Declining Business Dynamism in Europe: the Role of Shocks, Market Power, and Technology

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Introduction

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- Ongoing debate about potential factors: demographic shifts (Pugsley et al., 2015), declining knowledge diffusion (Akcigit & Ates, 2021), rising market power (De Loecker, Eeckhout & Mongey, 2021), and technological change (De Ridder, 2019; Chiavari, 2023)

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- Ongoing debate about potential factors: demographic shifts (Pugsley et al., 2015), declining knowledge diffusion (Akcigit & Ates, 2021), rising market power (De Loecker, Eeckhout & Mongey, 2021), and technological change (De Ridder, 2019; Chiavari, 2023)
- We bring **European data** to this debate.

Our Paper

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2. Analyze the microeconomic drivers underlying this decline, by examining the shocks and the responsiveness hypotheses (Decker, Haltiwanger, Jarmin, & Miranda, 2020)

3. Derive and apply a general framework that links differences in firms' market power and technology with responsiveness to productivity

Overview

Data

Facts on business dynamism in Europe

Shocks and responsiveness hypotheses

The role of market power and technology

Conclusions

Overview

Data sources

1. **CompNet micro-aggregated data** - 9th vintage
   - Firms with at least 20 employees (all firms for 14 countries)
   - Firms in all sectors, exc. financial, public, and real estate
   - Coverage: 1997-2020, but country-specific Details

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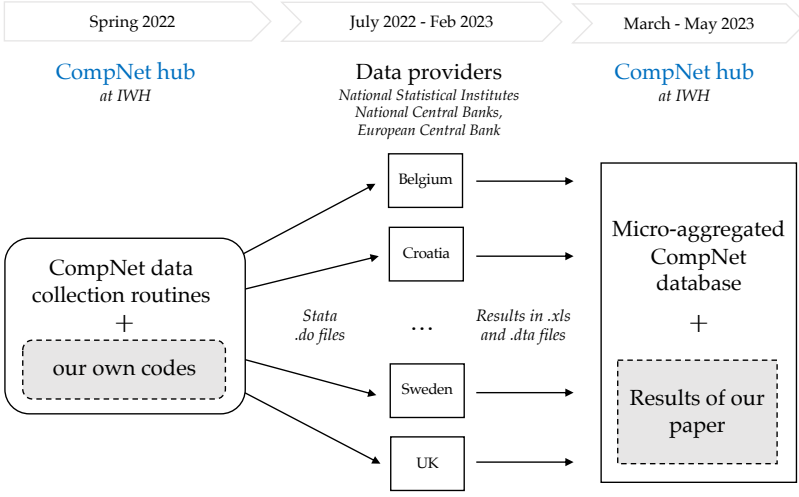
2. **Firm-product-level data** for the **German manufacturing sector** (*AFiD* modules, German Statistical Office)
   - Firms with at least 20 employees (1995-2017)
   - Allow us to estimate more flexible production functions

   → Used as robustness and to apply our framework

CompNet data collection process and timeline.



Main variables of interest

- **Aggregate job reallocation rate** defined as a weighted average of firm-level growth rates (Davis, Haltiwanger, & Schuh, 1996)

$$JR_t = \sum_i s_{it} \, |g_{it}| \tag{1}$$

  - where $g_{it} = \frac{L_{it} - L_{it-1}}{\overline{L}_{it}}$ with $\overline{L}_{it} = 0.5(L_{it} + L_{it-1})$ and employment weights $s_{it} = \frac{\overline{L}_{it}}{\sum_i \overline{L}_{it}}$

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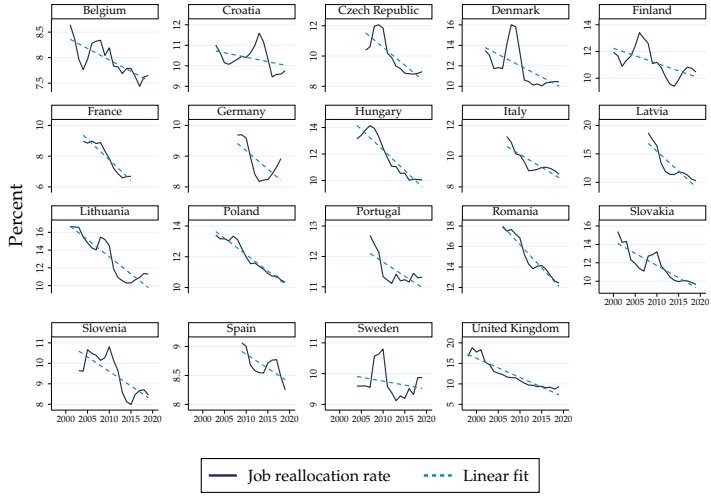
- **Share of employment of young firms** (age $\leq$ 5 years)

