

# Discussion of "Changing Business Dynamism and Productivity: Shocks vs. Responsiveness"

Decker et al., 2018

March 27, 2019

# Roadmap

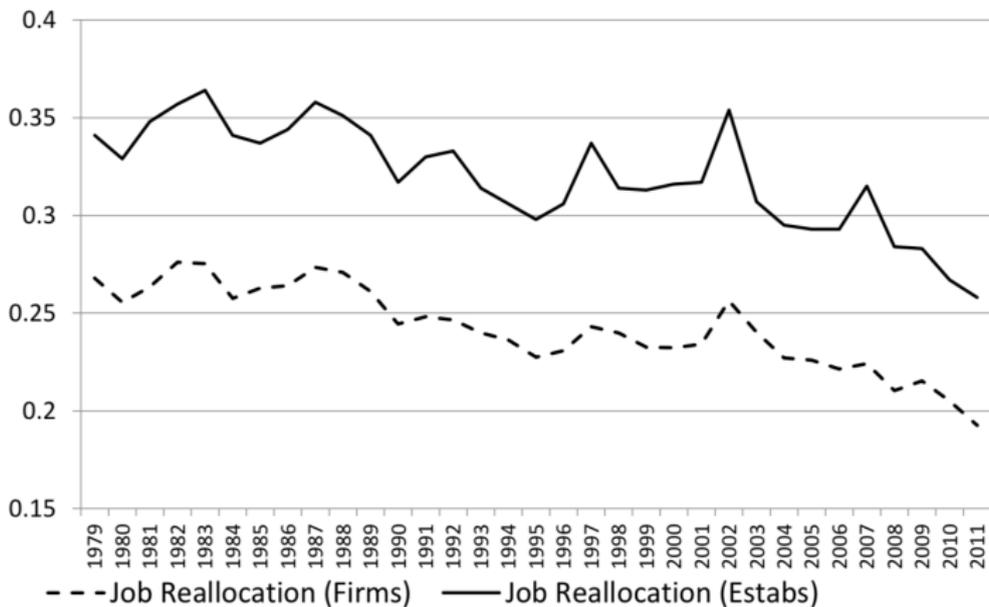
1. Background: “Declining Dynamism” literature
2. New Finding: Shocks vs Responsiveness
3. Underlying Model
4. Criticisms/Discussion
  - 4.1 What are the frictions?

# Background: “Declining Dynamism”

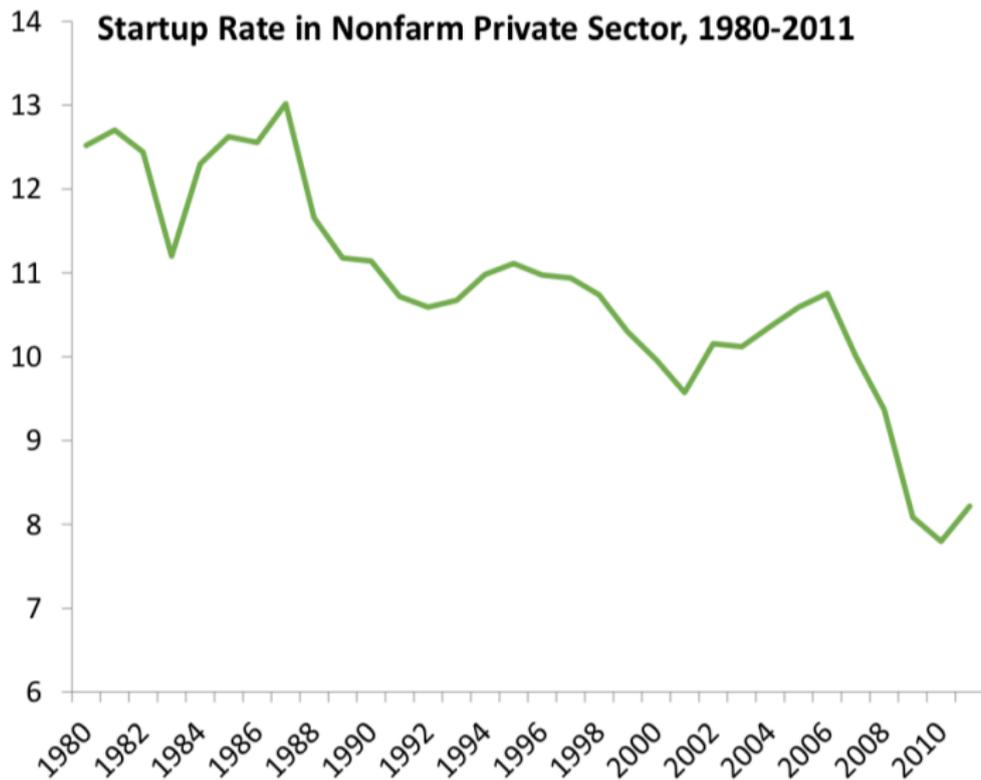
- ▶ Huge literature starting with Davis and Haltiwanger (1992)
- ▶ “Dynamism”: **Gross Job Creation + Gross Job Destruction**
  - ▶ (alternatively, rates of firm entry + firm exit)
- ▶ Claim #1: dynamism is important driver of economic growth/productivity growth/earnings growth
- ▶ Claim #2: US dynamism is declining
- ▶ Claim #3: declining dynamism is important cause of recent economic problems
- ▶ Claim #4: rising “policy distortions” slow dynamism

