Minimum wage and financially distressed firms: another one bites the dust

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Outline

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- ▶ Literature review
- ▶ Main hypothesis
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Motivation: minimum wage and financially distressed firms

► The costs of 'social policies' through minimum wage are bore by firms, which are affected asymmetrically. This asymmetry has several sources:

  ► The impact on firms' total costs depends on the incidence of the minimum wage.

  ► The firms' ability to absorb the wage cost shock by adjusting its profit margin and/or to pass the cost increase to consumers.

  ► On firms' flexibility to change its capital-to-labour ratio.

Motivation: minimum wage and financially distressed firms

Figure 1: Minimum wage and the unemployment rate
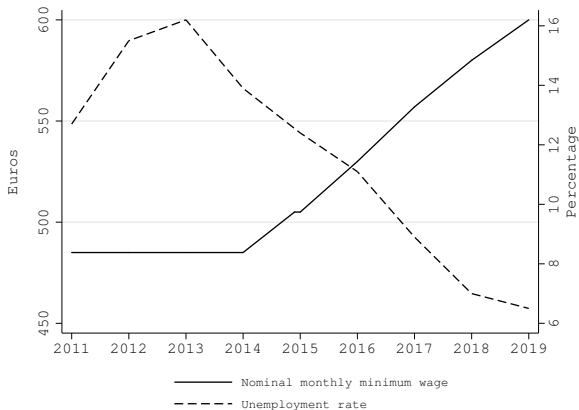
Source: INE & DGERT/MTSSS.

Motivation: minimum wage and financially distressed firms

▶ Our analysis focus on a period of time where a significant share of firms are highly indebted, have very low profitability and liquidity.

▶ The existence of financially distressed firms (FDF) represents a misallocation of resources. The level of resource waste depends on the incidence and on the exit and recovery rates of these firms.

▶ We define financially distressed firms as firms that cannot cover their interest expenditures with their EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) for three consecutive years. (Gouveia & Osterhold, OECD (2018))

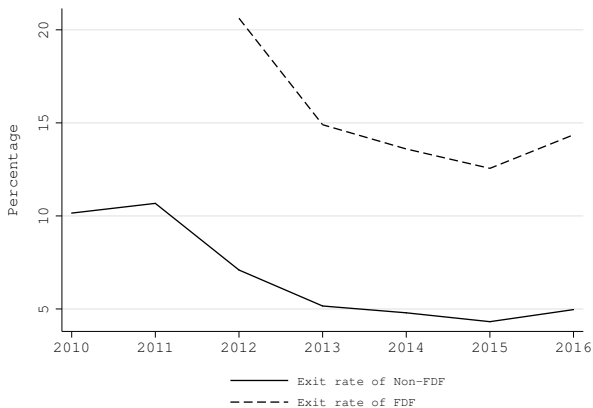# Motivation: minimum wage and financially distressed firms

Figure 2: FDF firms in the Portuguese economy
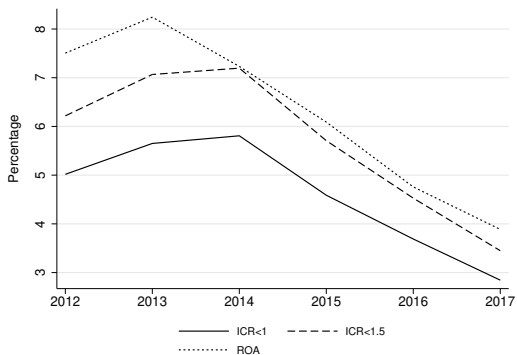
Source: SCIE.

Motivation: minimum wage and financially distressed firms
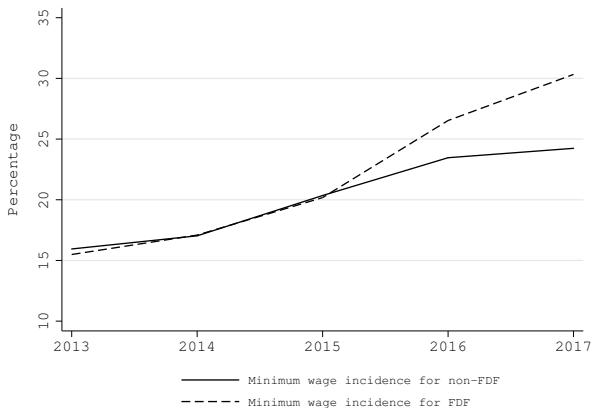
Figure 3: Exit rate

Source: SCIE.