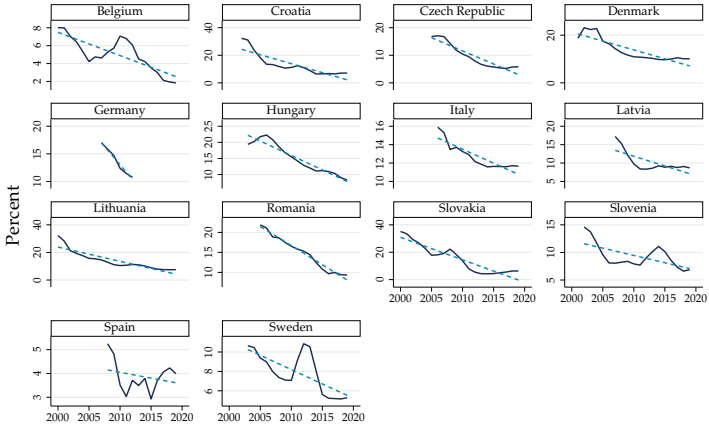
Overview

Fact 1. Declining *JR* all over Europe



Notes: 3-years MA. CompNet data, firms with at least 20 employees. ▸ Full sample

Fact 2. Declining shares of employment in young firms



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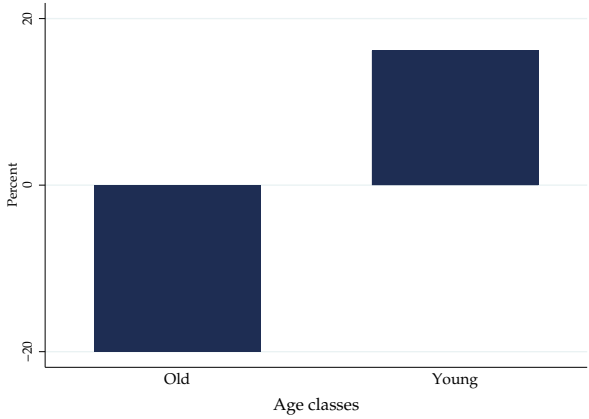
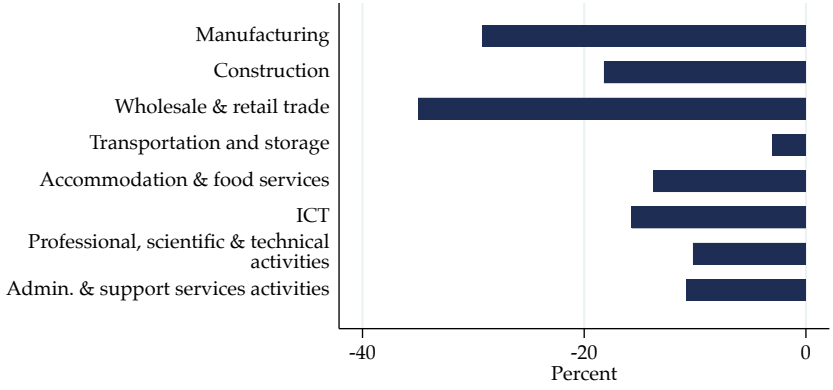
Fact 3. *JR* declined for mature firms but not for young firms



Notes: Average across countries of relative changes in *JR* by age-class. CompNet data, firms with at least 20 employees.

