



COMPETITION, THE LABOR SHARE, AND MONETARY POLICY (NOV 2024)

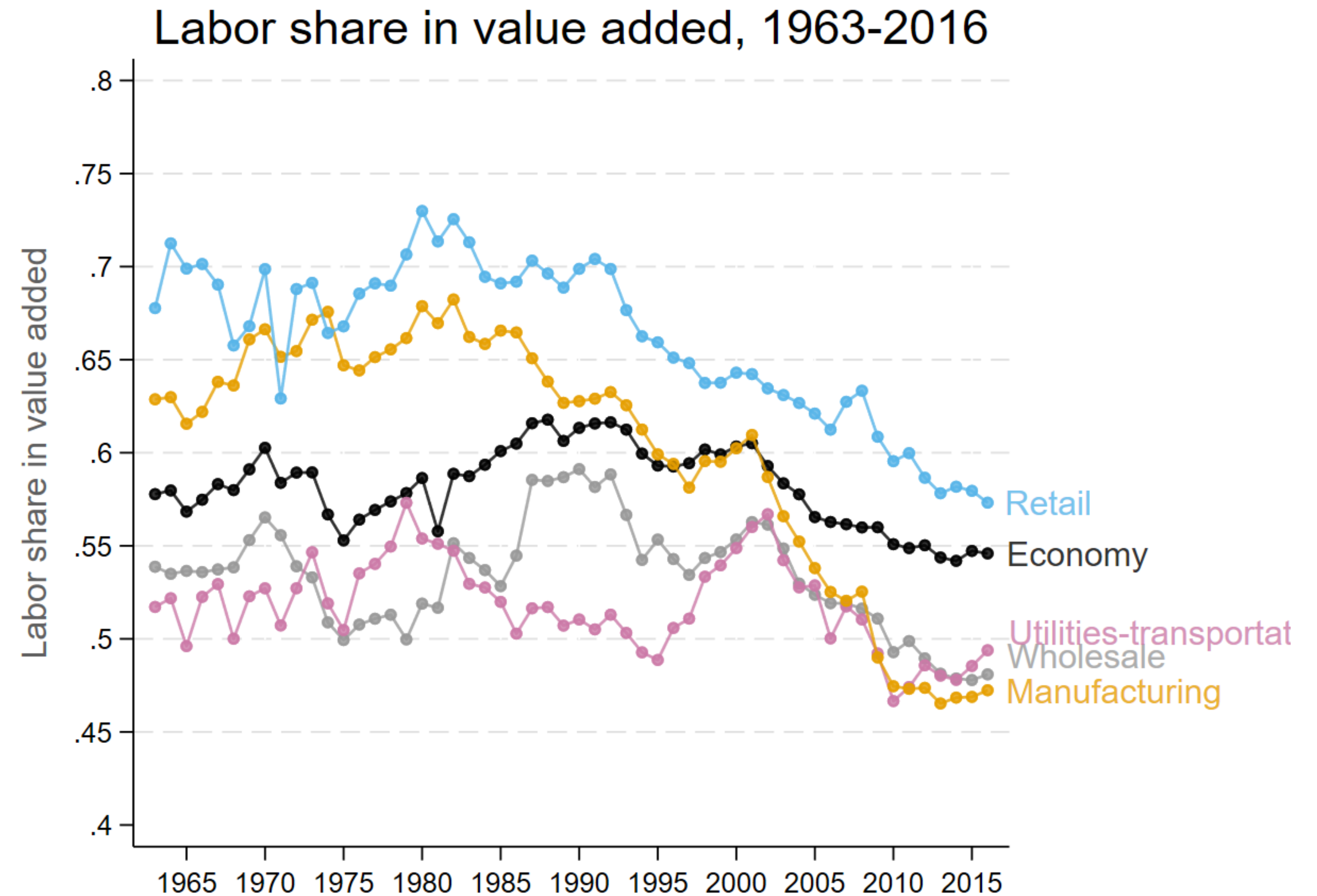
Pascual Restrepo, Yale
Economics Department

THE LABOR SHARE

- **Composite object:** technology - markups - markdowns

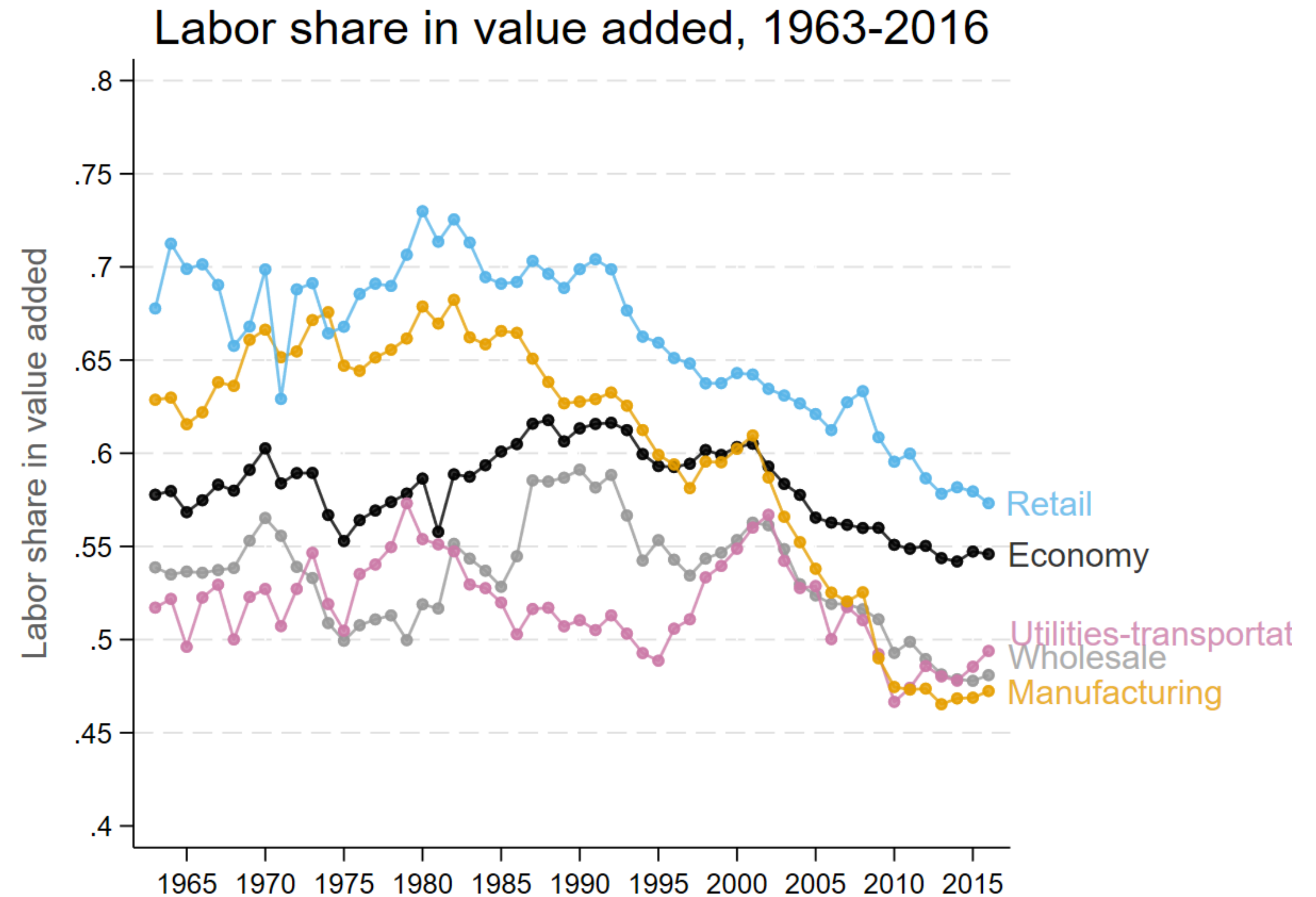
THE LABOR SHARE

- **Composite object:** technology - markups - markdowns
- **The labor share decline:**



