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Minimum wages in a dual labour market: Evidence from the 2019 minimum-wage hike in Spain

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Abstract

This paper provides an assessment of the 2019 minimum-wage hike in Spain, which increased the minimum wage by 22% and directly concerned 7% of dependent employees. The assessment is based on an individual-level analysis that follows the outcomes of workers that were employed in the year before the reform over time. Among directly affected workers, the hike in the minimum wage increased full-time equivalent monthly earnings by on average 5.8% and reduced employment by -0.6% (about 7400 jobs), which implies a very small own-wage labour demand elasticity of -0.1. The wage effects are stronger for workers on open-ended contracts, while the employment effects are stronger for workers on fixed-term contracts. Consequently, the own-wage labour demand elasticity is much stronger for workers on fixed-term contracts (-0.14 vs -0.06). In sum, the hike in the minimum wage significantly increased the wages of low-wage workers, but only resulted in very limited job losses among directly affected workers.

Keywords: wage-setting, wage-shifting, labour market duality, fixed-term contracts, employment protection

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1 Introduction

While the minimum wage continues to be surrounded with controversy, it is gaining growing political support across advanced economies. In the European Union, the Council and European Parliament adopted a new EU Directive on adequate minimum wages on 4 October 2022 (EU, 2022[1]). Rather than setting a one-size fits all minimum wage, it provides a framework for promoting adequate minimum wages. As an indicative reference value for an adequate minimum wage, it mentions 60% of the median or 50% of the average wage. Similarly, in the United States, there has been a strong push for increasing the federal minimum wage to 15$/ hour, which in terms of 2019 wages, corresponds to about 60% of the median (BusinessInsider, 2021[2]). A number of states already have state-level minimum wages at 15$/hour or above or have committed to implement these in the near future. The implications of the EU minimum wage directive and the prospect of having a federal minimum wage at 15$/hour remain however uncertain as the desirability of the minimum wage, its optimal level and its effects on employment continue to be intensively debated.

To contribute to the ongoing debate on the labour market effects of the minimum wage, this paper focuses on an unusually large increase in the minimum wage that took place in Spain in 2019. This increased the minimum wage by 22% in a single step and affected 7% of dependent employees. Minimum-wage increases of this magnitude are rare and provide an ideal setting for analysing the labour market effects of the minimum wage. The case of Spain is further of specific interest, since it is a prime example of a country with a dual labour market. At the time of the minimum wage reform, its incidence of temporary work was the second highest in the OECD (it declined significantly following the 2021 labour market reform). This could play an important role in shaping the employment effects of the minimum wage and how they are distributed across different groups of workers. Furthermore, new evidence on the minimum wage for Spain is particularly welcome since until recently there were only few little studies on the minimum wage. This reflects the fact that the minimum wage does not have any variation across regions or groups of workers (e.g., age) and minimum wage increases in the past tended to be gradual, resulting in only modest changes from year to year.

The main insight provided by this paper is that the 2019-minimum wage hike had a large positive effect on wages, but only a very small negative effect on employment. The analysis is based on an administrative dataset constructed from social security, income tax and census records (*Muestra Continua de Vidas Laborales* or MCVL). The wage and employment effects of the 2019 minimum wage hike are analysed using an individual-level approach that follows the wage and employment outcomes of incumbent workers over time following Clemens and Wither (2019[4]) and Dustmann et al. (2021[5]). The findings indicate that,

among directly affected workers, the hike in the minimum wage increased full-time equivalent monthly earnings by an average of 5.8% and reduced employment by 0.6%. This implies a small own-wage labour demand elasticity of -0.1 (0.6/5.8). It corresponds to an employment elasticity with respect to the minimum wage of -0.03 (0.6/22), the concept typically used in literature reviews [e.g. De Linde et al. (2014[1]) for the UK and Neumark and Shirley (2021[2]) for the US]. Moreover, the negative employment effects are stronger for workers on fixed-term contracts than those on open-ended contracts. This suggests that the minimum wage reduces labour market segmentation by increasing the relative attractiveness of open-ended contracts for employers.

The paper makes a number of contributions to the existing literature.

- There is a large literature on the employment effects of minimum wages. Ever since the path-breaking study of the minimum wage by Card and Krueger (1994[1]), which showed that the minimum wage had positive rather than negative employment effects, this has been an issue of intense debate. This challenged the conventional wisdom based the presence of competitive labour markets that minimum wages tend to price low skilled workers out of the market. Small positive employment effects are however consistent with imperfectly competitive labour markets where wages are set by monopsonic employers or through wage bargaining. The study by Card and Krueger (1994[1]) gave rise to a flurry of new studies, sometimes called the "new minimum wage research", which has constantly sought to improve on data, research designs and mechanisms that can explain the absence of sizeable employment effects (Cengiz et al., 2019[3]; Dustmann et al., 2021[4]; Harasztosi and Lindner, 2019[5]). Different readings of the literature yield different conclusions, with some reviews concluding there are no significant employment effects (Manning, 2021[2]) and others that there are (Neumark, Salas and Wascher, 2014[3]; Neumark et al., 2021[4]). Meta-analyses, which, by definition, are less subject to judgement, typically find small but negative employment effects (De Linde - Leonard, Stanley and Doucouliagos, 2014[1]). The present paper contributes to this large and growing literature by providing new evidence based on an exceptionally large increase in the minimum wage that took place in Spain, a country with a strongly segmented labour market. This suggests that minimum wage significantly increased the wages of directly affected workers but only had a small negative effect on employment.
- There are few papers that have specifically looked at the effects of minimum wages in a dual labour market. While there is ample evidence that the employment effects of adverse temporary labour demand shocks tend to be concentrated on workers with fixed-term contracts in dual labour markets (Bentolila, Dolado and Jimeno, 2012[6]), this is less obvious in the case of permanent adverse labour demand shocks, including minimum wage increases. Based on an intuitive model, we argue that what matters in such a context is the difference in expected dismissal costs (e.g. expected severance payment) and the scope for wage-shifting (e.g. bargaining power). Minimum wages crucially constrain the extent to which expected dismissal costs are shifted to workers through lower wages. Expected dismissal costs in our model depend on the risk of dismissal and

severance payments upon dismissal. By constraining the scope for wage-shifting, the employment effects of an increase in the minimum wage tend to be larger for workers with higher expected dismissal costs. The employment effects by type of contract are therefore an empirical question.[1] The findings in this paper suggest that the own-wage labour demand elasticity for workers on fixed-term contracts is significantly stronger than that for workers on open-ended contracts (-0.14 versus -0.06). This suggests that the minimum wage reduced labour market segmentation by increasing the relative attractiveness of open-ended contracts for employers.

- A growing number of studies analyse the 2019 minimum wage hike in Spain. Publicly available studies also find negative employment effects but estimates of their size vary considerably, with Barcelo et al (2021[4]) finding large negative effects and Gorjon et al. (2022[7]) more modest ones. These papers do not analyse how the effects differ by type of contract. A number of earlier studies have attempted to predict its impact on employment ex ante. For example, the Bank of Spain (2017[1]) estimated that the increase in the minimum wage between 2018-2020 could lead to a loss of total employment of 1.4% and 11.3% among affected workers. Job losses were expected to be concentrated among young workers as well as older workers above 45. These estimates rely on a previous study by Galán and Puente (2015[9]) for Spain that focused on the increase in the minimum wage between in 2004 and 2010. The present findings contribute to the ongoing policy debate on the desirability of increasing the minimum wage to 60% of the net average wage as intended by the current government.

The remainder of this paper is structured as follows. Section 2 provides an overview of the institutional and economic context in which the minimum wage hike took place. Section 3 presents an intuitive model that analyses how the minimum wage may affect employment of workers on fixed-term and open-ended contracts. Section 4 presents the data, while Section 5 provides descriptive statistics. Section 6 introduces the worker-level approach to assess the wage and employment effects of the minimum wage hike, presents the baseline results and discusses their robustness. Section 7 concludes.

[1] A higher minimum wage may also change incentives for long-term contracting as workers need some degree of experience to become sufficiently productive and hence increase the incentives for conversion (Rebitzer and Taylor, 1995[3]). Focusing on the 2016 increase in the minimum wage in Ireland, McGuinness and Redmond (2019[4]) find no evidence that it increased the probability of becoming jobless for workers on fixed-term contracts. However, they find that it leads to a reduction in working time and that this effect is stronger among temporary workers.

2 Institutional and economic context

2.1 Minimum wage

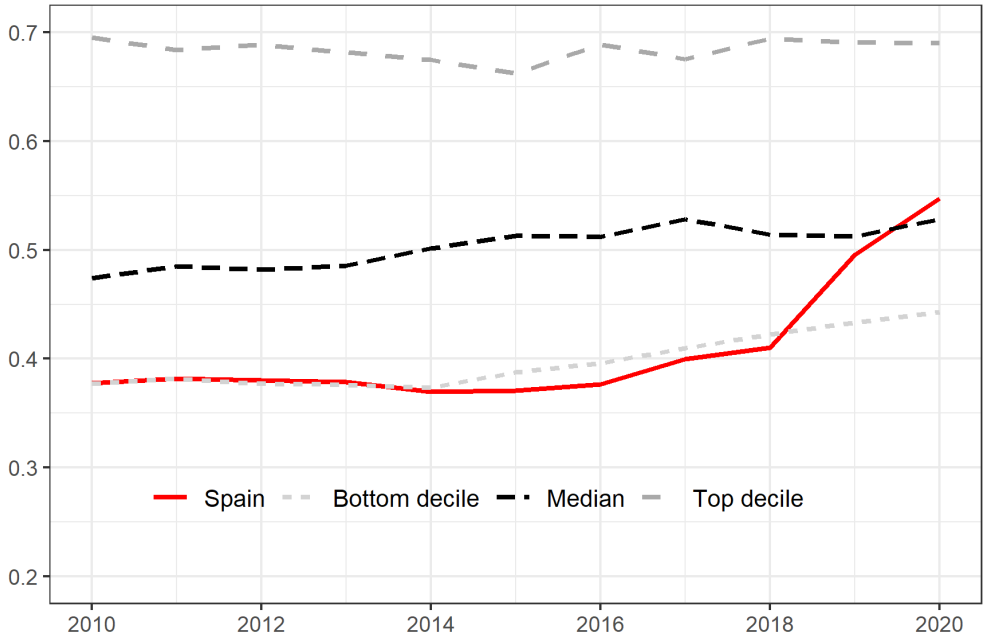
The statutory minimum wage was introduced in Spain in 1964. Initially, this allowed for regional sub-differences and sub-minima for teenagers. Since 1998, there has been a unique national minimum wage for all workers, irrespective of the characteristics of workers, their type of contract, economic activity and the region where they work. The minimum wage in Spain is defined in terms of a monthly wage for full-time workers who work the entire month which is rescaled in proportion to the hours and days actually worked. Yearly compensation at the minimum wage is calculated for 14 months, with the 13th and the 14th as supplements paid in June or December.