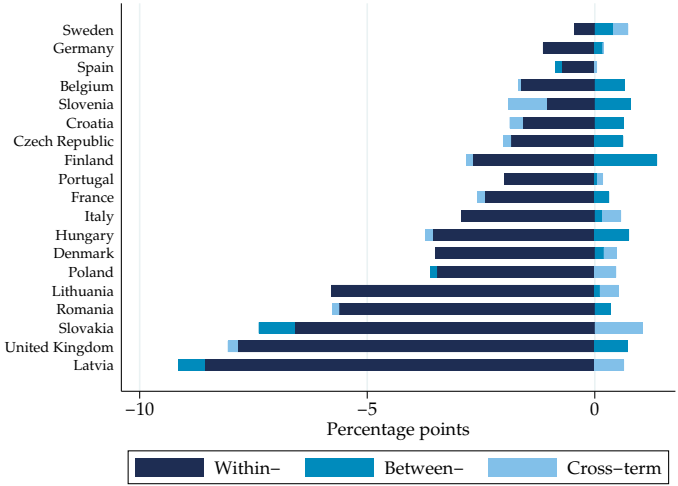
▸ FHK Decomposition ▸ Full sample

Fact 4. Widespread in all (macro)sectors



Notes: Average across countries of relative changes in *JR* by sector. CompNet data, firms with at least 20 employees. ▸ Full sample

Fact 5. Decline is driven by within-sector dynamics

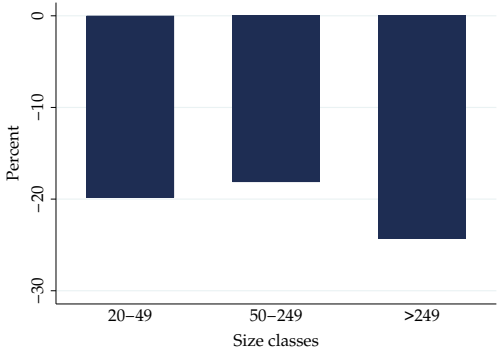


Notes: Decomposition of job reallocation changes across sectors. CompNet data, firms with at least 20 employees.

Decomposition details

Fact 6. Stronger decline among larger firms

(a) 20e sample



(b) All sample

Notes: Average across countries of relative changes in *JR* by size class. CompNet data. ▸ FHK decomposition

Overview

Declining job reallocation: hypotheses

- Decker, Haltiwanger, Jarmin & Miranda (2020) show that in standard models of firm dynamics a decline in the pace of job reallocation reflects either a **decline** in the
  1. dispersion of firm-level productivity **shocks**; *and/or*
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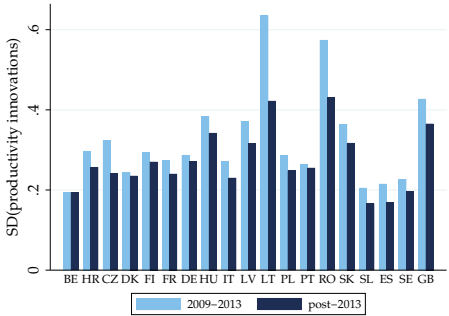
- We test the same hypotheses in Europe, following closely their approach to ensure a straightforward comparison.

1. Shocks hypothesis

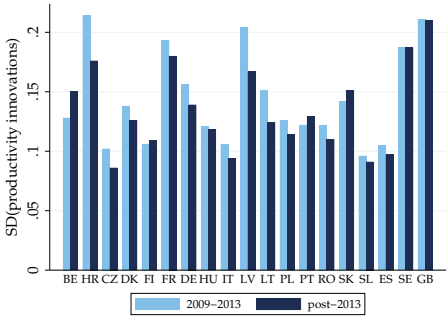
- We estimate a standard AR(1) process for productivity:

$$a_{it} = \rho_t \; a_{it-1} + \boldsymbol{\beta}'_{jt} \boldsymbol{X}_{jt} + \eta_{it} \tag{2}$$

(a) Labor Productivity



(b) Revenue-TFP



Notes: Standard deviation of productivity innovations η_{it}. Labor productivity is defined as value added per employee. Revenue-TFP as a residual from a PF estimated with cost-shares (median by industry-year). CompNet data, firms with at least 20 employees. ▸ ρ_t

2. Responsiveness hypothesis

- To test whether the responsiveness of labor demand to productivity has changed over time, we estimate:

$$g_{it} = \beta_0 + \beta_1 a_{it-1} + \beta_2 l_{it-1} + \delta_1 a_{it-1} T_t + \delta_2 l_{it-1} T_t + \boldsymbol{\beta}'_{jt} \boldsymbol{X}_{jt} + \epsilon_{it}. \quad (3)$$

where g_{it} is the DHS growth rate, a_{it-1} and l_{it-1} are lagged log productivity and employment, T is a time trend, and $\boldsymbol{X}_{jt}$ contains industry-year dummies.