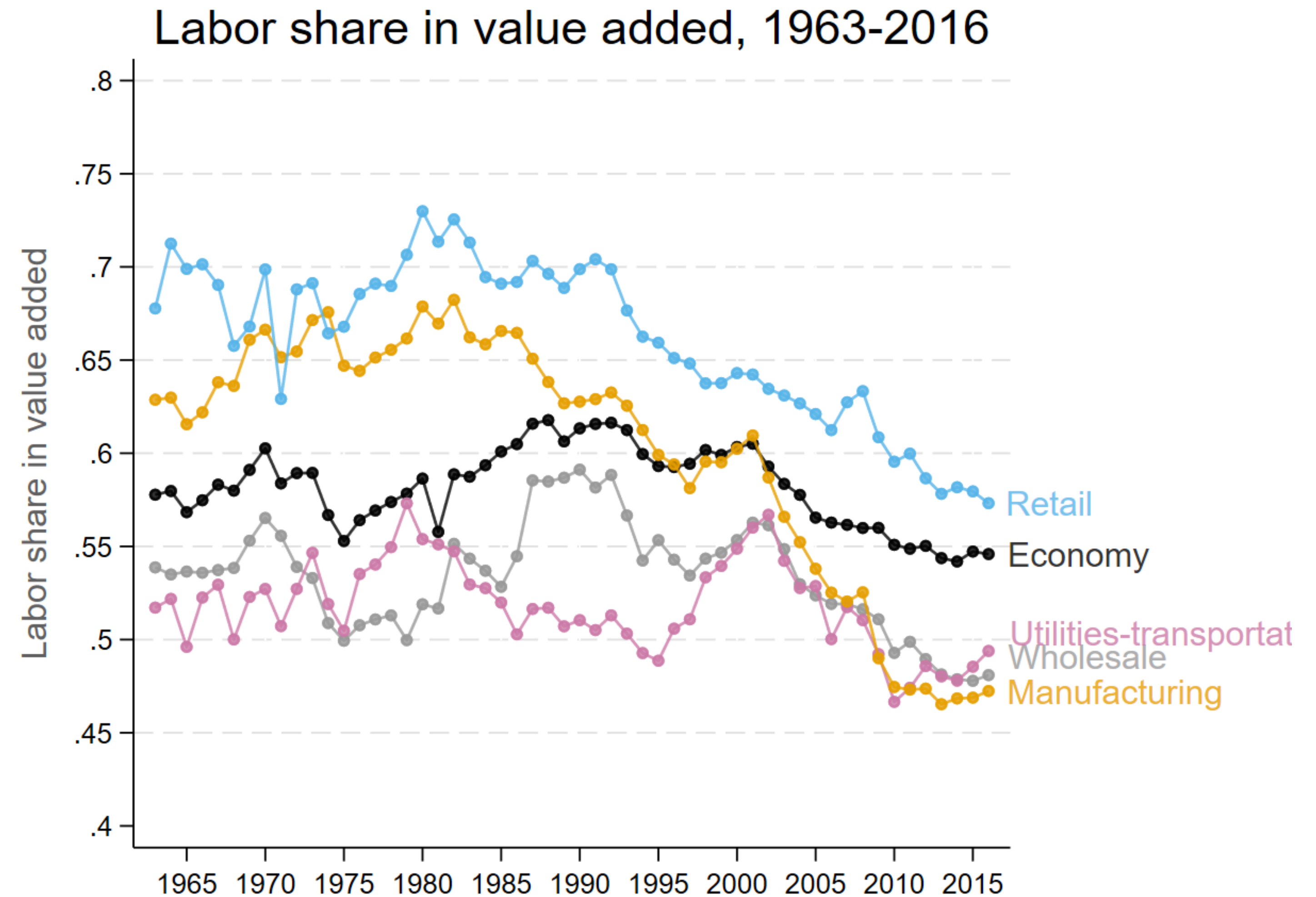
THE LABOR SHARE

- **Composite object:** technology - markups - markdowns
- **The labor share decline:**
 - Modest 6-7 pp decline on aggregate



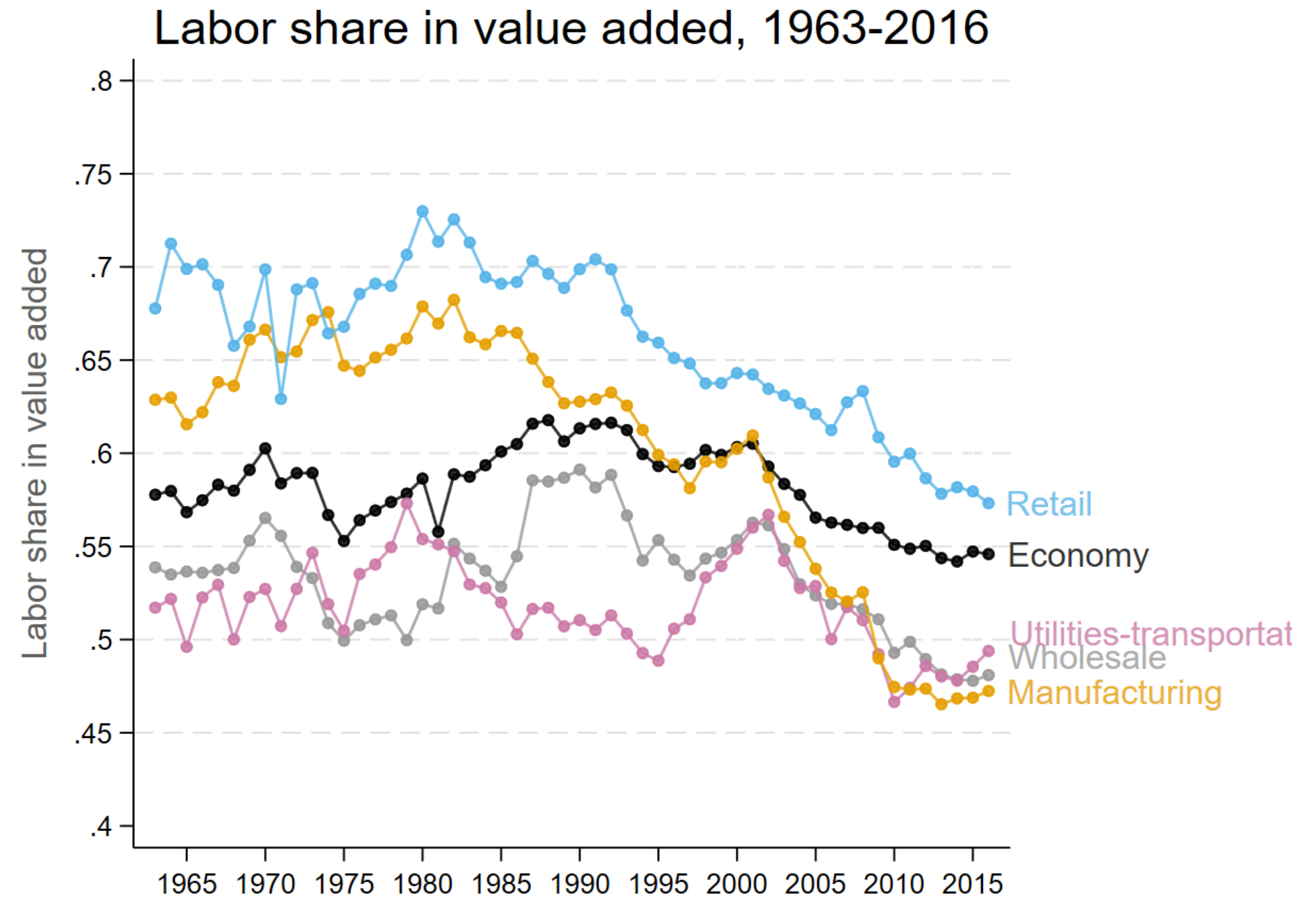
THE LABOR SHARE

- **Composite object:** technology - markups - markdowns
- **The labor share decline:**
 - Modest 6-7 pp decline on aggregate
 - Driven by sizable decline within key sectors since 1980s
 - Manufacturing - 20 pp
 - Retail - 15 pp
 - Wholesale trade - 10 pp



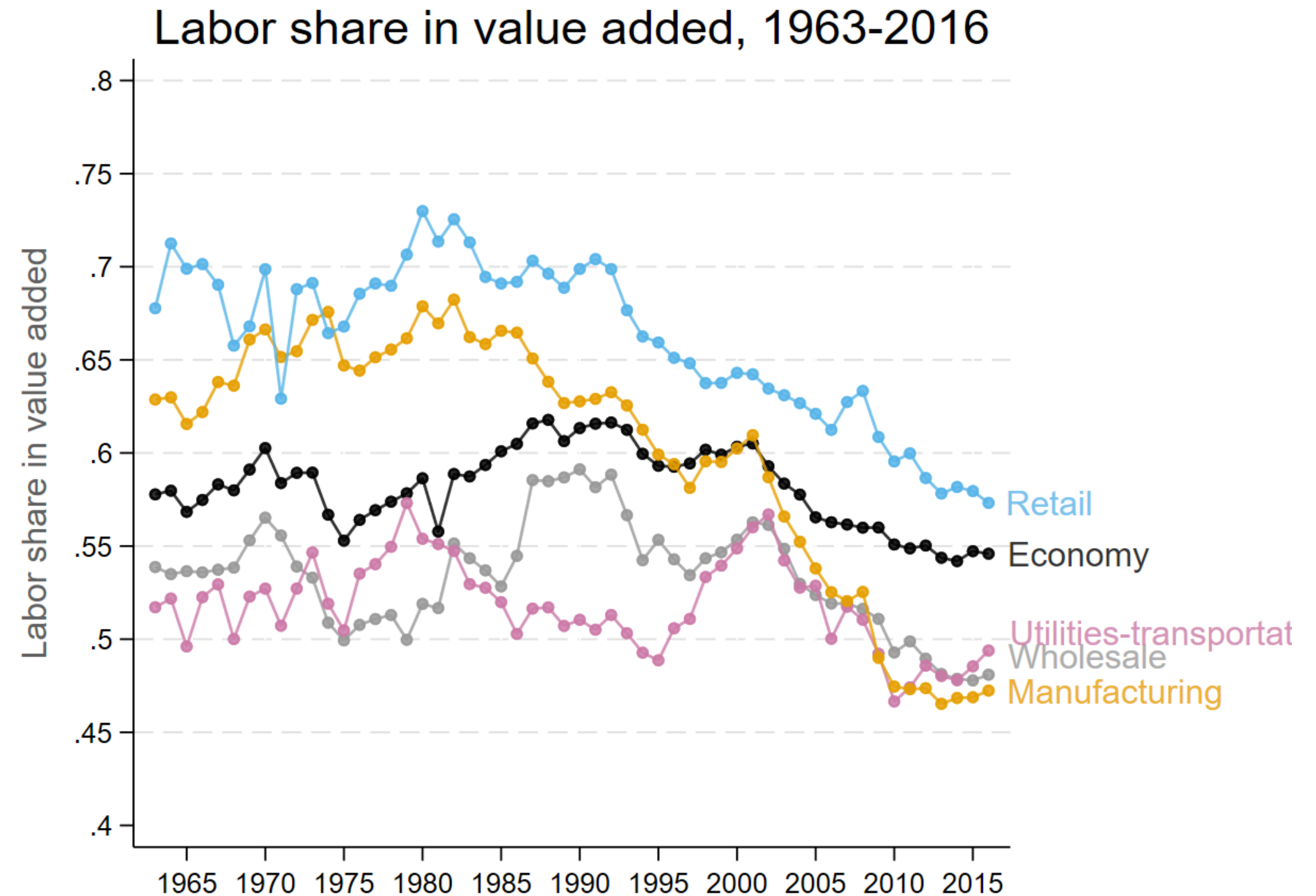
THE LABOR SHARE

- **Composite object:** technology - markups - markdowns
- **The labor share decline:**
 - Modest 6-7 pp decline on aggregate
 - Driven by sizable decline within key sectors since 1980s
 - Manufacturing - 20 pp
 - Retail - 15 pp
 - Wholesale trade - 10 pp
 - Similar patterns internationally