The minimum wage is set each year by the Spanish Government by Royal Decree, usually in December, with changes becoming binding from the beginning of the next year. Decisions are made on a discretionary basis in consultation with employer and worker representatives, taking into account past and predicted inflation and general economic conditions. The Spanish government states in the Royal Decree that the rise in the minimum wage was expected to bring about a progressive reduction in in-work poverty and wage inequality and promote sustained job creation and economic growth. Since January 2021, there is an independent commission of experts. Its main task was to define a path towards reaching a MW at 60% of average *net* wage by 2023 based on a set of indicators established in Art. 27 of the Constitution.

The minimum wage hike in 2019 followed a long period during which the minimum-to-median wage (Kaitz) ratio had been broadly stable at almost 40% (Figure 1). This was very low by OECD standards and consistently below the first decile of the distribution of the Kaitz ratio across OECD countries with a minimum wage. The 2019 hike in the minimum wage increased the Kaitz ratio to 50%. This corresponds to a monthly minimum wage of EUR 900, or EUR 1,050 if the mandatory 13 and 14th months are distributed over 12 months, consistent with the way earnings are recorded in our data. In 2020, the minimum wage was further increased, to 52% of the median, slightly above the median level in the OECD.

Figure 1 The 2019 minimum-wage hike in Spain in OECD context

Minimum wage as a share of the median wage in Spain in comparison of the bottom decile, top decile and median of its distribution across OECD countries with a minimum wage



Source: OECD Minimum Wage database

2.2 Employment protection

Employment protection relatively strict in Spain. According to the OECD employment protection index of the stringency of individual dismissals of workers on open-ended contracts, it is above average in Spain. This reflects amongst others the fact that severance pay for permanent workers in the case of economic dismissal is relatively high in Spain compared with other OECD countries. Severance pay is 20 days of pay per year service up to a maximum of 18 years.[2] Similarly, according to the OECD employment protection index on the stringency of regulations on the use of temporary contracts, Spain was among the top fifth of countries with the strictest rules, even before the 2021 labour market reform that further restricted their use. The regulation of fixed-term contracts relates to the circumstances where they can be used, the number of times they can be renewed and their cumulative duration.

Strict employment protection coincides with a high incidence of temporary work. In 2018, the incidence fixed-term contracts in dependent employment employees peaked at 27% in Spain and declined slightly to 25% in 2021 compared to 12% in the OECD as a whole. Following the 2021 labour market reform, its incidence dropped markedly to 21%. Temporary workers are also entitled to severance pay in Spain if their contract is not renewed or converted into a permanent one. However, the amount is lower than for workers on open-ended-term contracts. Severance pay for temporary workers amounts to 12 days of pay per year of service instead of 20 for permanent workers. In most other countries, terminating a temporary contract at its end date does not require paying severance pay.

2.3 Economic context

Our empirical findings have to be interpreted in the particular macroeconomic context in which the minimum wage was increased. The Spanish economy was characterized by steady economic growth in the years preceding the implementation of the reform. Between 2015 and 2018, nominal GDP grew over 15%, employment increased by 7% and the unemployment rate fell by more than 6 percentage points, despite remaining above 15% in 2018.

[2] In practice, firms often pay more to avoid the taking the risk that the dismissal is challenged in court for being unfair. If a layoff is declared unfair by a court, the worker receives a total compensation of 33 days of pay per year of service. Reinstatement cannot be imposed on the employer, except in the case of prohibited grounds, such as discrimination. At the same time, probation periods are relatively short and notification requirements limited.

3 Theory

A minimum wage hike can affect fixed-term and open-ended contracts differently because of differences in the expected dismissal costs, either in the form of a layoff tax (red tape) or private transfer from the firm to the worker (severance pay). To illustrate this, we present a simple two-period model below.

Workers are identical in all aspects except for their type of contract, which may be fixed-term (F) or open-ended (O). Workers can stay in the job for up to two periods. In each period in which a worker is employed, he or she produces output (y) and receives a wage (w). Open-ended contract workers are fired with a probability λ_O at the end of the first period or keep their job with probability $1-\lambda_O$. Fixed-term contract workers are fired with probability λ_F after one period or have their contract converted into an open-ended contract with probability $1-\lambda_F$. The cost of dismissal depends on the type of contract, c_i , $i \in \{F, O\}$, which is specified by labour regulations. Specifically, $c_F < c_O$, since in practice it is more costly to fire workers on open-ended contracts.

We start by considering the case of dismissal costs in the form of layoff taxes (as opposed to severance pay which represents a mandatory private transfer between the firm and the workers). In this case, the value of a given job for an employer (V) with contract (F,O) can be represented as the expected value of production net of labour and dismissal costs as follows:

(1a) $V_O = y - w - \lambda_O c_O + (1-\lambda_O)(y - w - \lambda_O c_O) = (2-\lambda_O)(y - w - \lambda_O c_O)$

(1b) $V_F = y - w - \lambda_F c_F + (1-\lambda_F)(y - w - \lambda_O c_O) = (2-\lambda_F)(y-w) - \lambda_F c_F - (1-\lambda_F)\lambda_O c_O$

This shows that jobs with higher expected dismissal costs will have a lower value for employers. For a given wage, a firm will keep a worker as long as the value of the job is positive $(V_i \geq 0)$, which is true when the following conditions hold for each type of worker:

(2a) $V_O \geq 0 \leftrightarrow w \leq y - \lambda_O c_O$

(2b) $V_F \geq 0 \leftrightarrow w \leq y - \frac{1}{2-\lambda_F}\lambda_F c_F - \frac{(1-\lambda_F)}{2-\lambda_F}\lambda_O c_O$

These conditions show that, while an increase in the minimum wage reduces the value of all low-wage jobs for firms, the value of a job is more likely to turn negative for workers with a higher expected dismissal costs. In particular, workers on open-ended contracts have higher expected dismissal costs when:

$$(3)\ \lambda_O c_O > \frac{1}{2-\lambda_F}\lambda_F c_F + \frac{(1-\lambda_F)}{2-\lambda_F}\lambda_O c_O \ \leftrightarrow \frac{c_O}{c_F} > \frac{\lambda_F}{\lambda_O}$$

While workers on fixed-term contracts receive lower severance pay upon dismissal, they have a higher risk of dismissal. Which of these two ratios is larger is an empirical question.

Now consider the situation where dismissal costs do not take the form of a layoff tax (red tape) but a mandatory private transfer from firms to workers (severance pay). In the absence of frictions and a minimum wage, layoff costs do not affect the value of a job to the firm (V), but do affect the wage (w). The minimum wage imposes a constraint on the extent to which expected dismissal costs can be reflected in lower wages. As a result, differences in expected dismissal costs will also affect the value of the job to the firm. The value of the job will be reduced more for workers with higher expected dismissal costs, similar as in the case of layoff taxes.

Allowing for frictions would effectively result in a mix of the two cases discussed above but would not change the results. Similarly, allowing for differences in bargaining power by type of contract in addition to frictions would not change the results. While workers on open-ended contracts are likely to have a stronger bargaining position since it is more costly to lay them off, this does not affect the overall surplus of the job.[3]

[3] An interesting extension could be to take account of the possible effects of minimum wages on productivity as in efficiency-wage models. Since workers on open-ended contracts face a smaller risk of dismissal in the case of underperformance, profit-maximining firms will pay more to workers on open-ended contracts than those on fixed-term ones to induce a similar effort. An increase in the minimum wage will increase productivity of workers who were previously paid below. This increase in productivity for a given wage will be larger for workers with a fixed-term contract as they are assumed to have a larger elasticity of effort to wages. Consequently, an increase in wages due to a higher minimum wage increases the risk of layoff more for workers on opened-ended contracts. More generally, the efficiency wage mechanism provides one explanation of why the employment response to the increase in minimum wages is relatively small.

4 Data

The Continuous Sample of Employment Histories (*Muestra Continua de Vidas Laborales* or MCVL) is an administrative dataset constructed from social security, income tax, and census records for a 4% random sample of the population who have, in a given year, a relationship with Spanish Social Security (e.g., pay social security contributions when working, receive unemployment benefits, or a pension when out of work). For each worker in a wave of the MCVL, it provides the complete labour market history. In principle, therefore, one could conduct a longitudinal analysis by just using the latest wave. However, since each subsequent wave adds individuals who enter the labour force for the first time and removes those who cease an affiliation with social security, the resulting dataset would not be representative over time (de la Roca and Puga, 2017[8]). To address this issue, we use all waves for the period of study.

The MCVL provides detailed information about job characteristics such as type of contract, tenure, sector of activity, working time, monthly earnings, occupation, as well as other personal information (sex, age, nationality, place of birth, place of residence). The information is spell-based, i.e., the unit of observation corresponds to any change in the individual's labour market status or any variation in job characteristics (including changes in occupation or contractual conditions within the same firm). For the purposes of this paper, the data are organised in calendar time at the quarterly frequency. Monthly earnings are averaged over the month of the quarter during which the worker was employed while job characteristics are based on the last month of the quarter. Monthly labour earnings are adjusted to full-time and full-month equivalents for individuals working part-time or incomplete months. As is common in social security data, earnings information is top coded. This is not an issue for this paper as we are primarily interested in low-wage workers with earnings close to the minimum wage (indeed high-wage earners are dropped from most of the analysis).

The sample used in the analysis is comprised of all workers with some tie with social security who are at least 16 years old. Workers in public administration and the armed forces (codes 75 and 99), self-employed, apprenticeships, workers without an employment contract and seasonal or discontinuous types of contracts are excluded from the baseline sample. Workers working less than 4 hours (10% of a full-time working week) and with earnings below the 2017 minimum wage (826 Euro) are dropped.

The resulting dataset covers the period 2016Q1 to 2019Q4, i.e. twelve quarters before the 2019 minimum wage hike and four quarters in its aftermath. While, in principle, it would have been possible to include 2020 into the analysis, this is done not to avoid confounding effects of the COVID-19 crisis that started in March 2020 and exclude the influence of the smaller but still above-average minimum wage increase that

took place on 1 January 2020. The dataset comprises about two million quarter-worker observations in each year.

About 7% of workers in 2018 earned less than the minimum wage in 2019 and hence were directly affected. Compared with the overall workforce, these workers are more likely to be female, young (below 35), have low skills (did not complete secondary school), be employed in low or low-to-medium skilled occupations, small firms (less than 10 employees), agriculture and non-market services and work on a fixed-term or part-time contract (Table 1). Slightly more than half of workers directly affected by the 2019 minimum wage hike were employed on a fixed-term contract.

