Gender Gap and Minimum Wage Policy in Spain

Ignacio González* Raquel Sebastián† Pedro Trivín‡

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Very Preliminary. Please do not circulate

Abstract

In 2019, the Spanish government raised the minimum wage by 22.3%, marking an unprecedented increase in both nominal and real terms. This paper examines the impact of this increase on the gender wage gap. Our approach is twofold. First, we leverage municipal-level variations in exposure to the reform. Our findings suggest that the minimum wage significantly reduced the gender wage gap, with 36% and 25% reductions at the 5th and 10th percentile of the wage distribution, respectively. Second, we analyze individual-level data to compare the effects on wages and employment for both women and men. Here our findings reveal that wages increased substantially and similarly for low-earnings men and women following the policy change, while neither their working hours nor employment probabilities were affected. Taken together, our results highlight three key findings: i) the minimum wage significantly reduced income disparities between men and women; ii) this reduction was primarily driven by compositional effects (i.e., women being overrepresented in low-paid jobs), as we find no evidence of differentiated impact between comparable men and women; iii) the minimum wage increase did not affect employment outcomes for either women or men.

Keywords: Gender Wage Gap, Minimum Wage.
JEL Codes: J16, J31, J38

*Department of Economics, American University. ignaciog@american.edu

†Department of Economic Analysis, and Quantitative Economics, Complutense University of Madrid. raquel.sebastian@ucm.es

‡Department of Economics, Management, and Quantitative Methods, University of Milan. pedro.trivin@unimi.it

1 Introduction

In recent decades, the minimum wage has emerged as a central policy tool aimed at reducing in-work poverty and mitigating wage inequality. By establishing a legally binding wage floor, minimum wage policies seek to ensure that workers in the lowest-paid jobs receive a guaranteed level of earnings. This objective is particularly relevant in the context of gender wage disparities, where structural inequalities—shaped by occupational segregation, social norms, bargaining power differences, and labor market discrimination—often result in women earning systematically less than men (Blau and Kahn, 2017). Given that women are disproportionately represented in low-wage sectors, minimum wage increases have the potential to act as a redistributive mechanism that narrows the gender wage gap.

Spain provides an ideal setting to analyze the effects of minimum wage policy on gender wage disparities. In January 2019, the Spanish government implemented an unprecedented 22.3% nominal increase in the national minimum wage, the largest hike in over four decades. This increase took place in a low-inflation economic environment, ensuring that the real value of the wage adjustment closely mirrored its nominal magnitude. Moreover, the magnitude of the policy shock allows for a unique opportunity to study its effects on gender-based earnings differentials, particularly given Spain's historical gender wage gap and the significant presence of women in minimum-wage jobs (De la Rica et al., 2015). Unlike other countries where minimum wage increases are often incremental, Spain's dramatic policy shift presents a quasi-experimental setting conducive to causal inference.

While much of the academic and policy discourse surrounding minimum wage increases focuses on employment effects—particularly concerns regarding potential job losses—less attention has been devoted to their implications for wage inequality. The relationship between minimum wage policies and the gender wage gap remains an open empirical question, with conflicting evidence across different institutional and labor market contexts. Some studies suggest that minimum wage hikes reduce gender wage disparities

by disproportionately benefiting women (Majchrowska and Strawiński, 2018; Caliendo and Wittbrodt, 2022), while others indicate that the effects may be heterogeneous, depending on broader labor market dynamics and employer responses (Bargain et al., 2019; Paul-Delvaux, 2024).

This paper investigates the impact of the 2019 Spanish minimum wage increase on the gender wage gap by leveraging individual-level administrative data from the Muestra Continua de Vidas Laborales (MCVL). Our empirical strategy is twofold. First, employing a difference-in-differences (DiD) methodology, we exploit geographical variation in exposure to the 2019 minimum wage reform to estimate its differential effects on male and female wage distributions. This approach is motivated by the fact that the impact of the minimum wage is not uniform across Spain, due to regional differences in wage distributions, industrial composition, and employment structures. By comparing regions with varying degrees of exposure to the policy change, we aim to provide robust evidence on how minimum wage adjustments influence gender wage disparities.

Second, desparturing from Dustmann et al. (2021), we use individual-level data to explore whether changes in the gender-specific wage distribution associated with the 2019 minimum wage reform mask heterogeneous effects by gender, not only in terms of wage growth but also in outcomes such as changes in hours worked, the probability of changing employers, and the likelihood of becoming unemployed.

Our study makes several contributions. First, we provide new evidence on the role of minimum wages in shaping gender wage inequality, an issue of growing importance as policymakers worldwide seek to foster more inclusive labor markets. Second, we utilize administrative individual data to examine the reform's impact across multiple dimensions of the labor market, including wages, hours worked, job mobility, and employment stability. Third, we focus on identifying heterogeneities by gender, allowing us to assess whether the reform's effects differed systematically between men and women.

The remainder of the paper is structured as follows. Section 2 explains the empirical strategy to estimate the effect of the MW 2019 reform exploiting geographical variation

and present the results. Section 3 do the same regarding the analysis using individual data. Finally, section 4 concludes.

2 Geographical Approach

2.1 Identification Strategy

To investigate the impact of a minimum wage increase on the gender wage gap, we leverage geographical-level variation in exposure to the reform. Specifically, we employ a *first-differences* approach at the municipality level, where the dependent variable is the change in the gender wage gap between period $t-1$ and t. Following Caliendo and Wittbrodt (2022), the exposure to the reform is defined as the share of women earning less than the 2019 minimum wage in 2018.[1] Municipalities are classified as treated if their exposure to the reform is above the median.

