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

Autor, David, Dorn, David, Katz, Lawrence F, Patterson, Christina, and Van Reenen, John, The Quarterly Journal of Economics, 135 (2020), 645–709.

Yu-Hsin Ho

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Department of Economics, National Taiwan University

Introduction

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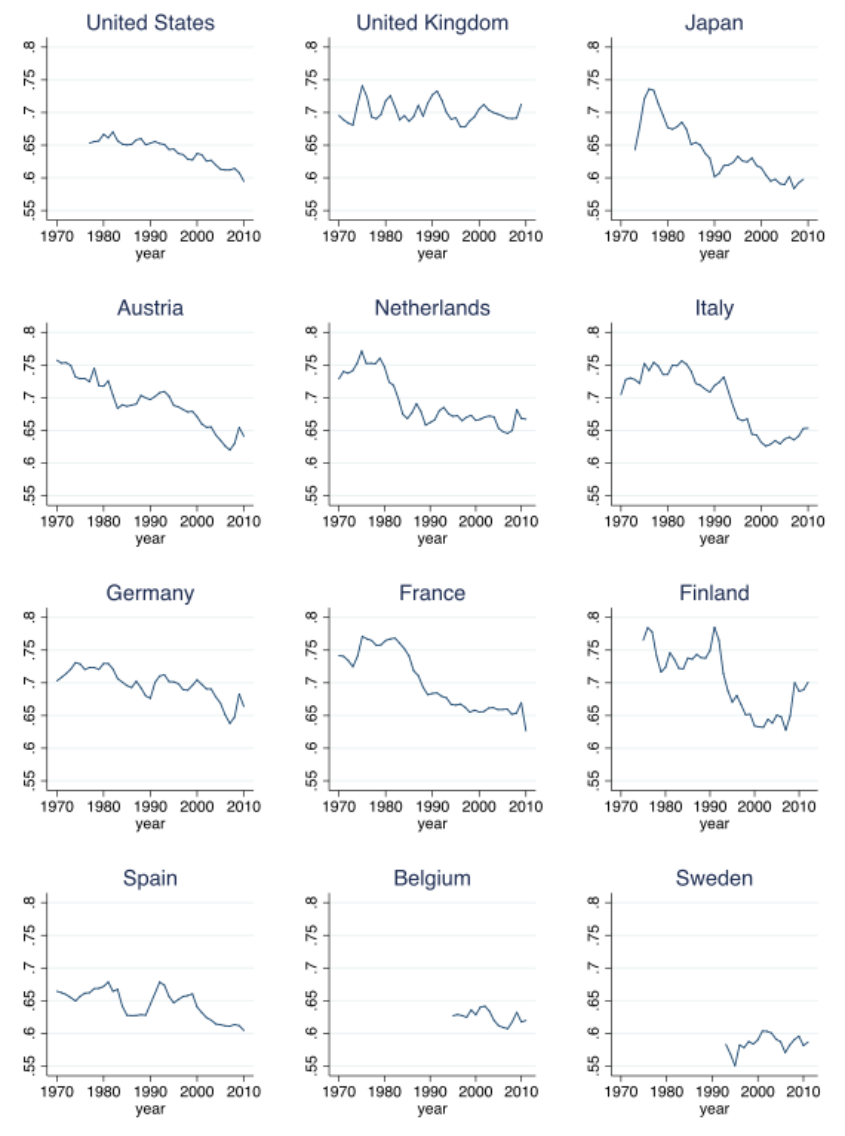

Figure 1: International Comparison: Labor Share by Country

Decline of labor share is a global phenomenon, why?

- Relative low price of capital
- International trade
- **Rise of superstar firms**
    - High monopoly profit (markup)
    - Winner takes most / Network effects
    - High initial investment (sunk cost)

7 Empirical Facts

1. Sales concentration
2. More concentration, larger decline in labor share.
3. Main force: Reallocation of sales between firms
4. More concentration, higher reallocation effect
5. Growth of productivity and innovation leads to concentration
6. Larger firms, higher markup
7. Decline in labor share is an international phenomenon

Conceptual Model

Conceptual Model

Consider a Cobb-Douglas Production Function:

$$Y_i = z_i L_i^{\alpha^L} K_i^{1-\alpha^L}$$

And define labor share for each industry i:

$$S_i \equiv \frac{wL_i}{P_i Y_i} = \frac{\alpha^L}{m_i}$$

where markup $m_i = \frac{P_i}{c_i}$, and economy-wide parameters $\{\alpha^L, w\}$

Empirically, we look at payroll over total sales.