Table 1. Characteristics of workers by wage bin

Share of employment in wage bin in raw, 2018

	[826-1050]	[1050-2000]	[2000,3000]	All
Female	56.35	48.58	43.26	45.94
Age				
16-24	14.62	7.16	2.34	5.61
25-34	29.87	25.31	20.98	22.48
35-44	25.65	30.24	35.15	31.57
45-54	20.46	24.76	27.37	26.40
55-64	9.18	12.22	13.87	13.61
Education				
below secondary	41.12	37.87	23.30	30.56
secondary	23.98	25.94	28.44	26.78
tertiary	11.39	14.51	35.13	24.95
Occupation				
Very-high-skilled occupation	0.48	2.02	12.29	9.36
High-skilled occupation	2.06	4.81	21.18	11.79
Medium-high-skilled occupation	16.45	21.30	26.33	22.05
Medium-low-skilled occupation	51.58	54.25	35.30	43.77
Low-skilled occupation	28.81	17.39	4.83	12.84
Firm size				
0-5	19.77	14.47	7.01	11.58
6-10	5.98	6.83	4.11	5.54
11-50	11.85	16.80	16.67	15.84
51-100	4.36	5.88	8.48	6.67
100+	11.12	20.54	36.98	28.26
Firm Age				
0-5	32.99	23.35	14.21	20.06
6-15	31.86	28.70	24.22	27.16
16-25	20.29	25.52	26.21	25.57
26-50	11.28	17.90	25.48	19.72
50+	2.17	3.62	9.40	6.74
Economic sector				
Agriculture	2.06	1.11	0.45	0.89
Mining	0.02	0.11	0.22	0.15
Manufacturing	6.36	11.38	18.09	13.95
Utilities	0.38	0.86	2.06	1.37
Construction	3.46	7.97	5.62	6.39
Market Services	59.56	58.66	42.46	52.32
Non-market services	22.64	15.45	20.53	17.37
Finance and insurance	0.64	0.63	1.89	2.54
Type of contract and job				
Fixed-term contract	52.70	36.04	25.26	31.84
Permanent contract	46.62	63.72	74.53	67.91
Full-time job	62.49	72.03	83.51	76.14
# Observations	129320	1097548	423087	1969835
Average earnings	952.40	1489.41	2418.42	2033.29

Source: Authors' calculations based on MCVL

5 Descriptive evidence

This section provides descriptive evidence on the effects of the 2019 minimum-wage hike on wages, employment and job flows (between firms and in and out of employment) by wage bin and type of contract.

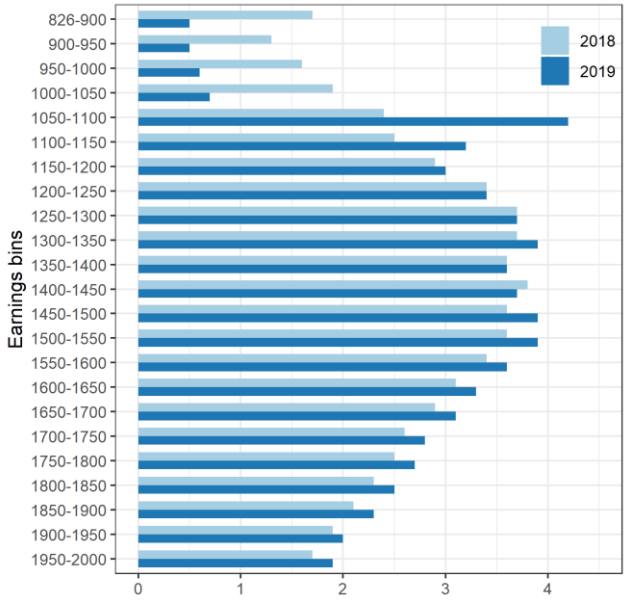
5.1 All workers

To get a first indication of the bite of the 2019 minimum-wage hike and its possible labour market effects, Figure 2 documents the frequency of low-wage workers before and after the 2019-minimum wage hike by 50-Euro wage-bin normalised by aggregate employment in 2018 (with the exception of the first wage bin which is 74 EUR). In 2018, 7% of workers had earnings below the 2019 minimum wage and hence were directly exposed to the minimum wage hike. In 2019, the majority of those workers, representing 4% of employment, had either moved to higher wage bins or left the workforce. At the same time, a non-negligible fraction, representing about 3% of employment, remains employed at a wage below the minimum wage in 2019. This fraction is about the same as that in 2018 with respect to the 2018 minimum wage. [4]

[4] As can be seen from Figure A1, non-compliance disproportionately concerns workers on fixed-term contracts. Non-compliance reduces the bite of the minimum wage and dampens any possible adverse employment effects. This provides an important argument for consistently differentiating between workers with open-ended and fixed-term workers.

Figure 2 Distribution of employment across wage bins

Frequencies normalised by 2018 employment by wage bin (%), 2018 and 2019



Wage bins are based on full-time equivalent monthly earnings over the distribution from the 2017 minimum wage to 2000 EUR.
Source: Authors' calculations based on MCVL

In Figure 3, we decompose the change in employment in each wage bin into workers who stay in their current firm but change wage bin ("within firm"), workers who change employer ("between firm") and workers who enter or leave the workforce in 2019 ("net employment"). The orange line documents the cumulative percentage employment change relative to 2018. To provide an indication of whether any of the observed changes are unusual in Panel B and may be the related to the 2019 minimum wage hike, Panel A provides the same information for the change between 2017 and 2018.

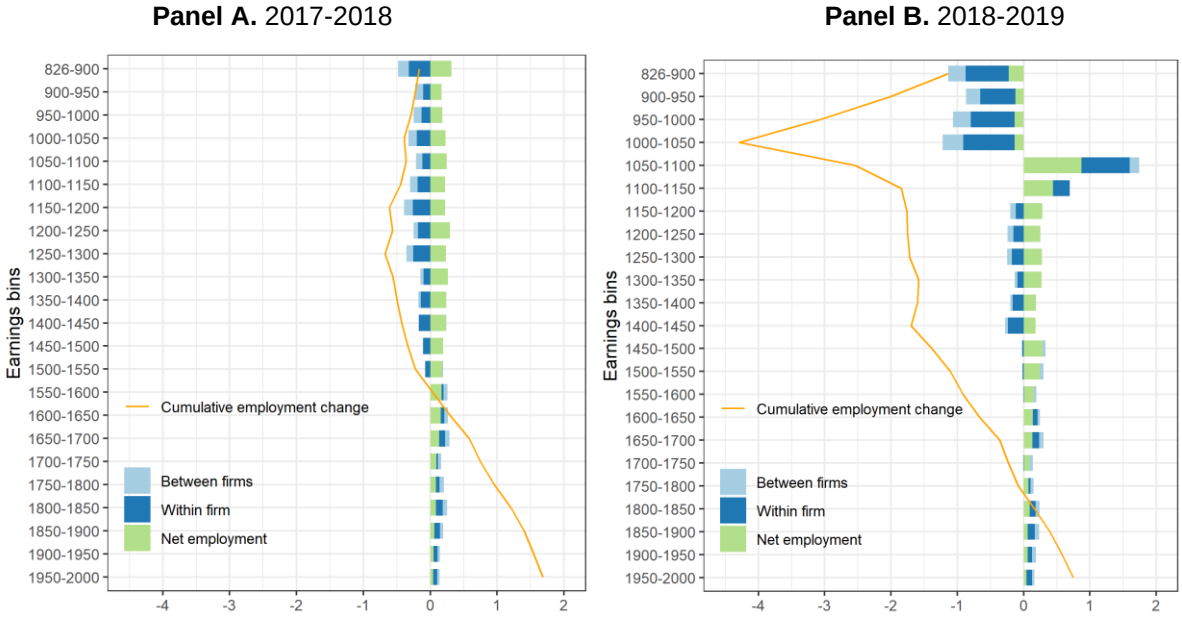
The bulk of directly affected workers in 2018 (about 90%) remain employed. About 60% of directly affected workers receive a raise of their present employer (dark blue bar), while about 30% moved to a different firm paying a higher wage (light blue bar). Negative net entry (green bar) accounts for the remaining reduction in employment below the 2019 minimum wage (10%) as somewhat more workers with a wage in 2018 below the 2019 minimum wage leave employment than there are workers who enter employment in 2019 at a wage below the minimum. This points to a modest negative employment effect among directly affected workers of about -0.4% of employment (0.1*4).

In the period immediately preceding the 2019 minimum hike (2017-2018), the employment change distribution is smooth (with the exception of the first bin which is larger in size and also captures the modest increase in the minimum wage in 2018). Moreover, both workers who stay in the same firm as well as those who move between firms tend to move up the wage distribution, while net entry into employment tends to be concentrated in low-wage firms.

Low wage employment up to 2000 EUR increased both before the minimum wage hike and at the time of minimum wage hike (orange lines). It increased by about 1.7% between 2017-2018 and 0.8% between 2018-2019. The smaller increase at the time of the minimum wage hike could reflect in part the role of the minimum wage, but may also reflect changes in macro-economic conditions, including wage inflation which shifts the wage distribution to the right from one year to the next.[5]

Figure 3 Change in the distribution of employment across wage bins by margin of adjustment

Change in frequencies by wage bin (%) normalised by 2018 employment



Note: Within-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who stay in the same firm. Between-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who change firms. Net emp refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who enter or exit employment. Cumulative employment change refers to the cumulative employment change along the worker wage distribution.
Source: Authors' calculations based on MCVL

5.2 Workers by type of contract

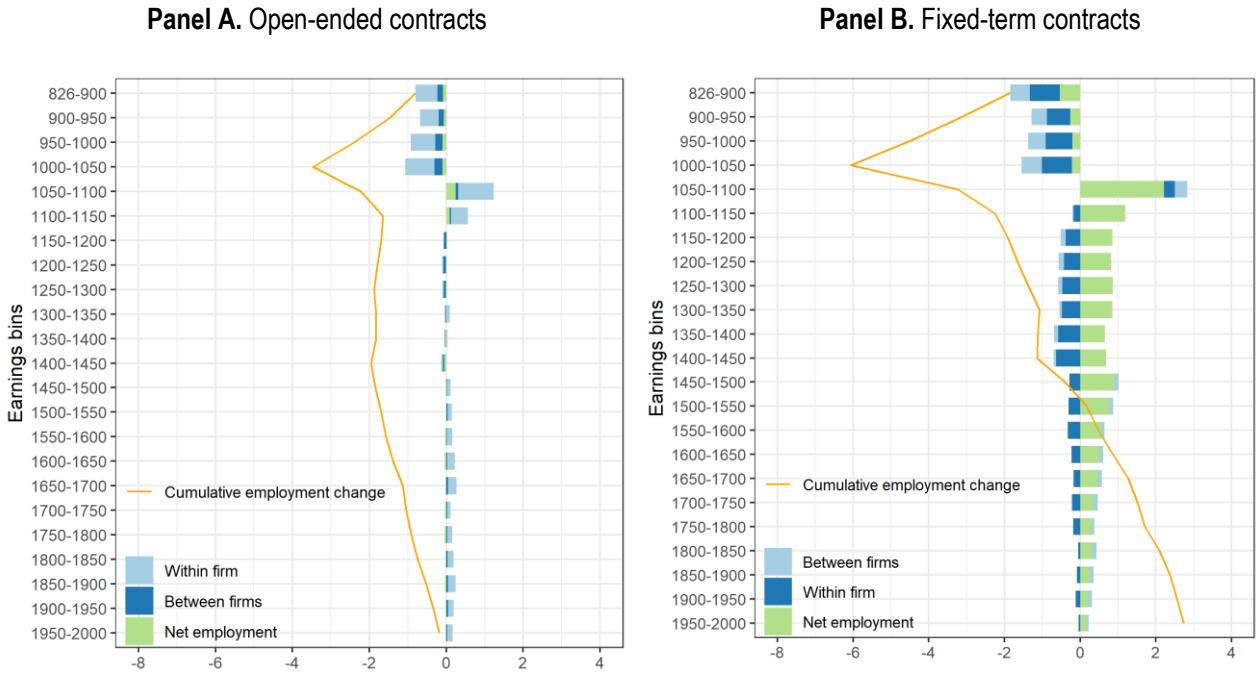
The same analysis by type of contract suggests that firms adjust very differently to increased labour costs in the case of fixed-term and open-ended contracts (Figure 4). Directly affected workers on a fixed-term contract are much less likely to move to a higher wage bin as a result of a raise in their wage from their current employer (half versus three quarters). Instead, they are much more likely to move to another firm or to leave employment altogether. Employment among directly affected workers on fixed-term contracts