To explore how the reform's effect varies across the wage distribution, we estimate separate regressions for selected percentiles j of the gender-specific wage distribution. The regression specification for each percentile j is given by:

$$\Delta GG_m^j = \alpha^j + \beta^j \cdot \text{Treated}_m + \Delta\gamma^j X_m + \varepsilon_m^j, \tag{1}$$

where ΔGG_m^j represents the change in the gender wage gap at percentile j of the wage distribution in municipality m, and β^j captures the treatment effect at that percentile. Treated_m is a binary indicator equal to 1 if municipality i was above the median in terms of exposure to the minimum wage reform. X_m represents a vector of municipality-level control variables in first differences, including changes in the overall unemployment rate, the women-to-men unemployment ratio, the ratio of women to men (ages 16–65), the share of the working-age population, the share of children under six in the total

[1] In the analysis we include both full-time and part-time workers. To calculate the 2019 hourly minimum wage we assume that a full-time worker works 1,920 hours per year (40 hours per week * 4 weeks per month * 12 months). Therefore the 2019 hourly minimum wage is calculated as $12,600/1,920 = 6.563$.

population, and the share of unemployment people from the service sector with respect to total unemployment. ε_m^j is the error term.

2.2 Data and stylized facts

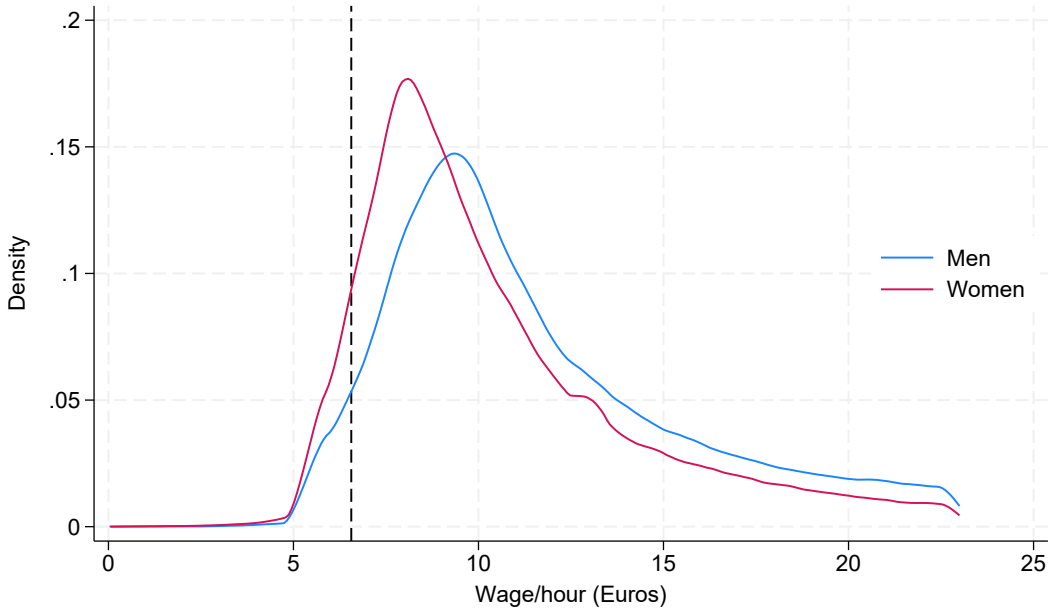
In our study, we rely on the 2019 version of the *Muestra Continua de Vidas Laborales* (MCVL), a Spanish administrative dataset that tracks individuals' employment histories over time. The MCVL is a longitudinal random sample drawn from Spain's Social Security (SS) records, covering approximately 4% of all SS-affiliated individuals per year, which corresponds to around 1.5 million individuals per wave. It provides detailed information on workers' employment status, contributions, and other labor-related variables, making it a valuable resource for labor market research and policy analysis.

For our analysis, we focus on employees aged 18–65 who were employed under the General Regime of the SS throughout the 2018-2019 period, excluding individuals who were self-employed at any point. We also restrict our sample to standard employment spells, omitting unemployment benefits and learning contracts; however, workers who held such contracts at some point during 2018-2019 are not excluded from the sample. Additionally, we remove workers with annual hours in the bottom and top 1% of the hours distribution.

Figure 1 presents the distribution of 2018 hourly wages by gender, with the vertical dashed line indicating the 2019 minimum wage hourly level. As seen in the figure, a larger share of women is concentrated in the lower end of the distribution, making them more affected by the minimum wage reform.

A limitation of the MCVL is that it only provides information on a worker's municipality of residence if they live in municipalities with more than 40,000 inhabitants; for the rest, only the province of residence is available. To maximize the number of geographical units used in our analysis, we include the 173 municipalities with more than 40,000 inhabitants, while workers in smaller municipalities are grouped at the province level (50 provinces, as Ceuta and Melilla are considered municipalities). This results in a total of

Figure 1: 2018 hourly wage distribution by gender



Source: MCVL 2019.

223 geographical units.

Table 1 presents the top 10 most and least exposed geographical areas. The most exposed areas have a female exposure to the reform ranging between 14.7% and 20.9%**, including the provinces of Extremadura (Badajoz and Cáceres, excluding municipalities with more than 40,000 inhabitants), Ourense, and several municipalities in the Canary Islands.

Conversely, the least exposed municipalities exhibit a female exposure to the reform between 1% and 2.4%, including municipalities from the Basque Country and Navarra as well as two of Spain's wealthiest municipalities, Pozuelo de Alarcón and Sant Cugat del Vallès.