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- We plot in the next figure $\widehat{\delta}_1$ / $\widehat{\beta}_1$

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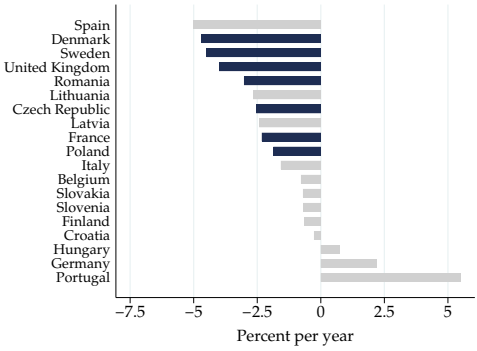

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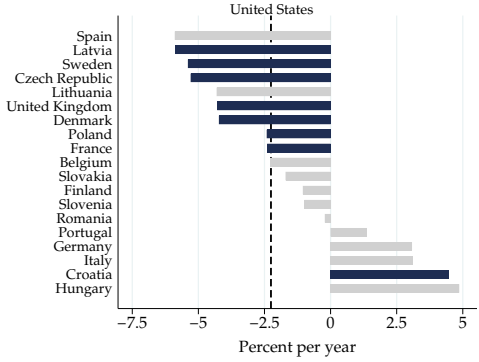

Notes: Relative changes in responsiveness over time. CompNet data, firms with at least 20 employees. Bars are colored in foo when both coefficients are significant at least at the 10% level. ▸ Full sample

- Decline of comparable magnitudes to the US (in relative terms).

Summing up

- US: $\uparrow$ shocks *vs.* $\downarrow$ responsiveness.

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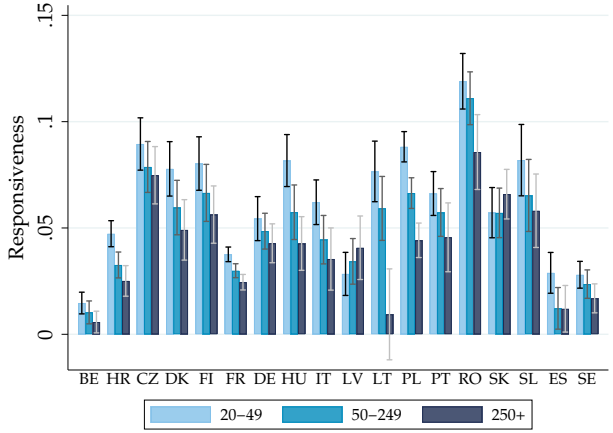
Summing up

- US: ↑ shocks *vs.* ↓ responsiveness.
- Europe: both shocks *and* responsiveness hypotheses appear relevant.
- We confirm this with the other database on German manufacturing firms (direct access, longer time span, refined productivity measures).
- DHJM argue that a **rise in adjustment costs** can rationalize the decline in responsiveness and job reallocation.
- However, labor markets in most European countries have become much more flexible in the last two decades (Eichhorst et al., 2017; Gehrke & Weber, 2018)

Gradient by size

- Moreover, we find that larger firms have lower responsiveness to productivity.



Notes: Estimated responsiveness to revenue-TFP by size class. CompNet data, firms with at least 20 employees.

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- Our contribution is to formalize this idea and to unpack the black box of firm responsiveness.
- We rationalize differences in responsiveness (across firms and over time) through variations in firms' market power, costs, and technology.
- Related to recent studies on increasing firm market power on product and labor markets, as well as changes in firms' production technology that replace labor with other inputs (De Loecker, Eeckhout, & Unger, 2020; Yeh, Macaluso, & Hershbein, 2022; Hubmer & Restrepo, 2021)

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Theoretical framework

- Firm i produces Q_{it} according to a Hicks-neutral production function

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- Profit-maximizing, (potentially) with market power in output and labor mkts

$$\Pi_{it} = P_{it}(Q_{it})Q_{it} - W_{it}(L_{it})L_{it} - V_{it}M_{it} - R_{it}K_{it}$$