[5] When looking at the full wage distribution the difference in the cumulative employment change is slightly smaller.

declined by about 6% of total 2018 employment, while about 1% leave employment. Employment of directly affected workers on open-ended contracts declined by about 3%, while only a tiny fraction leave employment. This suggests that the burden of adjustment to the increase in the minimum wage was disproportionately borne by workers on fixed-term contracts.

Figure 4. Net flow decomposition of change in the distribution of employment across wage bins

Change in frequencies between 2018 and 2019 normalised by 2018 employment by wage bin (%)



Note: Within-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who stay in the same firm. Between-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who change firms. Net emp refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who enter or exit employment. Cumulative employment change refers to the cumulative employment change along the worker wage distribution.
Source: Authors' calculations based on MCVL

In Figure A2 of the annex, we decompose the change in employment by wage bin into gross flows between wage bins within firms, gross flows between firms and wage bins and gross flows in and out of employment by wage bin. This is done separately for permanent and fixed-term workers for the period 2018 and 2019 as well as for the previous period. The main insight is that lower employment in bins below the 2019 minimum wage results from smaller flows in those bins rather than larger flows out of those bins. Outflows from wage bins are surprisingly similar to those in the previous year, whereas inflows in the bins below the new minimum wage effectively come to a halt. This is particularly apparent for workers on open-ended contracts.

6 Worker-level analysis

The main objective of the worker-level analysis is to assess how low-wage incumbent workers are affected by the 2019 minimum wage hike in terms of wages and employment relative to their counterparts in the previous year and higher wage workers in the same year who are unlikely to be affected by the minimum wage. The methodology closely follows that used by Dustmann et al. (2021[10]).[6]

6.1 Methodology

The worker-level approach consists of documenting how individual worker outcomes change following the 2019 minimum-wage reform using the panel dimension of the data and comparing how this differs between workers on fixed-term and open-ended contracts. The analysis proceeds in three steps.

In a first step, we regress worker outcome y_{it} (e.g. change in log wage, probability of being employed), on a set of indicator variables $1[b_{k-1} \leq y_{it-1} < b_k]$ equal to 1 if worker i falls into monthly earnings bin *k* at time t-1 (where $b_1 = 825.65$, $b_2 = 900$, $b_3 = 950$, ..., $b_N = 3000$) and a set of control variables as follows:

(1) $$\boldsymbol{y_{it} = \sum_k \mathbf{1}[b_{k-1} \leq y_{i\,t-1} < b_k]\gamma_{k2019} + \beta X_{it-1} + \varepsilon_{it}}$$

The coefficients γ_{k2019} measure average worker outcomes in bin k in t-1 conditional on individual baseline characteristics *X* measured at t-1. The individual characteristics included refer respectively to age, education, gender, nationality, tenure, type of contract (for the specification using all workers), occupation as well as province-industry fixed effects. Standard errors are clustered by province, industry and wage bin. As in the descriptive analysis, data are pooled across quarters within a year. Equation (1) is estimated using data for 2017-2019 for all workers, workers on fixed-term contract and workers on open-ended contracts. The model yields consistent estimates of the impact of the 2019 minimum wage hike under the assumption that there are no pre-treatment trends in average worker outcomes by bin and there are no macro-economic shocks that affect the change in worker in outcomes.

In a second step, we re-estimate the model to get the difference in worker outcomes (e.g. the change in wage growth) with respect to the pre-reform period (2017-2018):

[6] Since the approach focuses on incumbent workers it does not take account of workers who enter the workforce.

(2) $$\boldsymbol{y_{it} = \sum_k 1[b_{k-1} \leq y_{i\,t-1} < b_k](\gamma_{k2018} + \delta_{k2019}) + \beta X_{it-1} + \varepsilon_{it}}$$

where $\delta_{k2019} = \gamma_{k2019} - \gamma_{k2018}$ captures the differential change in outcomes. Equation (2) hence focuses on the difference from the pre-reform trend. The pre-reform trend could also be defined over a longer period as is done in one of the robustness checks. This model correctly identifies the causal impact of the 2019 minimum wage hike under the assumption that pre-treatment trends would have been constant in the absence of the reform and there are no macro-economic shocks affecting the change in worker outcomes.

In a third step, we collapse the k bins into four large bins K=1,2, 3, 4 with respectively workers earning less than 1050 EUR (the 2019 minimum wage), those earning between 1050 and 1320 EUR (which corresponds to the 25th percentile), those earnings between 1320 and 1678 EUR (which corresponds to the 50th percentile) and those between 1678 and 3000 EUR. Under the assumption that workers in bin K=4 are not affected by the 2019 minimum wage hike and workers in bin K=1 and K=4 are affected in the same way by macro-economic shocks, we can obtain a difference-in-differences estimate of the impact of the 2019 minimum wage hike on worker outcomes by taking the difference $\delta_{1,2019} - \delta_{4,2019}$.[7] The intermediate bins can be used to obtain an indication of the spillover effects.

6.2 Results on wages

To analyse the impact of the 2019 minimum wage hike, we focus on full-time equivalent monthly earnings taking account of both differences in working time and differences in the number of days employed in each month. The results are shown in Figure 6, with those in Panel A referring to equation (1) and those in Panel B to equation (2). Table 2 summarises the full results based on four broad earnings categories for all workers as well as by type of contract.

Wage growth tends to be higher for workers with wages below the 2019 minimum wage than for higher-wage workers, and this is the case even before the 2019 minimum wage hike (Figure 6, Panel A). In part, this may reflect the modest increase in the minimum wage that took place in 2018 and, in part, mean reversion, i.e., the fact that workers with low wages are more likely to observe wage increases whereas workers with high wages are more likely to observe wage reductions. To address this issue, we focus on the difference in wage growth between workers in 2017 and 2018 (Figure 6, Panel B). This shows that workers in 2018 with wages below the 2019 minimum wage experienced higher differential wage growth than higher-wage workers. Workers with wages just above the 2019 minimum wage up to the 50th

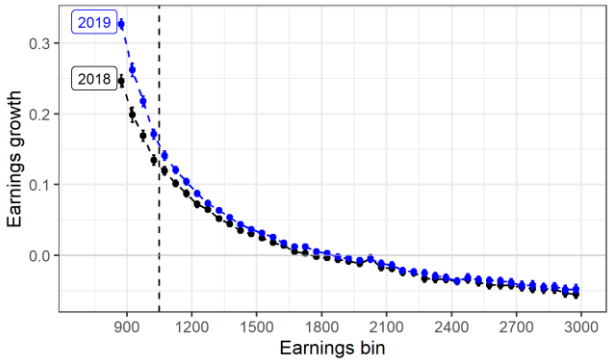
[7] As discussed in Cengiz et al (2019[3]), high-wage workers may be affected by the minimum wage as a result of the substitution in production between low and high-wage workers. However, since the share of minimum wage workers in firm value-added tends to be small substitution effects are likely to be small as well. To the extent that such substitution effects are present, this would *increase* the estimated employment effects in absolute value since substitution would increase high-wage employment at the expense of low-wage employment.

percentile (€1,678) experienced higher wage growth than workers with wages above the 50th percentile, pointing to the presence of modest spillovers. Significant spillover effects do not appear to be present for workers with wages above the 50th percentile since wage growth is essentially constant, economically small and not always statistically different from zero from this point of the wage distribution onwards. In other words, the minimum wage does not appear to have influenced the wages of workers with wages

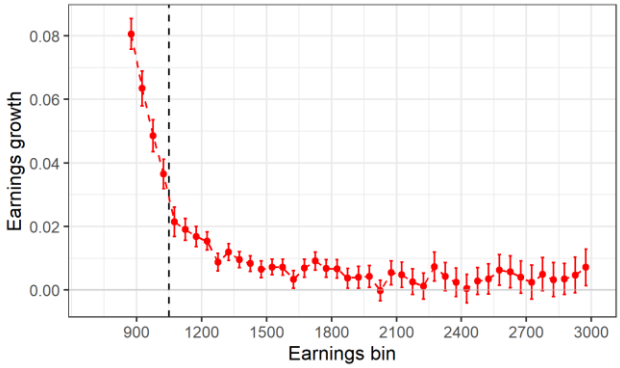
Figure 5. Individual wage effects

Annual growth in full-time equivalent monthly earnings

Panel A. Annual earnings growth



Panel B. The change in annual earnings growth



Notes: Estimates in Panel A refer to coefficients γ_{k2019} in equation 1. Estimates in Panel B refer to the coeffficients δ_{k2019} in Equation 2. The black vertical line indicates the 2019 minimum wage of Euro 1050. We also show the 95% confidence intervals based on standard errors that are clustered at the region X industry X bin level.

Source: Authors' calculations based on MCVL

Simply looking at the increase in wage growth for low-wage workers is not enough to capture the impact of the 2019 minimum-wage hike since higher wage workers also experience some increase in nominal wage growth due to changes in macro-economic conditions (e.g., inflation, aggregate productivity growth). The difference-in-difference estimates in Table 2 (columns 5 to 7) take care of this by focusing on the differential change in wage growth between workers with wages in 2018 below or just above the minimum wage with high -wage workers with earnings between 1678 EUR and 3000 EUR in 2018. This suggests that the 2019 minimum wage increased the wages of directly affected incumbent workers by on average 5.8% and those of workers just above the minimum wage by about 1.2% on average up to the 25th percentile and those with wages between the 25th and 50 the percentiles by a negligible 0.3% (Table 2, column 4).