# Declining Gross Job Flows

Figure: "Job Reallocation" = Creation + Destruction



# Declining Firm Creation



# State of the Literature

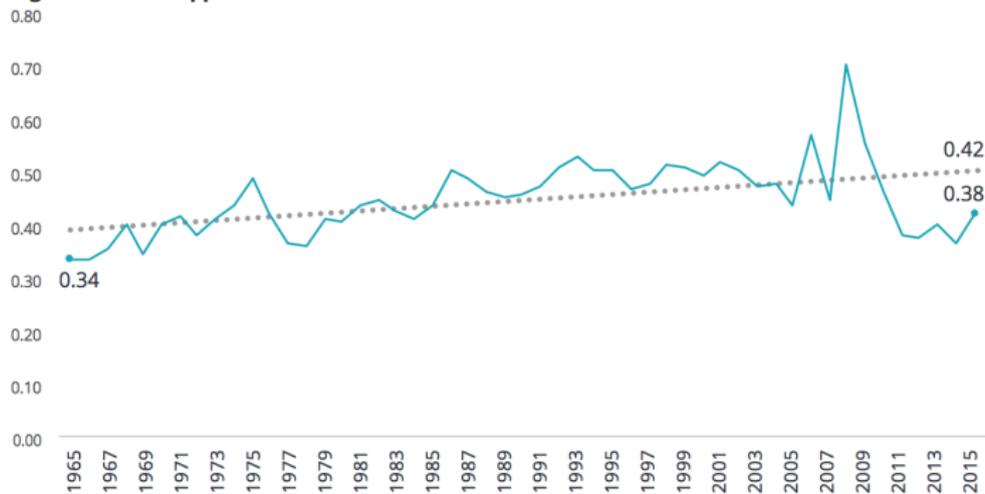
- ▶ No consensus on how/whether these patterns matter
  - ▶ Hsieh Klenow (2018): “The Reallocation Myth”:  
“Declining dynamism – falling rates of reallocation and entry/exit in the U.S. – has therefore been tied to the lackluster growth since 2005. **We challenge this view.**”
- ▶ Timing: steady secular declines in dynamism, even through 1995-2004 productivity boom
- ▶ “Firms” ambiguous: Mom&Pop vs Mark Zuckerberg
  - ▶ Hurst Pugsley (2011): most new firms are Mom&Pop
  - ▶ Guzman Stern (2016): high-potential start-up entry has *increased*
- ▶ Idiosyncratic volatility/churn in largest firms has *increased*
  - ▶ Comin and Philippon (2005), Carvalho and Gabaix (2013), Deloitte (2016)

Another interpretation: less entry of inefficient small business

# Quicker Rank Changes in Compustat Firms

## FIRM TOPPLE RATE

**Figure 23. Firm topple rate**



Source: Compustat; Deloitte analysis; Thomas C. Powell and Ingo Reinhardt, "Rank friction: An ordinal approach to persistent profitability," *Strategic Management* 31(11), November 2010, pp. 1244–55.

