

Minimum Wage and Work Accidents

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Motivation

- Minimum wages (MW) aim to improve economic conditions of low-income workers
- MW can have unintended consequences →
 - Employment effects
 - Price adjustments
 - Evasion
- Impact in working conditions/amenities largely overlooked and with mixed results (Hradil, 2018; Phelan, 2019; Merrill-Francis et al., 2022)

This project: MW → Workplace safety (Spain 2016-2019)

Workplace safety is costly...

- **Money** (e.g. purchasing and renewing protective equipment)
- **Labor** (e.g. Training new employees, monitoring protocols compliance)
- **Foregone production** (e.g. Allow for regular breaks, avoid over-work)

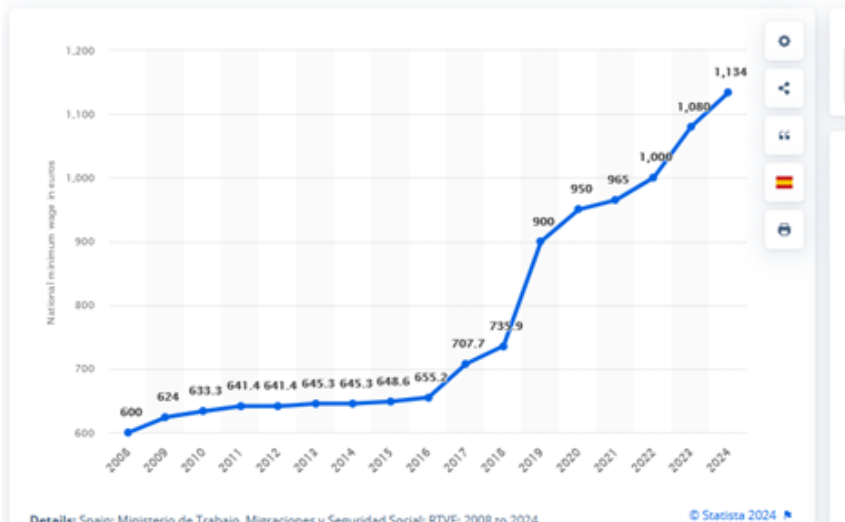
MW hike can result in...

- Employer reduces workplace safety provision (Work accidents ↑)
- Unemployment (Work accidents ↑)
- Workers better outside options (Work accidents ↓)
- Labor-by-capital substitution (Work accidents ?)

Background

Background: MW in Spain

National minimum wage per month in Spain from 2008 to 2024 (in euros)

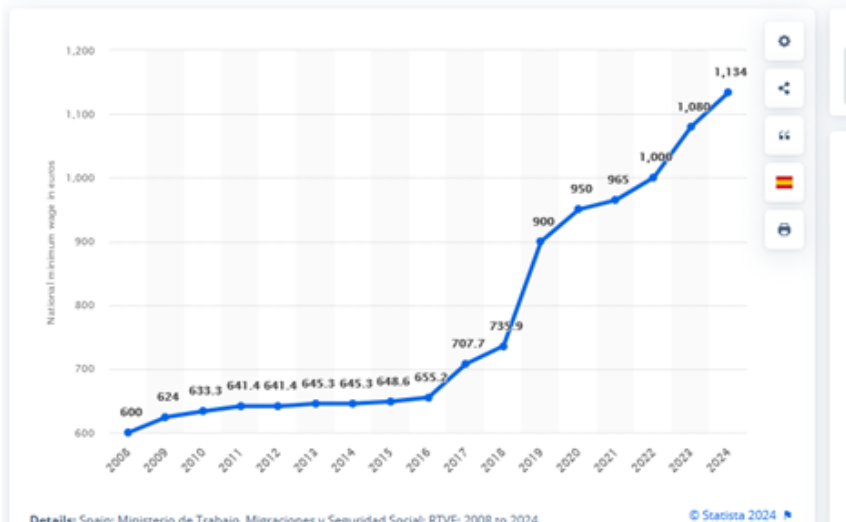


Background: MW Timeline

- **2011-15** 1st Mariano Rajoy (PP) government: Stable MW (-0.9 real change)
- **Dec 2015** General elections: PP wins without majority, fails to form government
- **June 2016** Repeat elections: PP wins without majority, forms government in Oct
- **Dec 2016** PP agrees 8% MW increase with PSOE in exchange reducing deficit
- **Dec 2017** PP agrees with unions and employers a 4% increase, plus €850 by 2020
- **May 2018** Court ruling finds PP to have illegally received kickbacks-for-contracts
- **June 2018** Vote of no confidence, Pedro Sanchez (PSOE) Prime Minister
- **Dec 2018** MW increases 22 percent to 900 euros

