Firing Costs and Productivity: Evidence from a Natural Experiment

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This paper.

We study the effect of **firing costs** on firm-level **productivity** (TFP).

Specifically: firms' response to a law harmonising notice periods for blue- and white-collar workers in Belgium

Motivation.

- Hsieh & Klenow (2009): Factor misallocation $\rightarrow$ TFP losses of 30%-60%
- Da-Rocha et al. (2019):
  - Simulations: **misallocation due to firing costs** $\rightarrow >$ 20% aggregate TFP loss
  - *"While the empirical evidence of factor misallocation across countries is overwhelming, the* ***connection with the specific policies [...] that create the bulk of misallocation remains elusive*** *"*

Motivation. Channels.

When firing costs ↗

- **Productivity ↘**
  - distortion of optimal hiring and firing (Bentolila & Bertola, 1990)
  - fewer productivity-enhancing investments (Da-Rocha et al., 2021)
- **Productivity ↗**
  - firms better screen new hires and invest more in automation (Autor et al., 2007)
  - workers invest more in firm-specific human capital (Acharya et al., 2014)

Results Preview & Contribution.

When firing costs ↗	Existing Literature	Our Paper
TFP	↘ (Bassasini et al., 2009; Cingano et al., 2010; Autor et al., 2007; Cingano et al., 2016)	↘

Results Preview & Contribution.

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(*) Important to account for employee types in the production function, *when their firing costs change differentially*

Results Preview & Contribution.

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Channels		
Hiring & firing freeze	Yes (e.g., Kugler & Pica, 2008; Marinescu, 2009)	Yes
Employee outsourcing	Yes (Autor et al., 2003)	Yes

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Employee outsourcing	Yes (Autor et al., 2003)	Yes
Workf. comp. changes	–	Yes
Cap.-labour substitution	Yes (Autor et al., 2007; Cingano et al., 2016)	No

Event. Change in Belgian Employment Protection Legislation.

- announced in July 2013, **effective from January 2014**
- improved outplacement rights & increased protection against unfair dismissals
- abolished trial periods
  - was $\leq 1y$ for white-collar & $\leq 2w$ for blue-collar employees
- **harmonised mandatory notice periods for blue- & white-collar workers**

Event. Harmonisation of Mandatory Notice Periods.

	Pre-regulation Seniority: 01/03-01/13		**Post-regulation** Seniority: 01/14-01/24	
	Notice period for White-Collar Employees			Δ
Gross salary $\leq$ 32,254	243 days	$\longrightarrow$	210 days	-33 days
Gross salary $>$ 32,254	303 days	$\longrightarrow$	210 days	-93 days
	Notice period for Blue-Collar Employees			
Hotel	48 days	$\longrightarrow$	210 days	+162 days
Textile	42 days	$\longrightarrow$	210 days	+168 days
Transportation	42 days	$\longrightarrow$	210 days	+168 days

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	Payment in lieu of notice (€40,000 salary)			
White-Collar	€43,000	$\longrightarrow$	€30,000	-€13,000
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Overall, **firing costs increased for blue-collar relative to white-collar workers**

Empirical Model.

$$TFP_{ist} = \beta \cdot Blue - collar_i \times Post_t + \Pi \cdot Controls_{it-1} + \mu_i + \theta_{st} + \varepsilon_{ist}$$

- Where TFP_{ist} is the residual from the production fct.
  - benchmark: output = value added & estimation following Ackerberg et al. (2015)
- **Highly robust** to alternative ways of estimating the production fct.
  - following Wooldridge (2009), translog production fct., time-varying elasticities, using revenues as output & materials as inputs
- **Important:** include worker types separately, otherwise: biased TFP estimates

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- Where: $Blue-collar_i = \begin{cases} 1, & Blue-collar\ share_{'09-'12} > p(50) \\ 0, & Blue-collar\ share_{'09-'12} \leq p(50) \end{cases}$, $Post_t = \begin{cases} 1, & t =' 14-' 17 \\ 0, & t =' 09-' 12 \end{cases}$
  - benchmark: compare matched "majority blue-collar" & "majority white-collar" firms
- **Additionally:** compare Belgian firms in "majority blue-collar" & "majority white-collar" industries to French & German firms
  - effect is symmetric and driven by blue-collar industries

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- $Controls_{it-1}$: lagged firm characteristics
  - $\ln(Assets)_{it-1}$, $Firm\,Age_t$, $(Total\,debt/Assets)_{it-1}$, $(EBITDA/Assets)_{it-1}$, $(Cash/Assets)_{it-1}$, $\ln(PPE/labour)_{it-1}$;
- μ_i: Firm FE
- θ_{st}: 2-digit sector x time FE

Results. Productivity.

	TFP (1)	TFP (2)	TFP (3)	TFP (4)
$Blue-collar_i \times Post_t$	-0.50*	-0.057***	-0.060***	-0.056***
	(0.028)	(0.017)	(0.014)	(0.013)
$Blue-collar_i$	0.088*	0.105***		
	(0.048)	(0.020)		
$Post_t$	0.020			
	(0.027)			
Obs.	48,852	48,852	48,852	48,852
R^2	0.001	0.780	0.941	0.944
Controls	No	No	No	Yes
Firm FE	No	No	Yes	Yes
2-digit NACE×year FE	No	Yes	Yes	Yes

- **TFP drops**: 5.6% for Blue- relative to matched White-collar firms
- **Dynamic model**: no effect during pre-period, persistent effect during post-period
- **Robust** to different TFP estimates, but key to account for worker types
- Cross-country comparison

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Results. Channels: Job Flows & Workforce Composition.