# Rising Firm Idiosyncratic Volatility in Compustat Firms

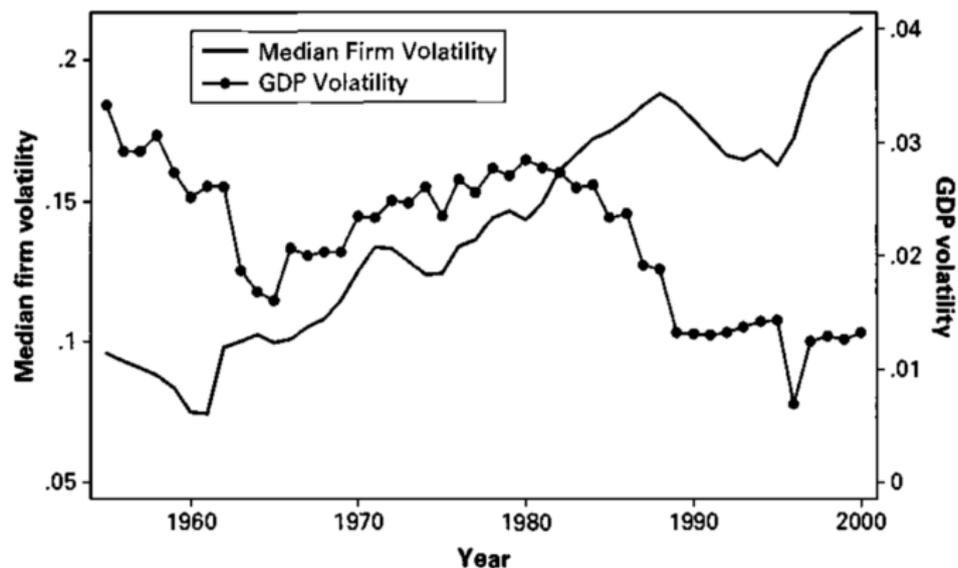


Figure 3.1

GDP Versus Individual Firm Sales Volatility: 10-Year Centered Rolling Standard Deviation of Growth Rates

## State of the Literature (2)

The new macro:

Misspecified model of firm heterogeneity + invisible “distortions” = ??

Acemoglu on Hsieh Klenow:

Hsieh and Klenow (2009) assume (following a practice that has become popular) that there are firm-specific “wedges” affecting total production and capital, essentially modeled as “taxes”.

- What are these? Certainly not taxes. Yet another residual in macro...