Toughness in the market competition

Tough competition leads to…

1. Overall reduction in markup: With-in firm effect
2. Reallocation of market share to large firms: Between-firm effect

   With increased weight for firms with lower labor share, weighted average labor share will decline.

For observed declining labor share, (2) must dominate (1).

Data

Data

1. U.S. Economic Census: 1982-2012
    1.1 annual payroll; output (sales); employment;
    1.2 per-establishment micro data
2. EU KLEMS: industry-level OECD data set, 1980~
3. UN Comtrade Database: 1992-2012
    3.1 Import time series from six country groups for each industry.
4. CompNet: Industry-level data from 14 EU countries, 2000-2012
5. BVD Orbis: Firm-level panel data from 6 EU countries.

Index Definitions

Labor Share

$$S = \frac{\text{Payroll}}{\text{Total Sales or Value Added}}$$

Concentration (Industry-level)

1. CR4: $\frac{\text{top 4 firms total sale}}{\text{total sales}}$
2. CR20: $\frac{\text{top 20 firms total sale}}{\text{total sales}}$
3. Herfindahl-Hirschman Index (HHI): Sum of square of top-50 market share

Empirical Findings

Empirical Findings

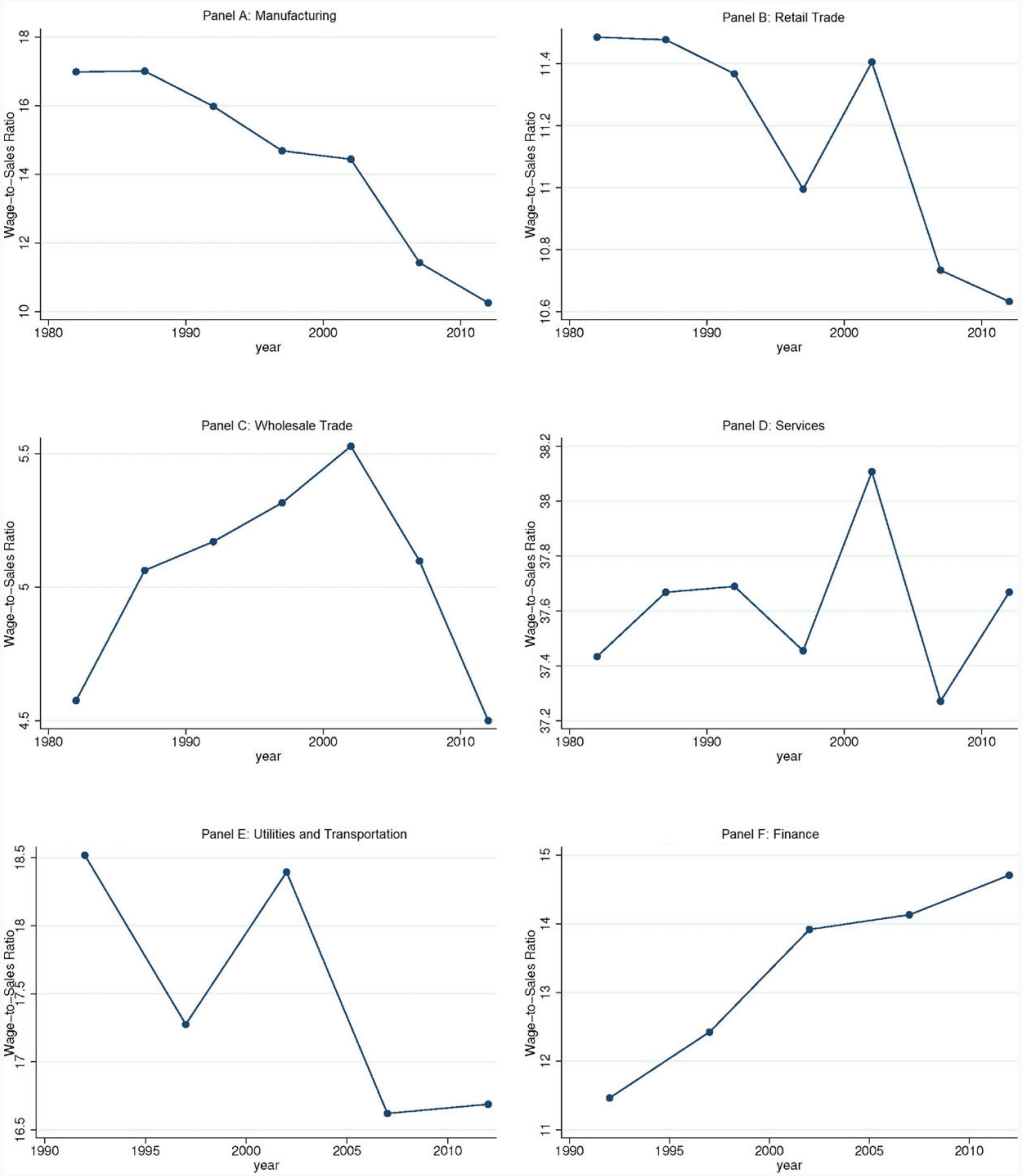

Figure 2: Average Payroll-to-Sales Ratio

Finding 1: Concentration

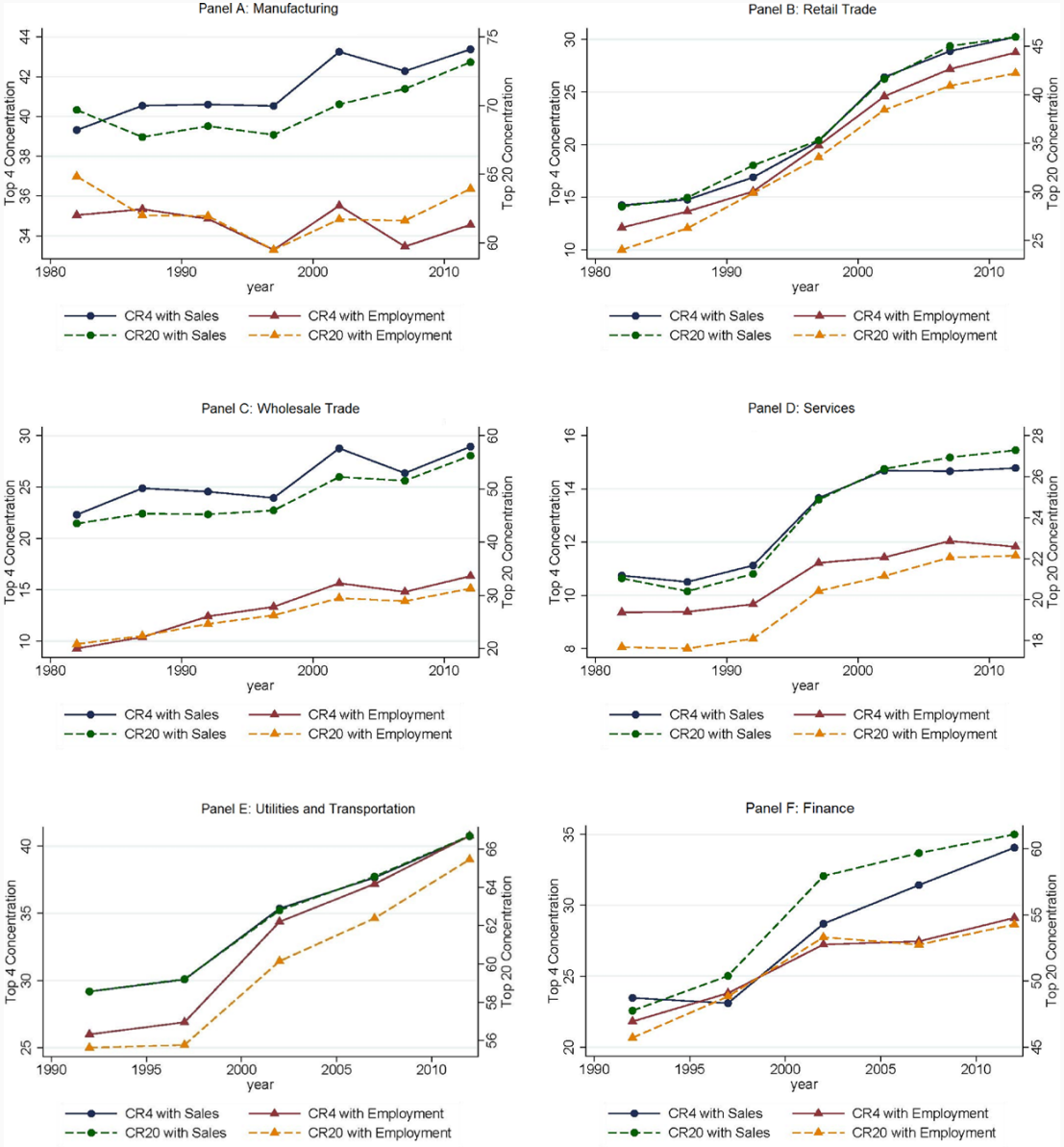

Figure 3: Average Concentration across Four-Digit Industries by Major Sector

Finding 2: Concentration ↔ Falling Labor Shares

