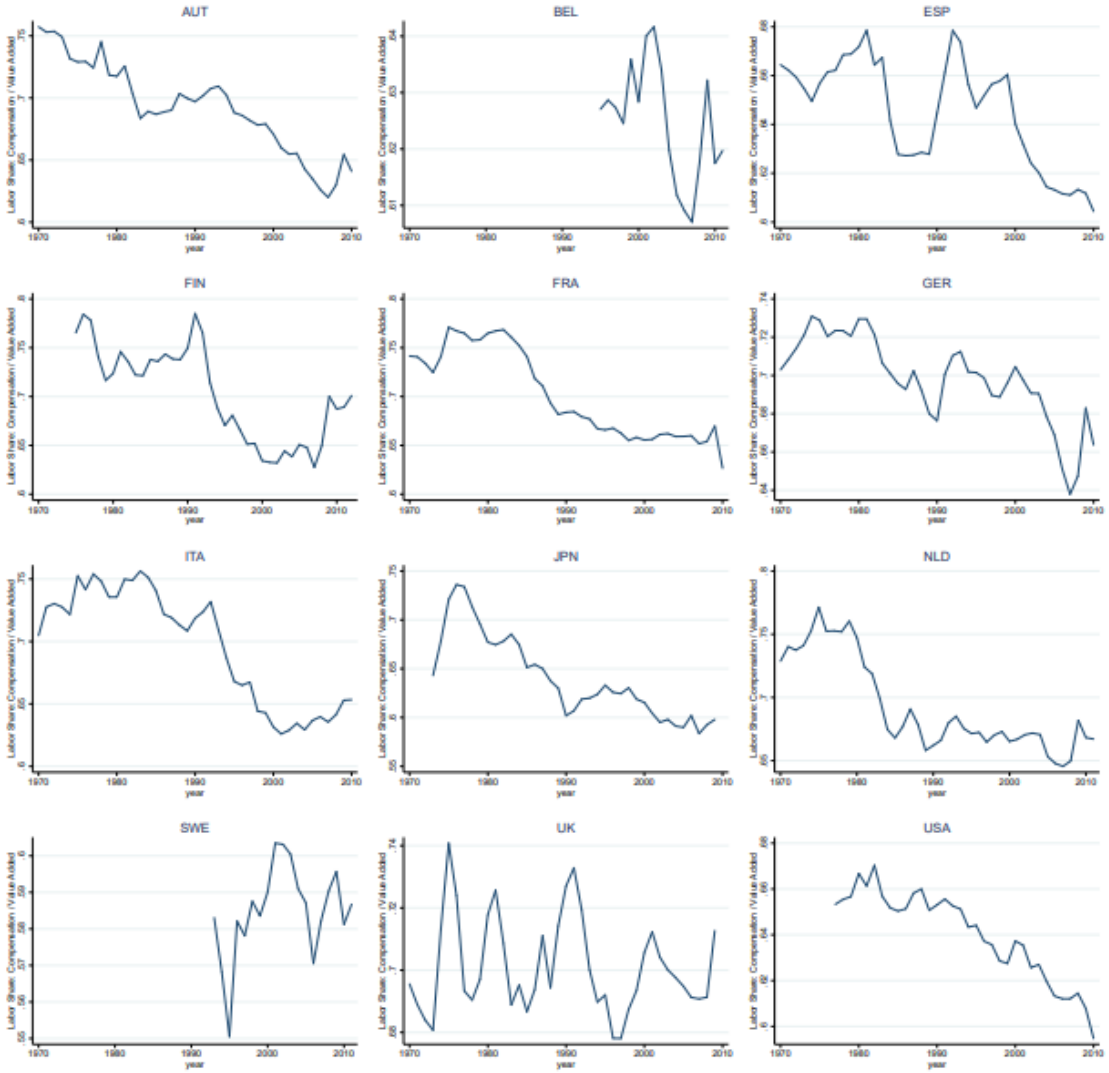
The Fall of the Labor Share and the Rise of Superstar Firms

by David Autor, David Dorn, Lawrence F. Katz, Christina Patterson, John Van Reenen, 2017

Granularity and Networks in the Global Economy, Master in Economics

Introduction

Motivation : a fall in the labor share in many countries



Notes: Each panel plots the ratio of aggregate compensation over value-added for all industries in a country based on KLEMS data.

