Declining Business Dynamism in Europe:

The Role of Shocks, Market Power, and Technology

NBER SI CRIW, Cambridge
July, 2024

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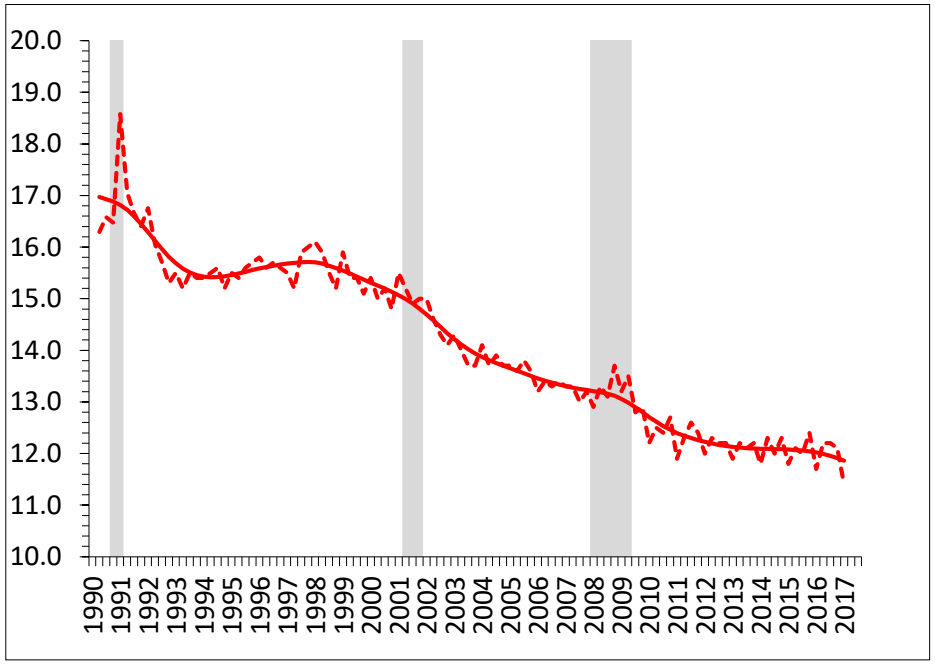
Declining Business Dynamism in U.S. is Evident from Multiple Data Sources and Indicators

Job Reallocation Rate, U.S. Private Non-Farm (Quarterly)

Source: BED



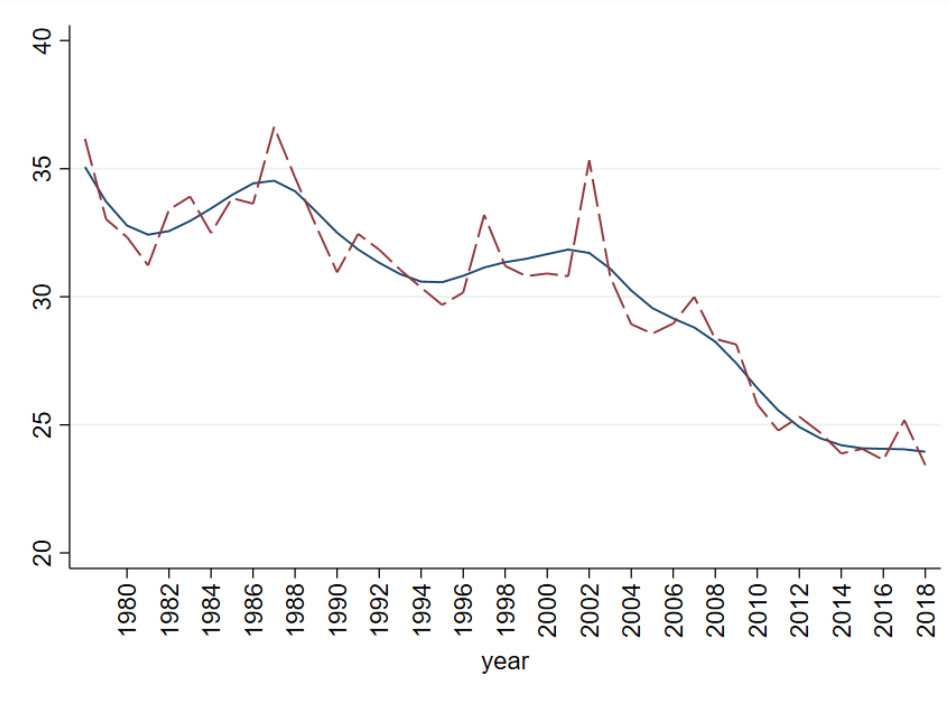
Dashed lines are Hodrick-Prescott Trends

- Declining Trend in Job Reallocation Accelerated in Post-2000 Period. Trend decline continues in post-Great Recession period.

- Reallocation closely connected to productivity growth.

Job Reallocation Rate, U.S. Private Non-Farm (Annual), HP Filter Trend

Source: BDS



- Similar patterns in Europe

Literature

Relevant literature

The role of business dynamism

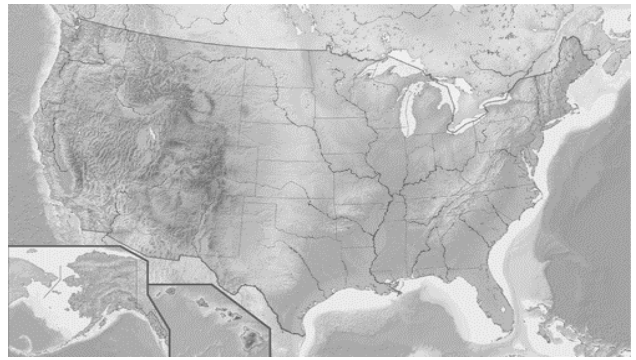
Productivity growth (Haltiwanger et al. (2014) Decker et al. (2020);
Innovation (Haltiwanger et al. (2014), Acemoglu et al. (2018), Akcigit & Ates (2021);
Recoveries (Pugsley & Sahin (2014)).

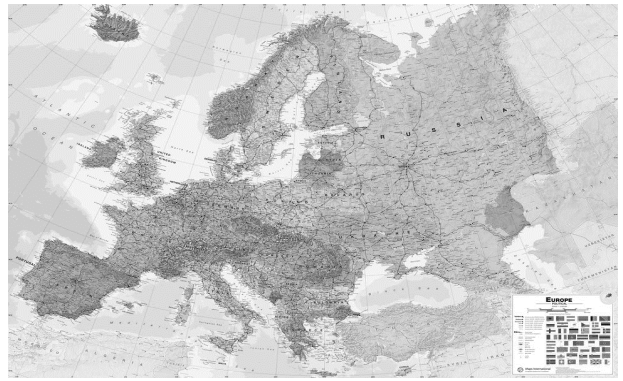
Literature

Decker et al. (2020), Maarten De-Ridder (2023), Criscuolo et al. (2015), Akcigit & Ates (2021), Karahan et al. (2016), De Loecker et al. (2021)….