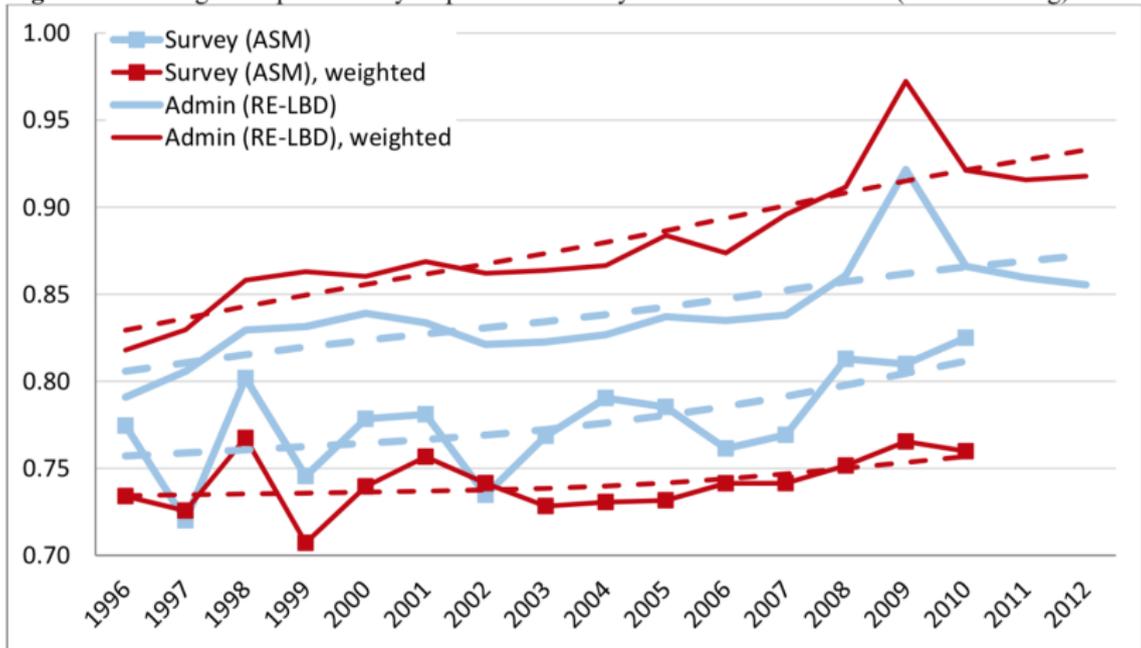
# Core Finding

This paper:

- ▶ Premise: declining dynamism could come from declining dispersion of shocks OR declining responsiveness
- ▶ New finding: **US firms now less responsive to productivity shocks**
- ▶ Interpretation:  
adjustment frictions  $\uparrow \Rightarrow$  responsiveness  $\downarrow \Rightarrow$  dynamism  $\downarrow$   
 $\Rightarrow$  productivity growth  $\downarrow$
- ▶ “Counterfactual” exercise: weaker responsiveness is quantitatively important source of slower productivity growth

# Rising Productivity Dispersion

**Figure A6:** Rising labor productivity dispersion in survey and administrative data (manufacturing)



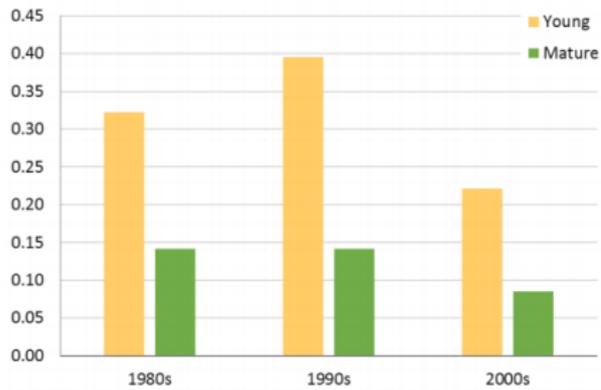
# Reduced Form Specification

Regress employment growth on TFP for US manufacturing plants, 1981-2010:

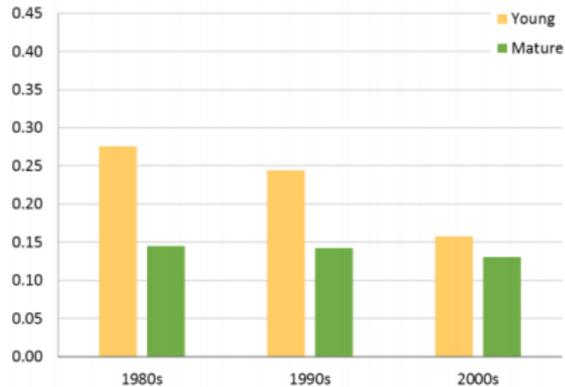
$$g_{e,t+1} = \sum_{age=y,m} [\beta_{age}TFP_{et} + \delta_{1age}TFP_{et} * Trend_t + \delta_{2age}TFP_{et} * Trend_t^2] * I_{age,et} + X'_{et}\Theta + \epsilon$$

Control for firm age, firm size, local business cycle conditions, etc.

# Marginal Effects of TFP on Employment Growth



(a) High Tech



(b) Non Tech

# Table 1

**Table 1:** Estimated Impact of Lagged Productivity on Plant-Level Employment Growth and Exit

	Growth including exit		Exit	
	High-Tech	Non Tech	High-Tech	Non Tech
TFP*Young	0.2025*** (0.0390)	0.2767*** (0.0090)	-0.0292* (0.0162)	-0.0905*** (0.0037)
TFP*Young*Trend	0.0317*** (0.0061)	0.0014 (0.0014)	-0.0160*** (0.0025)	-0.0005 (0.0006)
TFP*Young*Trend <sup>2</sup>	-0.0012*** (0.0002)	-0.00024*** (0.00005)	0.0005*** (0.0001)	0.0001*** (0.00002)
TFP*Mature	0.1228*** (0.0174)	0.1439*** (0.0043)	-0.0403*** (0.0072)	-0.0464*** (0.0018)
TFP*Mature*Trend	0.0054** (0.0026)	0.0005 (0.0007)	-0.0016 (0.0011)	-0.0012 (0.0003)
TFP*Mature*Trend <sup>2</sup>	-0.0003*** (0.0001)	-0.00004* (0.00002)	0.0001*** (0.00003)	0.00005*** (0.00001)

