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November 2, 2020

Abstract

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JEL Classification: *J38, L25*

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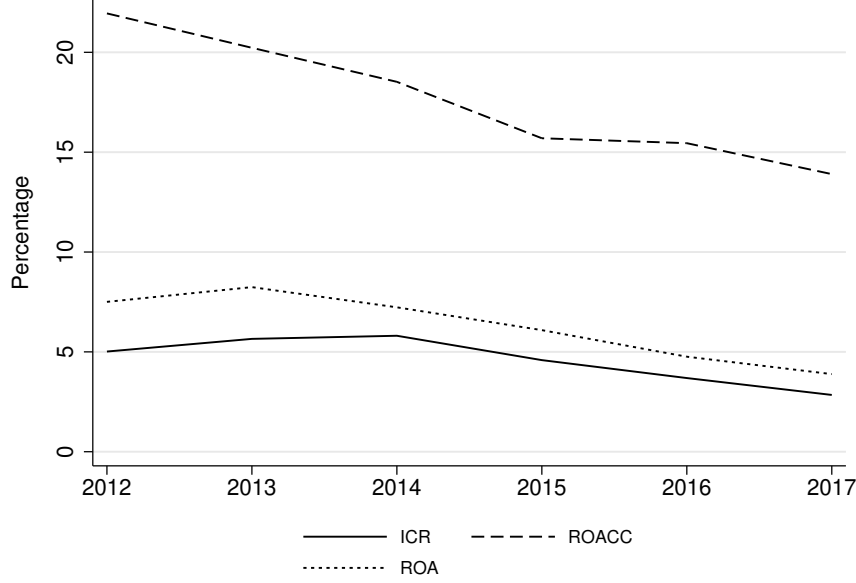
1 Introduction

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The fragile condition of financially distressed firms raised concerns about the effects of minimum wage policies. Minimum wage increases may induce a further deterioration of the financial condition of those firms, which may lead them to reduce employment and even to close down. Business leaders publicly expressed their concerns on the effects of wage cost increases, namely in sectors where there is a high minimum wage incidence and labor costs weigh heavily in total costs.



Source: Authors' computations using data from SCIE.

Figure 1: Share of financially distressed firms

The minimum wage in Portugal is set for a month of work and the full time weekly hours, with a maximum legal working week of 40 hours, are defined in the collective bargaining agreement. Between 2014 and 2017, the minimum wage increased 14.8%. In October 2014, minimum wage increased from 485 to 505 euros, a 4% change. Notwithstanding being a small increase, the percentage of workers receiving minimum wage jumped from 13.2% to 19.6%.¹

$$PRCI_{it} = \frac{Potencial\ wage\ bill_{i,t+1} - Current\ wage\ bill_{it}}{Total\ costs_{it}} \times 100 \quad (1)$$

This equation tells that the 'potential relative cost increase' associated with a minimum wage rise is the relative change in total costs that the firm would face in year t if the firm had to pay in year t the year $t + 1$ minimum wage, while maintaining the same productive structure, namely, not adjusting the composition, nor the size, of its labor force in view of the minimum wage increase. By computing the 'potential relative cost increase' we take into consideration the fact that the importance of labor costs varies across industries and firms.

¹The numbers mentioned in this part of the text come from a report on the minimum wage in Portugal published by the Portuguese Ministry of Labor.

2 Empirical analysis

2.1 Econometric strategy

To evaluate the impact of minimum wage increases on firm exit, we begin by estimating a logit model that accounts for firms' unobserved heterogeneity and in which the dependent variable is the probability that firm i will close down in period $t + 1$:

$$P(E_{i,t+1} = 1|\theta_{it}) = \lambda(\theta_{it}) = \frac{\exp(\theta_{it})}{1 + \exp(\theta_{it})} \quad (2)$$

$$\theta_{it} = \beta_1 PRCI_{it} + \beta_2 FDF_{i,t-1} + \beta_3 PRCI_{it}FDF_{i,t-1} + \beta_4' X_{it} + \eta_i \quad (3)$$

In equation (2), $E_{i,t+1}$ is a dummy variable that equals 1 if firm i exited during year $t + 1$ and equals 0 otherwise.