European literature

Bijnens & Konings (2020, Belgium), Akcigit et al. (2020, Turkey),
Several policy reports from the OECD -> All find declining business dynamism outside the US





Contributions

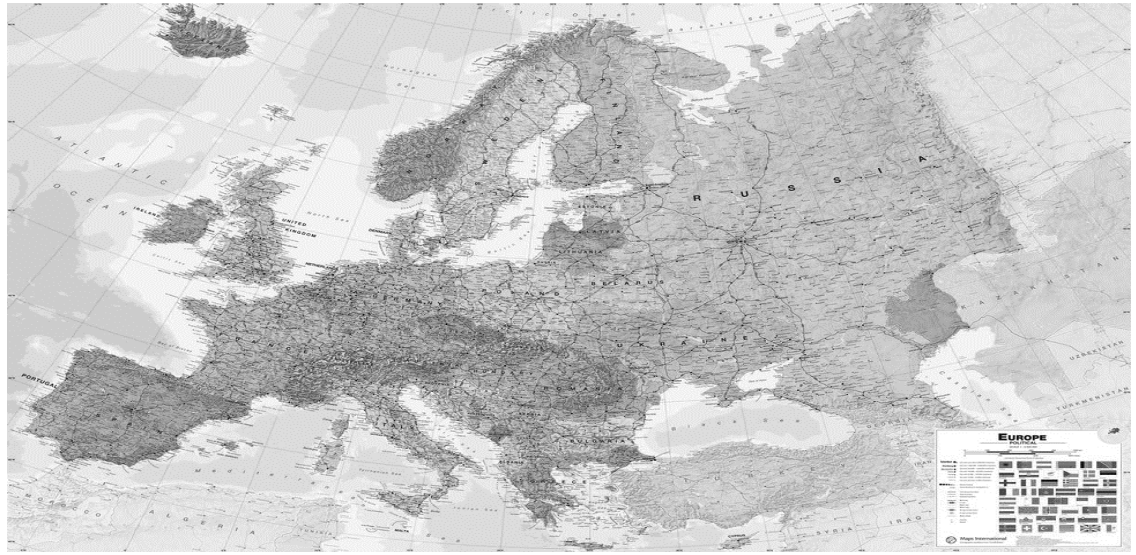
What do we do?

Data:

There is a lack of European wide data to study business dynamism. We gather **new data** for 19 European countries and document **new facts** on business dynamism in Europe.

Mechanisms behind business dynamism:

We derive a framework showing how market power and technology affect firms‘ labor demand and job reallocation rates between firms using German data.



Preliminary Findings

Declining business dynamism in almost every country in our data

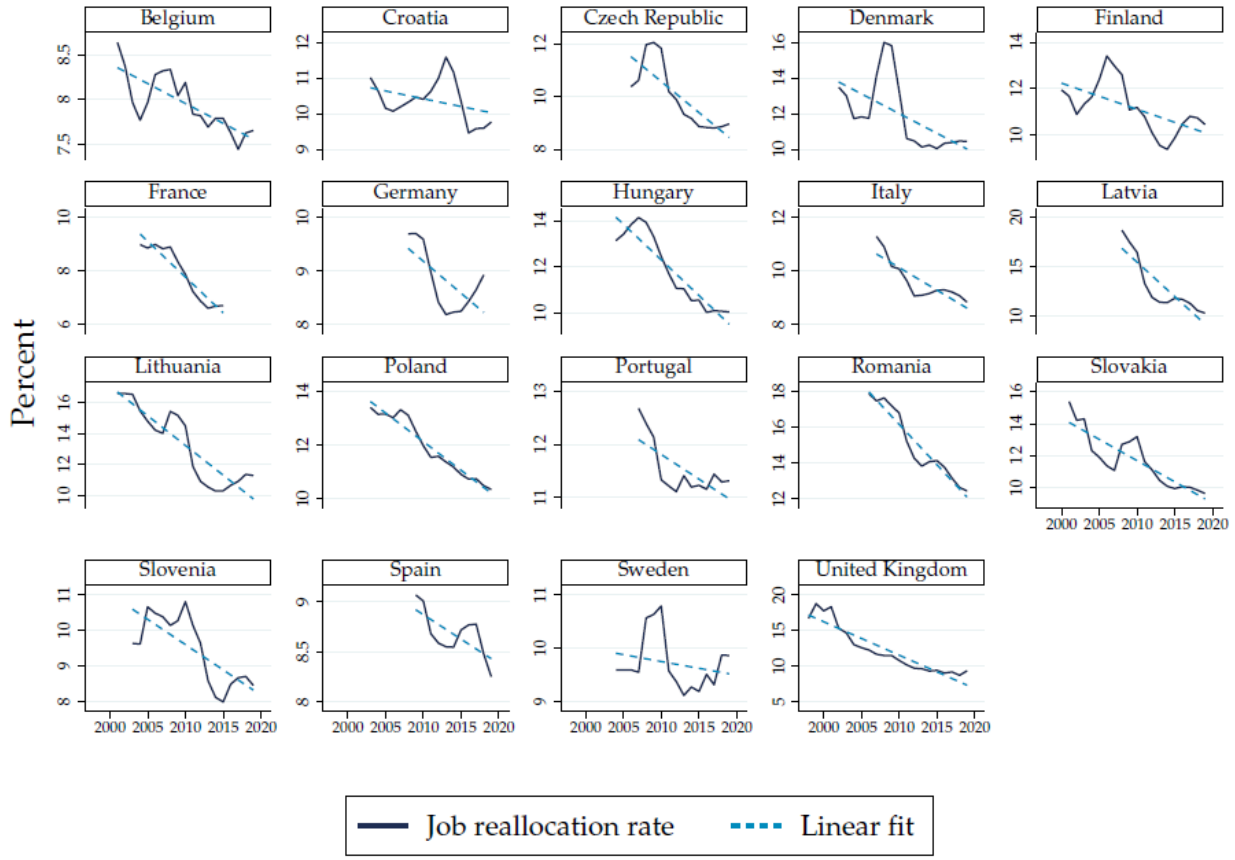
Firm responsiveness to productivity shocks declines similar to the US

Important role of technology and market power in driving decline

Business Dynamism in Europe

Fact 1. There is a pervasive decline in job reallocation in Europe.

Figure 2. Job reallocation rates in European countries.



Notes: Three-year moving averages of the job reallocation rates defined in Equation (1). The light blue dashed lines report linear trends. Germany excludes the construction sector in 2009. CompNet data, firms with at least 20 employees.

Business Dynamism in Europe

- Broad declines across
  - Geographies
  - Industries
  - Firm size
- Sharp decline in young firm activity
  - Very large for high-growth
- Composition effects account for 15% of the decline
  - Within effects dominate
- Consistent with US
  - Common drivers across very different regions (for broad patterns)

Empirical Framework: Part I
Decline in Dynamism: Shocks vs Responsiveness?

(German Manufacturing Sector)

Shocks vs Responsiveness

Canonical models of firm dynamics posit

- Reallocation is the result of businesses response to changing environment. Businesses facing positive productivity/profitability conditions enter/expand. If weak conditions then exit/contract => allocative efficiency
- Decline in reallocation:
  - **Shock Hypothesis:** the dispersion of idiosyncratic productivity or profitability realizations (shocks) has declined **=>** no incentive to change.
  - **Responsiveness Hypothesis:** businesses become more sluggish in responding to realized shocks **=>** weakened productivity selection and possibly large impacts on aggregate productivity.

Agnostic at this time about reasons for sluggishness

Empirical Strategy (AER 2020)

From canonical models estimate:

- $g_{it} = f_t(a_{it}, l_{it-1}), \qquad with \ \frac{\partial f_t}{\partial TFPR_{it}} > 0$

- Standard formulation from wide range of models of firm dynamics
- Can attribute empirical changes in g_{et} to:
  1. Changes in the distribution of a_{et} (shocks)
  2. Changes in the marginal responsiveness of g_{et} to a_{et}. The estimated **β** (Response)

<u>Our innovation:</u> We decompose the **β** into components related to:

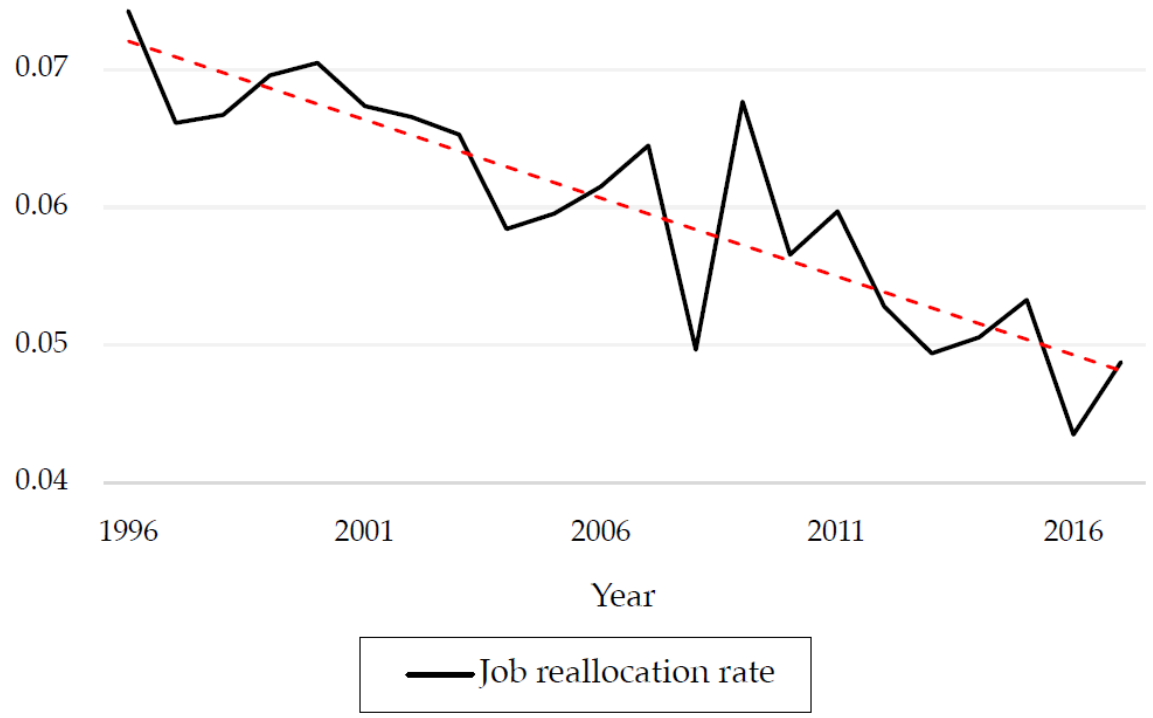
1. Frictionless/Trechnological components
2. Frictions/market power

Firms' responsiveness in the German manufacturing Sector: Data

- Data: AFiD-Panel Industrial Companies
- Unit: **Enterprise level** with product and price information
- Coverage: all manufacturing industries and German states
- Features:
  - **20+**, 40% rotating sample for most variables, (exclude exits)
  - Some variables available for all firms from 2002 (employment, sales).
- Years: 1995-2021
- Observations: +180,000 firm year
- Selected variables: economic sector, number of employees, turnover (domestic and foreign turnover), investments, hours worked, wages and salaries, sales

Reallocation Rates: German Manufacturing Sector

Figure 7. Evolution of job reallocation rates in the German manufacturing sector.



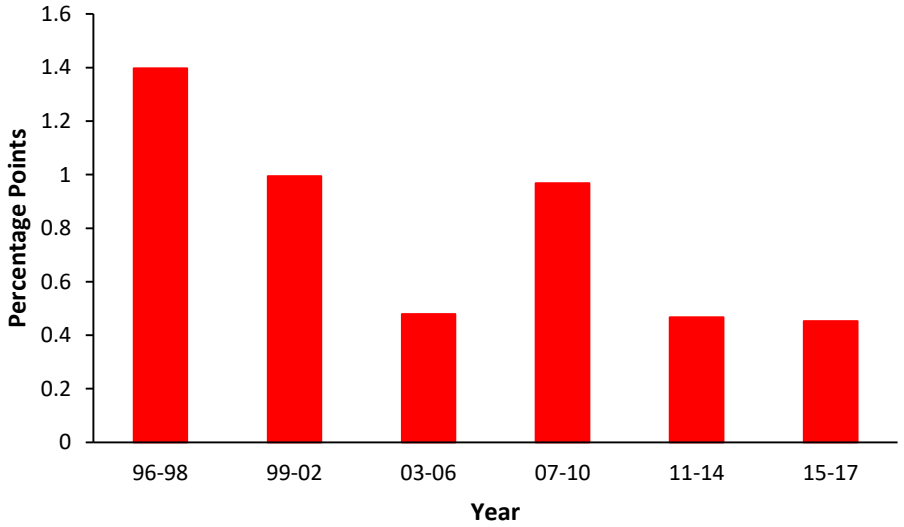
Firms' responsiveness in the German manufacturing Sector

Table 2. Responsiveness to productivity in the German manufacturing sector.

	Dependent variable: Employment growth rate (g_{ijt})					
	Productivity in levels ($tfpr_{ijt-1}$)			Productivity in first-differences ($\Delta tfpr_{ijt-1}$)		
	All firms	**Small firms**	**Large firms**	**All firms**	**Small firms**	**Large firms**
Period	(1)	(2)	(3)	(4)	(5)	(6)
1996-1998	0.0482***	0.0616***	0.0508***	0.0637***	0.0947***	0.0619***
	(0.0110)	(0.0090)	(0.0127)	(0.0207)	(0.0321)	(0.0217)
1999-2002	0.0343***	0.0425***	0.0365***	0.0344***	0.0655***	0.0313**
	(0.0066)	(0.0066)	(0.00759)	(0.0131)	(0.0205)	(0.0145)
2003-2006	0.0165***	0.0326***	0.0165**	0.0515***	0.0523***	0.0525***
	(0.0059)	(0.0071)	(0.0068)	(0.0114)	(0.0114)	(0.0128)
2007-2010	0.0334***	0.0305***	0.0353***	0.0775***	0.0513***	0.0815***
	(0.0052)	(0.0041)	(0.0059)	(0.0137)	(0.00924)	(0.0155)
2011-2014	0.0161***	0.0268***	0.0157***	0.0182*	0.0349***	0.0162
	(0.0044)	(0.0033)	(0.0049)	(0.0103)	(0.0131)	(0.0115)
2015-2017	0.0156***	0.0259***	0.0149***	0.0292	0.0500***	0.0268
	(0.0045)	(0.0043)	(0.0049)	(0.0197)	(0.0133)	(0.0216)
Lagged labor control	yes	yes	yes	no	no	no
Industry-Year FE	yes	yes	yes	yes	yes	yes
Observations	180,022	87,108	92,914	122,659	52,675	69,984
N of firms	38,721	25,785	16,533	27,480	16,847	12,602
R^2	0.053	0.039	0.057	0.048	0.038	0.052

Notes: Results from estimating firms' responsiveness using productivity levels (columns 1-3) and differences (4-6) on the right-hand side. Productivity variables are interacted with a full set of period dummies. All regressions include industry-year fixed effects. The specifications in levels also include a full set of interactions between period dummies and lagged labor. In columns (1) and (4), we report results for all firms, while in (2) and (5) for small firms (less than 100 employees), and in (3) and (6) for firms with more than 100 employees. ***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively. German micro data.

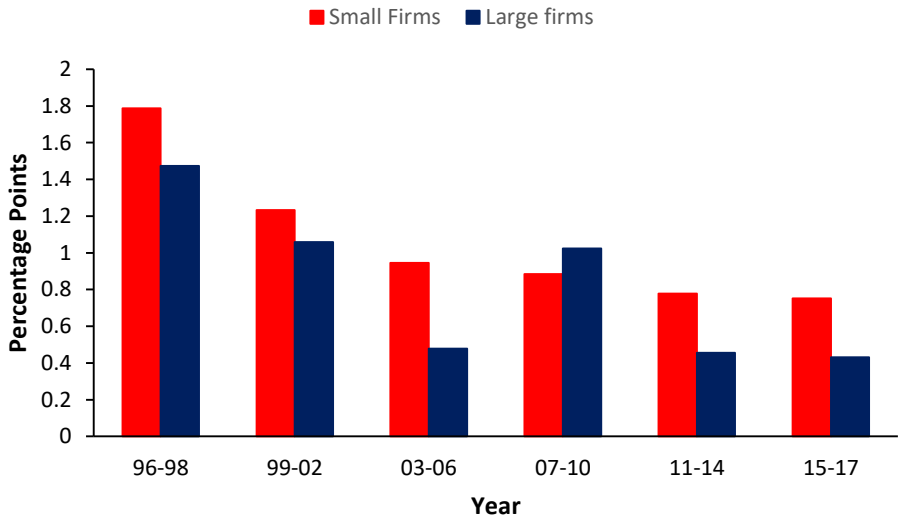
Firms' employment growth responsiveness: German manufacturing Sector: By Year



Note: Compares employment growth rate of firm that is one standard deviation above its industry-year mean productivity, versus the mean.