Firm-level regression: labor share on market share

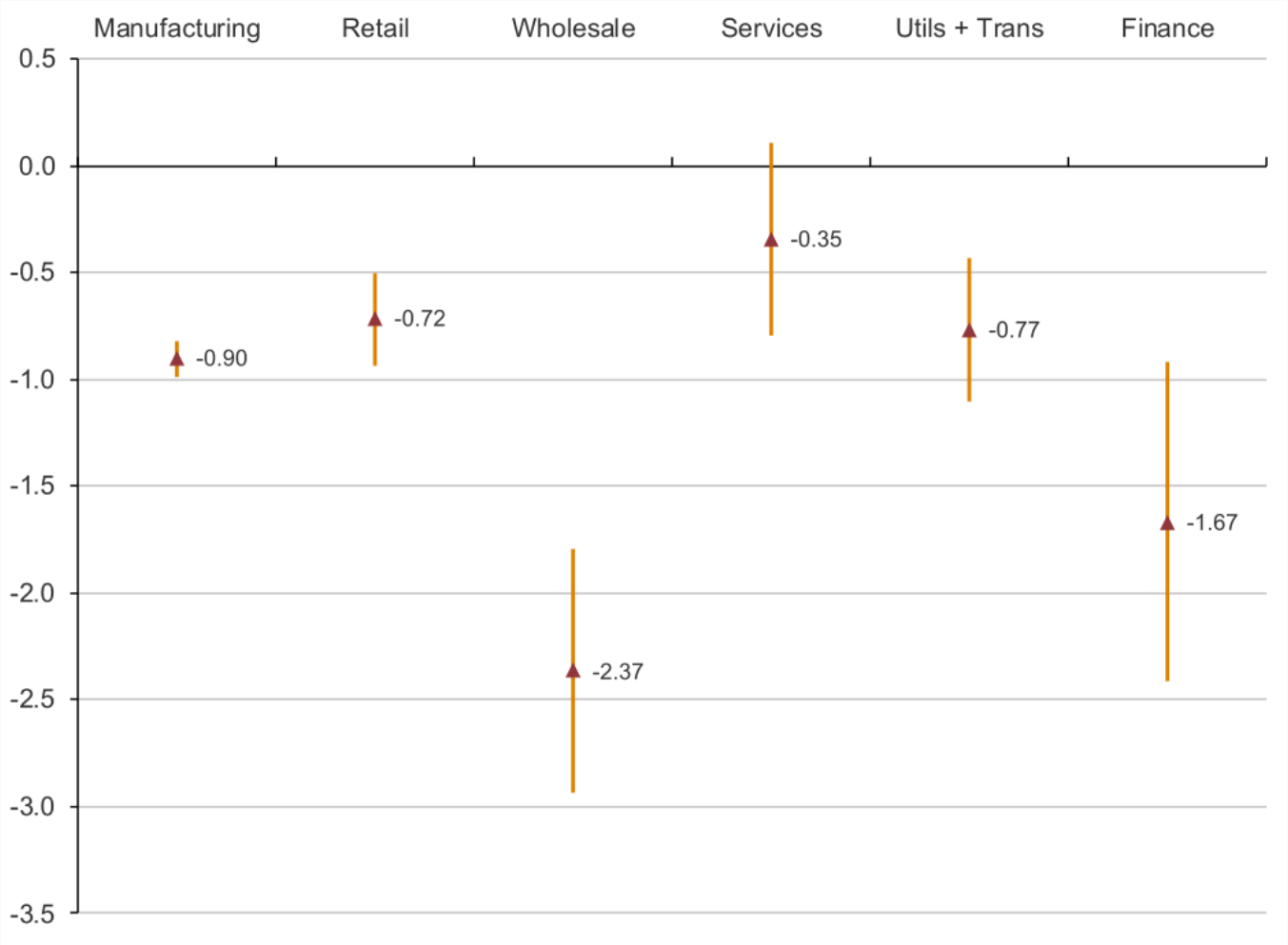

Figure 4: The Relationship between Firm Size and Labor Share

Industry-level regression: labor share on concentration index

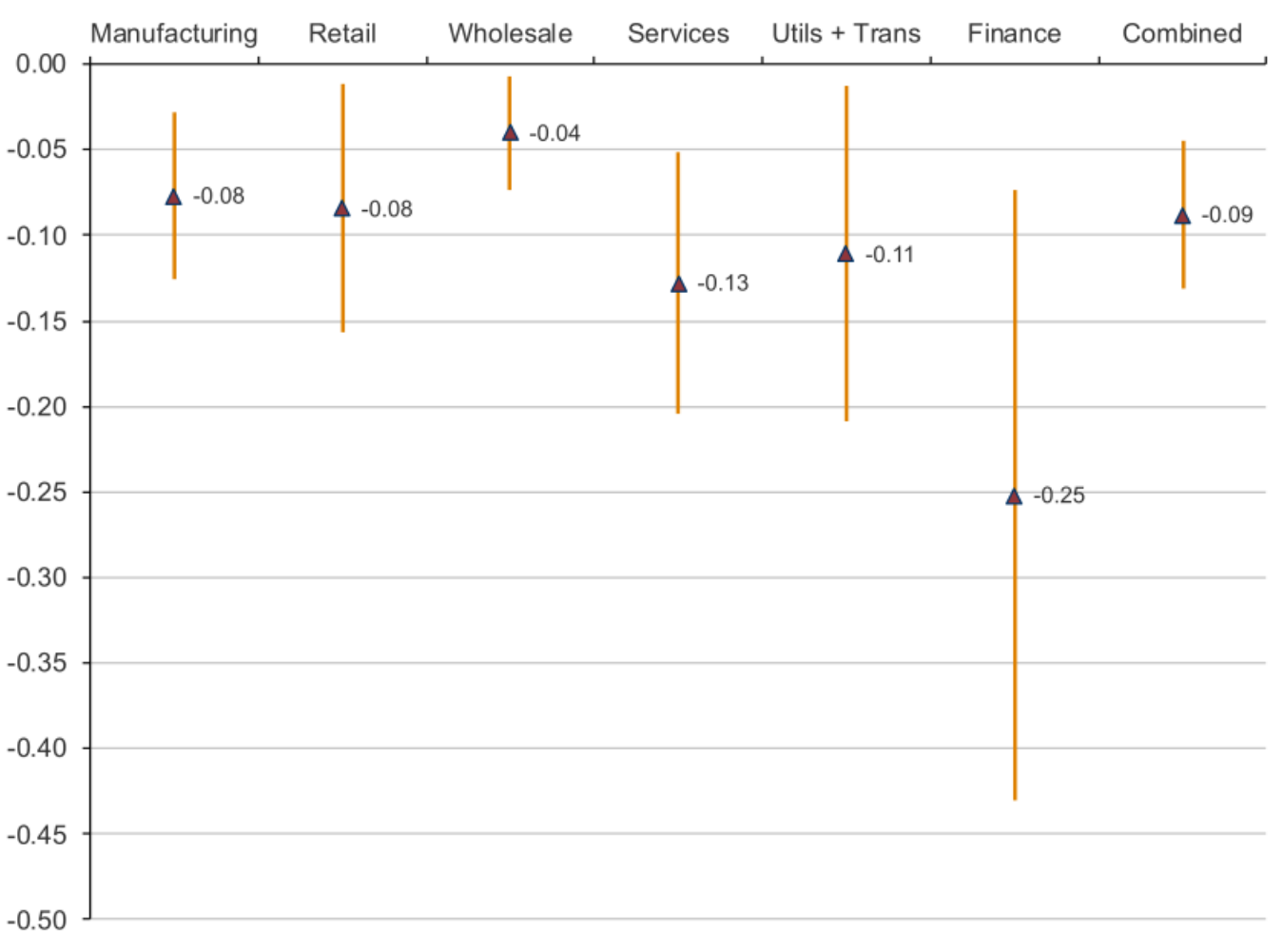

Figure 5: The Relationship between the Change in Labor Share and the Change in Concentration across Six Sectors

Robust for all model settings; Notice impacts of import, initial-capital.