Motivation: minimum wage and financially distressed firms

Figure 4: Share of minimum wage earners (MW incidence)

Source: SCIE, QPs & Pordata.

Literature review

► Draca et al. (2011, AEJ:AE) showed that the introduction of the national minimum wage in the United Kingdom raised wages and reduced firms' profitability. The reduction in firm profitability is stronger in less competitive sectors.

► Drucker et al. (2019, NBER) using data for Israel (2003-2010) conclude that minimum wages increases reduced firms' profitability and that firms with a higher incidence of minimum wage suffered higher losses and reduced their workforce more aggressively.

Literature review

- ► Harasztosi and Lindner (2019, AER), using data for Hungary (1997-2004) conclude that firms with higher minimum wage exposure suffered a low impact on revenue and profits, suggesting that firms were being able to pass through the consumers the costs by increasing prices.

- ► Mayneris et al. (2018, JDE) using data for China, find that minimum wage increases led to lower survival rates, while remaining firms increased productivity and showed no reduction in profits.

Main hypothesis

We test three main hypothesis:

- ▶ Minimum wage reduce employment growth
  - and FDF may suffer larger adjustments in employment

- ▶ Minimum wage increases reduce profitability
  - and FDF may suffer higher financial losses

- ▶ Minimum wage increases might trigger the insolvency of firms
  - and accelerates the exit of FDF.

Empirical strategy
Data

Table 1: Summary statistics Non-FDF and FDF (2013)

	Mean		SD		Min		Max	
	Non-FDF	FDF	Non-FDF	FDF	Non-FDF	FDF	Non-FDF	FDF
Δ % of number of employees	-0.36	-1.10	1.54	2.45	-6.90	-6.90	4.11	1.39
EBITDA Ratio (%)	2.82	-31.38	24.95	39.45	-148.24	-148.24	63.36	63.36
Number of employees	17.38	14.84	151.54	60.04	2.00	2.00	21602	2155
Dead	0.05	0.15	.	.	0	0	1	1
Treatment (PRCI)	0.05	0.05	0.15	0.11	0.00	0.00	12.69	2.57
Added value hour (euro)	16.50	3.64	118.08	71.88	-479.71	-4594.66	17790.95	973.31
Shares (%):								
Exports	4.17	2.58	15.51	11.91	0.00	0.00	100.00	100.00
Workers with a part time contract	5.65	5.83	16.45	17.34	0.00	0.00	100.00	100.00
Workers with a fixed term contract	21.44	18.79	29.60	29.47	0.00	0.00	100.00	100.00
Overtime hours worked	0.27	0.17	1.76	1.27	0.00	0.00	83.82	31.58
Costs of employees over total costs	33.09	33.44	20.49	17.90	0.02	0.06	100.00	98.22

Source: QP & SCIE. The number of observations is 93879 for Non-FDF and 5601 for FDF.

Note: We consider only firms with at least 2 workers in 2013 and at least 4 years of age.

Empirical strategy
Treatment variable - Potential Relative Cost Increase (PRCI)

$$Treatment_{it} = PRCI_{it} = \frac{Potential\ wage\ bill_{it+1} - Potential\ wage\ bill_{it}}{Total\ costs_{it}}$$

Table 2: Example of a minimum wage increase from 485 in t to 505 in $t+1$ for firm i

Worker ID	MonthlyWage$_t$	NewMonthlyWage$_{t+1}$	WageBill$_t$	WageBill$_{t+1}$	TotalCosts$_t$
1	485	505	2005	2035	12000
2	495	505	2005	2035	12000
3	505	505	2005	2035	12000
4	520	520	2005	2035	12000

$$PRCI = \frac{2035-2005}{12000} * 100 = 0.25\%$$

Empirical strategy

Treatment variable - Potential Relative Cost Increase (PRCI)

Figure 5: Average PRCI
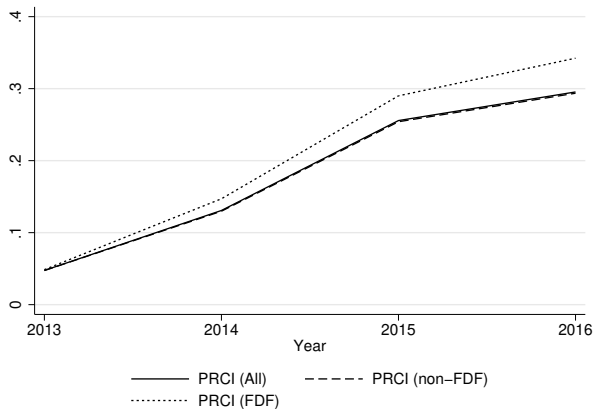
Source: QPs.