Interestingly, the effect of the 2019 minimum wage hike on wages is more pronounced for workers on open-ended contracts (7.1%) than those on fixed-term ones (4.2%). This is likely to reflect at least in part the fact that compliance with the minimum wage is lower for workers on fixed-term contracts. However, it

may also reflect a composition effect as it is easier to layoff workers on fixed-term contracts by not extending their contract than those on open-ended contracts, which will be discussed below.

Table 2. Individual wage effects

	2018-2019 minus 2018-2017				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050, P25]	[P25, P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.062***	0.016***	0.007***	0.004***	0.058***	0.012***	0.003***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.187	0.118	0.026				
Panel B: Fixed-term contracts							
2019 versus 2018	0.053***	0.02***	0.013***	0.011***	0.042***	0.009***	0.002
	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Baseline change (2018 versus 2017)	0.228	0.149	-0.007	-0.114			
Panel C: Open-term contracts							
2019 versus 2018	0.073***	0.014***	0.004***	0.002***	0.071***	0.011***	0.002**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.125	0.078	0.031	0.005			

Notes: This table shows the wage effects of the increase in the minimum wage for all, temporary, and open-ended contracts. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: Authors' calculations based on MCVL

6.3 Results on employment, unemployment and job mobility

We repeat the analysis above by focusing on the probability of remaining employed, becoming unemployed (i.e. receiving unemployment benefits), and changing firm. The analysis is again conducted separately for workers on open-ended and fixed-term contracts. The results are reported in Figure 7 and Table 3.

Low-wage workers are less likely to remain employed than higher-wage workers, even before the 2019 minimum wage hike (Figure 7, Panel A). This reflects the fact that job turnover is higher among low-wage workers (in part as they are more likely to have a temporary contract). To take account of this issue, we focus on the change in the probability of remaining employed (Figure 7, Panel B). This shows that incumbent workers in 2018 were less likely to remain employed in the next year than their counterparts in 2017. This is the case for incumbent workers with wages below the 2019 minimum wage but also for higher

wage workers, which are unlikely to be affected by the minimum wage. Comparing the change in the probability between directly affected workers with wages below the 2019 minimum wage and those with significantly higher wages above 3000 EUR, suggests that the 2019 minimum wage hike reduced the probability of employment among directly affected workers by -0.6 percentage points (Table 3). Similarly, workers with wages just above the 2019 minimum wage saw the probability of remaining employed decline by -0.3 percentage points relative to higher-wage workers. Very similar results are found for the probability of becoming unemployed, measured in the data as not working and receiving unemployment benefits, suggesting that the majority of workers who leave employment become unemployed (Figure 7, Panel C and Panel D).[8]

The estimated employment effects are small compared with the significant increase in wages that resulted from the 2019 minimum wage hike. The implied own-wage elasticity of labour demand is -0.1 for directly affected workers and -0.25 for workers just above the minimum wage (up to the 25th percentile). Back-of-the-envelope calculations suggest that the minimum wage hike caused about 7400 job losses among directly affected workers and about 10500 among those earning just above the minimum wage up to the 25th percentile.

The estimated employment effects are larger for workers on fixed-term contracts, despite the smaller impact of the minimum wage on their wages. Taking the coefficients at face value, the implied own-wage elasticity of labour demand for workers on fixed-term contracts is -0.14 and that for workers on open-ended contracts -0.06. The minimum wage therefore appears to increase the relative attractiveness of open-ended contracts for employers and reduce labour market segmentation.

Directly affected workers who remain employed may do so at the same firm while receiving a raise or by moving to another firm paying higher wages. Approximately 20% of workers directly affected by the 2019 minimum wage hike moves to a different firm (Figure 7, Panel E). This is only slightly more than in the previous year and the increase in job mobility is smaller than for high-wage workers (Panel F). As a result, the difference-in-differences estimate, which compares the differential change for low-wage workers with that of high-wage workers is negative but not statistically significant (Table 3). The results for workers on fixed-term and open-ended contracts are qualitatively similar.[9] This suggests that the 2019 minimum wage hike did not have a significant effect on reallocation in Spain.

Previous findings by Dustmann et al. (2021[5]) for Germany suggest that the minimum wages can have significant effects on reallocation. The absence of an effect on reallocation is unlikely to reflect the fact in Germany the minimum wage was introduced for the first time. The estimated wage increase associated with the minimum wage is about the same in the two countries. One factor that could play a role is the

[8] More precisely, about 60% of the decline in the probability of remaining employed reflects an increase in the probability of becoming unemployed while receiving benefits.

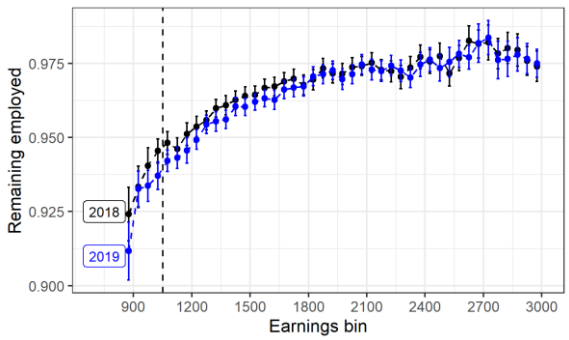
[9] While temporary workers are much more likely to move to another firm (40%), the increase among directly affected workers is very small and smaller than for higher-wage workers.

difference in time horizon. Whereas we focus on the year immediately following the increase in the minimum wage, Dustmann et al. (2021[5]) focus on the change with respect to the second year following the introduction of the minimum wage. Indeed, it is likely that reallocation effects materialise gradually, which might be a reason why we do not find such effects. Unfortunately, extending the analysis to more recent years is not obvious in the present context due to the outbreak of the COVID-19 crisis in 2020.

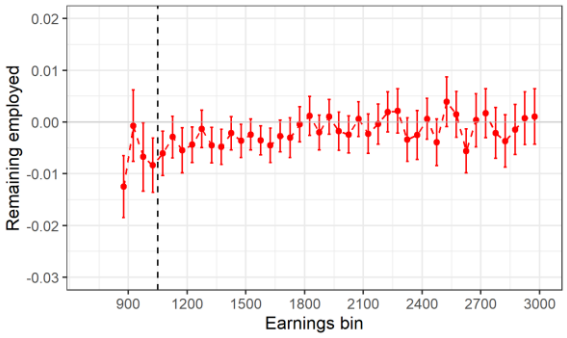
Figure 6. Individual effects on employment, unemployment, and job mobility

Probability of being in a given status and the change in this probability

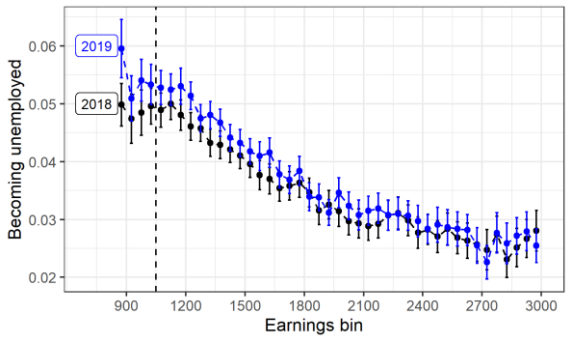
Panel A. Probability of remaining employed



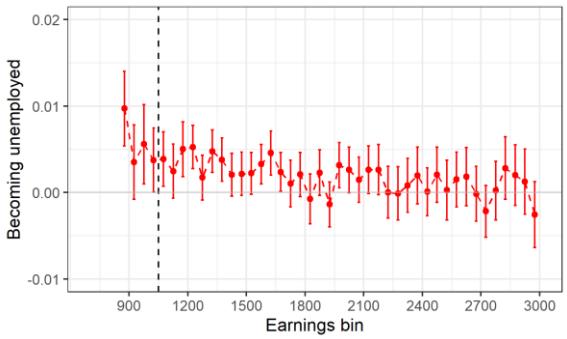
Panel B. Change



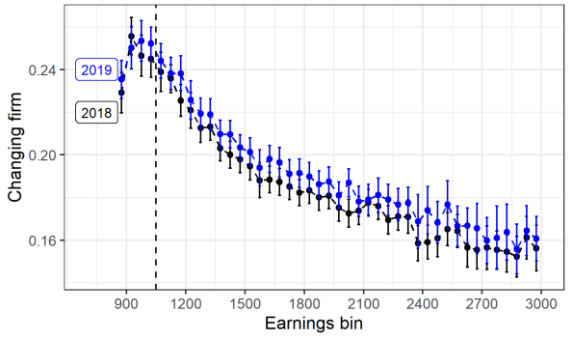
Panel C. Probability of becoming unemployed



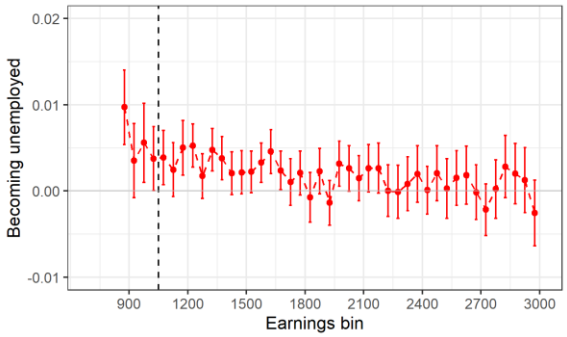
Panel D. Change



Panel E. Probability of changing firm



Panel F. Change



Notes: Estimates in Panel A refer to coefficients γ_{k2019} in equation 1. Estimates in Panel B refer to the coefficients δ_{k2019} in Equation 2. The black vertical line indicates the 2019 minimum wage of Euro 1050. We also show the 95% confidence intervals based on standard errors that are clustered at the region X industry X bin level.
Source: Authors' calculations based on MCVL

Table 3. Individual effects on employment, unemployment and job mobility

a) Individual effects on employment

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050[	[1050, P25[	[P25, P50[	[P50,3000[	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	-0.007***	-0.004***	-0.004***	-0.001**	-0.006***	-0.003***	-0.003***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.943	0.954	0.974	0.986			
Panel B: Fixed-term contracts							
2019 versus 2018	-0.01***	-0.005***	-0.008***	-0.004***	-0.006**	-0.002	-0.004**
	(0.003)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Baseline change (2018 versus 2017)	0.858	0.869	0.896	0.918			
Panel C: Open-term contracts							
2019 versus 2018	-0.004**	-0.003***	-0.001*	0.00	-0.004**	-0.002**	-0.001*
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.947	0.957	0.968	0.978			