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$$\Pi_{it} = P_{it}(Q_{it})Q_{it} - W_{it}(L_{it})L_{it} - V_{it}M_{it} - R_{it}K_{it}$$

- Take first-order conditions $\frac{\partial \Pi_{it}}{\partial L_{it}} = 0$ and rearrange

$$L_{it} = \frac{P_{it}Q_{it}}{\gamma_{it}\mu_{it}} \frac{\theta^L_{it}}{W_{it}} = F_{it}(\cdot) \frac{TFPR_{it}}{\gamma_{it}\mu_{it}} \frac{\theta^L_{it}}{W_{it}} \tag{4}$$

Decomposition of labor demand

- Take logs and first differences to obtain the employment growth rate

$$g_{it} \approx \Delta l_{it} = \underbrace{\Delta tfpr_{it} + \Delta f_{it}(\cdot)}_{\Delta r_{it}} + \Delta log(\theta^L_{it}) - \Delta log(\gamma_{it}) - \Delta log(\mu_{it}) - \Delta w_{it} \quad (5)$$

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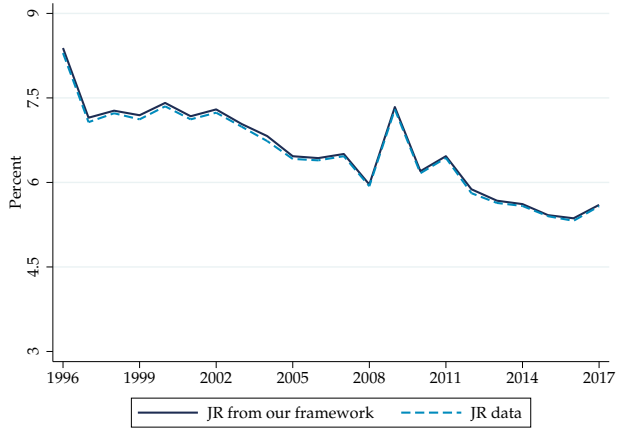
- We estimate at firm-year level θ^L_{it}, γ_{it} and μ_{it} based on Mertens (2020)

- Weighting (5) with employment yields the aggregate job reallocation rate as a sum of net changes in revenue, market power, technology, and wages:

$$\begin{aligned} \widehat{JR}_t &= \sum_i s_{it} \, |g_{it}| \\ &\approx \sum_i s_{it} |[\Delta r_{it} + \Delta log(\widehat{\theta^L_{it}}) - \Delta log(\widehat{\gamma_{it}}) - \Delta log(\widehat{\mu_{it}}) - \Delta w_{it}]| \end{aligned}$$

Empirical validation

- $\widehat{JR}$ retrieved in this way closely matches level and trend of actual JR



Notes: German manufacturing microdata, firms with at least 20 employees.

Decomposition of the responsiveness

- By dividing Δl by $\Delta tfpr$, we can decompose the responsiveness of employment to productivity (in terms of elasticity) into its drivers

$$\frac{\Delta l_{it}}{\Delta tfpr_{it}} = 1 + \frac{\Delta f_{it}(.)}{\Delta tfpr_{it}} + \frac{\Delta log(\theta^L_{it})}{\Delta tfpr_{it}} - \frac{\Delta log(\gamma_{it})}{\Delta tfpr_{it}} - \frac{\Delta log(\mu_{it})}{\Delta tfpr_{it}} - \frac{\Delta w_{it}}{\Delta tfpr_{it}}$$

- Responsiveness depends on both the *levels* and the *changes* in markups, markdowns, technology, and wages

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- Theoretical prediction: higher markups, markdowns, wages, and lower output elasticity of labor lead to lower responsiveness (Biondi, 2022)

Extended responsiveness regressions

We estimate

$$\Delta l_{it} = \beta_0 + \beta_{tfpr}\Delta tfpr_{it-1} + \quad \beta'_{int} \quad \Delta tfpr_{it-1} \times \quad \underbrace{\mathbf{\Lambda}_{it-1}}_{\begin{bmatrix} log(\mu_{it-1}) \\ log(\gamma_{it-1}) \\ w_{it-1} \\ log(\theta^L_{it-1}) \\ f(.)_{it-1} \end{bmatrix}} \quad + \beta'_{\Lambda}\mathbf{\Lambda}_{it-1} + \beta'_{jt}\boldsymbol{X}_{jt} + \epsilon_{it}$$