TABLE II

INDUSTRY-LEVEL REGRESSIONS OF CHANGE IN SHARE OF LABOR ON CHANGE IN CONCENTRATION, MANUFACTURING

	5-year changes			10-year changes		
	CR4 (1)	CR20 (2)	HHI (3)	CR4 (4)	CR20 (5)	HHI (6)
1 Baseline	−0.148***	−0.228***	−0.213**	−0.132***	−0.153***	−0.165*
	(0.036)	(0.043)	(0.085)	(0.040)	(0.055)	(0.093)
2 Compensation share of value added	−0.177***	−0.266***	−0.256**	−0.139***	−0.151**	−0.183
	(0.045)	(0.056)	(0.110)	(0.053)	(0.071)	(0.125)
3 Deduct service intermediates from value added in labor share	−0.339***	−0.514***	−0.502***	−0.261***	−0.353***	−0.303
	(0.064)	(0.074)	(0.175)	(0.056)	(0.065)	(0.275)
4 Value added-based concentration	−0.219***	−0.337***	−0.320***	−0.210***	−0.251***	−0.289***
	(0.028)	(0.045)	(0.060)	(0.037)	(0.054)	(0.075)
5 Industry trends (four-digit dummies)	−0.172***	−0.290***	−0.243**	−0.196***	−0.240***	−0.220*
	(0.043)	(0.047)	(0.100)	(0.059)	(0.088)	(0.128)
6 1992–2012 subperiod	−0.187***	−0.309***	−0.261**			
	(0.043)	(0.061)	(0.102)			
7 Including imports (1992–2012)	−0.163***	−0.285***	−0.233***			
	(0.036)	(0.052)	(0.089)			
Coefficient on Δ (imports/value added)	18.809***	20.467***	20.957***			
	(3.027)	(3.213)	(3.187)			
8 Control for initial capital/ value added	−0.146***	−0.231***	−0.214***	−0.122***	−0.148***	−0.161*
	(0.035)	(0.042)	(0.084)	(0.040)	(0.053)	(0.092)
Coefficient on initial capital/value added	−1.242***	−1.295***	−1.278***	−2.535***	−2.648***	−2.669***
	(0.308)	(0.324)	(0.292)	(0.595)	(0.598)	(0.563)
9 Employment-based concentration measure	0.036	0.024	0.160**	0.018	0.029	0.082
	(0.036)	(0.033)	(0.075)	(0.035)	(0.040)	(0.083)

TABLE III

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

	Stacked 5-year changes			Stacked 10-year changes		
	CR4 (1)	CR20 (2)	HHI (3)	CR4 (4)	CR20 (5)	HHI (6)
1 Manufacturing	−0.062***	−0.077***	−0.112***	−0.035	−0.034	−0.088**
$n = 2{,}328; 1{,}164$	(0.013)	(0.025)	(0.026)	(0.021)	(0.033)	(0.037)
2 Retail	−0.034*	−0.084**	−0.041	−0.043**	−0.067**	−0.068***
$n = 348; 174$	(0.020)	(0.037)	(0.025)	(0.018)	(0.029)	(0.023)
3 Wholesale	−0.038***	−0.040**	−0.084**	−0.037**	−0.036*	−0.064
$n = 336; 168$	(0.014)	(0.017)	(0.041)	(0.018)	(0.019)	(0.048)
4 Services	−0.091	−0.128***	−0.350***	−0.093	−0.137***	−0.377**
$n = 570; 258$	(0.057)	(0.039)	(0.084)	(0.070)	(0.042)	(0.156)
5 Utilities/Transport	−0.110***	−0.111**	−0.320***	−0.064	−0.096**	−0.226**
$n = 144; 48$	(0.031)	(0.050)	(0.082)	(0.044)	(0.038)	(0.098)
6 Finance	−0.221**	−0.252***	−0.567**	−0.236**	−0.274***	−0.723**
$n = 124; 62$	(0.084)	(0.091)	(0.208)	(0.095)	(0.084)	(0.295)
7 Combined	−0.077***	−0.088***	−0.150***	−0.060***	−0.076***	−0.118***
$n = 3{,}850; 1{,}901$	(0.017)	(0.022)	(0.028)	(0.018)	(0.023)	(0.032)

Finding 3: Between-firm Reallocation Dominates

Decomposition of labor share change

$$\Delta S = \underbrace{\Delta \bar{S}_S}_{\text{Within firm}} + \underbrace{\Delta \left[\sum (\omega_i - \bar{\omega}) \left(S_i - \bar{S} \right) \right]_S}_{\text{Between firm}} + \underbrace{\omega_{X,0} \left(S_{S,0} - S_{X,0} \right)}_{\text{Exiters}}$$

$$+ \underbrace{\omega_{E,1} \left(S_{E,1} - S_{S,1} \right)}_{\text{Entrants}}$$