2.3 Results

Baseline results: Figure 2 presents the β^j coefficients from equation (1) for percentiles ranging from the 5th to the 80th percentile.[2]

[2]As a proxy for wages, we use contributions from the MCVL. However, since contributions are capped at the top, they are not informative about changes in the gender gap in the upper part of the wage

Table 1: Geographical Areas Most and Least Exposed

Top 10 Most Exposed Areas			Top 10 Least Exposed Areas	
Area	%		Area	%
Badajoz (prov)	20.9	1	Basauri	1.0
Ourense (prov)	18.5	2	Álava (prov)	1.4
Ourense	17.8	3	Santurtzi	1.7
La Orotava	17.6	4	San Sebastián	1.7
Cáceres (prov)	17.6	5	Eivissa	1.8
Lorca	16.4	6	Pamplona	1.9
Santa Cruz de Tenerife (prov)	15.5	7	Pozuelo de Alarcón	2.0
Castellón (prov)	15.5	8	Calvià	2.0
Murcia (prov)	14.7	9	San Cugat del Vallès	2.0
Telde	14.7	10	Navarra (prov)	2.4

Notes: Perentage of women earning less than the 2019 minimum hourly wage.

Our findings indicate that the minimum wage increase significantly reduced the gender wage gap at the lower end of the wage distribution. At the 5th percentile, the gap decreased by 2.33 percentage points (pp), while at the 10th percentile, it fell by 2.17 pp. Moreover, our results suggest that the minimum wage increase contributed to narrowing the gender wage gap up to the 30th percentile of the gender-specific wage distribution.[3]

To assess the magnitude of the minimum wage's impact on the gender gap, Figure 3 shows this contribution, calculated as the percentile-specific absolute reduction observed in Figure 2 relative to the average gender gap in 2018 at each percentile. The results reveal that the minimum wage hike played a substantial role in reducing the gender gap, leading to a 36% reduction at the 5th percentile, 26% at the 10th percentile, and even a 6.7% reduction at the 25th percentile.

Robustness and placebos: Figure 4 demonstrates that our results are robust to alternative measures of exposure to the 2019 minimum wage reform. Specifically, Figure 4.a presents the β^j coefficients when using the share of women exposed to the reform rather than splitting the sample above or below the median of the exposure measure. Additionally, Figure 4.b employs the dummy version of equation (1) but defines exposure as the

distribution. This limitation is not critical to our analysis, as the minimum wage affects workers at the lower end of the wage distribution.

[3]In our baseline analysis we use yearly wages. Figure A.1 in the Appendix shows that our results are robust if we focus on a particular month. In this case, we focus on October as it is a month without holidays, summer vacations, or other major disruptions, making it a reliable reference period.

Figure 2: Minimum wage and gender gap: Yearly wage

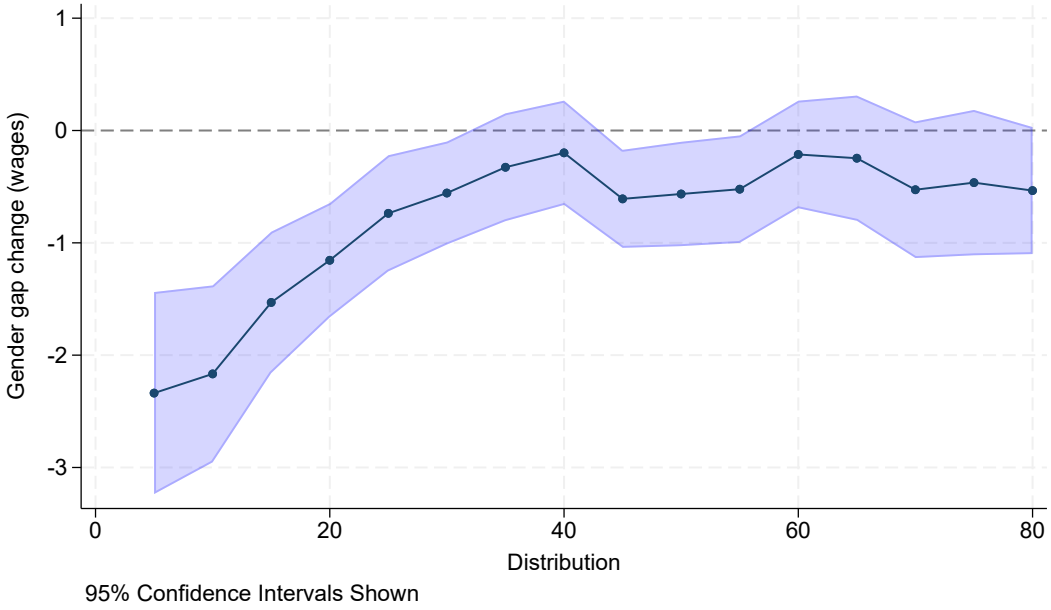
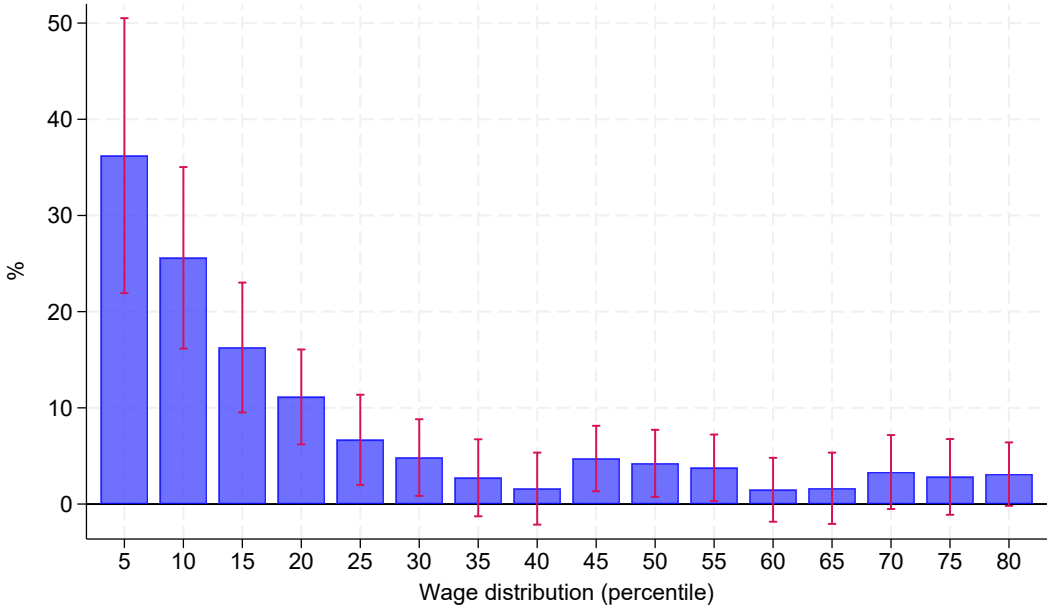
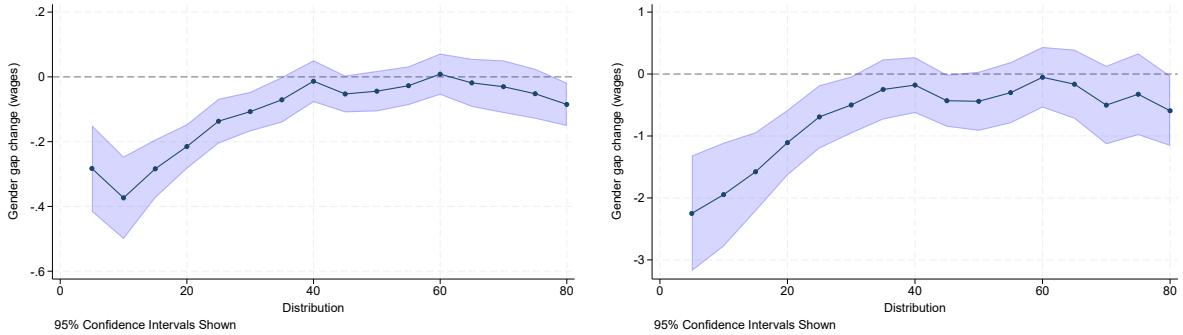