THE LABOR SHARE

- **Composite object:** technology - markups - markdowns
- **The labor share decline:**
 - Modest 6-7 pp decline on aggregate
 - Driven by sizable decline within key sectors since 1980s
 - Manufacturing - 20 pp
 - Retail - 15 pp
 - Wholesale trade - 10 pp
 - Similar patterns internationally
- **What drives the labor share decline? What are the implications for monetary policy?**



THE SIGNS

- Technology - markups - markdowns

THE SIGNS

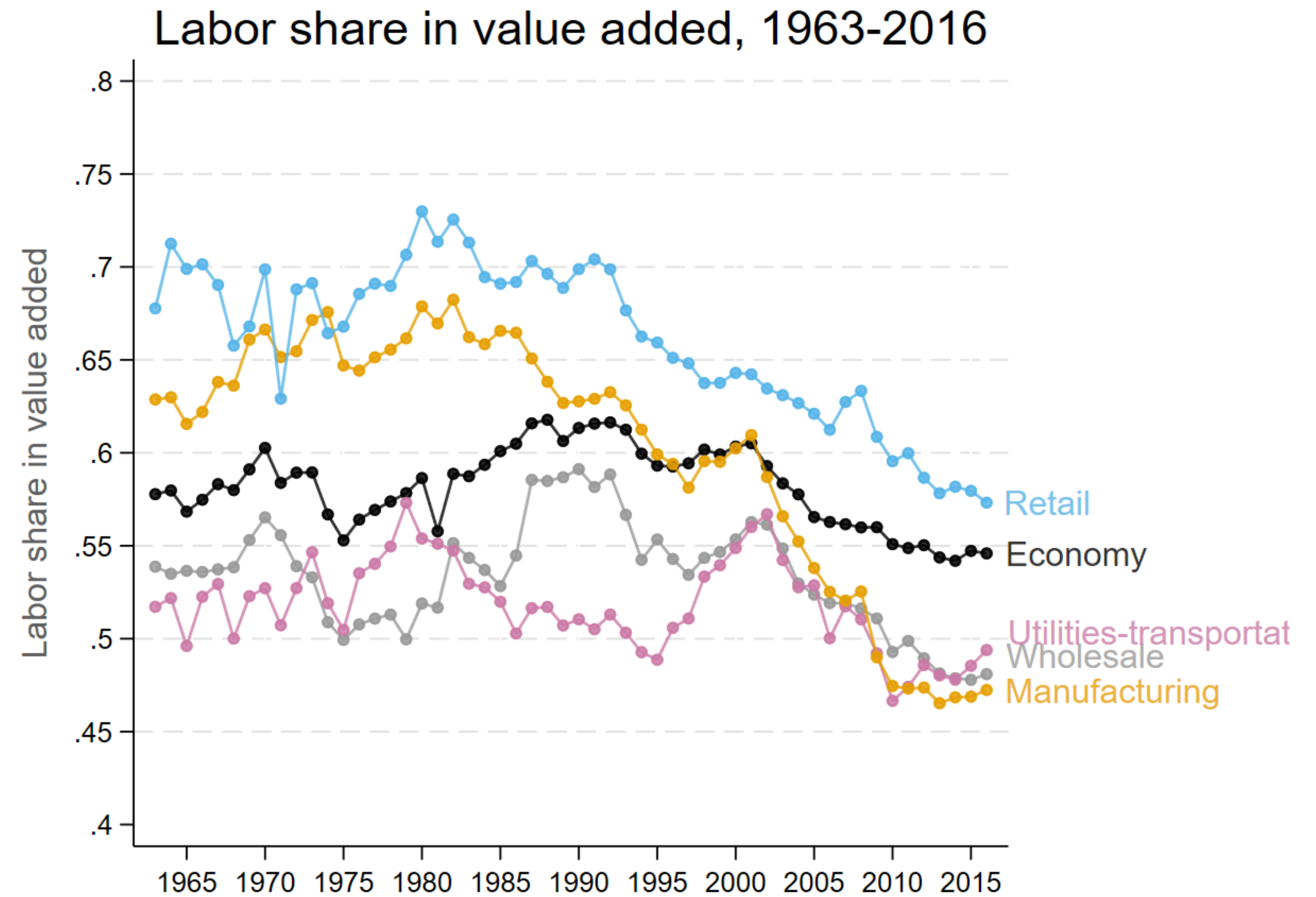
- Technology - markups - markdowns
- My view: **Automation** (and offshoring?)

THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:

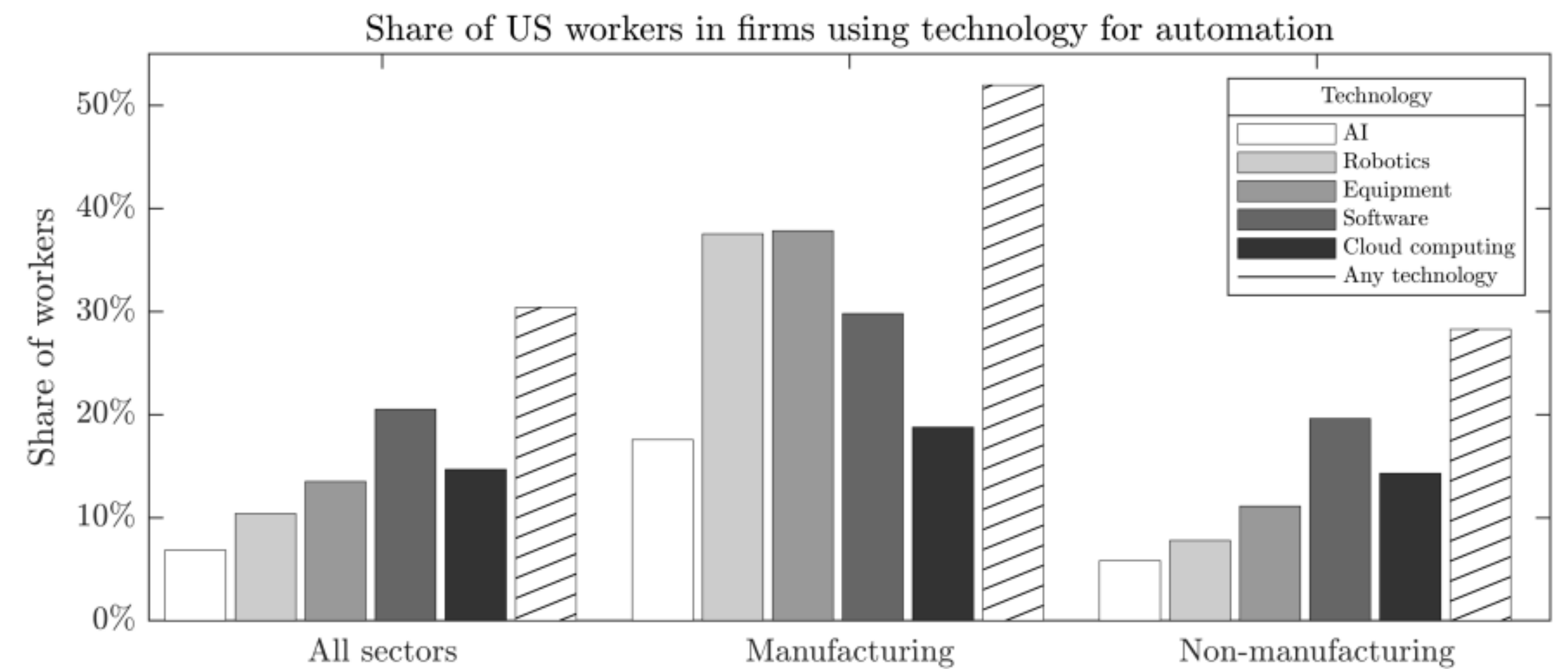
THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns



THE SIGNS

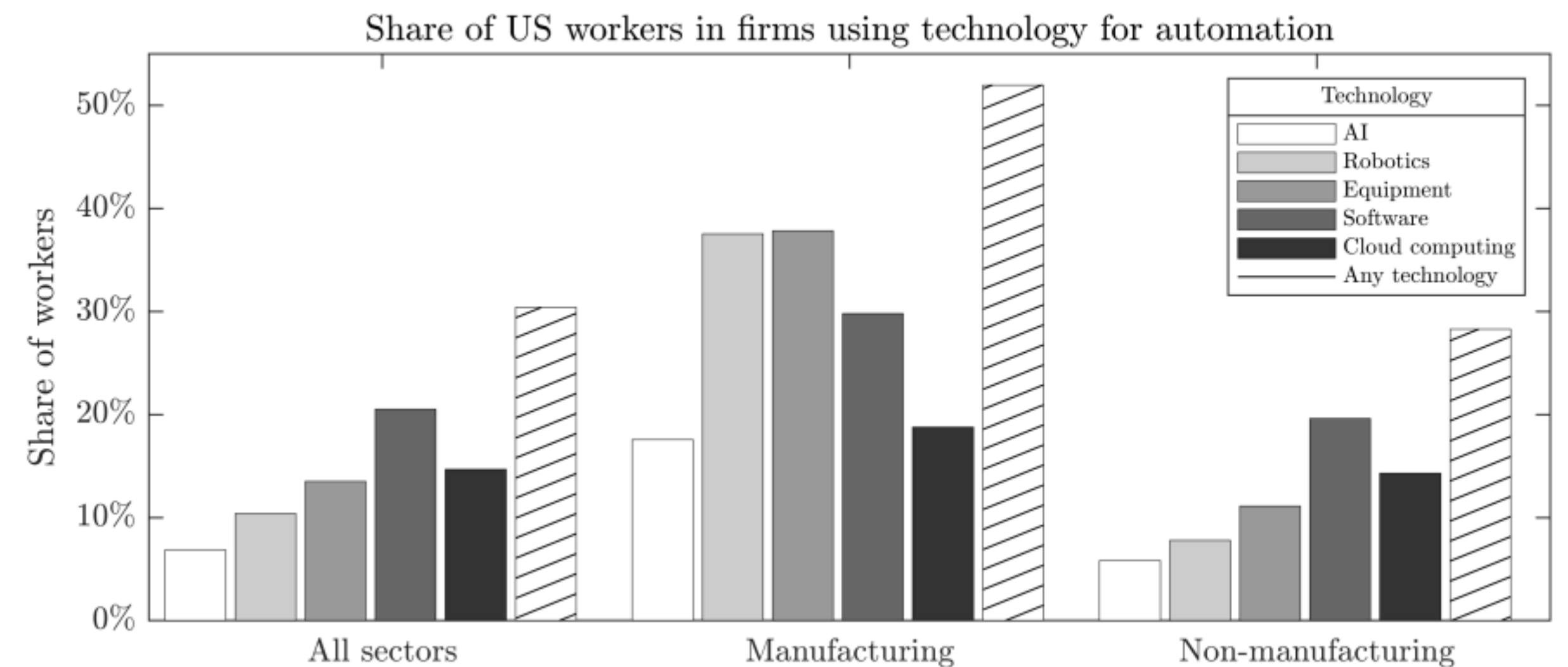
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns



From "Automation and the Workforce: A Firm-Level View from the 2019 Annual Business Survey," Acemoglu et al. 2022

THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)

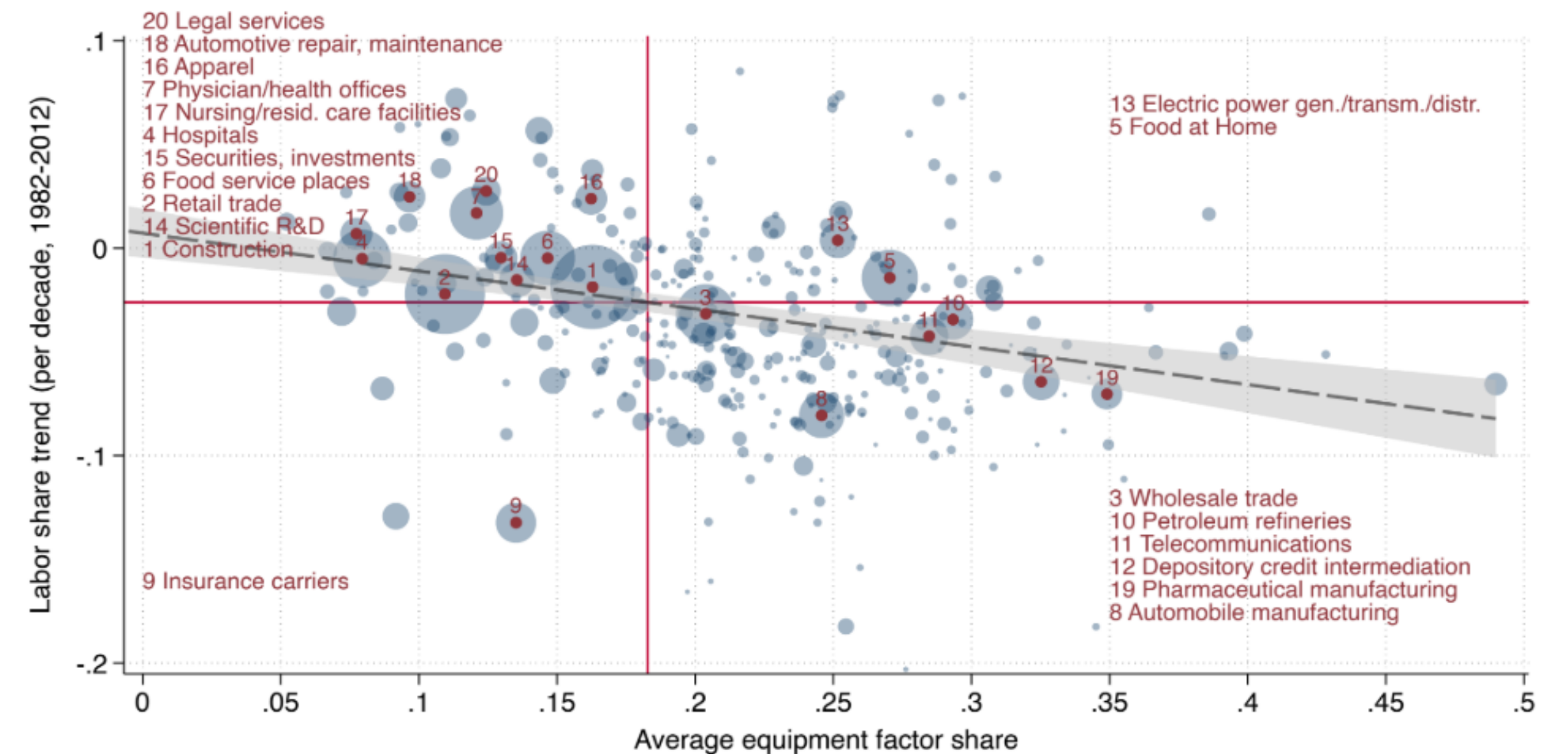


From "Automation and the Workforce: A Firm-Level View from the 2019 Annual Business Survey," Acemoglu et al. 2022

THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)

FIGURE 4: Labor share trends and equipment factor shares

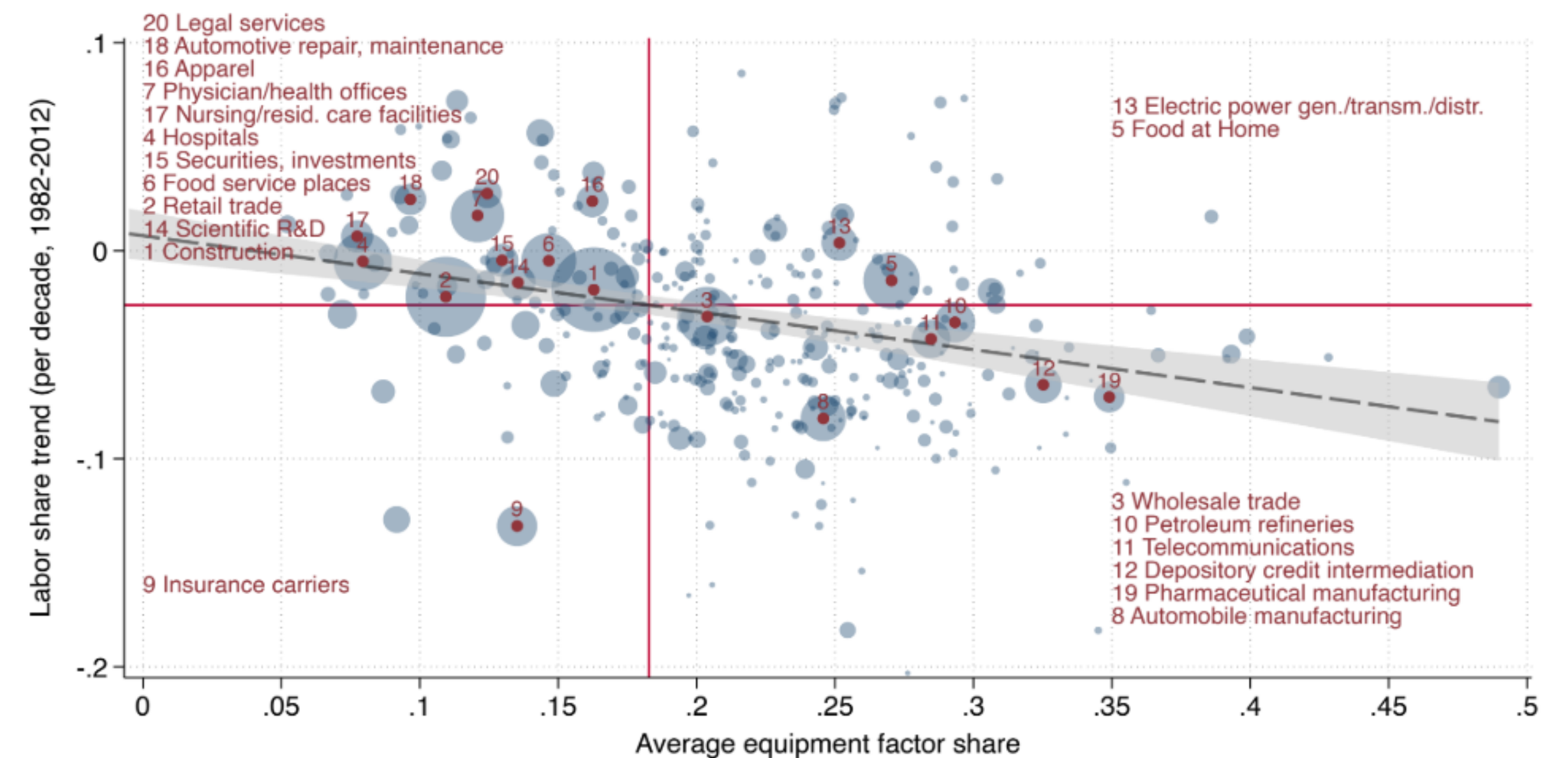


From "The Race Between Preferences and Technology," Hubmer 2023

THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)