Introduction

Motivation : a fall in the labor share in many countries

What are the causes ?

- Decrease in the cost of capital relative to labor (ICTs)
- Trade and international outsourcing
- Labor market institutions

This paper :

Is the increase in concentration a reason for the decrease in the labor share ?

Main idea :

- If globalization or technological changes advantage the most productive firms, product market concentration will rise
- Does it affect the labor shares ?

Introduction

Contributions

- Micro evidence on the evolution of the labor shares in the US
- New "Superstar Firms" model of the labor share change
- Empirical evidence consistent with the model :
  - Rise in sales concentration over time
  - Industries with largest increase in concentration have experienced the largest declines in the labor shares
  - Fall of the labor share is a between firm reallocation
  - Reallocation more pronounced in concentrated industries
  - Same patterns in other OECD countries

Outline

An illustrative model of superstar firms

Environment

- Production function : $Y_i = A_i V_i^{1-\alpha} K_i^{\alpha}$
  - Y_i : value added
  - V_i : variable labor
  - K_i : capital
  - A_i : efficiency parameter
- Assume there is a fixed amount of overhead labor needed for production F
  - Total labor : $L = V + F$
- Perfect competition of factors market : w and r
- Imperfect competition of product market
  - P_i price of good produced by firm i

An illustrative model of superstar firms

Main mechanisms

Share of labor costs (wL_i) in nominal value-added ($P_i Y_i$) :

$$\frac{wL_i}{P_i Y_i} = \frac{1-\alpha}{\mu_i} + \frac{wF}{P_i Y_i} \quad , \quad \mu_i = \frac{P_i}{c_i}$$

Decrease in the labor share if :

- Higher markup
- Lower fixed labor share in value added

$\Rightarrow$ A shock that increases the markup or favors the most productive firms will decrease the labor shares because of a reallocation effect between firms

An illustrative model of superstar firms

Monopolistically competitive setting

Appendix $\rightarrow$ model taking into account both the intensive and extensive margins

- Entrepreneurs pay a fixed cost to draw A_i
- Fixed cost to produce $\Rightarrow$ low productivity firms choose to exit
- High productivity firms will have a higher marker share and a higher share of profits in value added
- These firms have lower labor shares

The degree of concentration depends on the degree of competition :

- If consumers become more sensitive to prices / quality, more output is allocated to the most productive firms
- When competition increases, the labor share decreases

Outline

Data

- US Economic Census
  - Every five years (1982-2012)
  - 6 large sectors : manufacturing, retail trade, whole trade, services, finance, utilities and transportation
- KLEMS
  - Industry-level data, OECD
- Comtrade
  - Industry exports
- Compnet
  - Firm-level balance sheet in 14 EU countries
- BVD Orbis
  - Firms-level labor shares in the manufacturing sector of 6 EU countries

Data

Descriptive evidence

For the US :

- Downward trend for the labor share except for finance ▸ Fig
- Stronger concentration in sales than in employment ▸ Fig
- Negative correlation between firm size and labor share ▸ Fig

Outline

Results

Concentration and the fall of the labor share

$$\Delta S_{jt} = \alpha \Delta Conc_{jt} + \tau_t + u_{jt}$$

- $\hat{\alpha}$ negative and significant in most cases ▸ Table
- Magnitudes ? Comparison of conditional and unconditional time dummies to obtain the contribution of concentration to the fall of the labor share
- Contributions : 1/3 in services, 10% in manufacturing, 25% utilities and transportation, 100% in retail trade
- Labor share would have risen more in finance and wholesale trade without the increase in concentration

Results

Decomposing changes in the labor share within and between firms

- Model prediction : the decrease in the labor share should have and important between firm component since firms with low labor shares capture a rising fraction of value-added
- Melitz and Polanec (2015) decomposition :

$$S = \sum \omega_i S_i = \bar{S} + \sum (\omega_i - \bar{\omega})(S_i - \bar{S}) \ , \qquad \omega_i = \frac{P_i Y_i}{\sum P_i Y_i}$$