Extended responsiveness regressions

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$$\Delta l_{it} = \beta_0 + \beta_{tfpr}\Delta tfpr_{it-1} + \underbrace{\boldsymbol{\beta}'_{int}}_{\begin{matrix}0.39^{**}\\ -0.19^{***}\\ -0.044^{***}\\ -0.031^{*}\\ 0.023^{*}\\ 0.0001\end{matrix}} \Delta tfpr_{it-1} \times \underbrace{\boldsymbol{\Lambda}_{it-1}}_{\begin{bmatrix} log(\mu_{it-1}) \\ log(\gamma_{it-1}) \\ w_{it-1} \\ log(\theta^{L}_{it-1}) \\ f(.)_{it-1} \end{bmatrix}} + \boldsymbol{\beta}'_{\Lambda}\boldsymbol{\Lambda}_{it-1} + \boldsymbol{\beta}'_{jt}\boldsymbol{X}_{jt} + \epsilon_{it}$$

Notes: ***, **, * significant at the 1%, 5% and 10% level, with S.E. clustered at the firm level. German manufacturing microdata (1996-2017).

Ongoing work

- What is behind the decline in responsiveness?

$$\Downarrow \frac{\Delta l}{\Delta tfpr} = 1 + \frac{\Delta f(.)}{\Delta tfpr} + \underbrace{\frac{\Delta log(\theta^L)}{\Delta tfpr}}_{\downarrow} - \frac{\Delta log(\gamma)}{\Delta tfpr} - \underbrace{\frac{\Delta log(\mu)}{\Delta tfpr}}_{\uparrow} - \frac{\Delta w}{\Delta tfpr}$$

- Preliminary results: over time, firms increased their markups and decreased their output elasticity of labor relatively more in response to $\Delta tfpr > 0$

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- With responsiveness at the firm-year level, quantify the role of shocks and responsiveness in the overall decline of *JR*

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- We document a widespread reduction in job reallocation rates, mostly driven by within-sector dynamics and large firms
- Similarly to the US, we found that firms are becoming less responsive to productivity shocks. However, shock dispersion has declined too
- We propose and apply a novel framework to rationalize declining job reallocation via changes in firms' market power and technology

Thank you for your attention!

Country coverage

Belgium (2000-2020)	France (2003-202)	Lithuania (2000-2020)	Slovenia (2002-2021)
Croatia (2002-2021)	Germany (2001-2018)	Poland (2002-2020)	Spain (2008-2020)
Czech Republic (2005-2020)	Hungary (2003-2020)	Portugal (2004-2020)	Sweden (2003-2020)
Denmark (2001-2020)	Italy (2006-2020)	Romania (2005-2020)	UK (1997-2019)
Finland (1999-2020)	Latvia (2007-2019)	Slovakia (2000-2020)	

Note: For France, Germany, Poland, Romania, and Slovakia the only sample available is the one comprising firms with at least 20 employees. Sectors: Manufacturing, Construction, Transportation and storage, ICT, Professional activities, Administrative and service activities, Wholesale and retail trade.

Back

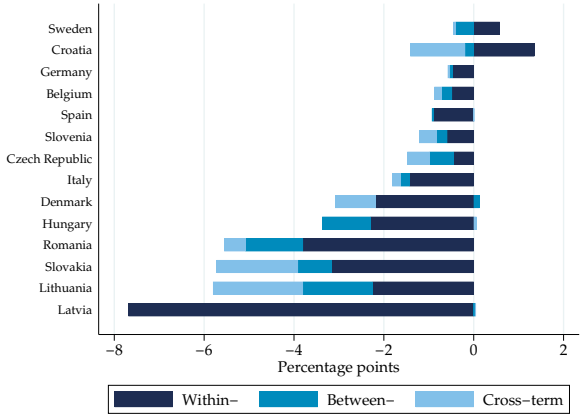
Decomposition details

- To quantify the contribution of within- and cross-sector changes, we apply the following decomposition (Foster, Haltiwanger, & Krizan, 2001):

$$\Delta JR_{c,(t-t_0)} = \underbrace{\sum_j s_{cjt_0}\, \Delta JR_{cj(t-t_0)}}_{\text{within-term}} + \underbrace{\sum_j \Delta s_{cj(t-t_0)}\, JR_{cjt_0}}_{\text{between-term}} + \underbrace{\sum_j \Delta s_{cj(t-t_0)}\, \Delta JR_{cj(t-t_0)}}_{\text{cross-term}} \tag{6}$$

where j indicates a sector within country c. s_{cjt_0} is the initial employment weight of sector j in c. Back