Responsiveness is 1/3 of what it used to be

Firms' employment growth responsiveness: German manufacturing Sector: By Year & Size

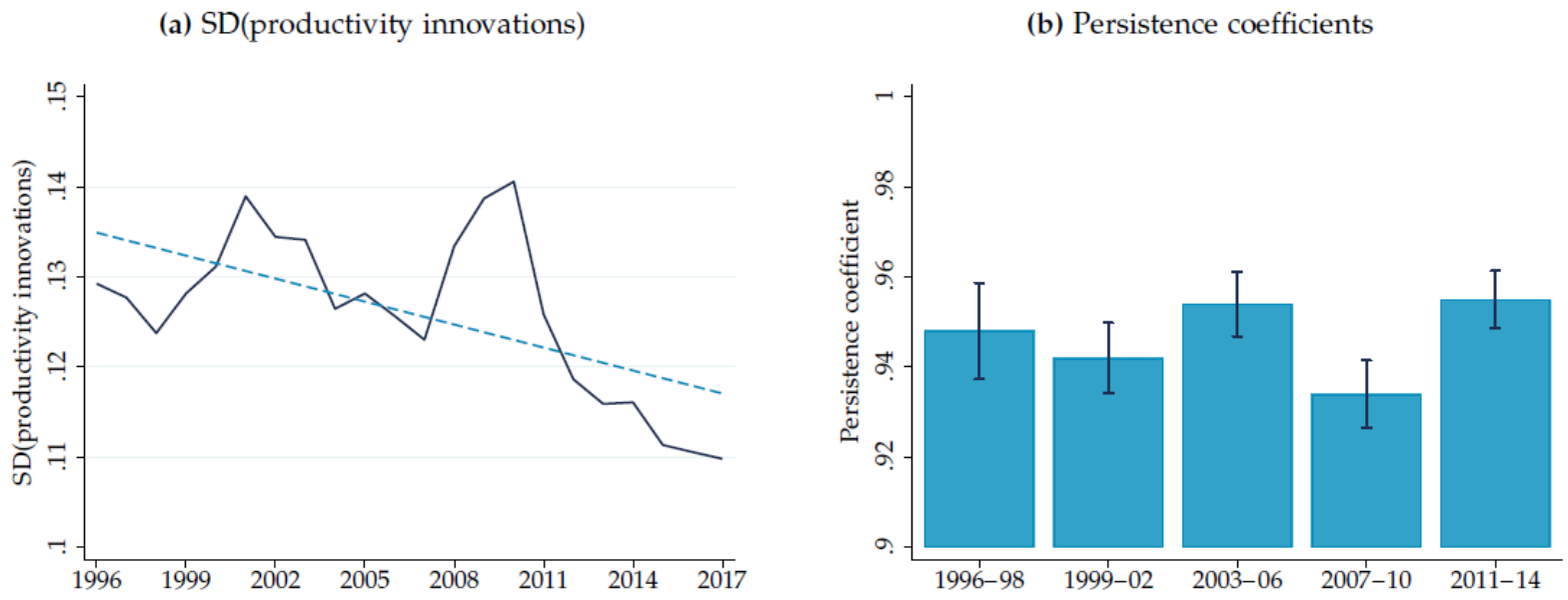


Note: Compares employment growth rate of firm that is one standard deviation above its industry-year mean productivity, versus the mean.

Responsiveness for small firms is 40% what it used to be
Responsiveness for large firms is 30% of what it used to be

Shock Hypothesis: German manufacturing Sector

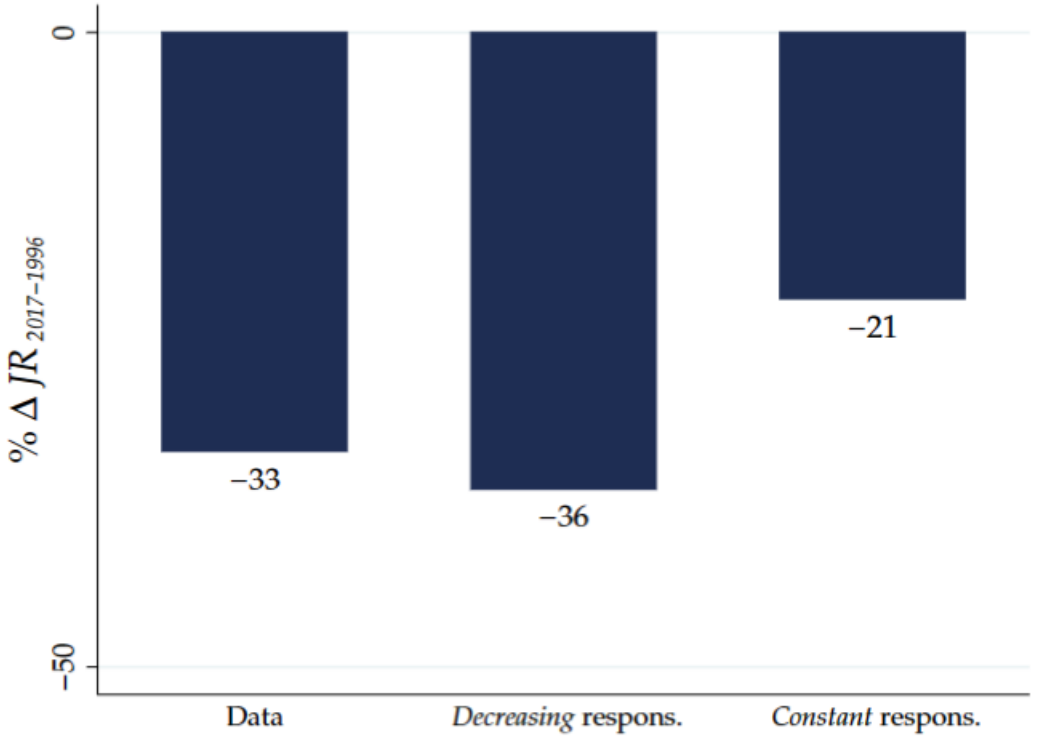
Figure 16. Productivity dynamics in the German manufacturing sector.



Notes: Estimates based on an AR(1) process for $TFPR_{it}$ that controls for industry-year fixed effects and is estimated separately for six periods (1996-1998, 1999-2002, 2003-2006, 2007-2010, 2011-2014, 2015-2017). The regressions feature 180,022 observations. In sub-figure (a), the solid line indicates the standard deviation (SD) of the residuals. The dashed line is a linear trend. In sub-figure (b), the bars indicate the persistence coefficients with 90% confidence intervals. German microdata.