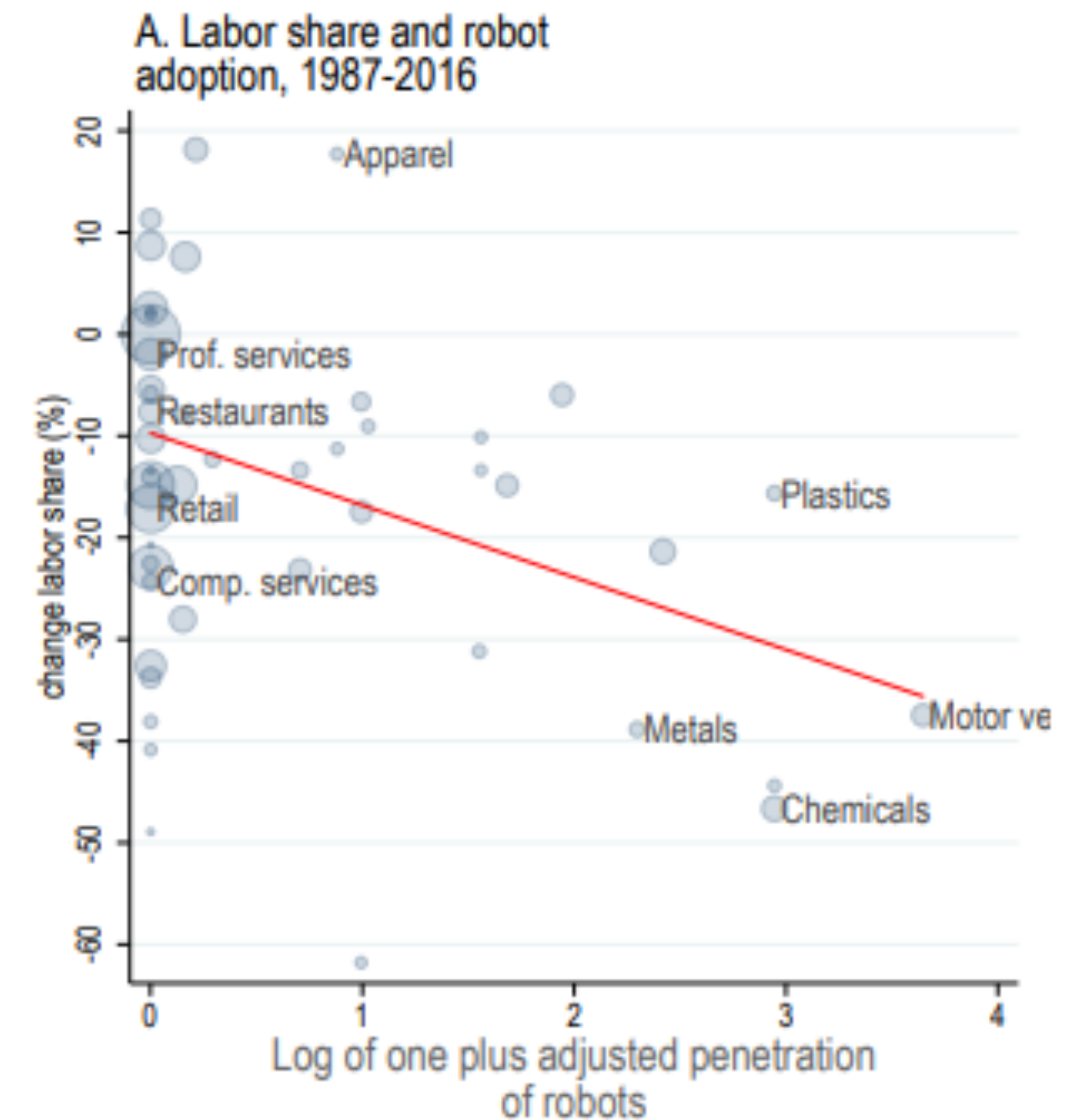
FIGURE 4: Labor share trends and equipment factor shares



From "The Race Between Preferences and Technology," Hubmer 2023

THE SIGNS

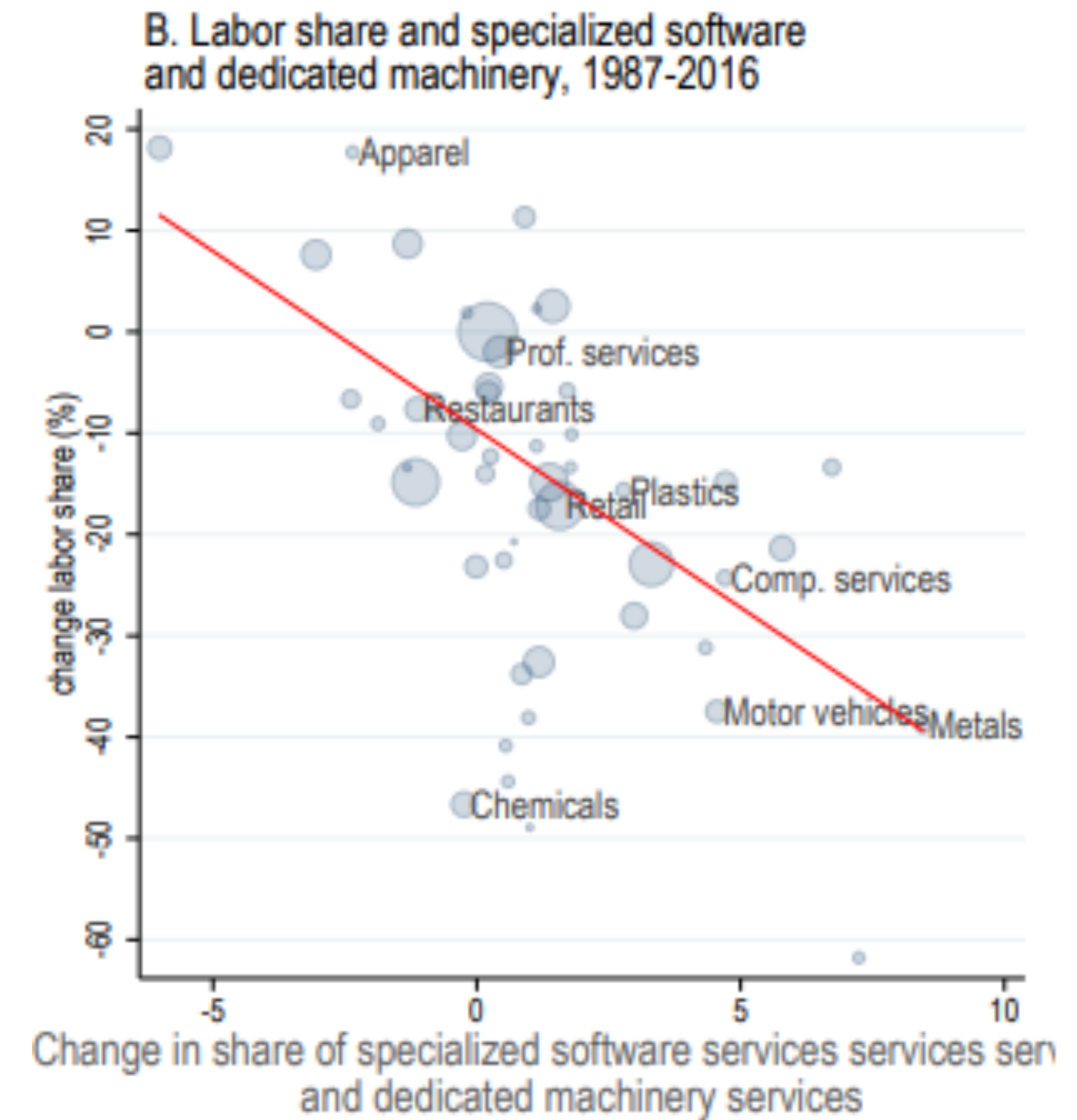
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)



From "Tasks, Automation, and the Rise in U.S. Wage Inequality," Acemoglu-Restrepo 2022

THE SIGNS

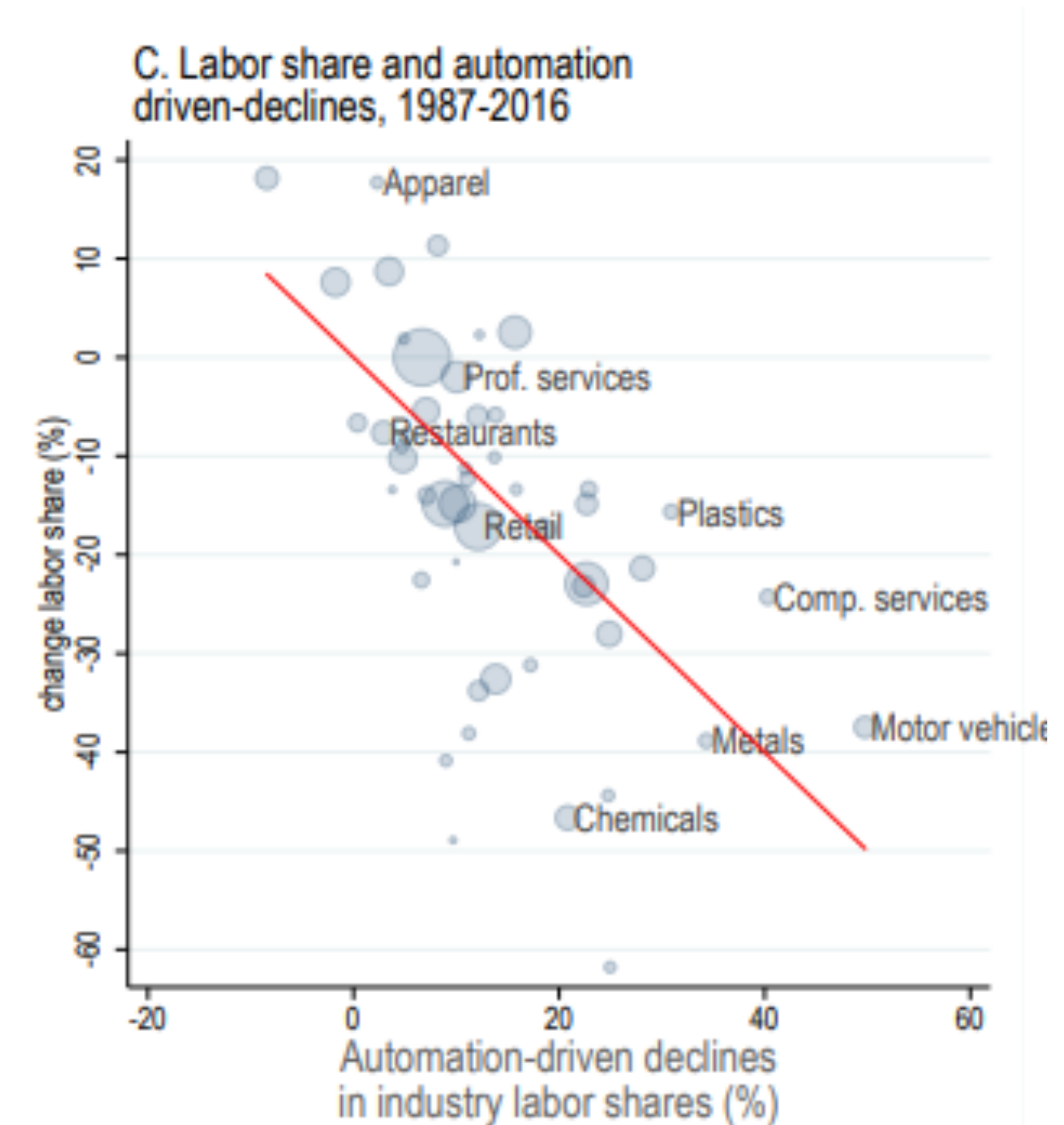
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)