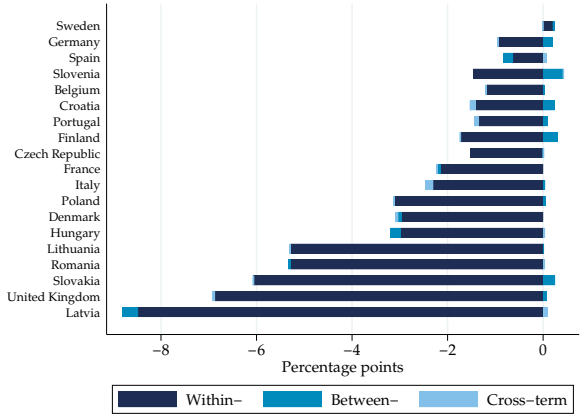
Fact 3: Decomposition by age



Notes: CompNet data, firms with at least 20 employees. ▸ FHK decomposition

▸ Back

Fact 6: Decomposition by size

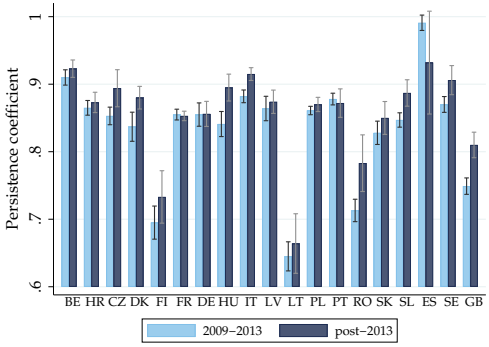


Notes: Decomposition of job reallocation changes across size classes. CompNet data, firms with at least 20 employees.

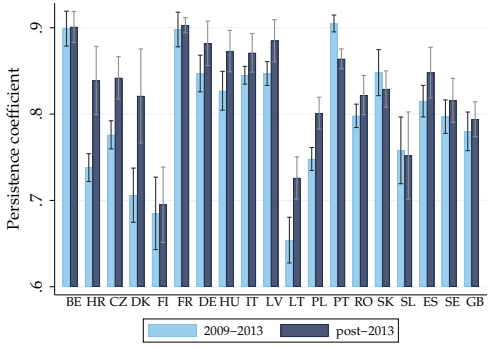
Back

Increasing persistence

(a) Labor Productivity



(b) Revenue-TFP

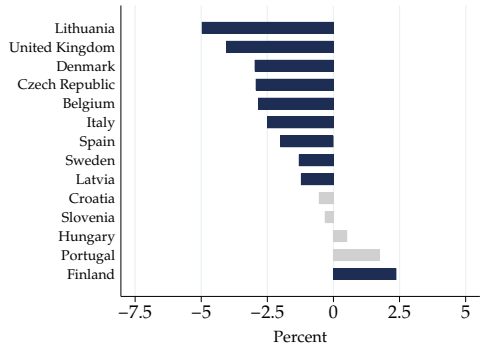


Notes: Estimated persistence in productivity dynamics in (2). CompNet data, firms with at least 20 employees.