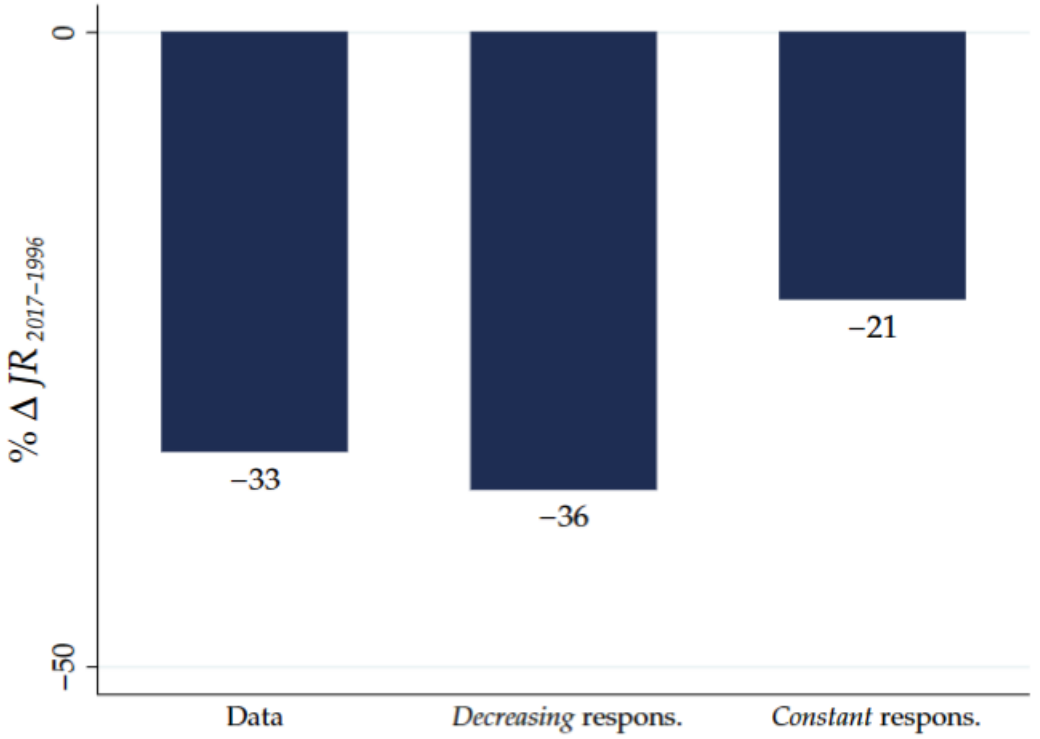
Decline in productivity dispersion particularly later part of the period

Counterfactuals from Policy Functions: Responsiveness vs Shocks



42% of the decline in reallocation is due to declining responsiveness
Remaining decline from changes in productivity shock dynamics

Counterfactuals from Policy Functions: Responsiveness vs Shocks



What drives the European decline in productivity shock dynamics??

Empirical Framework: Part II
Exploring Role of Market Power and Technology
(German Data)

Mechanisms behind declining job reallocation

Drivers of business dynamism

OUR CONTRIBUTION: **a framework linking market power and technology to declining responsiveness.**

Production: $Q_{it} = Q_{it}(L_{it}, K_{it}, M_{it}) * TFP_{it}$

Q = quantity, K = capital, L = labor, M = intermediates
$TFPR_{it} = TFP_{it} * P_{it}$, with P_{it} = output price

Profit maximization: $P_{it}(Q_{it})Q_{it} - w_{it}(L_{it})L_{it} - z_{it}M_{it} - r_{it}\,K_{it}$

FOC labor: $w_{it}\left(1 + \frac{1}{\varepsilon^L}\right) = \frac{P_{it}}{\mu_{it}} MPL_{it}$

ε^L= labor supply elasticity, μ_{it} = markup , MPL_{it} = marginal product of labor

Mechanisms behind declining job reallocation

Drivers of business dynamism

Reformulating: $L = \frac{P_{it}Q_{it}}{\gamma_{it}} \frac{\theta_{it}^{L}}{w_{it}} = f(.) \frac{TFPR_{it}}{\mu_{it}\gamma_{it}} \frac{\theta_{it}^{L}}{w_{it}}$

θ_{it}^{L}= output elasticity of labor
w_{it}= wage
f(.)= production function specification (CD, translog,…)

} Frictionless/technological components

$\gamma_{it} = \left(1 + \frac{1}{\varepsilon^{L}}\right)$ firms‘ monopsony power
μ_{it} = firms‘ product market power (markup)

} Frictions/market power components

Mechanisms behind declining job reallocation

Drivers of business dynamism

Taking logs and first differences:

$$g_{i,t+1} \cong \Delta l_{i,t+1} = l_{t+1} - l_t = \Delta TFPR_{it} + \Delta f(.)_{it} + \Delta \log(\theta_{it}^{L}) - \Delta \log(\gamma_{it}) - \Delta \log(\mu_{it}) - \Delta \log(W_{it})$$

$\Delta f(.)_{it}$= is the production function, (i.e., output) net of the productivity term

$\theta_{it}^{L} = \frac{\partial q_{it}}{\partial l_{it}}$ where ∂q_{it} is the translog production function

$\mu_{it} = \theta_{it}^{M} \frac{P_{it}Q_{it}}{V_{it}M_{it}}$ and $V_{it} = MRPM_{it}$ following DeLoecker & Warzynski (2012)

$\gamma_{it} = \frac{\theta_{it}^{L}}{\theta_{it}^{M}} \frac{V_{it}M_{it}}{W_{it}L_{it}}$ following Dobbelaere & Mairesse (2013)

NOTE: The average markup, markdown, and labor output elasticity equal 1.07, 1.08, and 0.30, respectively

Mechanisms behind declining responsiveness

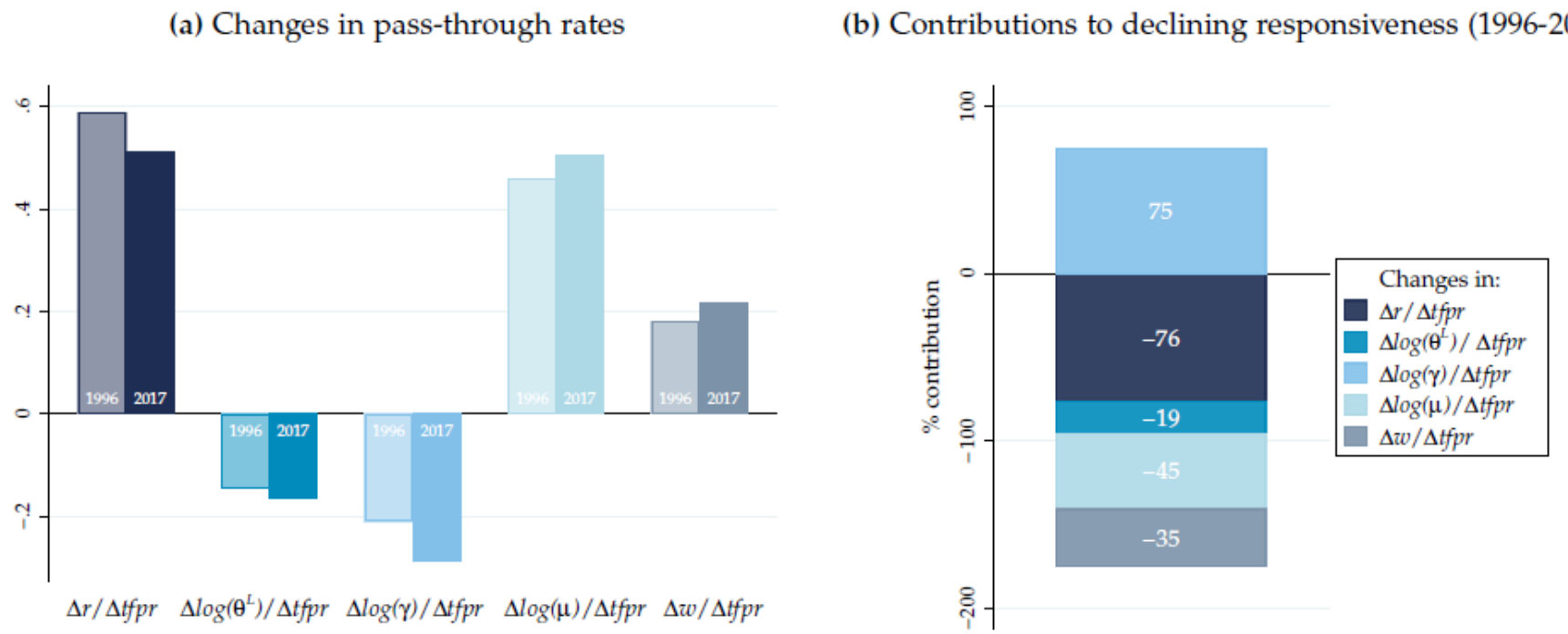
$$\frac{\Delta l_{it}}{\Delta TFPR_{it}} = 1 + \frac{\Delta f(.)_{it}}{\Delta TFPR_{it}} + \frac{\Delta \log(\theta_{it}^{L})}{\Delta TFPR_{it}} - \frac{\Delta \log(\gamma_{it})}{\Delta TFPR_{it}} - \frac{\Delta \log(\mu_{it})}{\Delta TFPR_{it}} - \frac{\Delta \log(W_{it})}{\Delta TFPR_{it}}$$

- We analyze how pass-through elements have changed over time
  - Start from estimated production function parameters
  - Take weighted means of each of the pass-through elements
  - Compare changes in pass-through between 1996 and 2017

Changes in Aggregate Market Power & Technology: 1996 to 2017

Declining responsiveness: Shocks, Market Power, Technology

Figure 19. Results of the responsiveness decomposition.