	Job flows		Workf. composition			Flex. margins	
	ln(Ent. emp.)	ln(Ex. emp.)	ln(Emp.)	ln(Blue emp.)	ln (White emp.)	ln(Outs. emp.)	ln(Hrs./ emp.)
$Blue-collar_i \times Post_t$	-0.088**	-0.071*	-0.018	-0.031	0.092***	0.080*	0.008*
	(0.037)	(0.042)	(0.014)	(0.020)	(0.021)	(0.042)	(0.003)
Obs.	44,917	45,772	48,852	48,852	48,852	29,515	48,852
R^2	0.820	0.844	0.978	0.964	0.944	0.833	0.751
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit NACE×year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- Hiring & firing decreases
- Workforce composition changes towards more white-collar workers
- Outsourcing & hours/employee increases

Results. Channels: Investments.

	(In)tangible Capital				Human Capital		
	ln(Tang. fix.)	ln(Mach. Equip.)	ln(Land, Build., ...)	ln(Intang. fix.)	Training (% emp.)	ln(Train. cost/emp.)	ln(Train. hrs/emp.)
$Blue - collar_i \times Post_t$	0.042*	-0.098	0.074**	-0.020	0.023	0.070	0.009
	(0.022)	(0.071)	(0.034)	(0.114)	(0.016)	(0.065)	(0.053)
Obs.	48,852	46,630	48,852	48,620	48,852	24,003	24,003
R^2	0.955	0.913	0.978	0.924	0.685	0.701	0.648
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit NACE×year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- No evidence of technology adoption
- No evidence of investment in human capital
- Constant elasticities further support view that production technologies do not change

Conclusion.

- We **study the effect of firing costs on productivity** in Belgium
  - corroborate existing evidence on a negative TFP effect & employment flows
  - provide **novel evidence** on workforce composition & investments
  - **highlight importance of accouting for heterogeneous effects on workers**
- **Policy:** balance benefits for workers with TFP effects, but also with effects on hiring, utilization & outsourcing
- **Theory:** importance of flexibility margins (outsourcing, utilization) when estimating TFP and evaluating effects of firing costs (Comin et al., 2021)

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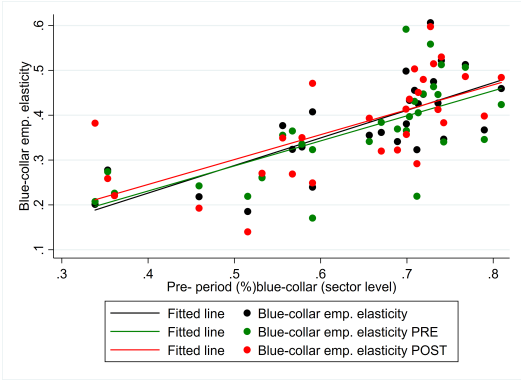
Thank you!

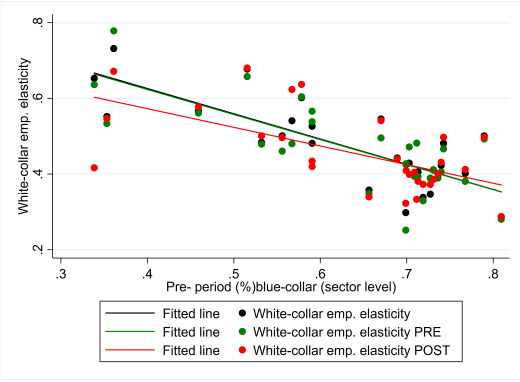
Appendix. Results. Alternative Control Groups.

	Blue-collar sectors	**White-collar sectors**	**Blue-collar sectors**	**White-collar sectors**
	Ln(Value added)	Ln(Value added)	Ln(Value added)	Ln(Value added)
$Belgian_i \times Post_t$	-0.028***	0.015**	-0.020**	0.017**
	(0.010)	(0.008)	(0.008)	(0.007)
Obs.	32,910	35,629	32,910	35,629
R^2	0.886	0.880	0.984	0.985
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
4-digit sector × year FE	Yes	Yes	Yes	Yes
4-digit sector × Country	Yes	Yes	No	No

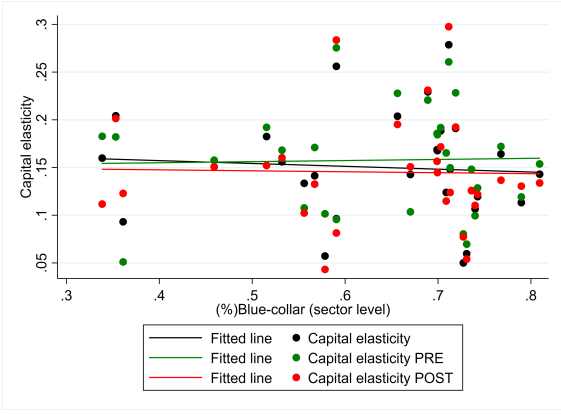
- Idea: compare (treated) Belgian firms to (untreated) German/French firms
- Have to rely on much less granular data back

Appendix. Elasticities - Worker Types.





Appendix. Elasticities - Capital.



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