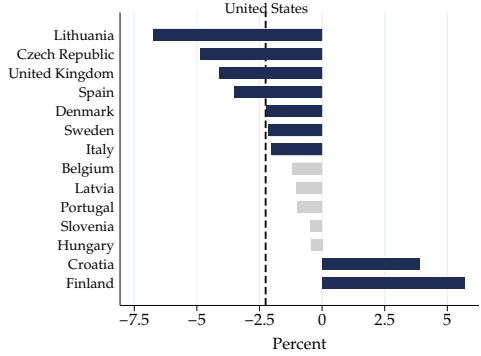
Back

Declining responsiveness over time - all sample

(a) Labor Productivity

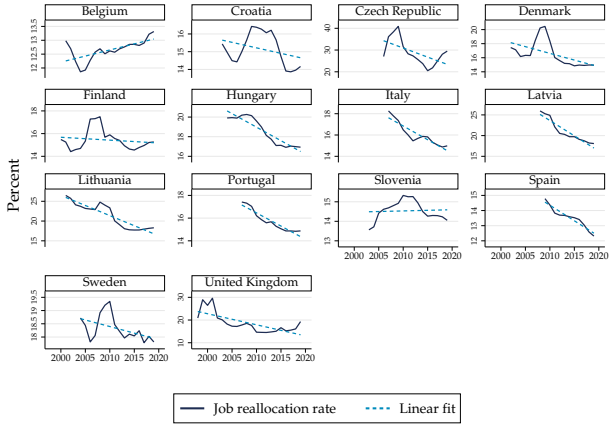


(b) Revenue-TFP



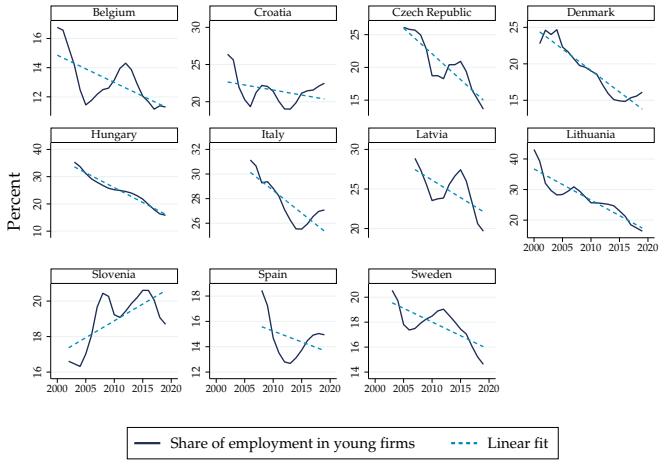
Notes: Relative changes in responsiveness over time. CompNet data, firms with at least 1 employee. Bars are colored in foo when both coefficients are significant at least at the 10% level. Back

Fact 1 - all sample



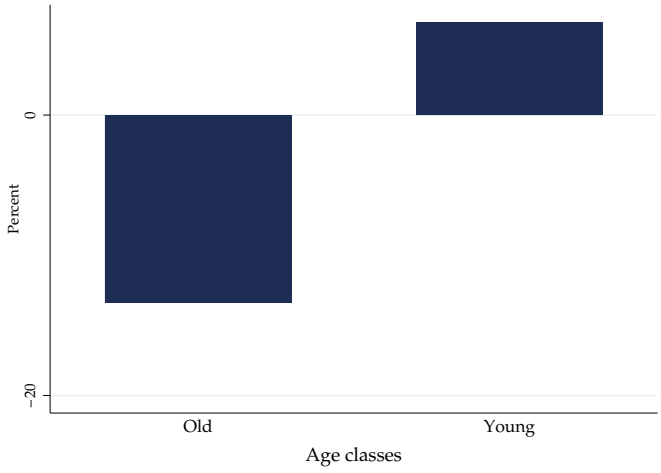
Back

Fact 2 - all sample



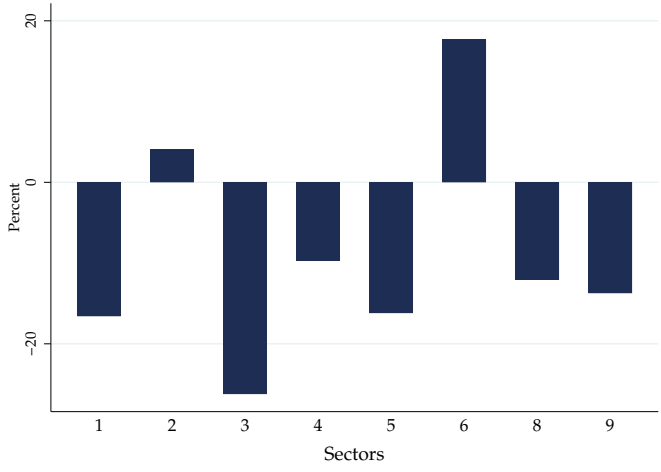
Back

Fact 3 - all sample



Back

Fact 4 - all sample



Back