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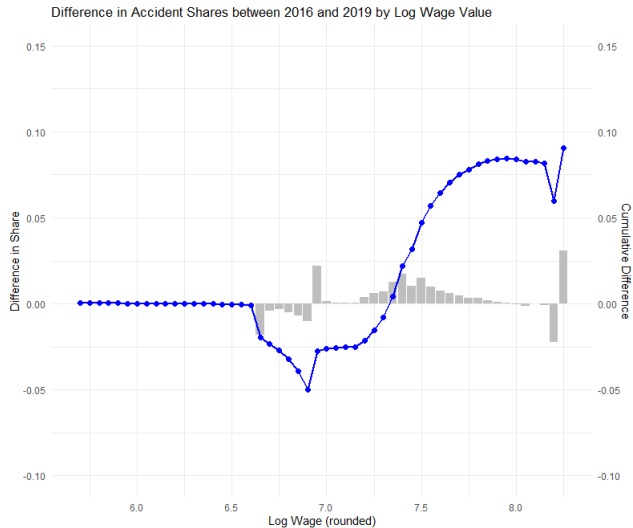


Suggestive evidence

Work accident shares, by log wage. 2016 vs 2019



Work accident shares change, by log wage. 2016 minus 2019



Data

Data Group 1: "The universal"

- Universe of employer-employee matches for 2016 to 2019
- Basic information
 - Worker: age, gender, occupation
 - Firm: size, economic activity, legal form
 - Contract: part/full-time, temporary/permanent
 - No wage information
- Sick leave register
 - Information on both regular sick leaves and work accident leaves

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Pros: Information for all workers, can run analysis at firm/establishment level

Cons: No information about wages

Data Group 2: "The four percent"

- Employer-employee matched data for a random 4% sample of individuals who worked at any point in 2016-2019
- Richer information
 - Complete work history
 - Wages
 - Firm size
 - Other fiscal information
- Sick leave register (same as for data group 1)

Data Group 2: "The four percent"

- Employer-employee matched data for a random 4% sample of individuals who worked at any point in 2016-2019
- Richer information
 - Complete work history
 - Wages
 - Firm size
 - Other fiscal information
- Sick leave register (same as for data group 1)

Pros: Wage information, and history prior to 2016

Cons: Only 4 percent sample, cannot observe all workers in firm/establishment

Data strategy

- Cannot merge across data groups (incompatible IDs)
- Could we still leverage the strengths of both datasets?

Empirical Strategy

DiD specification exploiting differential exposure to MW hikes across firms

$$y_{ft} - y_{f2016} = \alpha_f + \beta_t D_f + \gamma_t X_{f2016} + \varepsilon_{ft} \quad (1)$$

- y_{ft} : Work accidents per capita/working-hour for firm f in year t
- D_f : measure of exposure to MW hike for firm f
 - Share of 2016 employees affected by year t MW
 - Ratio of wage bill under year t MW over 2016 wage bill
- X_{f2016} control variables: economic activity, firm size, province... (?)

Imputing outcome/treatment: Strategy 1

- Focus on the four percent dataset
- Impute firms' accident rates and MW exposure based on observed workers

$$y_{ft} - y_{f2016} = \bar{y}_{ft} - \bar{y}_{f2016} + u_{ft} \quad (2)$$

$$D_{ft} = \bar{D}_{ft} + e_{ft} \quad (3)$$

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Imputing outcome/treatment: Strategy 1

Imputation can be improved using an additional source of data: Panel de datos de Empresas-Trabajadores (PET)

- Same information as 4pc sample we discussed, but sampling unit is establishment
- Unfortunately, the panel stops in 2016
- We can still train a model on this dataset to predict MW exposure for the establishments based on a subset of the workers
- Then impute MW exposure in the main dataset using this model

$$\hat{D}_{ft} = E(D_{ft} | \bar{D}_{f2016}, X_{f2016}) \quad (6)$$

Imputing outcome/treatment: Strategy 2

- Use both the universal and the four percent datasets
- Compute true firms' accident rates using universal dataset
- Impute firms' exposure to MW hikes based on Province \times Economic activity exposure to minimum wage (from 4pc sample)

The end

References I

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- M. Merrill-Francis, J. S. Vernick, E. E. McGinty, and K. M. P. Porter. Association between fatal occupational injuries and state minimum-wage laws, 2003–2017. *American journal of preventive medicine*, 62(6):878–884, 2022.
- B. J. Phelan. Hedonic-based labor supply substitution and the ripple effect of minimum wages. *Journal of Labor Economics*, 37(3):905–947, 2019.