Figure 3: Minimum Wage contribution to reduce the Gender Wage Gap.



share of women who, in 2018, earned less than the 2019 MW but at least the 2018 MW. Across both specifications, our findings remain robust, showing a significant reduction in the gender wage gap, with effects extending up to the 35th percentile of the wage distribution.

Figure 4: Minimum wage and gender gap: Robustness



(a) Continuous treatment

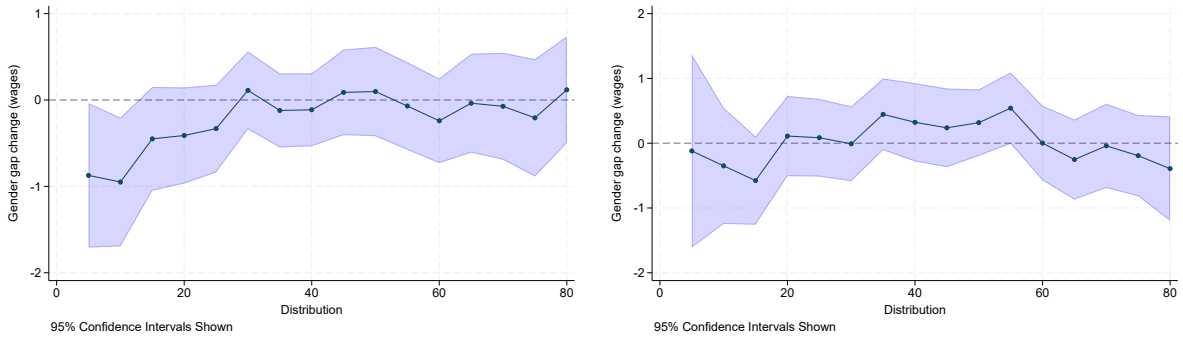
(b) Alternative definition exposure

There is a possibility that our results capture factors beyond the effect of the minimum wage hike. For instance, if women earn less than men at a given percentile of the gender-specific wage distribution—particularly at the lower end—it is possible that our findings reflect a mere catching-up effect rather than the causal impact of the reform. To assess this, we re-estimate equation (1) using two alternative periods: 2017-2018 and 2013-2014. If our results genuinely capture the causal effect of the minimum wage reform on the gender wage gap, the effects should be stronger in the 2018-2019 period.

The two placebo periods were selected for the following reasons. The 2017-2018 period is the closest to the reform, making it the most direct comparison. However, in 2018 the minimum wage increased by 4%, which could have had modest effects on the lower end of the wage distribution. To account for this, we also include 2013-2014, the most recent period with no changes in the minimum wage, ensuring a cleaner comparison.

Figure 5 presents the β^j coefficients for the placebo tests. Figure 5.a shows no effect across most of the distribution, except for a small negative effect at the 5th and 10th percentiles when we consider the 2017-2018 period. This effect is half the magnitude of

Figure 5: Minimum wage and gender gap: Placebos



(a) 2017-2018

(b) 2013-2014

what we observe in the 2018-2019 period. In contrast, Figure 5.b finds no effect at any point in the wage distribution for 2013-2014, the last period without a minimum wage increase.

Overall, these results suggest that our baseline estimates genuinely capture the causal effect of the minimum wage hike on the gender wage gap.[4]

However, the decrease in the gender wage gap may obscure heterogeneous effects of the minimum wage increase by gender. For instance, the gap could shrink simply because low-wage women are being pushed out of the labor market. To gain a more comprehensive understanding of the impact of the 2019 minimum wage reform, we next analyze individual-level data to assess its effects on various labor market outcomes.