Notes: Standard Errors in Parentheses. Dependent variable in Overall Growth columns is DHS growth rate. Dependent variable in Exit columns is indicator=1 if exit, 0 otherwise (linear probability Tech Sample is more than 120000 plant-year observations from 1981-2010. Non Tech Sample has more than 2 million observations. Young firms have age less than 5. Unreported are estimates of controls including year effects, state effects, firm age dummies, firm size dummies, log plant level employment in period t, state cyclical indicators (change in state level unemployment rate), state cyclical indicators interacted with TFP. All variables that use TFP including all interactions are fully interacted with firm age dummies.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Table 2

**Table 2:** Estimated Relationship Between Firm-level Employment Growth and Exit and Labor Productivity

	Growth including exit			Exit		
	All firms	High-Tech	Nontech	All Firms	High-Tech	Nontech
LP*Young	0.3484*** 0.0004	0.3845*** 0.0020	0.3467*** 0.0005	-0.1225*** 0.0002	-0.1258*** 0.0009	-0.1224*** 0.0002
LP*Young*Trend	-0.0047*** 0.0001	-0.0141*** 0.0006	-0.0043*** 0.0001	0.0014*** 0.0001	0.0026*** 0.0002	0.0014*** 0.0001
LP*Young*Trend <sup>2</sup>	0.0000*** 0.0000	0.0004*** 0.0000	0.0000*** 0.0000	0.0000*** 0.0000	-0.0001*** 0.0000	0.0000*** 0.0000
LP*Mature	0.2530*** 0.0004	0.2755*** 0.0021	0.2522*** 0.0004	-0.0756*** 0.0002	-0.0710*** 0.0009	-0.0758*** 0.0002
LP*Mature*Trend	-0.0055*** 0.0001	-0.0042*** 0.0006	-0.0056*** 0.0001	0.0019*** 0.0000	-0.0008*** 0.0002	0.0020*** 0.0000
LP*Mature*Trend <sup>2</sup>	0.0001*** 0.0000	0.0000 0.0000	0.0001*** 0.0000	0.0000*** 0.0000	0.0001*** 0.0000	-0.0001*** 0.0000
N	55383000	55383000	55383000	55383000	55383000	55383000
R <sup>2</sup>	0.1090	0.1263	0.1083	0.0937	0.1053	0.0931

Dependent variable in all regressions is firm-level employment growth rate (DHS). All regressions include controls for state business cycle (change in state unemployment rate) and firm employment size in period t-1. Labor productivity is measured as log difference from 6-digit NAICS industry mean. High-Tech is defined as in Hecker (2005). Observations rounded to nearest thousand.

\*\*\* p<0.01; \*\* p<0.05; \* p<0.10

# Counterfactual

What would have happened if firm responsiveness to TFP shocks remained the same?

$$\Delta_t^{t+1} = \sum_e (\theta_{e,t+1}^T - \theta_{e,t+1}^{NT}) a_{et}$$

$\theta^T$ : plant predicted employment

$\theta^{NT}$ : plant predicted employment without downward trend

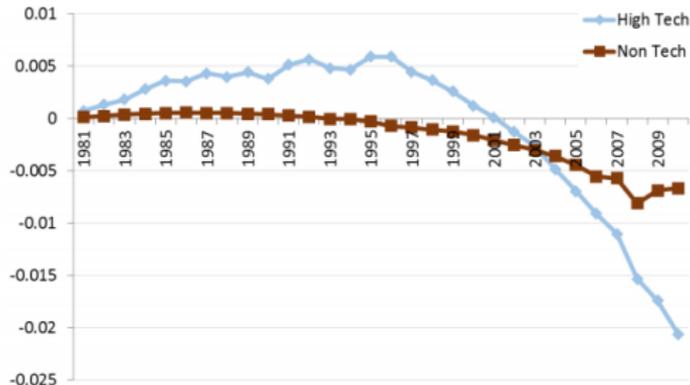
(Closely related to Olley-Pakes covariance term)

Baqee & Farhi (2019): Not the correct way to aggregate firm TFP.