- Change between period 1 and 2 can be rewritten :

$$\Delta S = \underbrace{\Delta \bar{S}_S}_{\textit{Within}} + \underbrace{\Delta[\sum (\omega_i - \bar{\omega}(S_i - \bar{S})]}_{\textit{Between firms}} + \underbrace{\omega_{X,1}(S_{S,1} - S_{X,1}) + \omega_{E,2}(S_{E,2} - S_{S,2})}_{\textit{Contribution of entering and exiting firms}}$$

- Main component of labor fall : between component ▸ Fig

Results

Between firm component and rising concentration

- Model prediction : the industries where concentration rose the most were those that experiences the largest fall in the between component of labor share
- Regression of the between firm component on concentration
- Results consistent with the model ▸ Fig

Results

International evidence

Summary of results :

- Correlation of the labor share of each country with the others : from 0,7 to 0,9
- Decline in labor share in similar industries
- Countries with the greatest increase in concentration exhibited the sharpest falls in the labor share
- The fall in the labor share is primarily a between firm reallocation

Results

What explains the rise in concentration ?

Technology

- Is rising concentration more prevalent in industries with rapid technological advances ?
- 2 measures of technological change :
  - Patent-intensity
  - TFP
- Regression of these measures on concentration : positive correlation

$\rightarrow$ Slowdown of technological diffusion ?

- Measure of technological diffusion : speed of patent citations
- In industries where the speed of diffusion has slowed, concentration had risen by more

Results

What explains the rise in concentration ?

Trade

- Relationship between changes in labor share and changes in Chinese import intensity ?
- OLS + 2SLS using Autor, Dorn and Hanson (2013)
- Find a positive correlation between the rise of chinese import and the increase in concentration
- Effect not precise

Other factors ?

- Business dynamism, computer investment, routine task-replacing technical change,...
- No robust correlation found