3 Individual Approach

3.1 Data and stylized facts

For the individual-level analysis, we continue using the 2019 version of the MCVL but with a slightly different sample selection. As detailed below, our main results rely on

[4]Another potential concern is that our results may reflect a mean reversion effect rather than a causal impact. To address this, we re-estimate equation (1) including the gender gap in $t-1$ as a control variable. Figure A.2 in the Appendix presents the results for both 2018-2019 and 2017-2018. While our baseline estimates remain qualitatively unchanged, the coefficients for 2017-2018 are now statistically insignificant across the entire wage distribution. This further reassures the robustness of our main findings.

comparing labor market outcomes of individuals in the 2017–2018 period with those of comparable individuals in 2018–2019. To ensure consistency, we now focus exclusively on individuals who were employed under the General Regime of Social Security (SS) throughout 2017–2018, as in our previous analysis, excluding non-standard employment spells such as unemployment benefits and learning contracts.

Unlike before, we restrict the sample to workers aged 18–60. This adjustment is made because, rather than using a year-specific wage distribution for the analysis, we now consider changes in labor outcomes between $t-1$ and t, aiming to minimize potential biases related to retirement decisions. As before, we exclude workers in the bottom and top 1% of the hours distribution. Additionally, in this section, we only consider workers earning between 3 and 21 euros per hour at $t-1$.

Departing from Dustmann et al. (2021), we analyze individual wage growth using a bin-based approach. Wage growth $g^w_{i,t}$ between $t-1$ and t for worker i is regressed on wage bin indicators:

$$g^w_{it} = \sum_q \mathbf{1}[b_{q-1} < w_{i2018} \leq b_q]\gamma_q + \beta X_{i,t-1} + e_{it}, \tag{2}$$

where b_{q-1} and b_q define wage bin boundaries, and γ_q captures the average wage growth between $t-1$ and t for workers in wage bin q, conditional on a vector of individual baseline characteristics $X_{i,t-1}$ measured at $t-1$.[5]

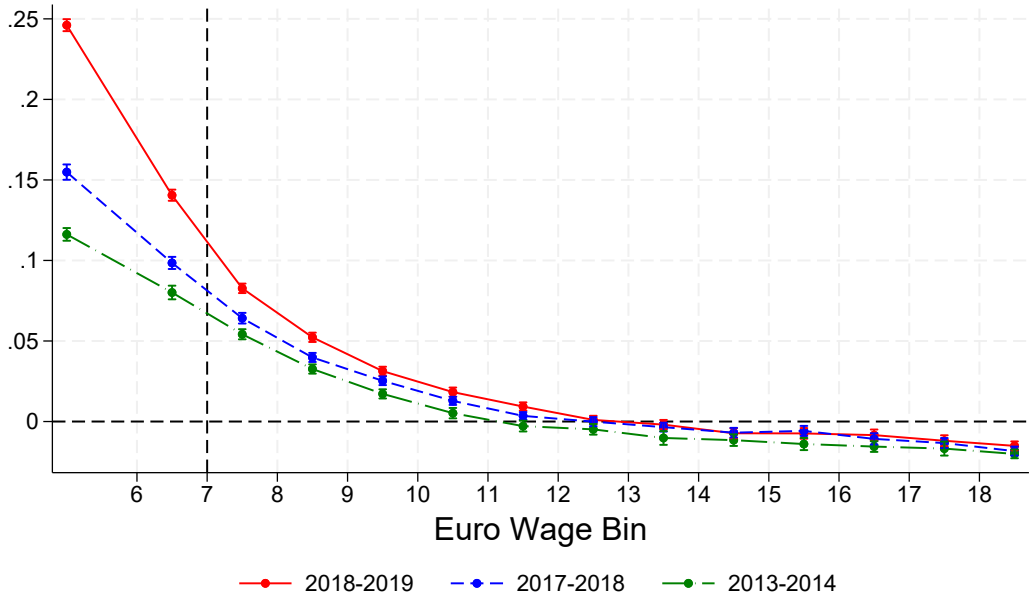
Figure 6 displays the average growth rates by bin for three periods. We define 14 wage bins, with most bins covering 1-euro increments, except for the first bin (3–6 euros per hour at $t-1$) and the last bin (18–21 euros per hour at $t-1$).

A common trend across all three periods is that lower-wage workers experience higher wage growth than those higher in the wage distribution. This pattern is expected due to mean reversion, as workers at the lower end of the distribution typically see faster wage growth than those with higher salaries. Another potential factor is overall economic

[5]Specifically, we control for age, nationality, education, municipality, sector (2-digit NCAE), and full-time employment status.

growth, which may contribute to wage increases within a given year. Following Dustmann et al. (2021), we attempt to isolate these effects by estimating a reparameterized version of equation (2), using one of the pre-policy periods as a reference.

Figure 6: Hourly wage growth rate by wage bin



Notes: 95% confidence intervals clustered at the municipality level.

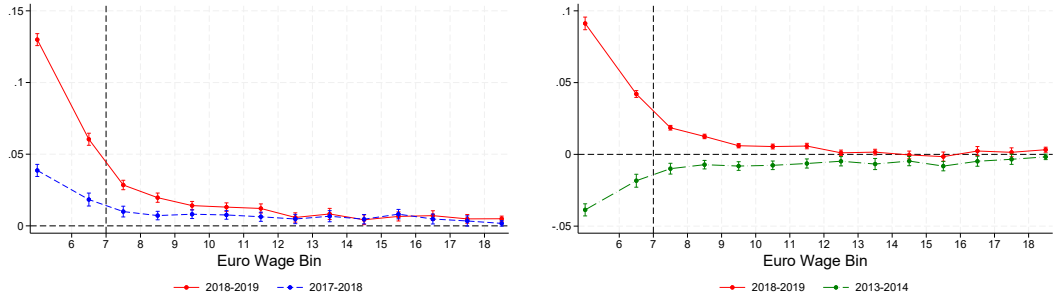
Figure 7 presents the results when using 2013–2014 (Figure 7.a) and 2017–2018 (Figure 7.b) as reference periods. Under the assumption that mean reversion and time effects remain stable, Figure 7.a captures the causal effect of the 2018 and 2019 minimum wage reforms on wage growth. As expected, the effect is significantly stronger in 2018–2019 than in 2017–2018, reflecting the larger MW increase in 2019. Specifically, for the 2019 MW reform, wage growth was approximately 13% for the bottom bin and 5.2% for the next bin. Notably, the 2019 MW reform appears to have positive spillover effects on wage growth for workers earning up to 11 euros per hour.