From "Tasks, Automation, and the Rise in U.S. Wage Inequality," Acemoglu-Restrepo 2022

THE SIGNS

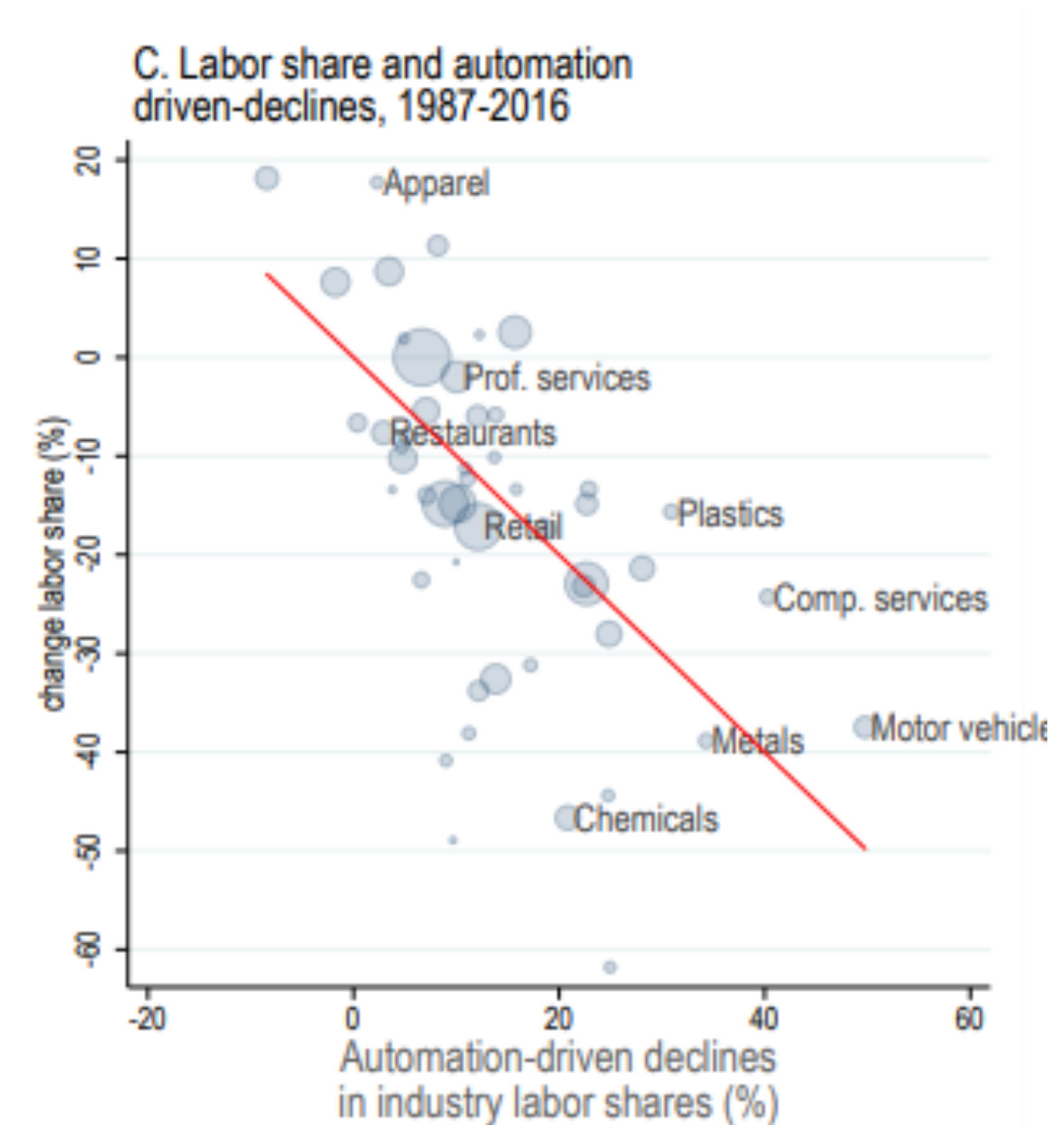
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)



From "Tasks, Automation, and the Rise in U.S. Wage Inequality," Acemoglu-Restrepo 2022

THE SIGNS

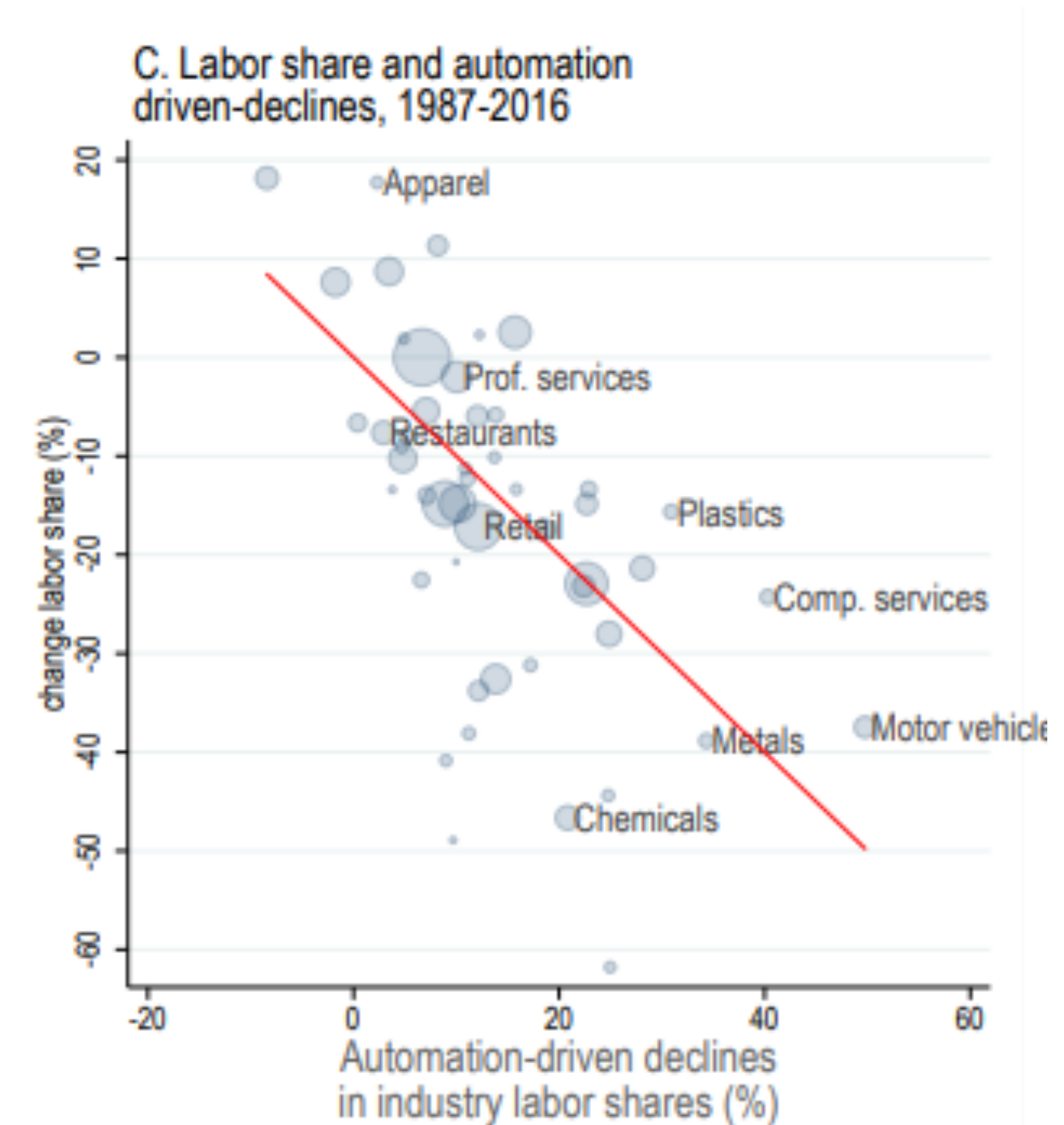
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)
 - Within industries, firms adopting technologies for automation see decline in their labor share (Acemoglu-Lelarge-Restrepo 2020; Acemoglu et al. 2022)



From "Tasks, Automation, and the Rise in U.S. Wage Inequality," Acemoglu-Restrepo 2022