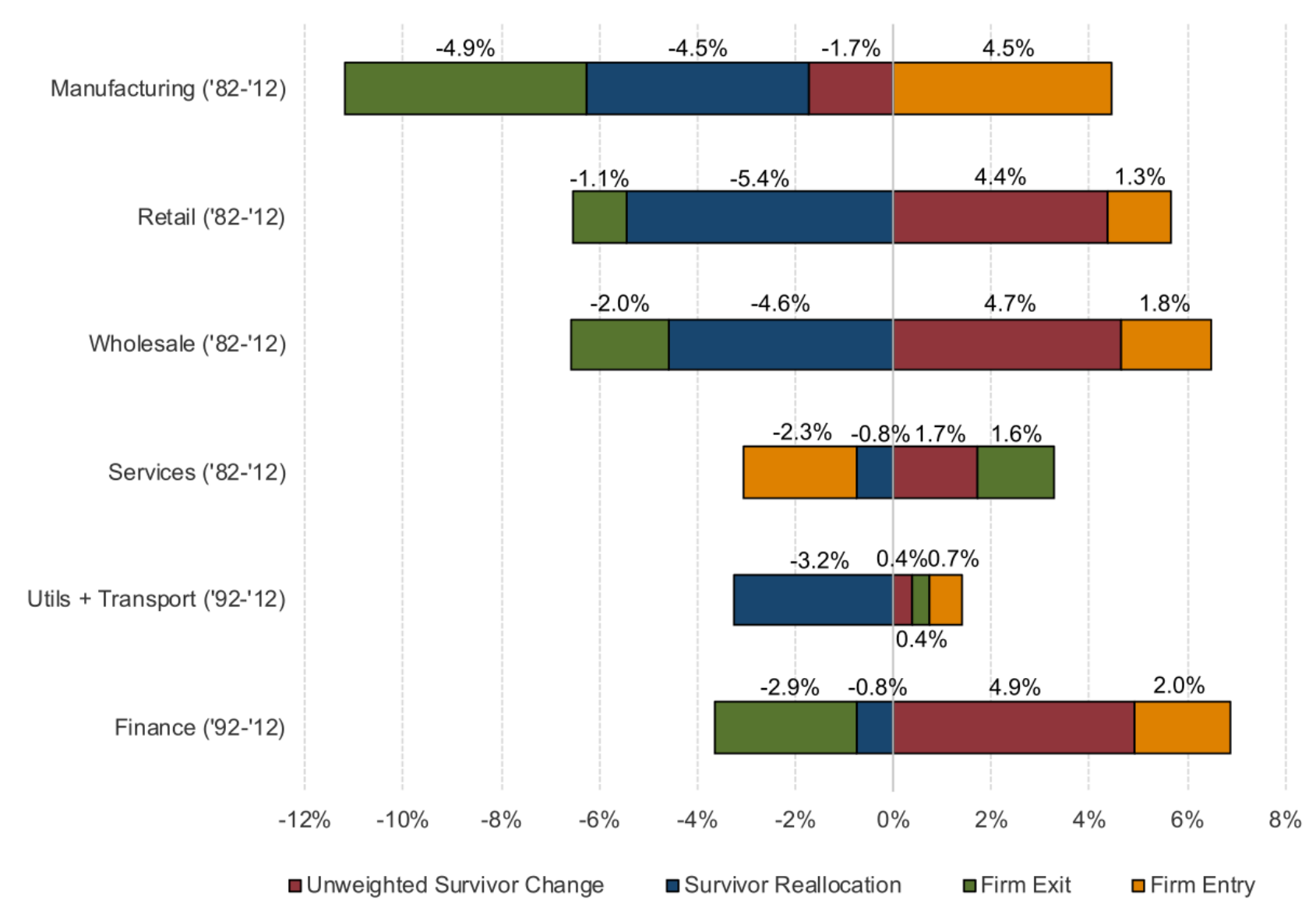

Figure 6: Melitz-Polanec Decomposition of the Change in Labor Share in All Six Sectors