In Figure 7.a, the reference period is 2013–2014, as it was the first period without MW changes. However, the five-year gap raises concerns about the stability of macroeconomic time effects. To address this, Figure 7.b uses 2017–2018 as a reference. While this comparison benefits from more similar macroeconomic conditions, it is important to note

that the MW increased by 4% in 2018, making our estimates of the 2019 MW reform's effects conservative. Even so, we observe that wage growth for the bottom bin remains around 10%, with spillover effects extending to workers earning 8–9 euros per hour.[6]

Having established that the 2019 MW reform had a positive impact on wage growth for individuals employed in both $t-1$ and t, the next section examines gender-based heterogeneity in labor market outcomes.

Figure 7: Hourly wage growth rate by wage bin and reference period



(a) Reference 2013-2014 (b) Reference 2017-2018

Notes: 95% confidence intervals clustered at the municipality level.

3.2 Identification strategy

To analyze the impact of the 2019 minimum wage reform on various labor market outcomes by gender, we consider workers earning between 3 and 7 euros as those affected by the 2019 MW reform and the control group are those workers earning between 14 and 18 euros per hour in $t-1$. We exclude people earning between 7 and 14 euros in order to avoid problems related to spillover effects across the distribution related to the 2019 MW reform.

In order to allow a different effect by gender, we estimate the following DiD regression:

[6]Figures A.3 and A.4 in the Appendix show that our results remain consistent when using data from a specific month (October) instead of the entire year.

$$g_{it}^{w} = \beta_1(\text{Treated Male}_i * \text{Post}_t) + \beta_2(\text{Treated Female}_i * \text{Post}_t) + \gamma\text{Post}_t \tag{3}$$

$$+ \delta\text{Treated Male}_i + \theta\text{Treated Female}_i + \mathbf{X}_{i,t-1}\boldsymbol{\beta} + \epsilon_{it}, \tag{4}$$

where $g_{i,t}^{w}$ represents the wage growth of individual i in period t. The variable Post_t is an indicator for the post-reform period (2019), while Treated Male_i and Treated Female_i identify workers in the first two bins of the wage distribution in $t-1$, separated by gender. The control group consists of men and women earning between 14 and 18 euros per hour in $t-1$. $X_{i,t-1}$ includes a set of pre-determined covariates such as age, nationality, education, industry, municipality, and full-time status, while e_{it} is the error term, clustered at the municipality level.

It is worth noting that as our dependent variable is in growth rates, we are comparing the growth rate in 2018-2019 with that of 2017-2018 for those at the bottom of the distribution with respect to workers upper in the wage distribution. The coefficient β_1 captures the causal effect of the 2019 MW reform on the wage growth of treated men, while β_2 captures the effect on treated women. The coefficient γ accounts for general wage growth in the post-reform period, while δ and θ control for pre-existing differences between treated and control groups before the reform.

A significant and positive β_1 or β_2 would indicate that the MW increase led to higher wage growth for the respective treated group compared to the control group. By comparing β_2 and β_1 we aim to study whether the previous decrease in the gender wage gap is hiding heterogeneities on the impact in the labor market by gender.

In the following section, beyond wage growth we also present the results for the probability of working the same or more hours, the probability of changing the company, and the probability of remaining employed.

3.3 Results

Figure 8 presents the results of our analysis using two timeframes: full-year data (Figure 8.a) and data restricted to October (Figure 8.b). Each figure is organized into four panels, corresponding to the dependent variable under examination, and displays the estimates of β_1 and β_2 from Equation (4).

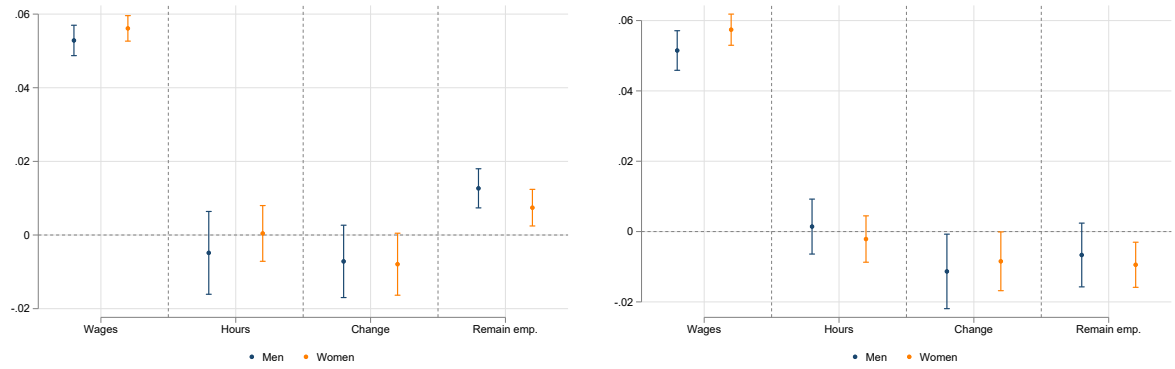
The results reveal no significant gender disparities across any category, and most findings remain consistent whether we use annual or October-specific data. Wages increased by approximately 4% for both low-earning men and women. However, we detect no significant effects on the probability of increasing hours worked and only a modest reduction in the likelihood of changing employers. Notably, the probability of remaining employed shows divergent results depending on the timeframe: while there are no gender differences, the effects vary between annual and monthly analyses.