Notes: Changes in the components of responsiveness, i.e. right-hand side terms of Equation (12) (Panel (a)) and their contribution to decline in responsiveness (Panel (b)). Based on sub-sample with $|Deltatfpr| \geq 0.01$, i.e. productivity change of at least 1%. German microdata.

Declining responsiveness: Shocks, Market Power, Technology

- Factors affecting markdowns:
  - Factors affecting worker mobility:
    - non compete agreements
    - regulations regarding immigrants
  - Increase in firm specific skills (creates lock-in)
  - Rise in switching costs: cost of relocation, cost of learning new systems
- Factors affecting markups:
  - Market concentration
  - Product differentiation
  - Cost efficiency (superstars)
  - Network effects (lock-in)
  - Branding

Conclusion

Summary and Implications

Conclusion

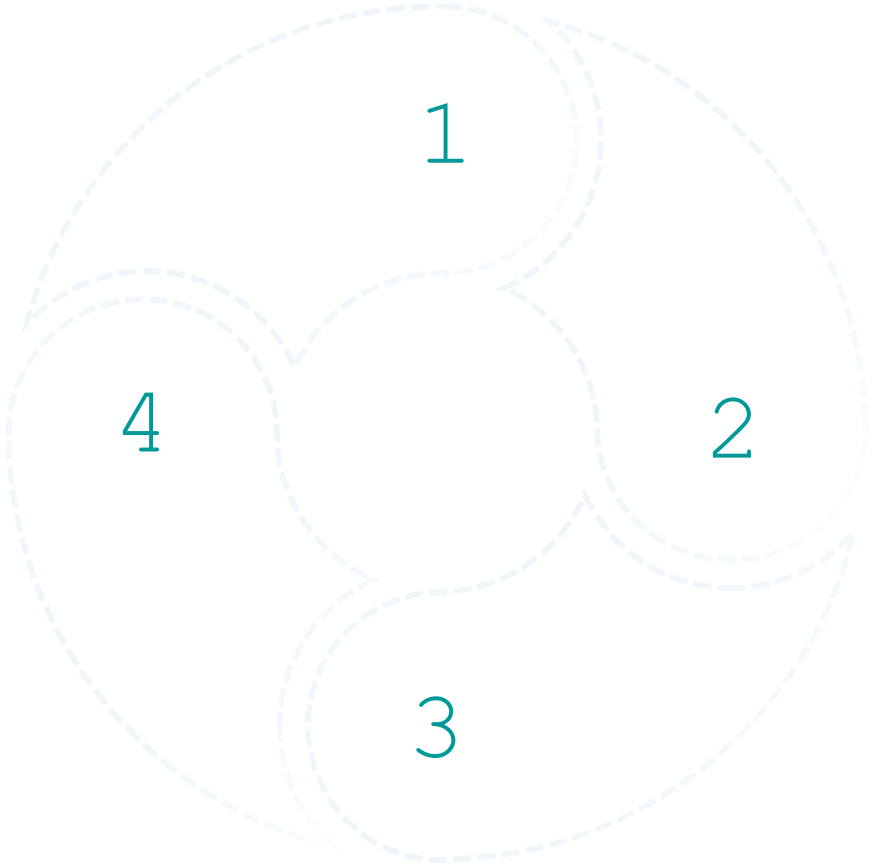
Summary and Implications

New European Data: Business dynamism in Europe is declining

Wide-spread phenomenon across almost all countries of our study. Accompanied by a decline in high-growth young firms. Common across sectors.

New framework to Show role of Market power & technology

We use micro-data to study the role of market power and technology and find these are important determinants of the decline in business dynamism particularly for large firms.



However, Decline in Business dynamism is pervasive: Within-sector, and size phenomenon

Within-sector and size component determines decline in business dynamism. No role for cross-sector reallocation

Broad decline in firm responsiveness and muted productivity dynamics.

We document a decline in firms' responsiveness for the German manufacturing sector. Explains 40% of the decline in job reallocation.

Next Steps

- Explore role of labor adjustments costs in this framework
  - Implementation of Heartz reforms in Germany
  - Impacts on markups/markdowns/wages
  - Very active field of research Cooper, Haltiwanger, Willis (2024) Haltiwanger et al (2024)
- Dig into the decline in shock dispersion
  - Apparent both in Germany and in the US post financial crisis
  - Product price data in Germany across all manufacturing industries
- Narrow down and strengthen the focus of the paper

Thanks!

Additional Slides

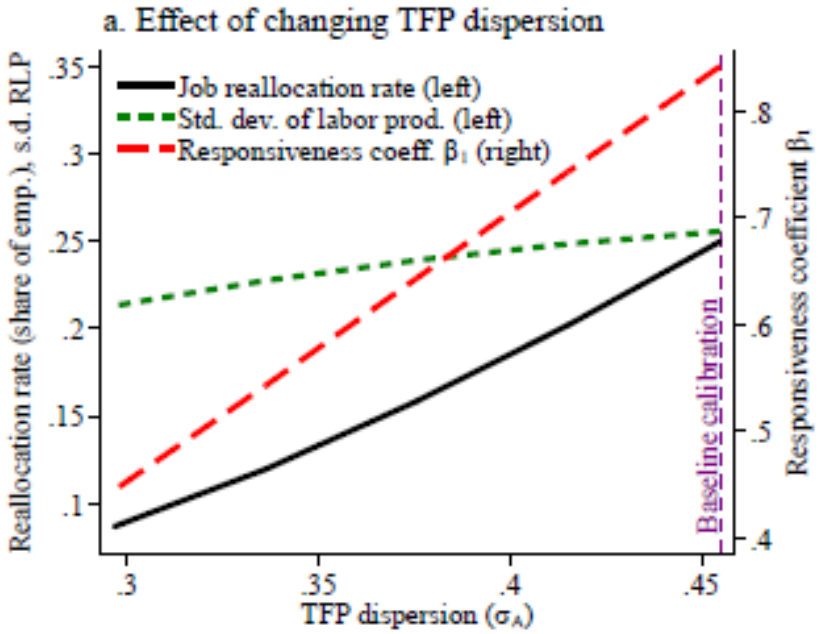
Summary thus far

- Significant declines in reallocation, 30%: Similar to US
  - H:0 Responsiveness: Large declines → Similar to U.S.
  - H:0 Shocks: Declines in TFPR and LP → Different from US (partly)
- Both elements contribute to declines in job reallocation

- One possible explanation is adjustment costs (see AER 2020)
- We are going to explore role of market power and technology ➔ German data

(more data demanding and longer time period)

