)							
Age 30 to 39	0.02**	0.02*	0.02**	-0.00	-0.00	-0.01*	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Age 40 to 49	0.04***	0.05***	0.02**	-0.00	0.02***	0.01**	0.03***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Age 50 to 59	0.03***	0.04***	0.03**	-0.01	0.01***	-0.01**	0.04***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Age 60 to 80	0.03**	0.11***	-0.01	-0.00	-0.01	-0.01*	0.02*
	(0.01)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Non-national	0.04	0.05***	0.00	0.02	0.09*	0.02	0.03***
	(0.03)	(0.01)	(0.01)	(0.02)	(0.05)	(0.01)	(0.01)
Education Level (ref: lower secondary)							
Upper secondary	-0.02***	-0.03***	-0.02**	-0.01**	-0.02***	-0.03***	-0.02***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
Tertiary	-0.03***	-0.07***	-0.07***	-0.02***	-0.04***	-0.07***	-0.05***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Sector (ref: other)							
Agriculture and industry	-0.00	0.05***	0.01	0.00	0.01**	0.01*	-0.01**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Wholesale and retail	0.01	0.03**	0.01	0.00	0.00	0.01*	0.01*
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Accommodation and food	0.02	0.04**	-0.00	0.01	0.01	0.01	0.03***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Health and social work	0.00	-0.01	0.01	0.00	0.01	0.02**	0.00
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Public admin and defence	0.02**	-0.02**	-0.01	-0.01	-0.00	0.01**	-0.02***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Permanent contract	-0.03***	-0.05***	-0.12*	-0.00	-0.01**	-0.02***	-0.02
	(0.01)	(0.02)	(0.06)	(0.01)	(0.00)	(0.01)	(0.01)

Part-**time**	0.04***	0.07***	0.14***	0.02***	0.07***	0.15***	0.09***
	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.02)	(0.01)
Observations	9,260	7,392	7,645	8,223	16,930	19,525	12,359

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Data source: EU-SILC UDB 2017-2018, version of 20/03/2020.

CHAPTER 5: CONCLUSION

In this paper, we undertook a comparative analysis of minimum wage employment in Ireland, relative to a selection of other European countries with statutory minimum wages. Our country selection includes a group of high-income countries that are most comparable to Ireland; namely, the eight countries with the highest minimum wage rates: Ireland (IE), Belgium (BE), Germany (DE), Spain (ES), France (FR), Luxembourg (LU), the Netherlands (NL) and the United Kingdom (UK), as well as some lower-wage countries: Estonia (EE), Greece (EL), Hungary (HU), Latvia (LV), Poland (PL) and Portugal (PT). We compare the characteristics of minimum wage employees across countries, as well as the poverty risk and levels of job satisfaction among minimum wage employees, relative to higher-paid workers.

Currently, 21 of the 27 EU countries, along with the UK, have a minimum wage. Recently, there has been significant focus on minimum wage policy across Europe with the introduction of the EU Minimum Wage Initiative. This initiative proposes a legal instrument to ensure every worker in the EU has a fair minimum wage by 2024, and consultations are currently under way between the European Commission and social partners throughout Europe. In this regard, our comparative analysis should provide valuable information on both the similarities and differences in minimum wage employment across Europe.

We find that the incidence of minimum wage employment varies considerably across countries. In Ireland, 9.6 per cent of employees are on the minimum wage. Countries with a relatively high incidence of minimum wage employment are Portugal (15.6 per cent), Germany (15.1 per cent), Poland (14.8 per cent), Hungary (14.2 per cent), Germany (14.0 per cent), Spain (14.0 per cent), UK (13.6%), Luxembourg (13.0 per cent) and Estonia (10.7 per cent). The incidence is low in Belgium (1.7 per cent), Netherlands (2.6 per cent) and Greece (4.5 per cent). The minimum wage rate in Ireland, in nominal terms, is the second highest of the 22 countries, after Luxembourg. However, in purchasing-power standard terms, the Irish minimum wage is just the seventh highest, behind Luxembourg, Germany, the Netherlands, Belgium, the UK and France.

We compare minimum wage employees across a range of characteristics. We find that Ireland and the Netherlands are the only two countries where there is no statistically significant difference in the incidence of minimum wage employment associated with gender. In all countries except Latvia, age is a strong predictor of minimum wage status. For example, in Ireland, employees aged above 29 years are five to eight percentage points less likely to be on the minimum wage relative to those under 29 years. In most countries, non-nationals are more likely to be on the

minimum wage than nationals; in Ireland, non-nationals are three percentage points more likely to be minimum wage employees than Irish nationals. Education level is also a significant factor in all countries. Tertiary-educated workers are less likely to be on the minimum wage compared to lower-educated workers. In all countries, working in accommodation and food or wholesale and retail increases the likelihood of earning the minimum wage. These sectoral effects seem particularly important in light of the public health restrictions relating to the Covid-19 pandemic. Across Europe, there have been widescale business closures, with accommodation, food, wholesale and retail being hit particularly hard. Therefore, minimum wage employees are likely to suffer disproportionately from job losses arising from the pandemic. Ireland has the highest percentage of minimum wage workers in these sectors. Minimum wage employees in Ireland may, therefore, be particularly exposed to employment risks relating to the Covid-19 pandemic.