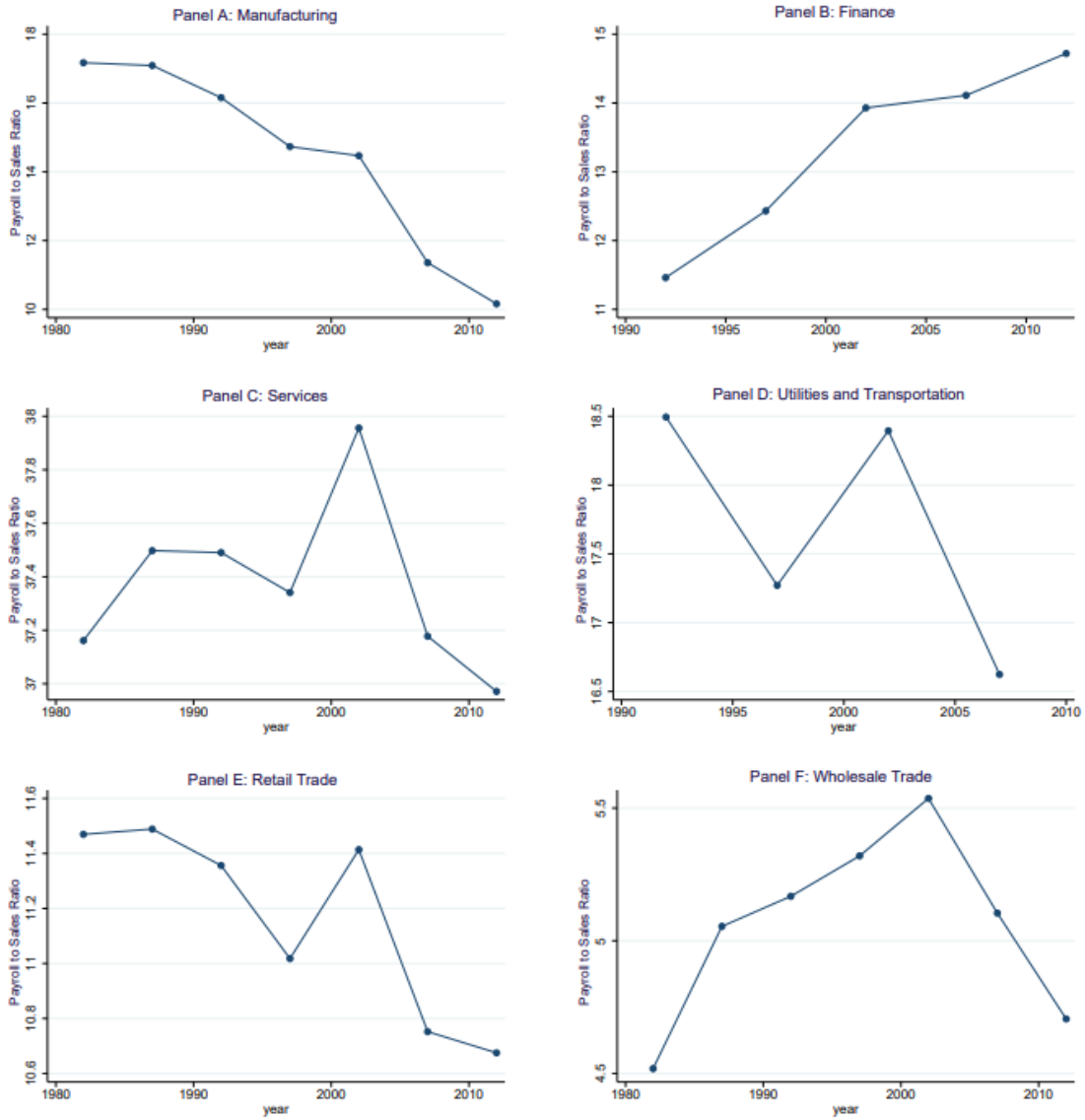
Outline

Conclusion

- This paper provides a Superstar Firms model
- Empirical evidence consistent with the predictions of the model :
  - Increase in sales concentration over time
  - Negative correlation between concentration changes and changes in labor share
  - Main component of the fall in labor share is a between firm reallocation
  - Negative correlation between the reallocation component and concentration
  - Similar patterns in other OECD countries
- Further research : better understanding of the shocks that lead to superstar firms (what about inputs ? outsourcing ?)

Appendix

Decrease in labor share by industries



Notes: Each panel plots the overall payroll-to-sales ratio in one of the six major sectors covered by the U.S. Economic Census.

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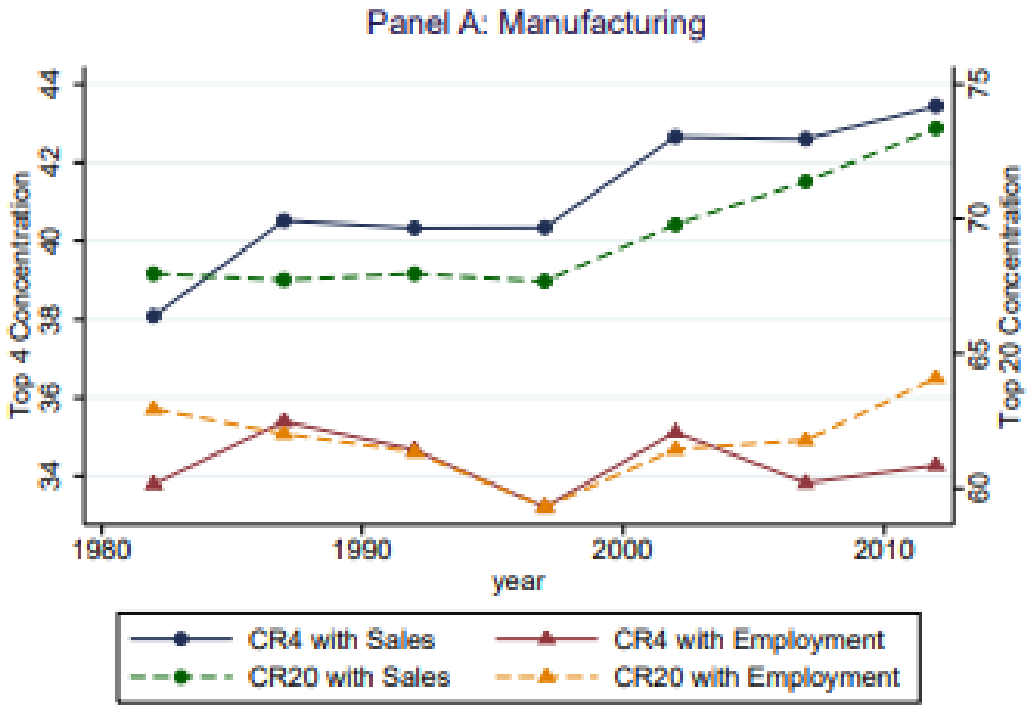
Concentration in manufacturing