Notes: This table shows the employment effects of the increase in the minimum wage for all, temporary, and open-ended contracts. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL

b) Individual effects unemployment

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050[	[1050, P25[	[P25, P50[	[P50,3000[	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.006***	0.004***	0.004***	0.001***	0.004***	0.003***	0.002***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.041	0.039	0.031	0.020			
Panel B: Fixed-term contracts							
2019 versus 2018	0.008***	0.007***	0.007***	0.004***	0.004**	0.003**	0.003**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.079	0.078	0.073	0.061			
Panel C: Open-term contracts							
2019 versus 2018	0.003*	0.002***	0.001**	0.000	0.002	0.002**	0.001
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.042	0.036	0.028	0.019			

Notes: This table shows the unemployment effects of the increase in the minimum wage for all, temporary, and open-ended contracts. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL

c) Individual effects on job mobility

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050[	[1050, P25[	[P25, P50[	[P50,3000[	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.005**	0.007***	0.008***	0.009***	-0.004	-0.001	0.000
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Baseline change (2018 versus 2017)	0.194	0.182	0.139	0.105			
Panel B: Fixed-term contracts							
2019 versus 2018	0.007***	0.008***	0.011***	0.008***	-0.001	0.000	0.003
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Baseline change (2018 versus 2017)	0.43	0.423	0.388	0.352			
Panel C: Open-term contracts							
2019 versus 2018	0.004	0.007***	0.008***	0.010***	-0.005	-0.002	-0.002
	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Baseline change (2018 versus 2017)	0.172	0.153	0.108	0.078			

Notes: This table shows the job mobility effects of the increase in the minimum wage for all, temporary, and open-ended contracts. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL

6.4 Robustness tests

To test the robustness of our results, we consider a number of sensitivity checks. First, we check whether the wage and employment effects depend on the way we define the pre-reform trend (Table A1-A3). Using 2016-2017 instead of 2017-2018 as in the baseline, does not significantly change the estimated wage effects but approximately doubles the negative employment effects. This is mainly driven by a stronger employment response among workers on temporary contracts. However, the reduction in employment remains small relative to the increase in wages. Second, we check whether the results depend on the definition of the reference group. Using workers with wages between 3000-3500 instead of 1678-3000 again leads to similar wage effects but larger employment effects, particularly for workers on temporary contracts (Table A4-A6). Third, we restrict the analysis to workers who work full-time in 2018. The does not qualitatively change the results. Finally, re-estimating the model by quarter yields very similar results (Figure A3). There is no clear evidence to suggest that the effect of the minimum wage increased during the course of year. This may be the case if wages are not adjusted in immediately.

7 Conclusions

This paper provides an assessment of the effects of the 2019 minimum-wage reform in Spain. It provides three key findings.

First, among directly concerned workers, the hike in the minimum wage increased full-time equivalent monthly earnings by on average 5.8% and reduced employment by 0.6%. The implied labour demand elasticity with respect to own wages among directly affected workers was therefore very small and equal to -0.1. This corresponds to about 7400 jobs lost.

Second, the minimum wage had modest spillover effects on higher-wage workers earning up to the 25th percentile of the wage distribution (1320 EUR). Monthly earning increased by 1.2%, while employment declined by 0.3%. This may have caused the loss of an additional 10400 jobs. However, the total employment effect relative to the increase in the minimum wage remains rather small and smaller than found in similar studies by Barcelo at el. (2021[4]) and Gorjon et al. (2022[7]).

Third, the increase in the minimum wage appears to reduce labour market segmentation by increasing the relative attractiveness of open-ended contracts for employers. While the effect on wages is stronger for workers on open-ended contracts, possibly because of better compliance, the estimated employment effects are stronger for workers on fixed-term contracts. Taking the coefficients at face value, the implied own-wage labour demand elasticity for workers on fixed-term contracts is more than twice as high as that for workers on open-ended contracts (-0.14 vs -0.06).

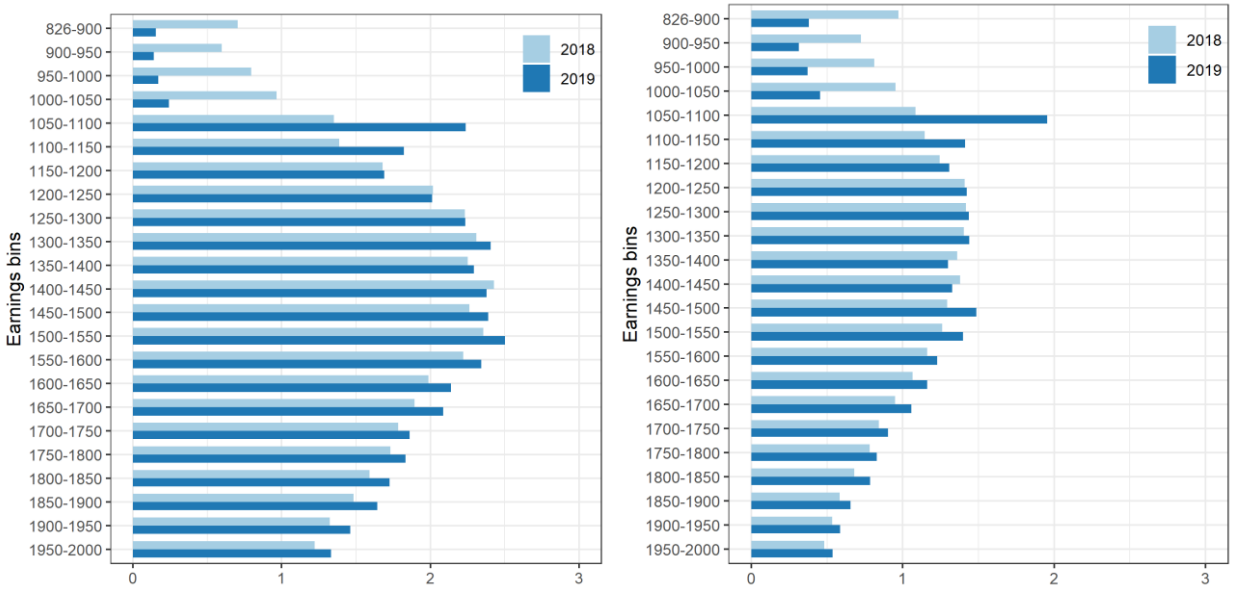
In future work, we plan to extend the analysis using a firm-perspective by examining how firms absorb the increase in labour costs and how it affects the performance of different groups of firms. To the extent possible, it will consider both within firm effects (e.g., capital-intensity, productivity) and between-firm effects (e.g., reallocation).

Annex A.

Figure A.1. Distribution of employment across wage bins for permanent and fixed-term workers

Frequencies normalised by total 2018 employment by wage bin (%), 2018 and 2019

Panel A. Open-ended contracts
Panel B. Fixed-term contracts

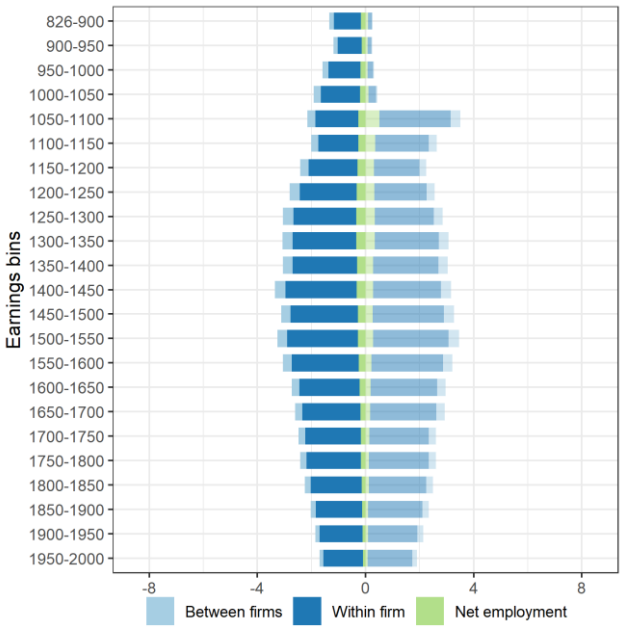


Source: Authors' calculations based on MCVL

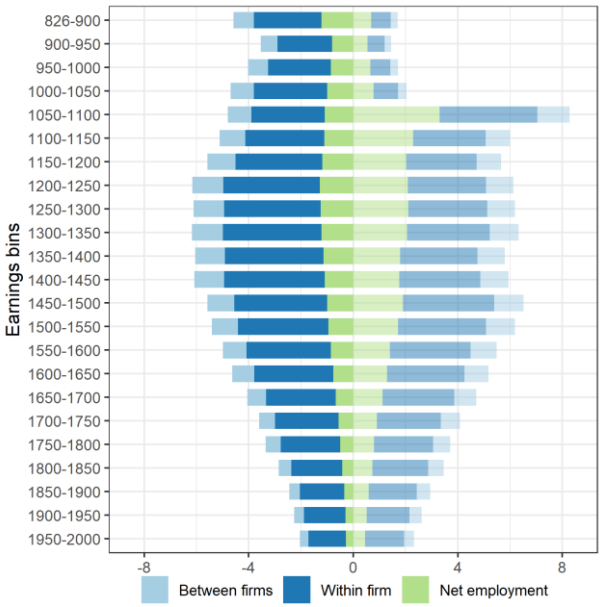
Figure A.2. Gross flow decomposition of change in the distribution of employment across wage bins

Change in frequencies between 2018 and 2019 normalised by 2018 employment by wage bin (%)

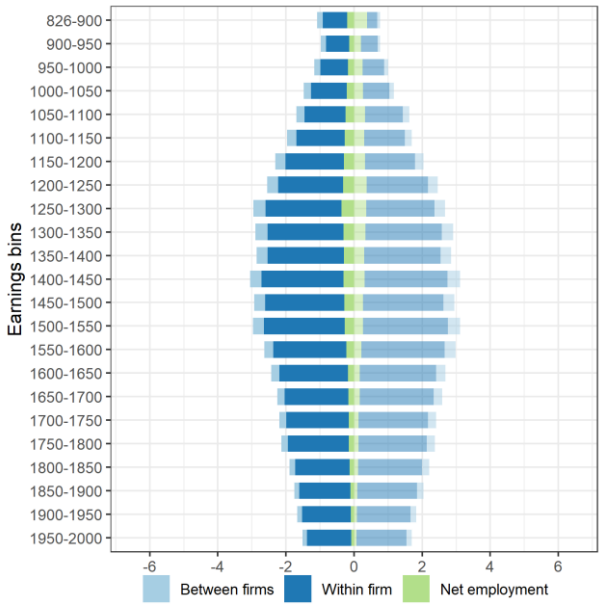
Panel A. Open-ended contracts, 2018-2019