We also examined the risk of poverty among minimum wage employees. Minimum wage increases may be more effective at combating poverty in countries where a relatively large proportion of minimum wage workers are at risk of poverty, as the increases will affect a greater number of poor households. At 11.4 per cent, Ireland has the lowest poverty rate of minimum wage workers among all countries. This is also lower than the 17 per cent observed using data from 2013 and 2014 (Maître, McGuinness and Redmond, 2017). The rate is also relatively low in Poland, at 15 per cent. The poverty rate among minimum wage employees is relatively high in other countries, including the Netherlands (46 per cent), Luxembourg (41 per cent), Spain (35 per cent) and Estonia (35 per cent). Therefore, while minimum wage policy will, to a certain extent, target workers at risk of poverty, our results suggest that minimum wage policy in Ireland may be less effective, compared to the other EU countries, in raising the income levels of the poorest households.

Finally, lower job satisfaction among minimum wage employees compared to non-minimum wage employees may indicate that such jobs are viewed as suboptimal by workers across one or more dimensions. We find that job satisfaction among minimum wage employees is lower than among higher-paid employees in all countries. After controlling for other factors including age, gender, nationality, education, sector and contract type, we found that, in most (9 out of 14) countries, minimum wage employees are less likely to be satisfied in their job compared to higher-paid workers. The estimates range from less than five percentage points in Estonia and Portugal, to approximately ten percentage points in Ireland, Belgium and Hungary.

References

Bossler, M. and Broszeit, S., 2017. Do minimum wages increase job satisfaction? Micro-data evidence from the new German minimum wage. *Labour*, *31*(4), pp.480-493.

Eurofound (2020). 'Minimum wages in 2020: Annual review', Dublin: Eurofound.

Eurofound (2019). 'Minimum wages in 2019: Annual review', Dublin: Eurofound.

Eurostat (2020). 'Minimum wage statistics', Luxembourg: Eurostat.

Furåker, B., 2020. The issue of statutory minimum wages: views among Nordic trade unions. *Economic and Industrial Democracy*, *41*(2), pp.419-435.

Low Pay Commission (2019). 'Three year report (2015-2018)', Dublin: Low Pay Commission.

Maître, B., S. McGuinness, and P. Redmond (2017). 'A study of minimum wage employment in Ireland: the role of worker, household and job characteristics', Dublin: Economic and Social Research Institute.

McGuinness, S., Redmond, P. and Delaney, J. (2020). Minimum wage non-compliance, *Applied Economics Letters*, forthcoming.

Redmond, P., Doorley, K. and McGuinness, S. (2020). The impact of a minimum wage change on the distribution of wages and household income, *Oxford Economic Papers*, 2020, gpaa048.

APPENDIX A

TABLE A.1: MINIMUM WAGE RATES ACROSS COUNTRIES, EU-SILC 2016

Country	Hourly minimum wage rate	Monthly minimum wage rate	Hourly minimum wage rate +5%
Portugal	3.48	618.33	3.66
Poland	2.40	425.45	2.52
Hungary	2.00	350.69	2.10
Germany	8.50	1440.00	8.93
Spain	4.43	764.40	4.66
United Kingdom	7.68	1403.50	8.06
Luxembourg	11.02	1922.96	11.57
Estonia	2.47	430.00	2.59
France	8.71	1466.62	9.14
Ireland	9.15	1546.35	9.61
Latvia	2.12	370.00	2.23
Greece	3.84	683.76	4.03
Netherlands	9.09	1530.90	9.54
Belgium	8.96	1516.88	9.41

Notes: The minimum wage rates are based on those compiled by Eurostat (earn_mw_cur) which can be accessed at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=earn_mw_cur&lang=en. Employees are entitled to 14 monthly minimum wage payments per year in Spain (€655.20), Portugal (€530) and Greece (€586.08). In Belgium, the minimum wage increased halfway through the year in 2016, from €1,501.82 to €1,531.93. The minimum wage of €1,516.88 is simply the average of the two. This also occurred in Poland and the Netherlands.

APPENDIX B

TABLE B.1: MISSING JOB SATISFACTION INFORMATION (%)

Country	Missing (%)
Belgium	8%
Germany	1%
Estonia	19%
Greece	6%
Spain	1%
France	26%
Hungary	13%
Ireland	38%
Luxembourg	27%
Latvia	24%
Netherlands	0%
Poland	0%
Portugal	0%
United Kingdom	51%
Total	16%

Data source: EU-SILC UDB 2017-2018, version of 20/03/202.

TABLE B.2: CHARACTERISTICS OF EMPLOYEES WITH MISSING AND NON-MISSING JOB SATISFACTION DATA (ALL COUNTRIES)

	Missing	Non-**missing**
Minimum wage	12%	11%
Male	59%	48%
Age 30-39	23%	22%
Age 40-49	25%	30%
Age 50-59	23%	29%
Age 60-80	9%	9%
Non-national	13%	7%
Upper-secondary education	39%	37%
Tertiary education	44%	46%
Agriculture and industry	26%	24%
Wholesale and retail	13%	12%
Accommodation and food	4%	4%
Health and social	12%	12%
Public admin and defence	17%	23%
Permanent contract	93%	91%
Part-time employment	16%	16%

Data source: EU-SILC UDB 2017-2018, version of 20/03/202.

TABLE B.3: CHARACTERISTICS OF EMPLOYEES WITH MISSING AND NON-MISSING JOB SATISFACTION DATA (IRELAND ONLY)

	Missing	Non-missing
Minimum wage	11%	7%
Male	60%	42%
Age 30-39	24%	26%
Age 40-49	26%	32%
Age 50-59	19%	24%
Age 60-80	7%	9%
Non-national	12%	12%
Upper-secondary education	27%	17%
Tertiary education	60%	72%
Agriculture and industry	24%	18%
Wholesale and retail	15%	11%
Accommodation and food	7%	6%
Health and social	13%	18%
Public admin and defence	12%	19%
Permanent contract	95%	95%
Part-time employment	20%	23%

Data source: EU-SILC UDB 2017-2018, version of 20/03/202.

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