THE SIGNS

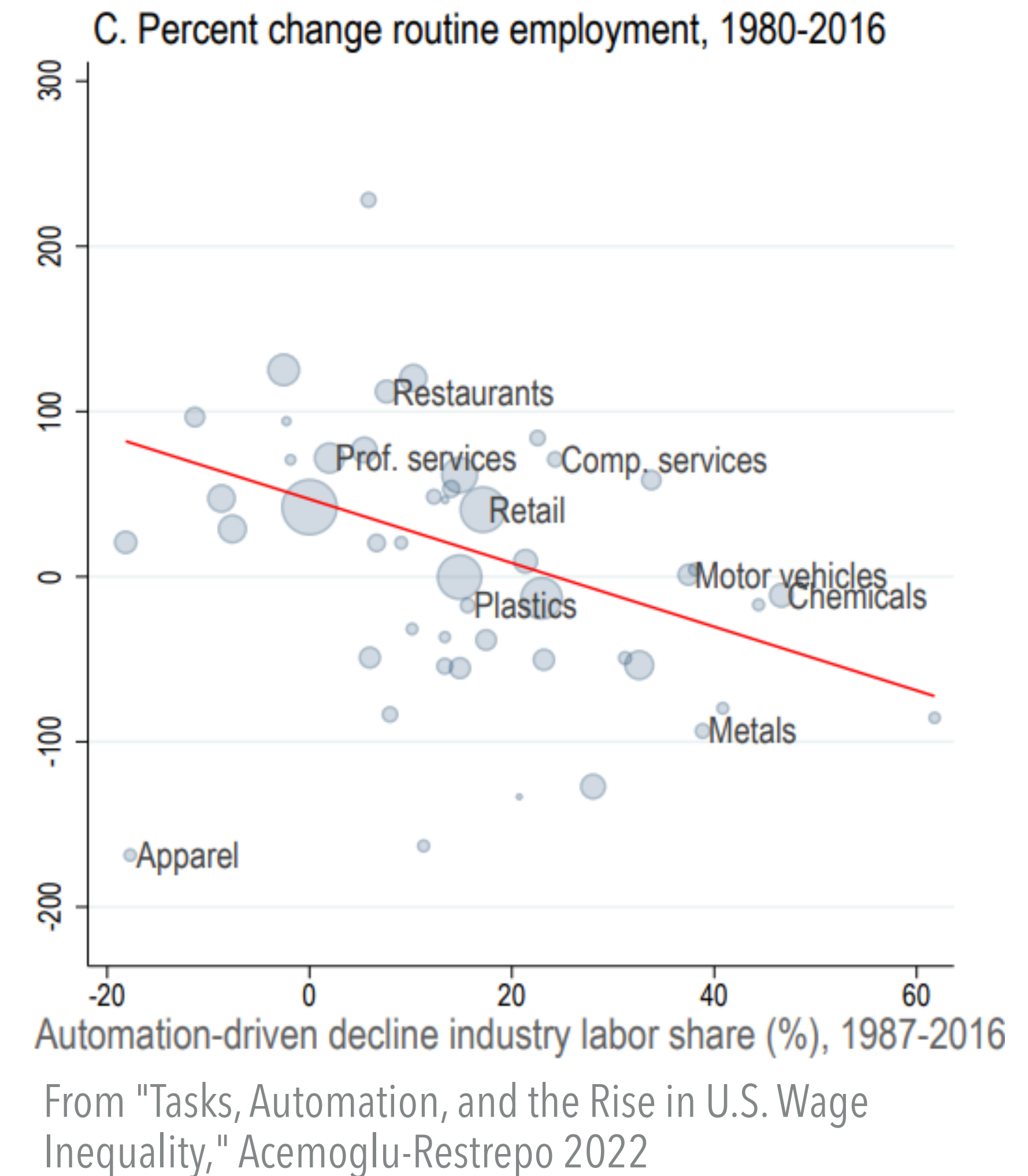
- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)
 - Within industries, firms adopting technologies for automation see decline in their labor share (Acemoglu-Lelarge-Restrepo 2020; Acemoglu et al. 2022)
 - Decline in labor share correlates with decline in share of production and clerical workers (Acemoglu-Restrepo 2022)



From "Tasks, Automation, and the Rise in U.S. Wage Inequality," Acemoglu-Restrepo 2022

THE SIGNS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Signs pointing to automation:
 - Sectoral patterns
 - Within sector, faster decline in equipment and computer intensive industries (Hubmer 2023)
 - Proxies for investment in automation-related equipment explain 50% of labor share decline across sectors (Acemoglu-Restrepo 2022)
 - Within industries, firms adopting technologies for automation see decline in their labor share (Acemoglu-Lelarge-Restrepo 2020; Acemoglu et al. 2022)
 - Decline in labor share correlates with decline in share of production and clerical workers (Acemoglu-Restrepo 2022)



THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation** (and offshoring?)

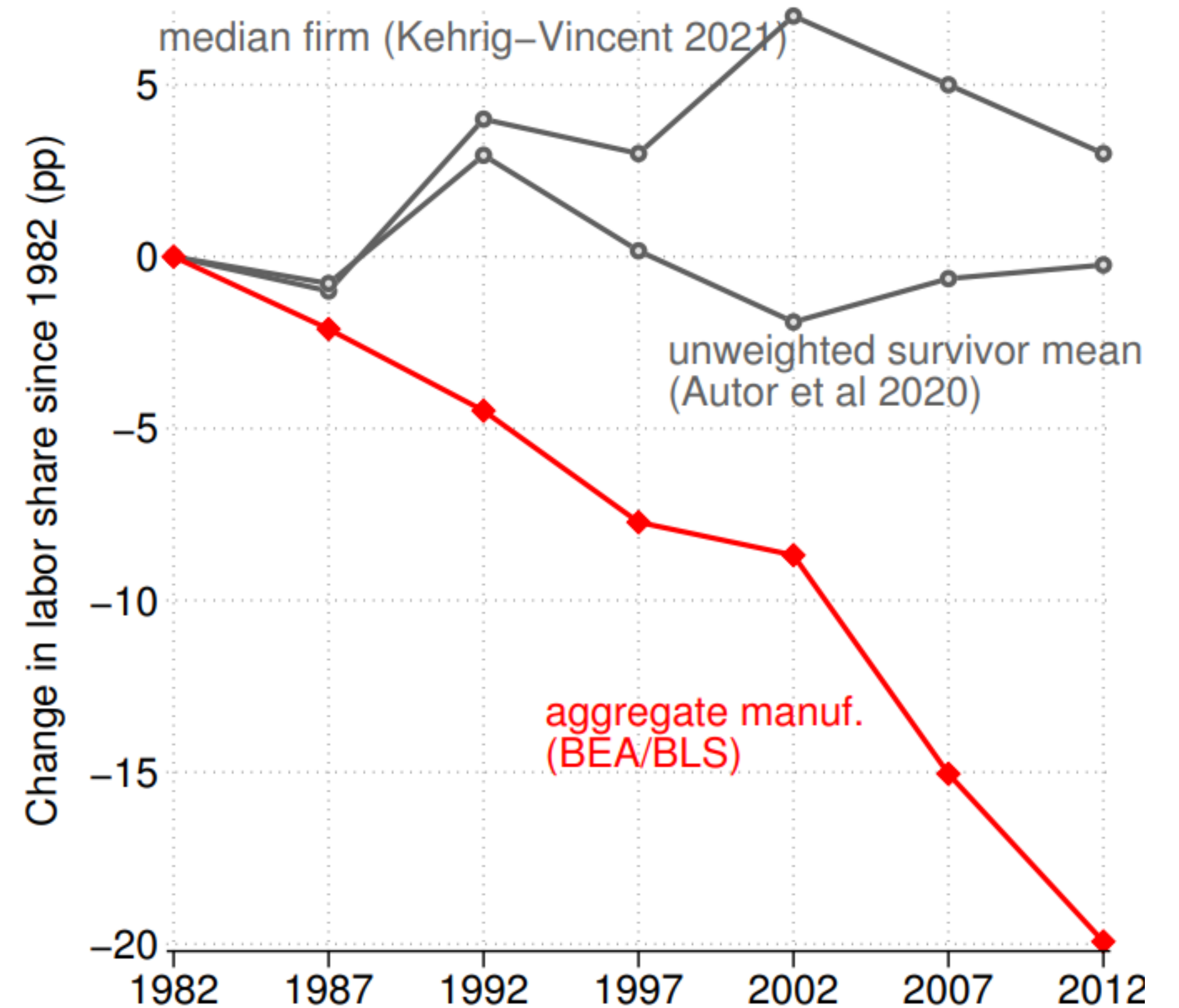
THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Main objections:
 - Labor share of typical firm rising (Autor et al. 2020; Kehrig-Vincent 2021)

THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Main objections:
 - Labor share of typical firm rising (Autor et al. 2020; Kehrig-Vincent 2021)