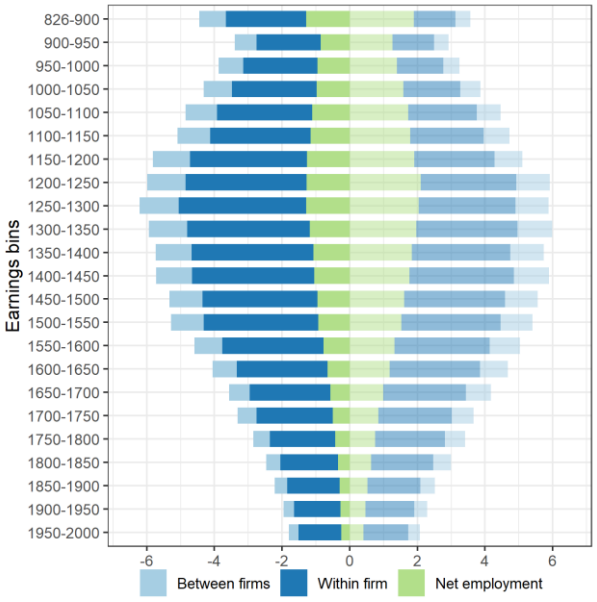
Panel B. Fixed-term contracts, 2018-2019



Panel C. Open-ended contracts, 2017-2018



Panel D. Fixed-term contracts, 2017-2018

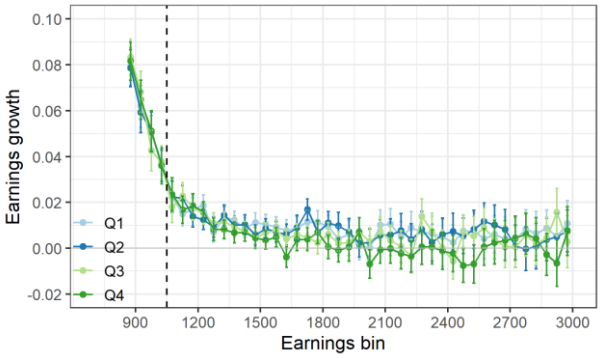


Note: Within-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who stay in the same firm. Between-firm refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who change firms. Net emp refers to net employment changes in a given bin as a share of total employment in 2018 related to workers who enter or exit employment.
Source: Authors' calculations based on MCVL

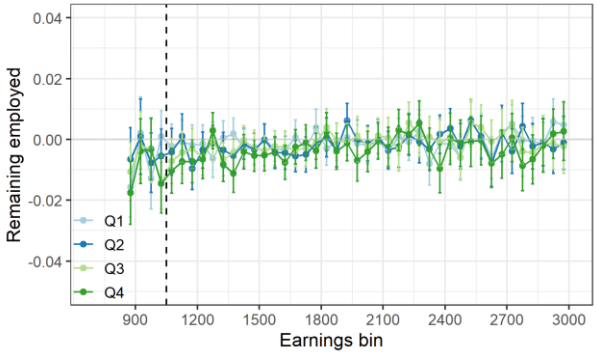
Figure A.3. Wage and employment effects at the quarterly level

Annual growth in FTE monthly earnings

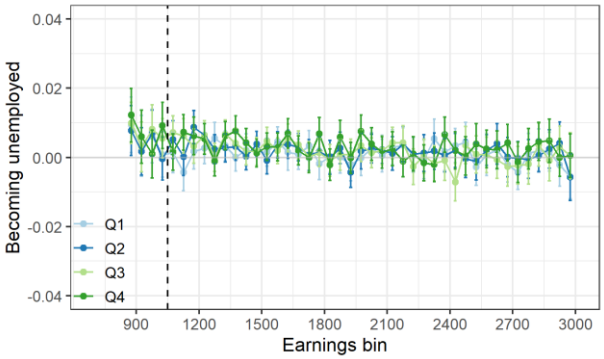
Panel A. The change in annual earnings growth employed



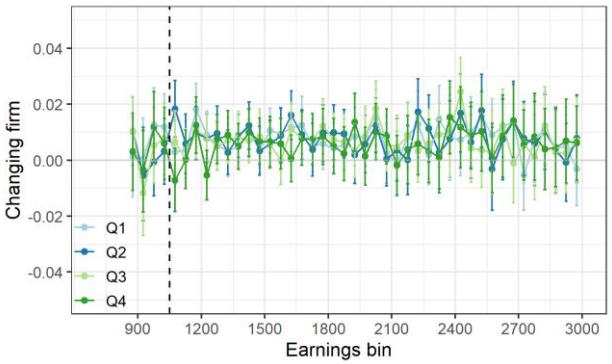
Panel B. The change in the probability of remaining employed



Panel C. The change in the probability of becoming unemployed



Panel D. The change in the probability of changing firm



Source: Authors' calculations based on MCVL

Table A.1. New baseline – All contracts

	Changes relative to 2017 versus 2016				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: earnings							
2019 versus 2017	0.077***	0.021***	0.015***	0.011***	0.065***	0.010***	0.004***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.170	0.112	0.016	-0.030			
Panel B: remaining employed							
2019 versus 2017	-0.013***	-0.004***	-0.003***	-0.001	-0.012***	-0.003**	-0.002**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.948	0.954	0.973	0.985			
Panel C: becoming unemployed							
2019 versus 2017	0.008***	0.006***	0.003***	0.002***	0.006***	0.004***	0.002***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.041	0.038	0.032	0.021			
Panel D: changing firm							
2019 versus 2017	0.010***	0.022***	0.021***	0.017***	-0.008**	0.004	0.004
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Baseline change (2017 versus 2016)	0.189	0.166	0.124	0.094			

Notes: In this robustness check, we use 2016-2017 as a baseline instead of 2017-2018. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.2. New baseline – Temporary contracts

	Changes relative to 2017 versus 2016				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: earnings							
2019 versus 2017	0.066***	0.025***	0.024***	0.022***	0.045***	0.004*	0.002
	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)
Baseline change (2017 versus 2016)	0.209	0.140	-0.024	-0.130			
Panel B: remaining employed							
2019 versus 2017	-0.019***	-0.007***	-0.007***	-0.004***	-0.015***	-0.003	-0.002
	(0.003)	(0.002)	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)
Baseline change (2017 versus 2016)	0.863	0.867	0.893	0.915			
Panel C: becoming unemployed							
2019 versus 2017	0.011***	0.011***	0.007***	0.006***	0.005**	0.004***	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.079	0.077	0.074	0.060			
Panel D: changing firm							
2019 versus 2017	0.013***	0.027***	0.031***	0.023***	-0.010**	0.004	0.008*
	(0.004)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)
Baseline change (2017 versus 2016)	0.423	0.404	0.367	0.335			

Notes: In this robustness check, we use 2016-2017 as a baseline instead of 2017-2018. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.3. New baseline – Open-ended contracts

	Changes relative to 2017 versus 2016				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: earnings							
2019 versus 2017	0.085***	0.017***	0.011***	0.009***	0.076***	0.009***	0.002**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.112	0.074	0.024	-0.001			
Panel B: remaining employed							
2019 versus 2017	-0.006***	-0.003***	-0.001	0.000	-0.006***	-0.003**	-0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.948	0.956	0.967	0.978			
Panel C: becoming unemployed							
2019 versus 2017	0.005***	0.003***	0.001*	0.000	0.005***	0.003***	0.001
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2017 versus 2016)	0.040	0.036	0.029	0.020			
Panel D: changing firm							
2019 versus 2017	0.008*	0.017***	0.016***	0.016***	-0.008	0.001	0.000
	(0.005)	(0.003)	(0.002)	(0.002)	(0.005)	(0.004)	(0.003)
Baseline change (2017 versus 2016)	0.165	0.139	0.096	0.068			

Notes: In this robustness check, we use 2016-2017 as a baseline instead of 2017-2018. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.4. New control group – All contracts

	Changes relative to 2018 versus 2017					Difference-in-differences			
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	[3000,3500]	Col. (1) minus col. (5)	Col. (2) minus col. (5)	Col. (3) minus col. (5)	Col. (4) minus col. (5)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: earnings									
2019 versus 2018	0.062***	0.016***	0.007***	0.004***	0.008***	0.054***	0.008***	-0.001	-0.003**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.191	0.121	0.028	-0.021	-0.060				
Panel B: remaining employed									
2019 versus 2018	-0.007***	-0.004***	-0.004***	-0.001**	0.001	-0.008***	-0.005***	-0.005***	-0.002**
	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.942	0.953	0.973	0.985	0.986				
Panel C: becoming unemployed									
2019 versus 2018	0.006***	0.004***	0.004***	0.001***	0.000	0.005***	0.004***	0.003***	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.0420	0.0390	0.0320	0.0210	0.0160				
Panel D: changing firm									
2019 versus 2018	0.005**	0.007***	0.008***	0.009***	0.009*	-0.003	-0.001	0.000	0.000
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Baseline change (2018 versus 2017)	0.195	0.182	0.139	0.106	0.086				

Notes: In this robustness check, we use workers with wages between 3000-3500 instead of P50-3000. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively.
* p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.5. New control group – Temporary contracts

	Changes relative to 2018 versus 2017					Difference-in-differences			
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	[3000,3500]	Col. (1) minus col. (5)	Col. (2) minus col. (5)	Col. (3) minus col. (5)	Col. (4) minus col. (5)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: earnings									
2019 versus 2018	0.053***	0.020***	0.013***	0.011***	0.018***	0.036***	0.003	-0.005	-0.007*
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
Baseline change	0.230	0.151	-0.007	-0.115	-0.215				
(2018 versus 2017)									
Panel B: remaining employed									
2019 versus 2018	-0.010***	-0.005***	-0.008***	-0.004***	0.006**	-0.016***	-0.011***	-0.013***	-0.009***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Baseline change	0.857	0.868	0.896	0.916	0.926				
(2018 versus 2017)									
Panel C: becoming unemployed									
2019 versus 2018	0.009***	0.007***	0.007***	0.004***	0.003*	0.005**	0.004**	0.004*	0.001
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Baseline change	0.079	0.078	0.073	0.061	0.047				
(2018 versus 2017)									
Panel D: changing firm									
2019 versus 2018	0.007**	0.008***	0.011***	0.008***	0.004	0.002	0.004	0.006	0.003
	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Baseline change	0.429	0.423	0.388	0.353	0.312				
(2018 versus 2017)									

Notes: In this robustness check, we use temporary workers with wages between 3000-3500 instead of P50-3000. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Source: Authors' calculations based on MCVL.