Finding 4: Between-Firm Reallocation Is Strongest in Concentrating Industries

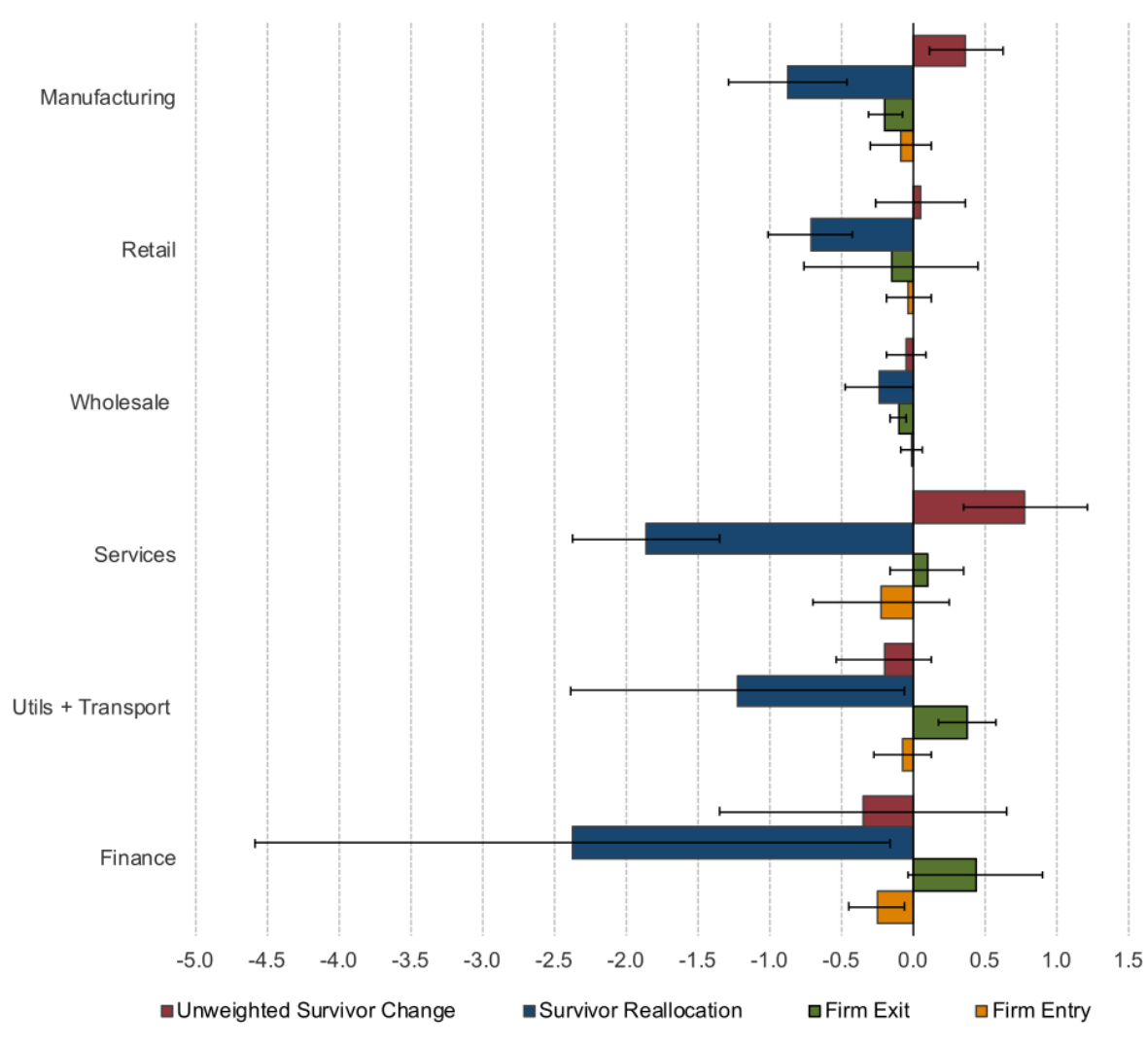

Figure 7: Regressions of the Components of ΔS on ΔConcentration

Finding 5: Concentration ↔ Innovation & Productivity Growth

TABLE VI

CHARACTERISTICS OF CONCENTRATING INDUSTRIES

	CR4 (1)	CR20 (2)	HHI (3)
Panel A: Manufacturing only			
1 Patents per worker	0.090**	0.057***	0.056**
	(0.006)	(0.022)	(0.022)
2 Value added per worker	0.126***	0.074***	0.067***
	(0.028)	(0.020)	(0.025)
3 Capital per worker	0.092**	0.026	0.081***
	(0.041)	(0.022)	(0.029)
4 Five-factor TFP	0.055***	0.024*	0.028*
	(0.019)	(0.013)	(0.017)
5 Payroll per worker	0.013	0.005	0.016
	(0.018)	(0.011)	(0.010)
6 Material costs per worker	0.120***	0.074***	0.068***
	(0.028)	(0.018)	(0.023)
Panel B: All sectors			
7 Manufacturing sales per worker	0.125***	0.067***	0.069***
	(0.027)	(0.018)	(0.016)
8 Retail sales per worker	0.049	0.098	0.027
	(0.048)	(0.067)	(0.023)
9 Wholesale sales per worker	0.16***	0.207***	0.031**
	(0.058)	(0.042)	(0.013)
10 Services sales per worker	0.082	0.125***	0.041**
	(0.055)	(0.036)	(0.019)
11 Utilities/transportation sales per worker	0.415***	0.304***	0.117***
	(0.096)	(0.092)	(0.023)
12 Finance sales per worker	0.270*	0.216*	0.144***
	(0.143)	(0.111)	(0.052)
13 Combined sales per worker	0.155***	0.147***	0.053***
	(0.031)	(0.026)	(0.011)

Conclusion

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Conceptual Mechanism

Capital Intensive Competition $\rightarrow$ Innovative and High Productivity $\rightarrow$ Concentration $\rightarrow$ Superstar firms $\rightarrow$ High Markup $\rightarrow$ Low Labor Share

- Superstar firms might enact barriers to entry to protect their positions
- Prevalent labor outsourcing practices
- Future research
    - Inequality, outsourcing, part-time job, rank-and-file workers, etc.