



Firm Responsiveness over the Business Cycle

New Evidence From Europe

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Roadmap

- 1 Motivation
- 2 Literature
- 3 Data and Methodology
- 4 Empirical Findings
- 5 Conclusion

Motivation

- ▶ **Key Question:** How do firms respond to changes in profitability?
- ▶ **Why It Matters:**
 - Impacts on aggregate employment and output
 - Facilitates resource reallocation and aggregate productivity
- ▶ **Firm Responses:**
 - **Employment:** Adjusting workforce or hours worked
 - **Capital:** Investing in tangible and intangible assets

- ▶ **Firm Responsiveness and Productivity Dynamics:** Decker et al. (2020); Cooper et al. (2023)
- ▶ **Business Cycles and Adjustment Patterns:** Salgado et al. (2019); Caggese & Pérez-Orive (2022)

Research Gap:

- ▶ Limited evidence on cross-country responsiveness
- ▶ Lack of insights into tangible/intangible capital adjustments

Data

- ▶ Micro data infrastructure (MDI), created under the EU Technical Support Instrument project¹.
- ▶ Datasets: BR and BS.
- ▶ Focused on manufacturing firms in the Netherlands and France (2010–2019).

¹The MDI received funding from the H2020 project grant Microprod, 2019-222, and the EU TSI project, European Commission, Directorate-general for Structural Reform Support under grant agreement No. 101101853 and No. 101140673 (Austria).

TFP Estimation

- ▶ Production functions are estimated at the two-digit manufacturing sector level, following Akerberg et al. (2015)²:

$$\log \text{Revenue}_{i,t} = \alpha \log \text{Employment}_{i,t} + \beta \log \text{Capital}_{i,t} + \varepsilon_{i,t}$$

- ▶ TFPR is assumed to follow an AR(1) process, and $\eta_{i,t}$ is the unexpected component:

$$\varepsilon_{i,t} = \rho \varepsilon_{i,t-1} + \eta_{i,t}, \quad \eta_{i,t} \sim \mathcal{N}(0, \sigma_{\eta}^2)$$

² tool available in MDI

Responsiveness Analysis

$$y_{i,t} = \beta_0 + \beta_1 \eta_{i,t-1} + \beta_2 D_t + \beta_3 \eta_{i,t-1} D_t \\ + \alpha_1 \eta_{i,t-1}^2 + \alpha_2 \eta_{i,t-1}^2 D_t + \gamma X_{i,t} + \varepsilon_{i,t}$$

- ▶ **Extensive Margin:** Probability of adjustment ($\mathbf{1}^{adj} = 1$):
 - A firm's growth rate in employment exceeds 2.5% in absolute value.
- ▶ **Intensive Margin:** Magnitude of adjustment ($g_{i,t}$)
- ▶ Incorporates economy-wide state (D_t) and convexity of responses

Extensive Margin Response

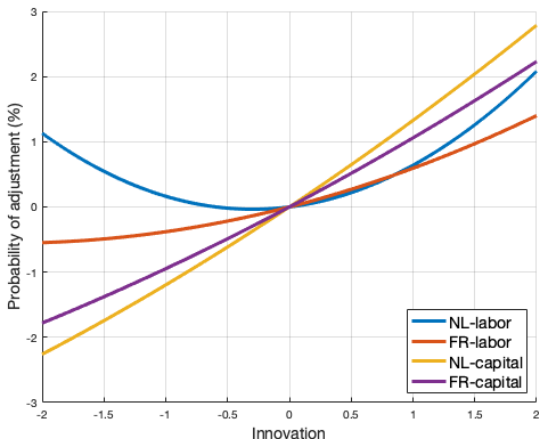


Figure: Extensive margin responsiveness

Notes: The figure plots the extensive margin responsiveness of firms as the sum of the linear and quadratic coefficient of the above regression for the Netherlands and France.

Intensive Margin Response

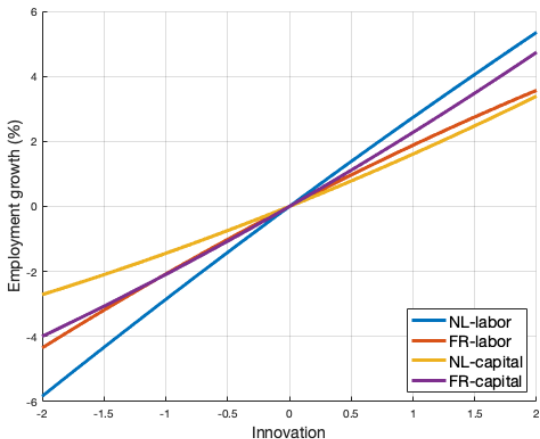


Figure: Intensive margin response

Notes: The figure plots the intensive margin responsiveness of firms that do actually adjust.

Extensive Margin Response over BC

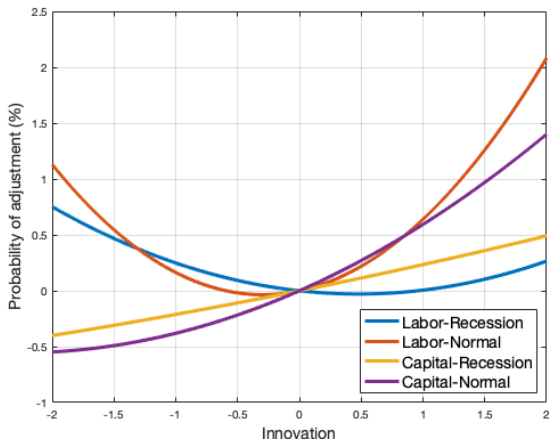


Figure: Extensive margin responsiveness over the business cycle

Notes: The figure plots the extensive margin responsiveness of firms during a recession as the sum of the linear and quadratic coefficient of the above regression for the Netherlands.

Empirical Findings

Preliminary Results:

- ▶ Cross-country differences in responsiveness
- ▶ Lower adjustment probabilities (labour and capital) during recessions
- ▶ Convex response patterns in the Netherlands (extreme shocks → higher responsiveness)

Conclusion

Key Insights:

- ▶ Cross-country differences in the probability that firms respond to changing profitability
- ▶ Adjustments are less frequent during recessions
- ▶ Convex response patterns in the Netherlands

Next Steps:

- 1 Analysis over more countries (Finland, Slovenia, Portugal,...)
- 2 Disaggregate into tangible and intangible capital
- 3 Explore heterogeneity by firm size, age, and export status
- 4 Investigate drivers of cross-country differences

Thank you!

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