Autor et al. (2017): Larger firms have lower labor share – too much weight on small firms.

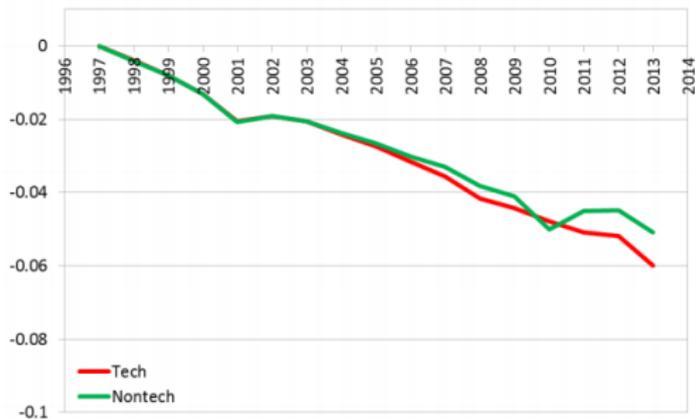
# Counterfactual – TFP

Figure: Diff-in-diff counterfactual (TFP), Manufacturing



# Counterfactual – Labor Productivity

Figure: Diff-in-diff counterfactual (Labor Productivity)



# A Model of Adjustment Costs: Setting

Reduced form Hopenhayn & Rogerson (1993) with a tweaked cost function.

- ▶ Firm's objective:

$$V(L_{i(t-1)}, A_{it}) = A_{it} (L_{it})^\phi - wL_{it} - C\left(\frac{\Delta L_{it}}{L_{i(t-1)}}\right) + \beta V(L_{it}, A_{i(t+1)}),$$

- ▶ Cost function:

$$C(x) = \gamma(x)^2 + F_+x\mathbb{1}[x > 0] + F_-x\mathbb{1}[x < 0],$$

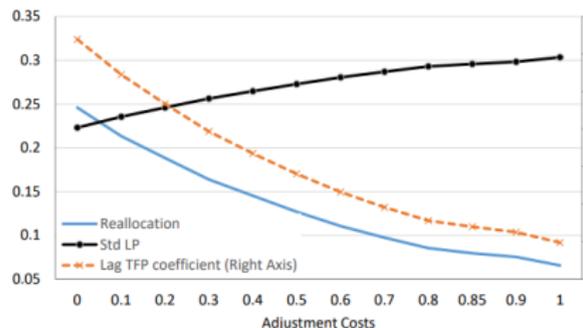
- ▶ Productivity DGP: AR(1) with parameter  $\rho$ .

## Model Limitations:

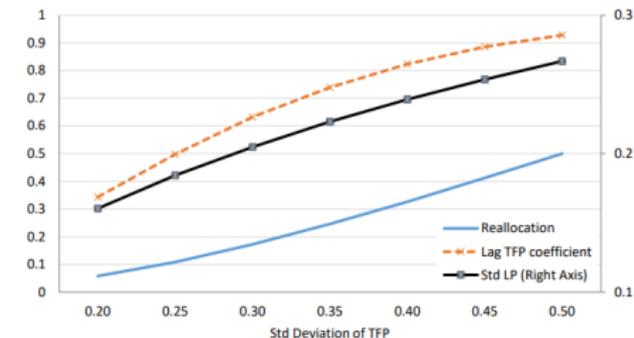
- ▶ Only intensive margin.
- ▶ No differences between young and old firms.

# A Model of Adjustment Costs: CF

- Increase in adjustment costs: downsizing cost  $F_-$ , holding fixed  $F_+$ .



(a) Adjustment Costs



(b) STD of TFP

# Discussion

- ▶ Alternatives to adjustment costs.
- ▶ Miscellaneous comments.

# Discussion: Nature of Adjustment Costs

- ▶ What are these rising adjustment costs??
  - ▶ Haltiwanger at conferences: "...occupational licensing, zoning, ... "
  - ▶ Really?
- ▶ Alternative channels:
  - ▶ financial frictions,
  - ▶ changes in knowledge diffusion,
  - ▶ costs of innovation.