Empirical strategy
Regression analysis

We estimate the following model:

$$\Delta Y_{i,t+1} = \gamma_1 PRCI_{it} + \gamma_2 FDF_{it} + \gamma_3 PRCI_{it} FDF_{it} + \gamma_4' X_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Where $Y_{i,t+1}$ is:

- $\ln E_{i,t+1}$ - employment
- $EBITDA/Op.Revenue_{i,t+1}$ - profitability

Empirical strategy
Regression analysis

To study the impact of an increase of the minimum wage on the exit (death) of financially distressed firms, we estimate a logit model with fixed effects, in which the dependent variable is the probability that firm i ceased to exist in period $t + 1$:

$$P(D_{it+1} = 1) = \lambda(\theta_{it}) = \frac{\exp(\theta_{it})}{1 + \exp(\theta_{it})} \tag{2}$$

$$\theta_{it} = \beta_1 Treatment_{it} + \beta_2 FDF_{it} + \beta_3 Treatment_{it} FDF_{it} + \beta_4' X_{it} + \eta_i + \varepsilon_{it} \tag{3}$$

Empirical strategy
Results

Table 3: Profits and Employment growth effects

	Profit		Employment	
	(1)	(2)	(3)	(4)
	Panel A: Baseline			
PRCI	-9.8842***	-9.9816***	-3.9870***	-5.5859***
	(3.197)	(3.179)	(1.458)	(2.000)
	Panel B: Full specification			
PRCI	-9.3802***	-9.4769***	-3.7410***	-5.3030***
	(3.093)	(3.079)	(1.408)	(1.950)
FDF	15.0175***	14.9387***	-2.0298***	-2.1600***
	(0.987)	(0.988)	(0.685)	(0.721)
PRCI $\times$ FDF	-16.2153***	-16.3066***	-9.8711***	-11.0962***
	(2.994)	(3.026)	(1.669)	(1.942)

Table 4: Impact on the probability of exit of the average firm

	2013	2014	2015	2016
Logit				
Non-FDF	5.0	13.4	24.5	27.5
FDF	5.6	15.9	27.3	30.4
LPM – A (firms that exited)				
Non-FDF	2.6	7.2	14.0	16.2
FDF	3.7	11.1	21.9	25.9
LPM – B (all firms)				
Non-FDF	0.2	0.5	1.0	1.2
FDF	0.6	1.7	3.4	4.1

Empirical strategy

Results

Figure 6: Treatment effects
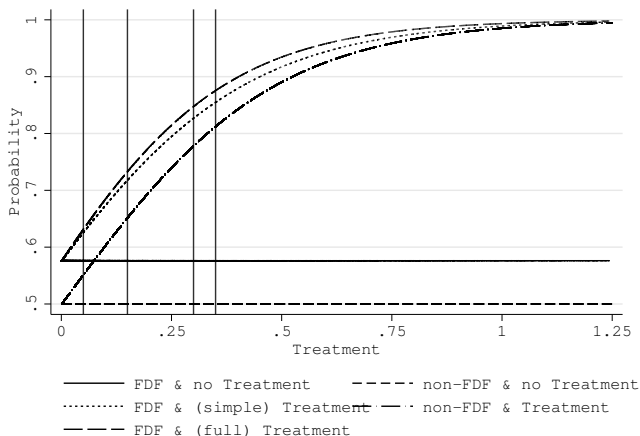
Source: Authors' computations with data from SCIE and QP.

Conclusions

- ▶ Minimum wage reduces employment growth and profitability.

- ▶ The impact on the employment growth and profitability of FDF is twice the impact for non-FDF.

- ▶ Minimum wage increases had a positive impact on firms' exit. This impact was amplified for FDF.

- ▶ Minimum wage policies may have had a supply side effect by accelerating their death and, thus, breaking the deadlock of FDF congestion.

- ▶ By eliminating low profitability firms, which are also the least productive, minimum wage policies may have contributed to improve aggregate productivity through a cleansing effect.