Changes in Shock Process



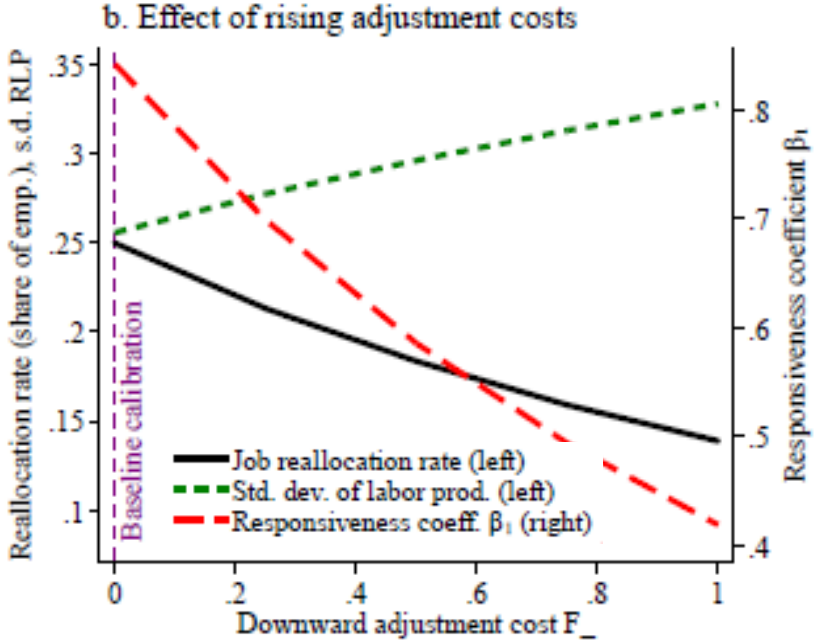
Decline in dispersion of TFP (holding persistence and adjustment costs constant):

1. **Lower** job reallocation
2. **Lower** responsiveness (volatility effect dominates real options effect).
3. **Lower** dispersion in Labor Productivity

Changes in Adjustment frictions

Holding TFP dispersion σ_A and persistence ρ constant, increasing adjustment cost $F\_$ ➔

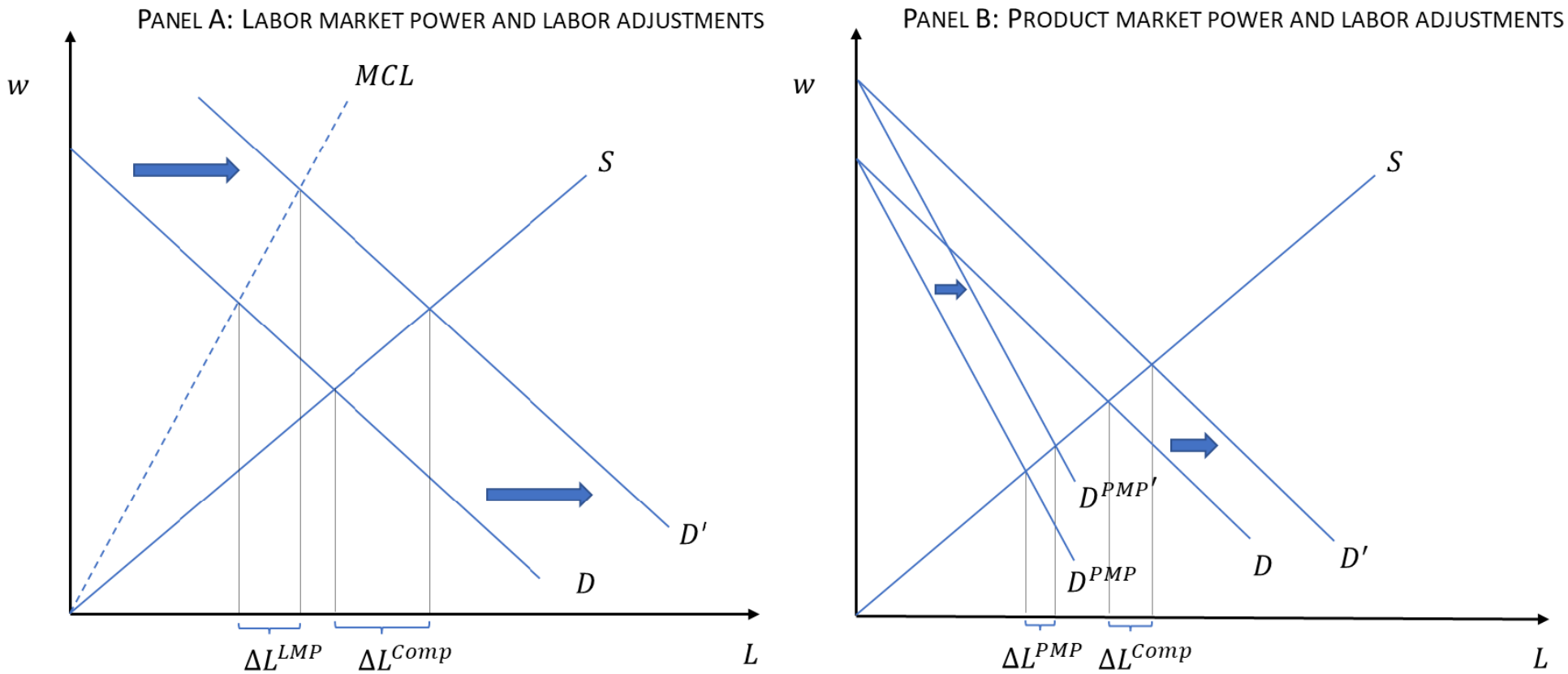
1. **Lower** job reallocation
2. **Lower** *responsiveness* of emp growth to TFP ("Lag TFP coefficient")
3. **Higher** dispersion of labor productivity



Mechanisms behind declining responsiveness

Drivers of business dynamism

Figure 8. Firm derived factor demand with and without market power.



Notes: Panel A shows how labor market power affects firms' labor adjustments. Panel B shows how product market power affects firms' labor adjustment