Table A.6. New control group – Open-ended contracts

	Changes relative to 2018 versus 2017					Difference-in-differences			
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	[3000,3500]	Col. (1) minus col. (5)	Col. (2) minus col. (5)	Col. (3) minus col. (5)	Col. (4) minus col. (5)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: earnings									
2019 versus 2018	0.073***	0.014***	0.004***	0.002***	0.006***	0.067***	0.007***	-0.002	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.126	0.079	0.032	0.006	-0.021				
Panel B: remaining employed									
2019 versus 2018	-0.004**	-0.003***	-0.001*	0.000	0.000	-0.004*	-0.002*	-0.001	0.000
	(0.002)	(0.001)	(0.001)	(0.000)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.947	0.957	0.968	0.978	0.981				
Panel C: becoming unemployed									
2019 versus 2018	0.003*	0.002***	0.001**	0.000	0.000	0.003*	0.002**	0.001	0.000
	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.042	0.037	0.028	0.019	0.017				
Panel D: changing firm									
2019 versus 2018	0.004	0.007***	0.008***	0.010***	0.011**	-0.007	-0.003	-0.003	-0.001
	(0.004)	(0.003)	(0.002)	(0.002)	(0.005)	(0.006)	(0.006)	(0.006)	(0.005)
Baseline change (2018 versus 2017)	0.172	0.153	0.108	0.078	0.064				

Notes: In this robustness check, we use temporary workers with wages between 3000-3500 instead of P50-3000. The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Source: Authors' calculations based on MCVL.

Table A.7. Individual wage effects – Full-time workers

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.063***	0.010***	0.004***	0.003***	0.060***	0.007***	0.001*
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.145	0.088	0.022	-0.005			
Panel B: Fixed-term contracts							
2019 versus 2018	0.052***	0.014***	0.008***	0.007***	0.045***	0.007***	0.001
	(0.003)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Baseline change (2018 versus 2017)	0.194	0.127	-0.003	-0.069			
Panel C: Open-term contracts							
2019 versus 2018	0.072***	0.009***	0.003***	0.002***	0.070***	0.007***	0.001
	(0.003)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.105	0.066	0.029	0.01			

Notes: The spillover and control groups are defined based on the earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.8. Individual effects on employment – Full-time workers

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050,P25]	[P25,P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	-0.008***	-0.005***	-0.003***	-0.002***	-0.006**	-0.003***	-0.001
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.939	0.954	0.974	0.986			
Panel B: Fixed-term contracts							
2019 versus 2018	-0.012***	-0.007***	-0.007***	-0.005***	-0.006	-0.001	-0.002
	(0.004)	(0.002)	(0.002)	(0.001)	(0.004)	(0.003)	(0.002)
Baseline change (2018 versus 2017)	0.862	0.878	0.912	0.937			
Panel C: Open-term contracts							
2019 versus 2018	-0.004**	-0.004***	-0.001	-0.001	-0.003	-0.003***	0.000
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.949	0.96	0.97	0.979			

Notes: This table shows the employment effects of the increase in the minimum wage for full-time workers with all, temporary, and open-ended contracts. The spillover and control groups are defined based on the full-time equivalent earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.9.Individual effects on unemployment – Full-time workers

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050, P25]	[P25, P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.007***	0.005***	0.002***	0.001***	0.006***	0.004***	0.001
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.042	0.036	0.027	0.017			
Panel B: Fixed-term contracts							
2019 versus 2018	0.013***	0.008***	0.005***	0.004***	0.009***	0.004**	0.002
	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Baseline change (2018 versus 2017)	0.081	0.078	0.07	0.057			
Panel C: Open-term contracts							
2019 versus 2018	0.002	0.003***	0.001	0.001*	0.002	0.002**	0.000
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Baseline change (2018 versus 2017)	0.044	0.036	0.027	0.018			

Notes: This table shows the unemployment effects of the increase in the minimum wage for full-time workers with all, temporary, and open-ended contracts. The spillover and control groups are defined based on the full-time equivalent earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

Table A.10. Individual effects on job mobility – Full-time workers

	Changes relative to 2018 versus 2017				Difference-in-differences		
Earnings bin in t-1	[826,1050]	[1050, P25]	[P25, P50]	[P50,3000]	Col. (1) minus col. (4)	Col. (2) minus col. (4)	Col. (3) minus col. (4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: All contracts							
2019 versus 2018	0.008**	0.009***	0.009***	0.009***	-0.001	0.000	0.001
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Baseline change (2018 versus 2017)	0.186	0.171	0.122	0.089			
Panel B: Fixed-term contracts							
2019 versus 2018	0.01**	0.009**	0.013***	0.010***	0.000	-0.001	0.003
	(0.005)	(0.004)	(0.003)	(0.003)	(0.006)	(0.004)	(0.004)
Baseline change (2018 versus 2017)	0.415	0.406	0.36	0.324			
Panel C: Open-term contracts							
2019 versus 2018	0.007	0.009***	0.008***	0.009***	-0.002	0.000	-0.001
	(0.005)	(0.003)	(0.002)	(0.002)	(0.005)	(0.003)	(0.003)
Baseline change (2018 versus 2017)	0.162	0.144	0.1	0.07			

Notes: This table shows the job mobility effects of the increase in the minimum wage for full-time workers with all, temporary, and open-ended contracts. The spillover and control groups are defined based on the full-time equivalent earnings distribution in 2018, where the 25th and 50th percentiles were approximately €1,320 and €1,678, respectively. * p < 0.10, ** p < 0.05, *** p < 0.01. Source: Authors' calculations based on MCVL.

References

Arindrajit, D., L. T. and R. Michael (n.d.), "Minimum Wage Shocks, Employment Flows, and Labor Market Frictions", *Journal of Labor Economics*, Vol. 34, pp. 663-704. [21]

Barceló, C. et al. (2021), "Los efectos del salario mínimo interprofesional en el empleo: nueva evidencia para España. Documentos Ocasionales N.º 2113.". [13]

Bentolila, S., J. Dolado and J. Jimeno (2012), "Reforming an insider-outsider labor market: the Spanish experience", *IZA Journal of European Labor Studies*, Vol. 1/1, p. 4, https://doi.org/10.1186/2193-9012-1-4. [6]

BusinessInsider (2021), *How the Minimum Wage Compares to Median Wages in Every State*, https://www.businessinsider.com/how-minimum-wage-compares-to-median-wages-in-every-state-2021-2?r=US&IR=T (accessed on 1 September 2022). [18]

Card, D. and A. Krueger (1994), "Minimum wages and employment: a case study of the fast-food industry in New Jersey and Pennsylvania", *American Economic Review*, Vol. 84/4, pp. 772-793, https://doi.org/10.1257/AER.90.5.1397. [11]

Cengiz, D. et al. (2019), "The Effect of Minimum Wages on Low-Wage Jobs*", *The Quarterly Journal of Economics*, Vol. 134/3, pp. 1405-1454, https://doi.org/10.1093/QJE/QJZ014. [22]

Cengiz, D. et al. (2019), "The Effect of Minimum Wages on Low-Wage Jobs*", *The Quarterly Journal of Economics*, Vol. 134/3, pp. 1405-1454, https://doi.org/10.1093/QJE/QJZ014. [3]

Clemens, J. and M. Wither (2019), "The minimum wage and the Great Recession: Evidence of effects on the employment and income trajectories of low-skilled workers", *Journal of Public Economics*, Vol. 170, pp. 53-67, https://doi.org/10.1016/J.JPUBECO.2019.01.004. [20]

de la Roca, J. and D. Puga (2017), "Learning by Working in Big Cities", *The Review of Economic Studies*, Vol. 84/1, pp. 106-142, https://doi.org/10.1093/RESTUD/RDW031. [8]

De Linde - Leonard, M., T. Stanley and H. Doucouliagos (2014), "Does the UK Minimum Wage Reduce Employment? A Meta-Regression Analysis", *Britisch Journal of Industrial Relations*, https://doi.org/10.1111/bjir.12031. [1]

Dolado, J. et al. (1996), "The Economic Impact of Minimum Wages in Europe", Vol. 11/23, pp. 317-372. [9]

Dustmann, C. et al. (2021), "Reallocation Effects of the Minimum Wage", *The Quarterly Journal of Economics*, Vol. 137/1, pp. 267-328, https://doi.org/10.1093/QJE/QJAB028. [4]

EU, C. (2022), *Council and European Parliament reach provisional agreement on new EU law*, http://www.consilium.europa.eu/press (accessed on 1 September 2022). [17]

Galán, S. and S. Puente (2015), "Minimum wages: Do they really hurt young people?", *B.E. Journal of Economic Analysis and Policy*, Vol. 15/1, pp. 299-328, https://doi.org/10.1515/BEJEAP-2013-0171/PDF. [16]

Giupponi, G. et al. (2022), *The Employment and Distributional Impacts of Nationwide Minimum Wage Changes"*, https://www.dropbox.com/s/36i0nrippbwi66l/LPC_220930.pdf?dl=0 (accessed on 17 October 2022). [23]

Gorjón David Martinez de Lafuente Gonzalo Romero, L. et al. (2022), "Employment effects of the minimum wage: Evidence from the Employment effects of the minimum wage: Evidence from the Spanish 2019 reform". [7]

Harasztosi, P. and A. Lindner (2019), "Who Pays for the Minimum Wage?", *American Economic Review*, Vol. 109/8, pp. 2693-2727, https://doi.org/10.1257/AER.20171445. [5]

Langella, M. and A. Manning (2021), "THE MEASURE OF MONOPSONY", *Journal of the European Economic Association*, pp. 19(6):2929–2957, https://doi.org/10.1093/jeea/jvab039. [25]

Lazear, E. (1990), "Job Security Provisions and Employment", *The Quarterly Journal of Economics*, Vol. 105/3, p. 699, https://doi.org/10.2307/2937895. [24]

Manning, A. (2021), "The Elusive Employment Effect of the Minimum Wage", *Journal of Economic Perspectives*, Vol. 35/1, pp. 3-26, https://doi.org/10.1257/JEP.35.1.3. [14]

McGuinness, S. and P. Redmond (2019), "The Impact of a Minimum-Wage Increase on Temporary-Contract Workers", *Fiscal Studies*, Vol. 40/2, pp. 149-173, https://doi.org/10.1111/1475-5890.12186. [12]

Neumark, D., J. Salas and W. Wascher (2014), "Revisiting the Minimum Wage—Employment Debate: Throwing Out the Baby with the Bathwater?:", *https://doi.org/10.1177/00197939140670S307*, Vol. 67/SUPPL, pp. 608-648, https://doi.org/10.1177/00197939140670S307. [15]

Neumark, D. and P. Shirley (2021), "MYTH OR MEASUREMENT: WHAT DOES THE NEW MINIMUM WAGE RESEARCH SAY ABOUT MINIMUM WAGES AND JOB LOSS IN THE UNITED STATES?", *NBER WORKING PAPER SERIES*, http://www.nber.org/papers/w28388 (accessed on 25 August 2022). [2]

Rebitzer, J. and L. Taylor (1995), "The consequences of minimum wage laws Some new theoretical ideas", *Journal of Public Economics*, Vol. 56/2, pp. 245-255, https://doi.org/10.1016/0047-2727(93)01411-3. [19]

Spain, B. (2017), "LOS EFECTOS SOBRE EL EMPLEO Y LOS SALARIOS DE LA RECIENTE SUBIDA DEL SALARIO MÍNIMO", *Economic Bulletin*. [10]