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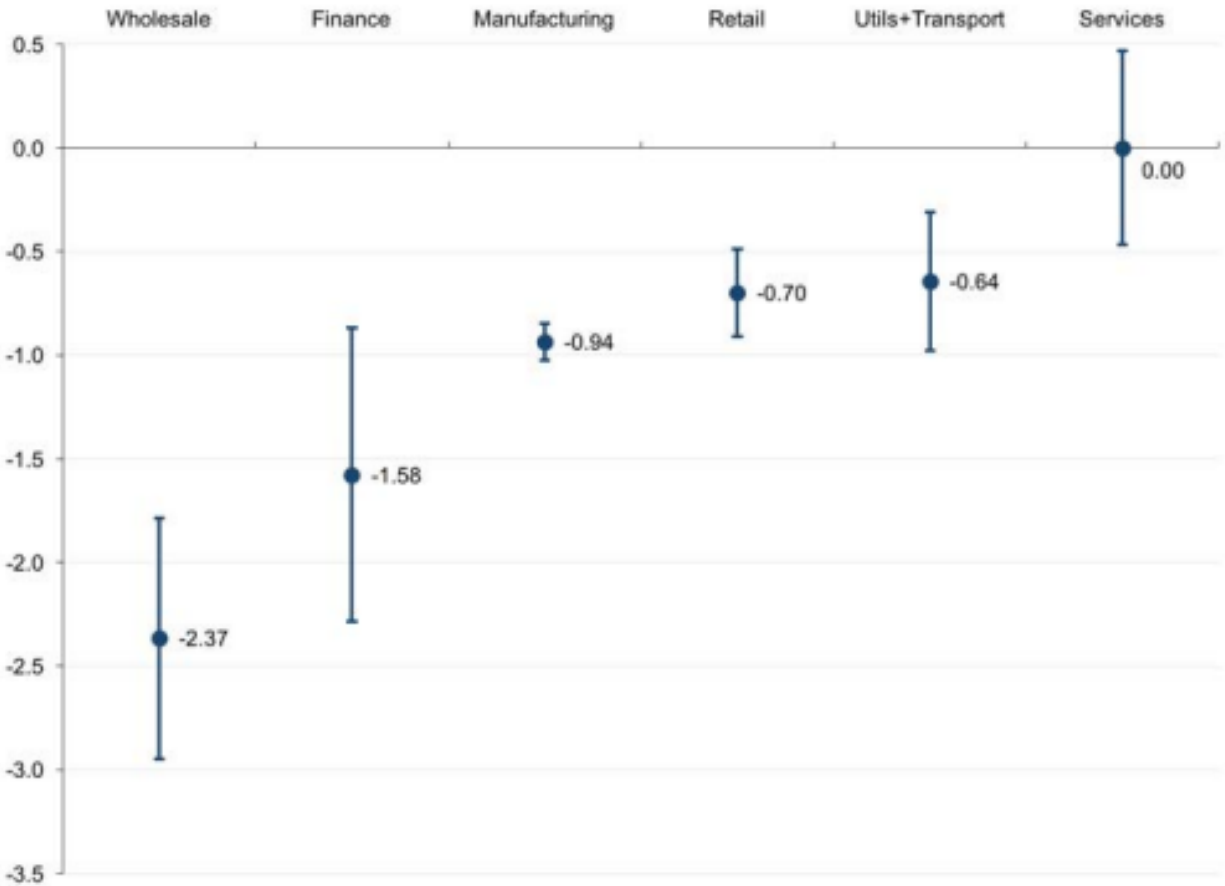
Appendix