Share of young firms: Size class 1 to 9

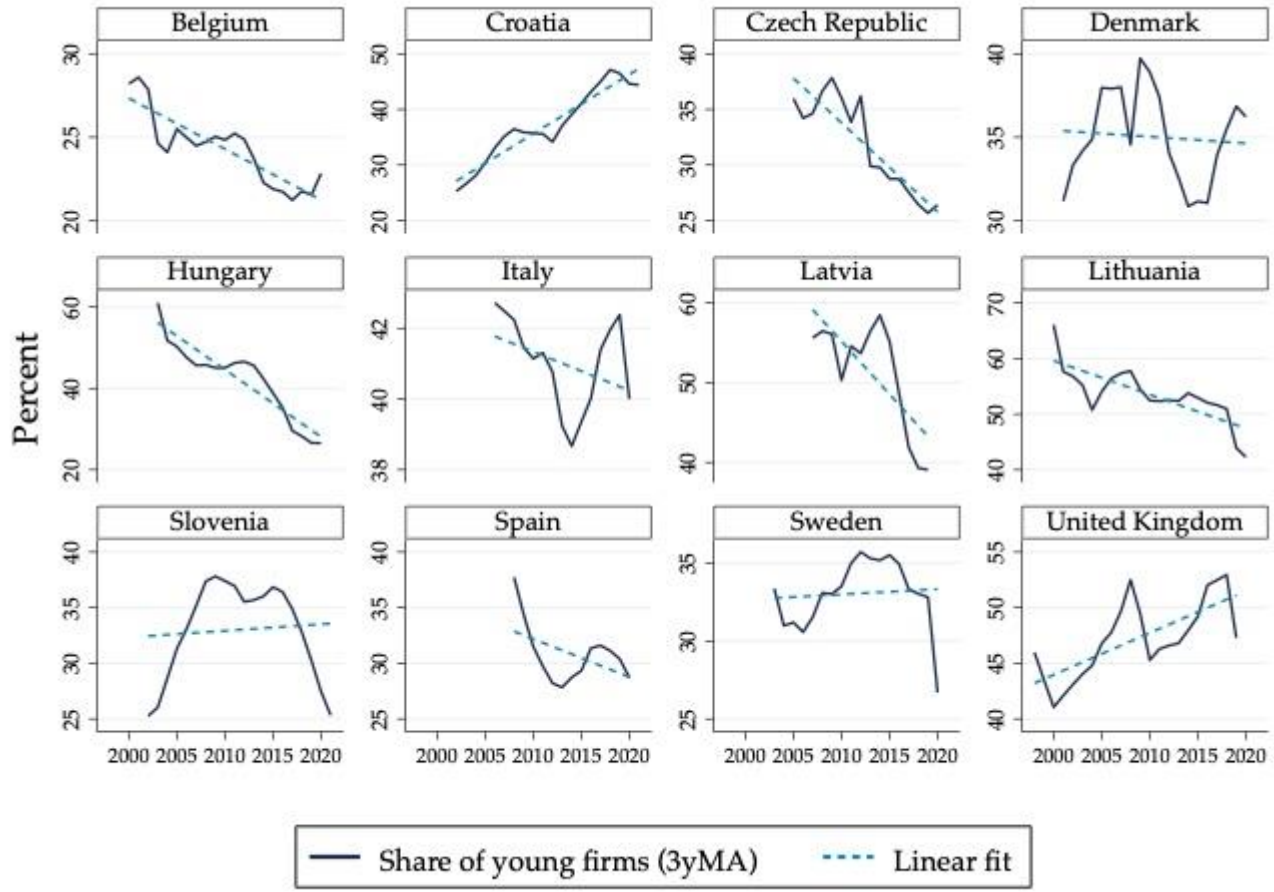
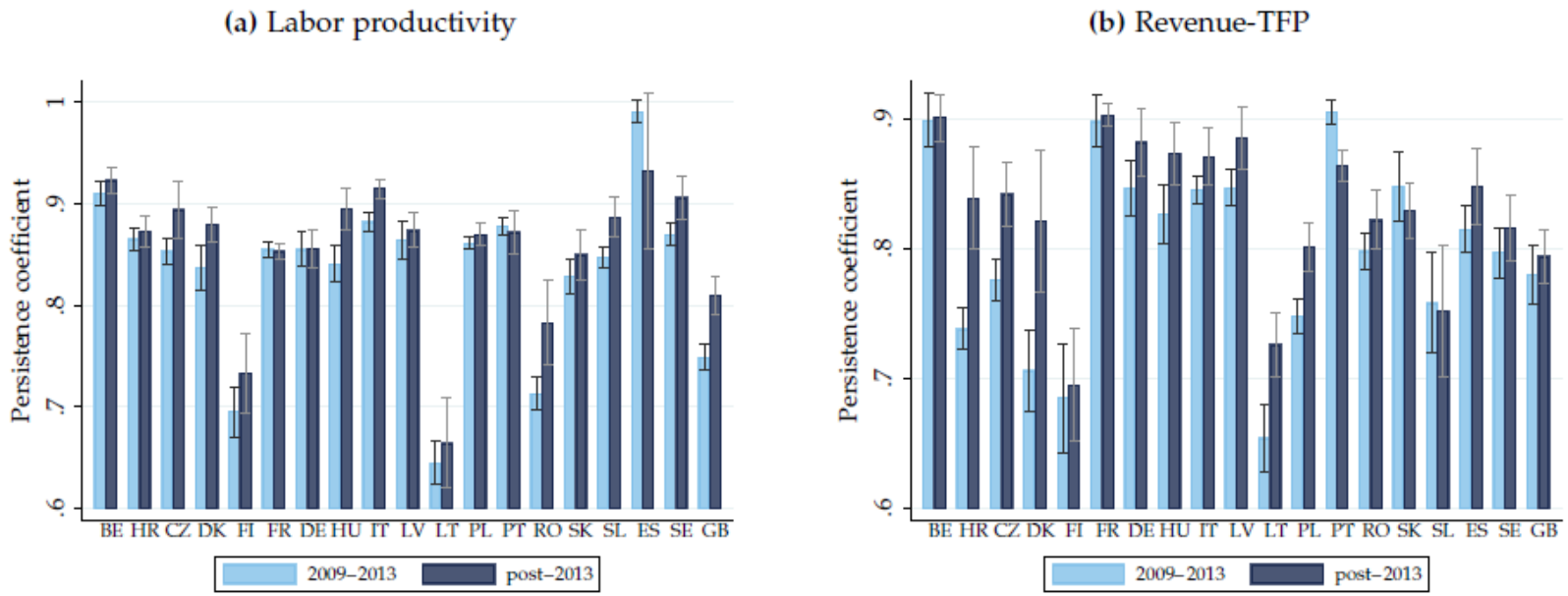


Figure 14. Increasing persistence in productivity dynamics.



Notes: Point estimates of the persistence coefficient ρ_t in the AR(1) in Equation (7) estimated over two consecutive periods. CompNet data, firms with at least 20 employees.

back

$$g_{it} = \beta_0^{DHJM} + \beta_1^{DHJM} tfpr_{it} + \beta_2^{DHJM} tfpr_{it} * T_t + \beta_3^{DHJM} l_{it-1} + \beta_4^{DHJM} l_{it-1} * T_t + \beta_5^{DHJM} X_{it} + \varepsilon_{it}$$

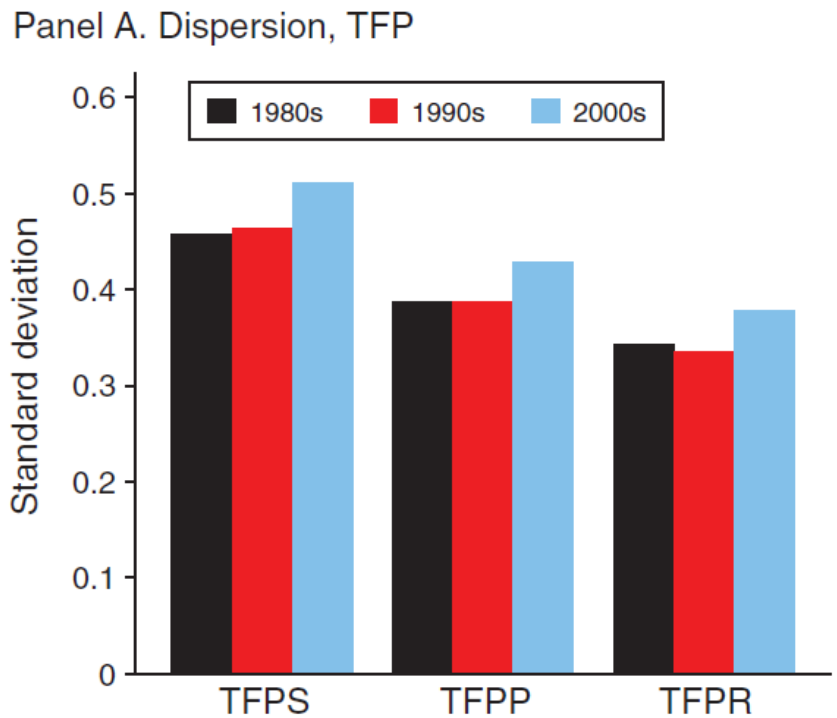
back

Theoretical Approach: Reallocation and Allocative Efficiency

Canonical models of firm dynamics with adjustment costs (Hopenhayn and Rogerson (1993))

- Reallocation is the result of businesses response to changing environment. Businesses facing positive productivity/profitability conditions enter/expand. If weak conditions then exit/contract => allocative efficiency
- Decline in reallocation:
  - **Shock Hypothesis:** the dispersion of idiosyncratic productivity or profitability realizations (shocks) has declined **=>** no incentive to change.
  - **Responsiveness Hypothesis:** businesses become more sluggish in responding to realized shocks due to adjustment costs **=>** weakened productivity selection and possibly large impacts on aggregate productivity.

Shock Hypothesis



Responsiveness Hypothesis