This discrepancy may stem from how we define our dependent variable, which takes a value of 1 if the individual is employed at any point during the period under analysis. While this definition is reasonable for monthly data, it becomes less precise when applied to annual data. To address this and further validate our findings, Figure ¡ 9 presents monthly estimates for the four dimensions of interest. Specifically, we estimate equation (4) separately for each month in the sample. For example, the two points in the top-left panel of Figure 9.a represent β_1 and β_2 when comparing wage growth in January 2018–2019 to wage growth in January 2017–2018 for the treatment and control groups.

The wage effects and the probability of working more hours exhibit remarkable stability throughout the year, regardless of the month analyzed. However, the probability of changing employers shows more pronounced negative coefficients for men than for women during certain months in the middle of the year. As for the probability of remaining employed, we observe some negative effects toward the end of the year, though these effects do not differ by gender.

In summary, our findings indicate that the 2019 minimum wage reform raised wages for both men and women in the lower wage distribution by a similar magnitude. While we find

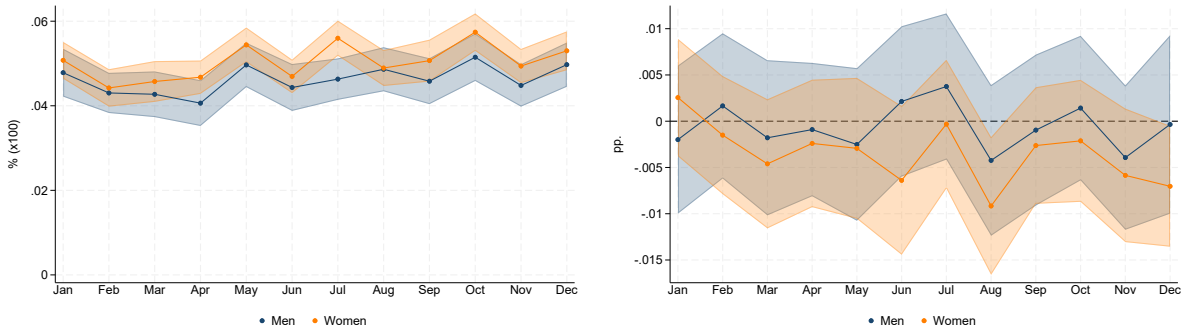
Figure 8: Minimum wage effects by gender (alternative sample: 2017-2019 reg general)



(a) Yearly (b) October

Notes: 95% confidence intervals clustered at the municipality level.

Figure 9: Minimum wage effects by gender over time



(a) Wage growth (b) Prob. same or more hours

(c) Prob. change firm (d) Prob. remain employed

Notes: 95% confidence intervals clustered at the municipality level.

no significant negative employment effects for most of the year, the modest negative effects observed at the end of the year were shared equally by both genders. Consequently, the reduction in the gender wage gap observed in the geographical analysis can be attributed to the higher concentration of women in low-wage jobs rather than to heterogeneous effects on labor market outcomes.

4 Conclusion

This paper examines the impact of the 2019 minimum wage increase in Spain on the gender wage gap and labor market outcomes. By leveraging both geographical and individual-level data, we provide robust evidence on how this unprecedented policy intervention affected wage disparities and employment dynamics between men and women. Our findings yield three key insights.

First, the 2019 MW reform significantly reduced the gender wage gap, particularly at the lower end of the wage distribution. Using a geographical approach, we find that the gender wage gap decreased by 36% at the 5th percentile and 25% at the 10th percentile.

Second, our individual-level analysis reveals that the wage effects of the MW reform were remarkably similar for men and women. Low-earning men and women experienced comparable wage growth of approximately 4%, with no significant differences in their probability of increasing hours worked or changing employers.

Third, the 2019 MW reform did not lead to significant adverse employment effects for either gender. While we observe some modest negative effects on the probability of remaining employed toward the end of the year, these effects were shared equally by men and women.

These findings suggest that the gender wage gap reduction stemmed from women's concentration in low-wage jobs rather than heterogeneous labor market effects. Importantly, they alleviate concerns that minimum wage increases might disproportionately harm women's employment prospects.

Our results have important policy implications. They demonstrate that minimum wage policies can be an effective tool for reducing gender wage disparities, particularly in contexts where women are concentrated in low-wage jobs. The 2019 MW reform in Spain not only raised wages for low-earning workers but also contributed to greater gender equity in the labor market without triggering significant negative employment effects.

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APPENDIX: Supplementary tables and figures