Size and labor share

Figure 5: The Relationship Between Firm Size and Labor Share

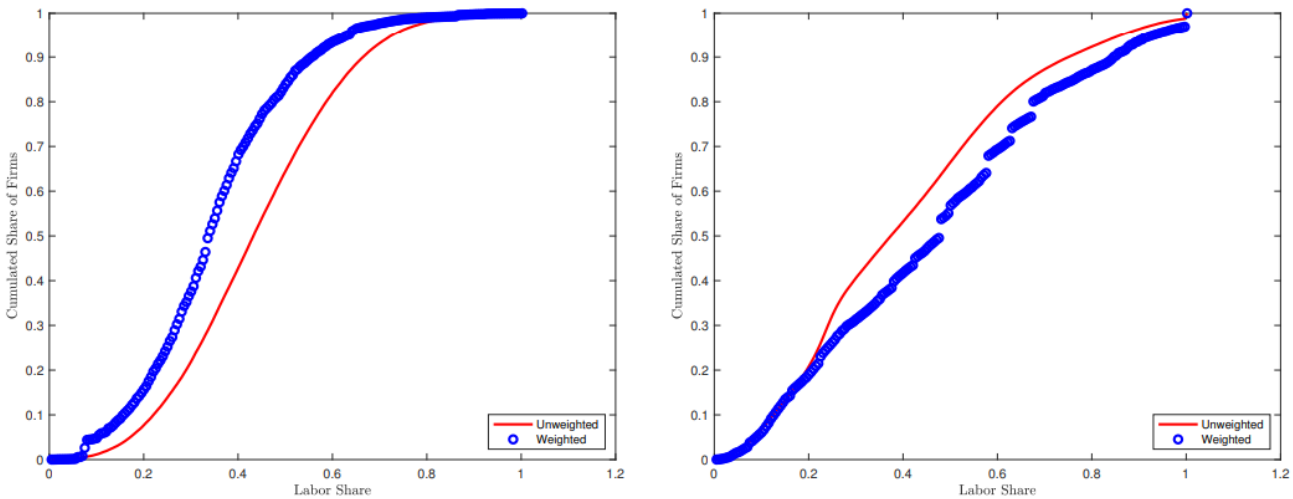


Notes: The dots indicate the coefficient estimates of a regression of a firm's labor share on its share of overall sales in its four-digit industry. The regressions include all years available for that sector, and year fixed effects. The labor share is defined as the payroll-to-sales ratio in each sector. The blue lines represent the 95% confidence intervals.

Appendix

Size and labor share

Figure 2. Distribution of Labor Shares Across French Firms



(a) Tradable Sectors **(b)** Non-tradable Sectors

Notes: This figure plots the cumulative distribution of firm-level labor shares ($\alpha_{n,j}(f)$), in tradable and in non-tradable sectors. The solid (red) lines correspond to the unweighted distribution and the (blue) circles to the weighted distribution, where firms' weights are defined according to their share in aggregate value added. Calculated from French balance-sheet data together with the WIOD information on sectoral labor shares, for 2005.

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From di Giovanni, Levchenko and Mejean (2017)

Appendix

Concentration and labor share

Table 3: Industry Regressions of the Change in the Payroll-to-Sales Ratio on the Change in Concentration, Different Sectors

		Stacked Five-Year Changes						Stacked Ten-Year Changes					
		CR4		CR20		HHI		CR4		CR20		HHI	
		(1)		(2)		(3)		(4)		(5)		(6)	
1	Manufacturing	-0.064	**	-0.087	**	-0.107	**	-0.044	*	-0.044		-0.096	**
	n = 2,328; 1,164	(0.013)		(0.024)		(0.027)		(0.022)		(0.034)		(0.037)	
2	Retail	-0.036	~	-0.085	*	-0.045	~	-0.045	*	-0.070	*	-0.075	**
	n = 348; 174	(0.021)		(0.037)		(0.026)		(0.018)		(0.029)		(0.023)	
3	Services	-0.090		-0.127	**	-0.354	**	-0.087		-0.129	**	-0.378	*
	n = 570; 285	(0.057)		(0.037)		(0.083)		(0.070)		(0.043)		(0.158)	
4	Wholesale	-0.035	**	-0.039	*	-0.079	*	-0.037	*	-0.036	*	-0.067	
	n = 336; 168	(0.012)		(0.016)		(0.039)		(0.018)		(0.018)		(0.050)	
5	Finance	-0.230	**	-0.265	**	-0.565	**	-0.252	**	-0.291	**	-0.740	*
	n = 124; 62	(0.083)		(0.080)		(0.204)		(0.091)		(0.070)		(0.294)	
6	Utilities + Transport	-0.118	**	-0.116	**	-0.434	**	-0.048		-0.122	*	-0.269	**
	n = 144; 48	(0.026)		(0.044)		(0.054)		(0.072)		(0.051)		(0.104)	
7	All combined	-0.076	**	-0.093	**	-0.144	**	-0.063	**	-0.083	**	-0.122	**
	n = 3,850; 1,901	(0.016)		(0.022)		(0.028)		(0.019)		(0.024)		(0.033)	