2.2 Results

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As an alternative to the logit functional form, in columns (7) and (8) of Table 1 we report the estimates obtained using the linear probability model, estimated in the same sample as the logit model, i.e., the sample of firms that did exit during 2014-2017. As

Table 1: Profitability, employment and exit

	Profit		Employment		Exit (Logit)		Exit (LPM - A)		Exit (LPM - B)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Baseline										
PRCI	-9.8842*** (3.197)	-9.9816*** (3.179)	-3.9870*** (1.458)	-5.5859*** (2.000)	4.4586*** (0.280)	4.3970*** (0.255)	0.0979 (0.074)	0.1014 (0.075)	0.0388*** (0.013)	0.0388*** (0.012)
Panel B: Full specification										
PRCI	-9.4955*** (3.144)	-9.5863*** (3.128)	-3.7775*** (1.428)	-5.3323*** (1.969)	4.4094*** (0.220)	4.3452*** (0.248)	0.5644*** (0.051)	0.5610*** (0.050)	0.0370*** (0.012)	0.0370*** (0.012)
Lag FDF	-3.7604*** (0.895)	-3.7798*** (0.899)	-1.3050** (0.641)	-0.9133 (0.670)	0.5279*** (0.091)	0.5425*** (0.073)	0.1467*** (0.023)	0.1490*** (0.023)	0.0149*** (0.004)	0.0151*** (0.004)
PRCI \times Lag FDF	-11.0203*** (2.871)	-11.1090*** (2.905)	-6.0761*** (1.592)	-7.4045*** (1.886)	0.3881 (0.341)	0.4083 (0.317)	0.1516** (0.061)	0.1533** (0.061)	0.0503*** (0.012)	0.0507*** (0.012)

Notes: Standard errors are clustered at the firm level for models (1)-(4) and (7)-(10); for models (5) and (6) standard errors are computed by bootstrap. Significance levels: *, 10%; **, 5%; ***, 1%. The dependent variables are identified in each set of columns. Panel A reports estimates for a baseline model without the financial distress indicator and its interaction with PRCI; in Panel B those variables are included. LPM stands for Linear Probability Model. The estimations reported in columns (1), (3), (5) and (7) include additionally the following control variables: part-time workers, fixed-term workers, overtime labor, relative labor costs, exports weight, leverage ratio, valued-added per hour, short-term debt, long-term debt and the number of workers and its square. Results under Exit (Logit) are estimated by conditional logit while the remaining models account for firm unobserved heterogeneity using the fixed effects estimator. The number of observations is 27998 for columns (5), (6), (7) and (8). The number of observations is 368085 for the remaining estimations. The model Exit (LPM - A) is estimated with the same sample as the model Exit (Logit) model. The model Exit (LPM-B) is estimated with the same sample as the Profit and Employment models.

in the logit model, the coefficients are positive and statistically significant at the 1% significance level. Hence, qualitatively the results are the same as in the logit model. Quantitatively, the change in the probability of exit assigned to the minimum wage rise is a bit lower than in the logit model — see the mid-section of Table 2. This is especially so for non-financially distressed firms, for which this model estimates impacts that are not much higher than half of the logit estimates. Nevertheless, the magnitude of the average impact is still reasonably large, reaching 16 percentage points in 2016. For financially distressed firms, the linear model also produces lower estimates of the average impact than the logit model, but the difference is relatively small (less than six percentage points). In short, the linear probability model attenuates the magnitude of the average impact of the minimum wage increases, but is in line with the conclusions derived from the logit model.

Table 2: 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

Notes: The numbers are the difference in the probability of exit between a firm with a value for the treatment variable equal to the average of that variable for the same category of firms (non-FDF or FDF) in each year, and a firm with the same characteristics but a zero value for the treatment variable. “Logit” uses the estimates in column (5) of Table 1. “LPM - A” and “LPM - B” use the estimates in columns (7) and (9), respectively.

We also estimated the linear probability model on the full sample of firms. The results are in columns (9) and (10) of Table 1. Extending the sample to include the firms that did not exit during 2014-2017 makes some difference. First, the dummy for financially distressed firms is no longer statistically significant. Second, and more importantly, the attenuation effect detected above is now much stronger. The estimated average impact is now in the range 0.2 – 1.2 for non-financially distressed firms, and in the range 0.6 – 4.1 for financially distressed firms.

3 Conclusion

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