## Discussion: Financial Frictions

- ▶ Main outcome of interest: response of employment to TFP shocks.
- ▶ Natural suspect: frictions in the labor market.
- ▶ Alternative: frictions in the capital markets.
- ▶ Decline in job reallocation: a symptom rather than a cause.

# Discussion: Monetary Policy

Gertler & Gilchrist (1991):

- ▶ Following tight monetary policy, small firms sales decline at a faster pace than large firm sales.
- ▶ Bank lending to small firms contracts, while it actually rises for large firms.



## Discussion: Financial Frictions

- ▶ Similar argument: development of financial markets.
- ▶ Growth of financial sector: Greenwood & Scharfstein(2013), Philippon(2008).
  - ▶ Bai et al.(2015): price informativeness has increased since 1960.
- ▶ Financial frictions and responsiveness:
  - ▶ Arellano, Bai & Kehoe (2016): evidence on the Great Recession.

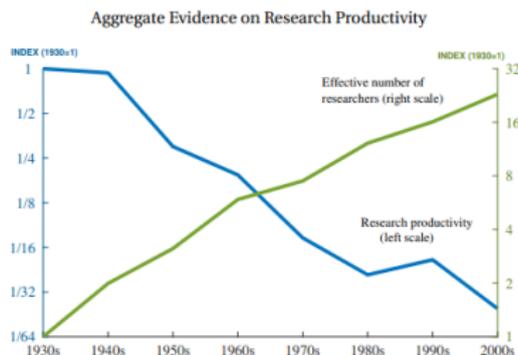
# Discussion: Miscellaneous

1. Is age a primary determinant of the responsiveness? Can we test this?
  - ▶ Identifying the main covariates of firm responsiveness can shed light on the nature of frictions:
    - ▶ Labor adjustment costs should mainly affect firms with higher employment.
    - ▶ Credit constraints – smaller "cash poor" firms.
    - ▶ Costs of innovation – either high or low TFP firms depending on the form of innovation costs.
2. Asymmetrical response?
  - ▶ Some hypothesis that can explain Decker
  - ▶ Negative shocks vs positive shocks.

# Discussion: Endogenizing TFP

If the TFP process is endogenous,

- ▶ Suppose some labor frictions are present.
- ▶ Employment growth would depend on expected TFP growth.
- ▶ Increase in the costs of innovations over time would result in a downward trend in "responsiveness".
- ▶ Responsiveness of young and old firms: depends on the form of innovation costs.
- ▶ Bloom et al.(2019): research productivity is falling, innovation is getting costlier.



# Discussion: Diffusion of Knowledge

Ackigit & Ates (2019):

- ▶ Increase in the concentration of patenting in the hands of large firms.
- ▶ Decline in the diffusion of knowledge.
- ▶ Model:
  - ▶ Innovation investment is endogenous.
  - ▶ Rates of growth depend on the gap between "the best & the rest".
- ▶ "Direct" effect of concentration under endogenous growth
  - ▶ does not require changes in adjustment costs – or even presence of adjustment costs.

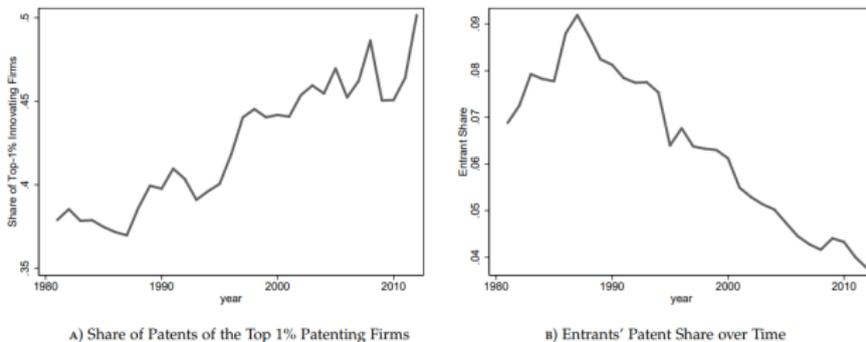


Figure 9: Registry of Patents

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