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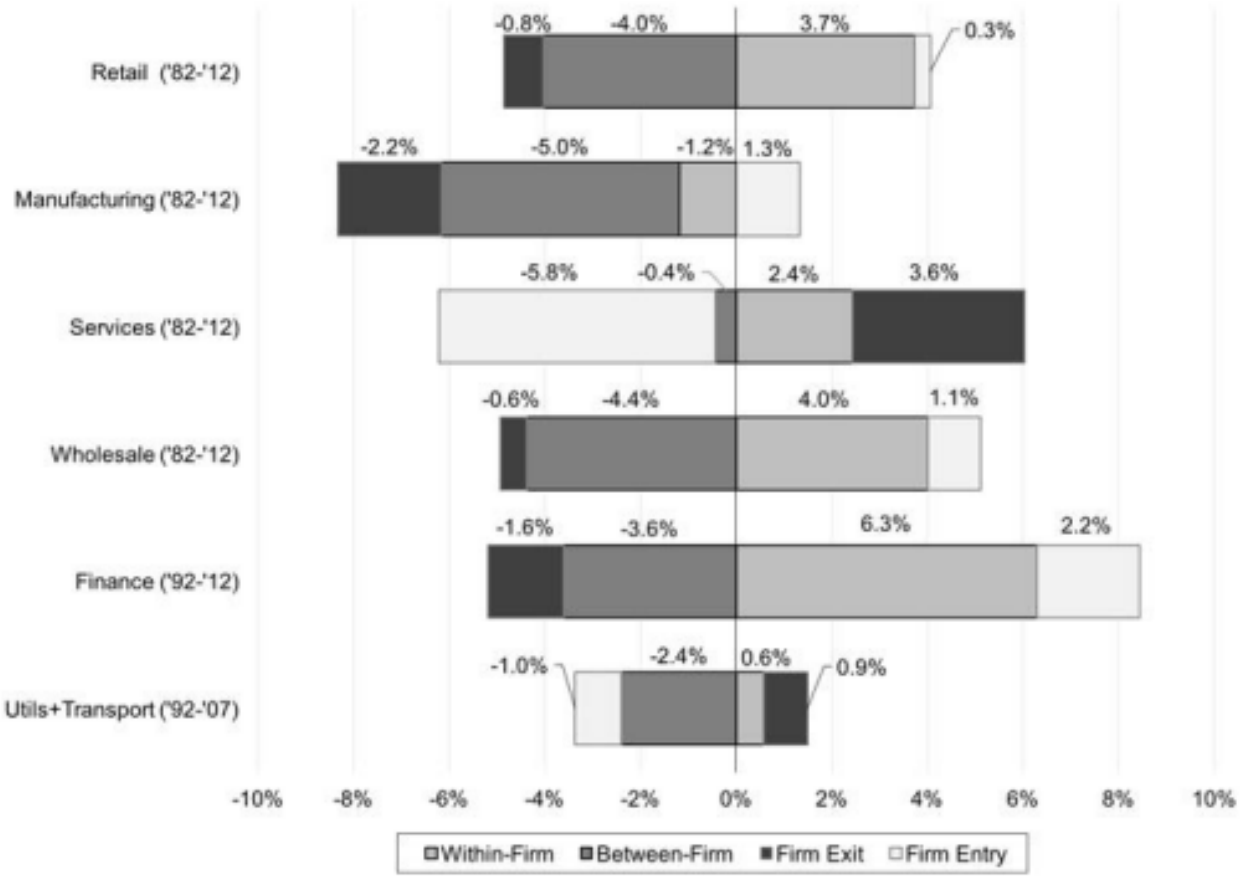
Melitz and Polanec decomposition

Figure 10: Melitz-Polanec Decomposition of the Change in Labor Share in Six Sectors



Notes: Each bar represents the cumulated sum of the Melitz-Polanec decomposition components calculated over adjacent five-year intervals. Table 5 reports the underlying year-by-year estimates.

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Appendix

Between component and concentration

Figure 11: Regressions of the Components of the Change in Labor Share on the Change in Concentration