Figure A.1: Minimum wage and gender gap: October wage

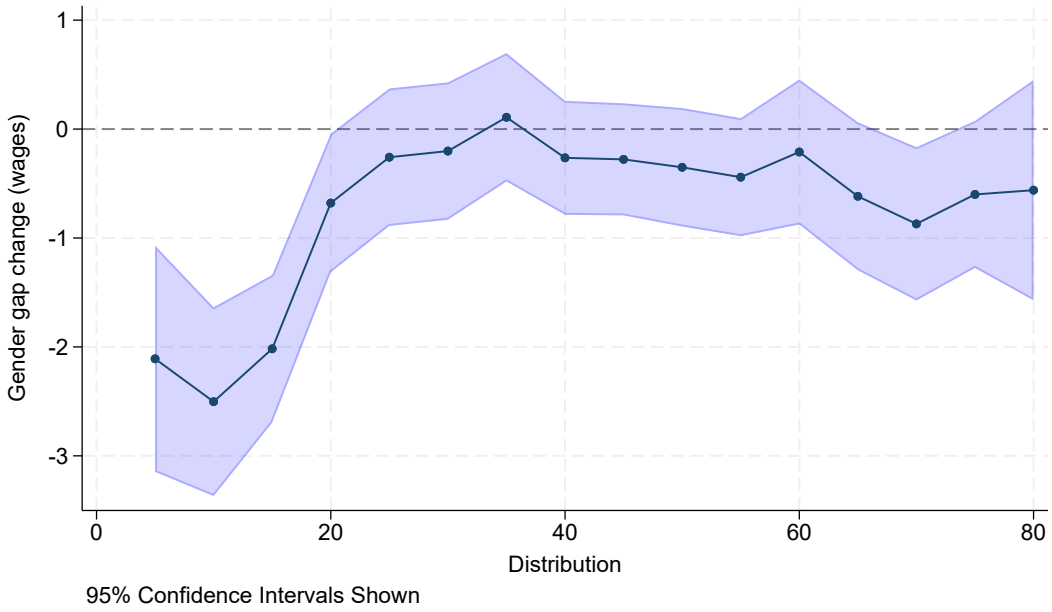
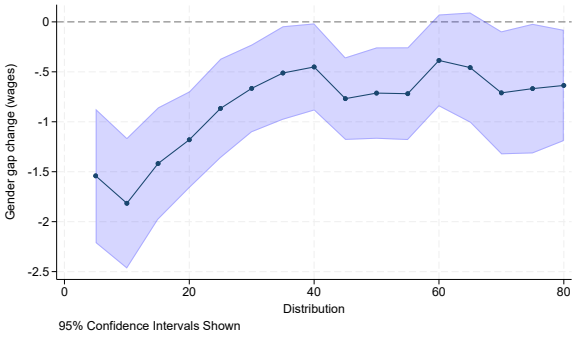
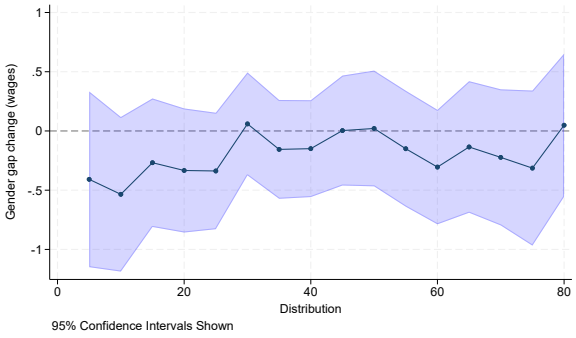


Figure A.2: Minimum wage and gender gap: Reverse to the mean

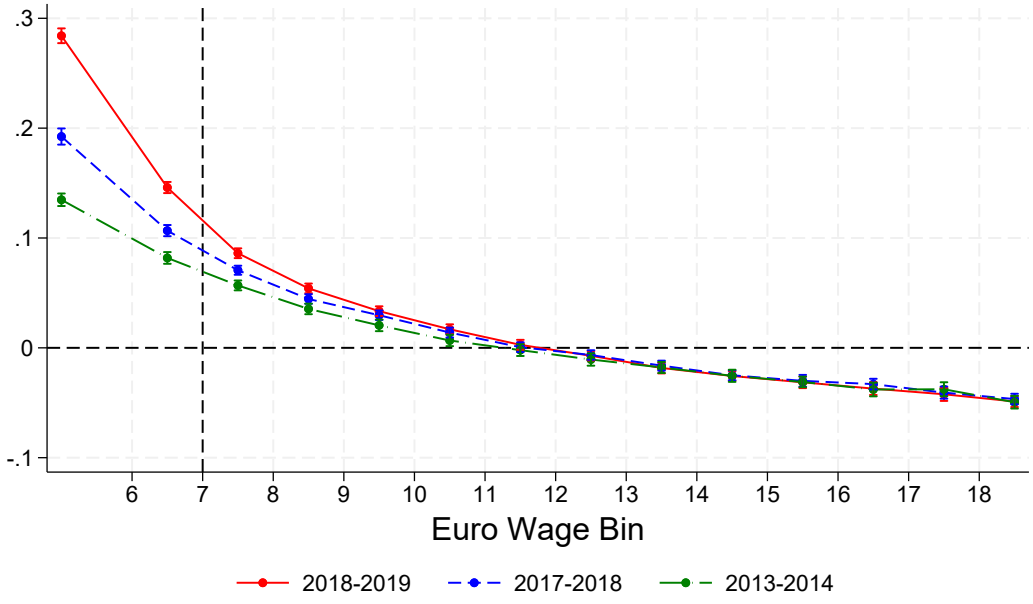


(a) 2018-2019



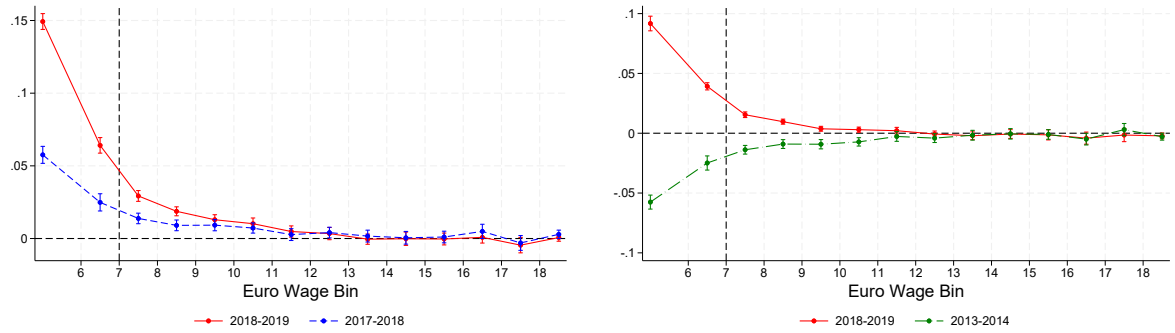
(b) 2017-2018

Figure A.3: Hourly wage growth rate by wage bin (October info only)



Notes: 95% confidence intervals clustered at the municipality level.

Figure A.4: Hourly wage growth rate by wage bin and reference period (October info only)



(a) Reference 2013-2014

(b) Reference 2017-2018

Notes: 95% confidence intervals clustered at the municipality level.