Labor share decomposition in manufacturing

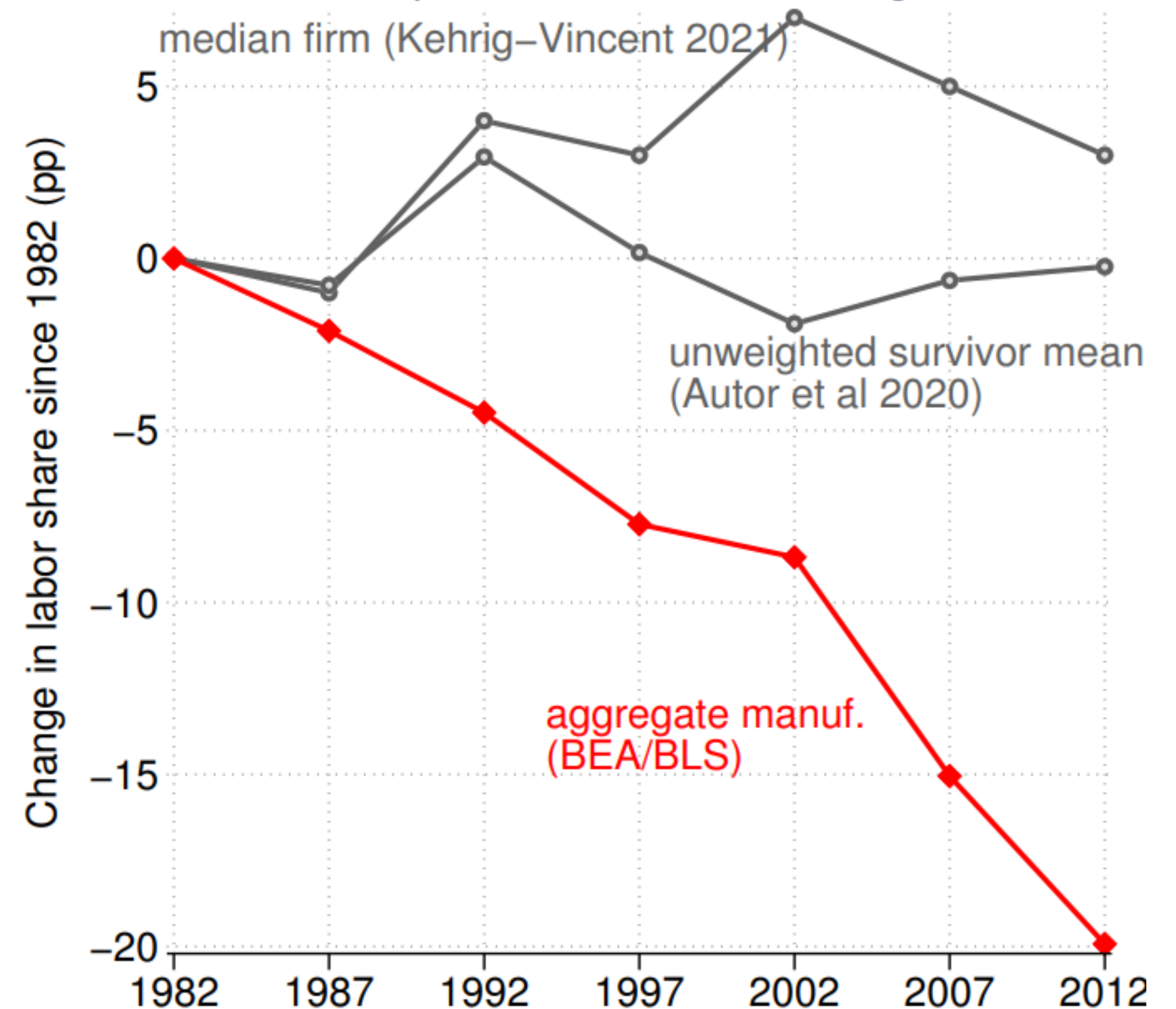


THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Main objections:
 - Labor share of typical firm rising (Autor et al. 2020; Kehrig-Vincent 2021)

Response: for a variety of reasons, mostly large firms automate (Hubmer-Restrepo 2024; Acemoglu et al. 2021)

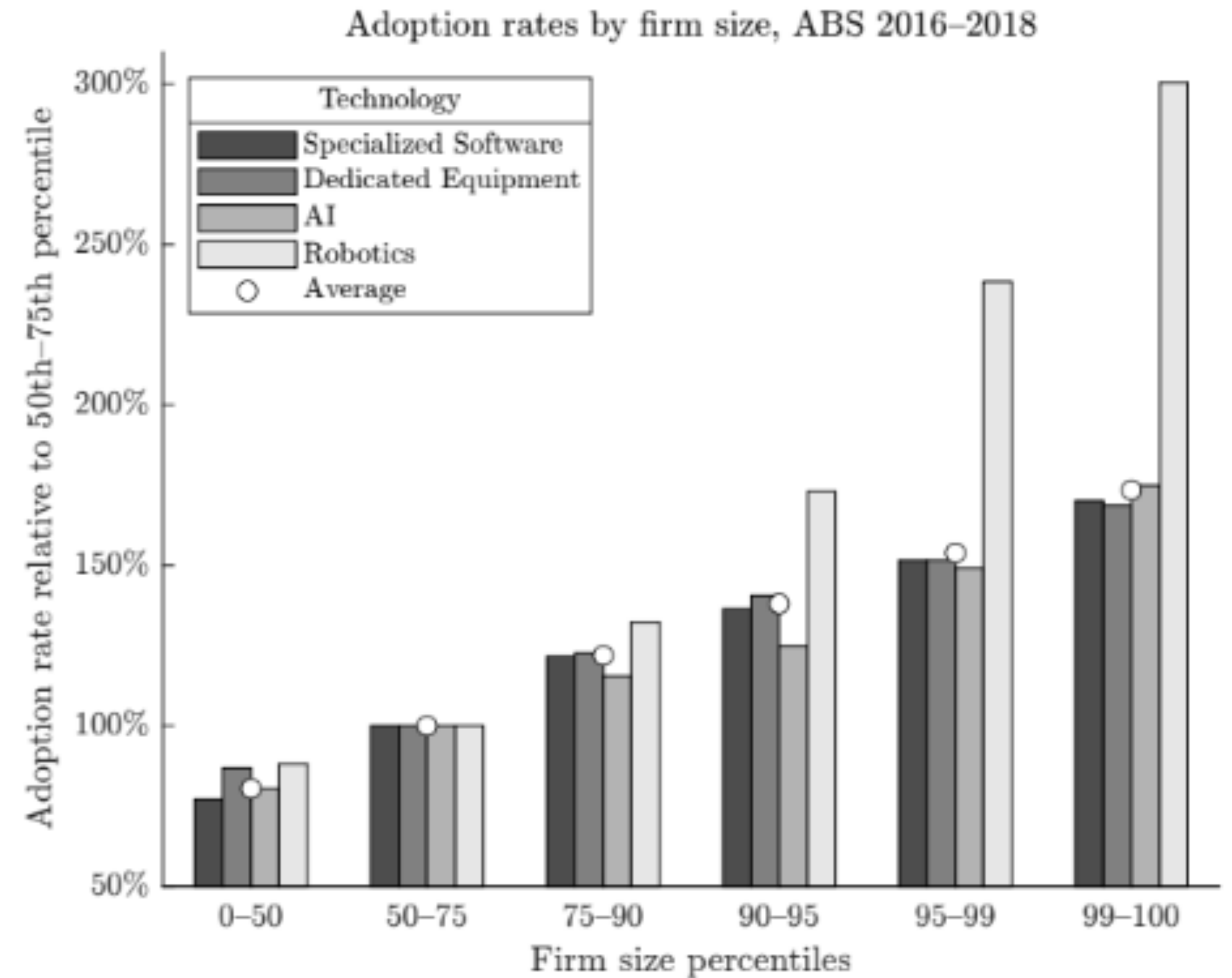
Labor share decomposition in manufacturing



THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Main objections:
 - Labor share of typical firm rising (Autor et al. 2020; Kehrig-Vincent 2021)

Response: for a variety of reasons, mostly large firms automate (Hubmer-Restrepo 2024; Acemoglu et al. 2021)



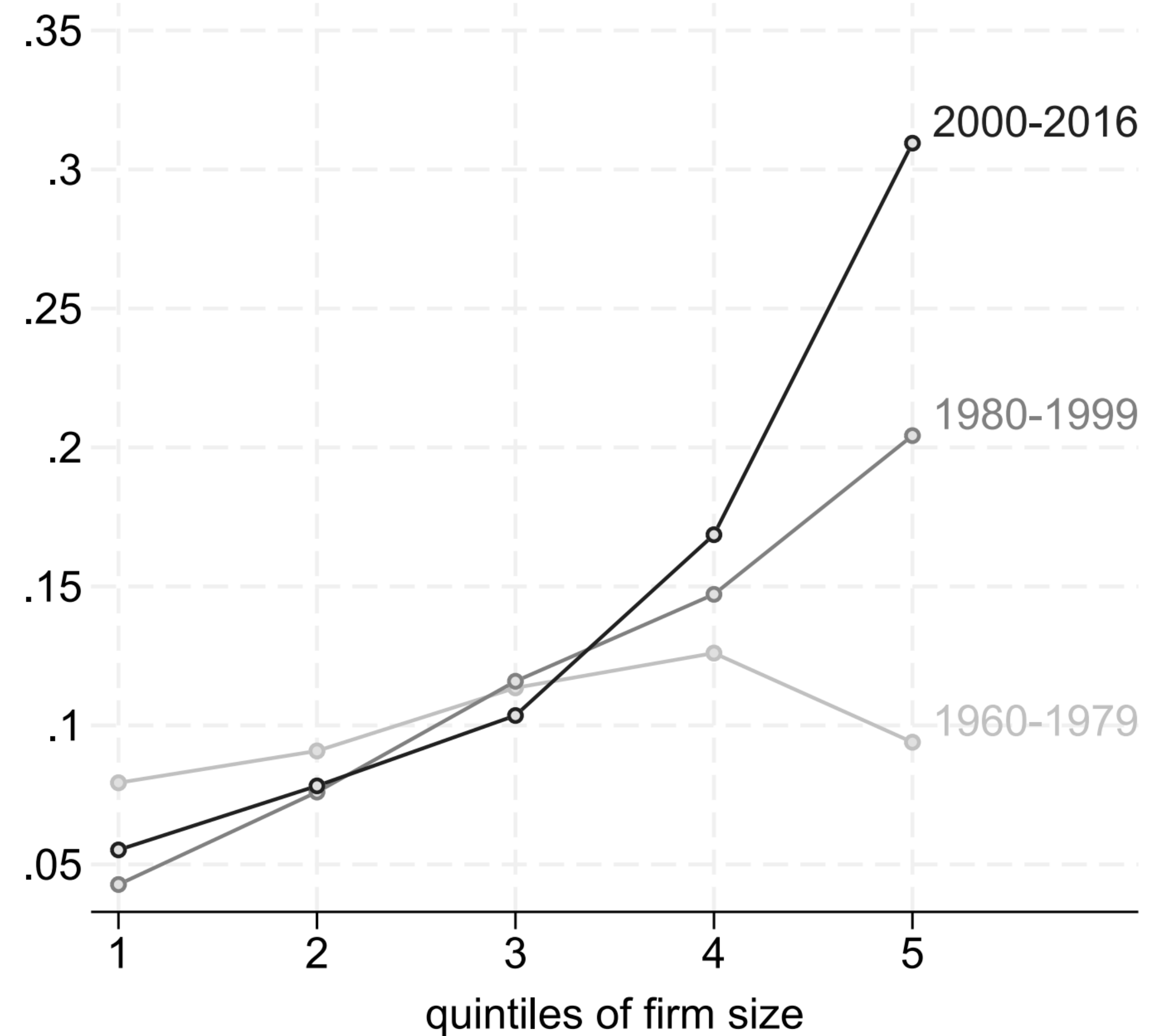
From "Not a Typical Firm: Capital-Labor Substitution and Firms' Labor Shares"
Hubmer-Restrepo 2024

THE OBJECTIONS

- Technology - markups - markdowns
- My view: **Automation (and offshoring?)**
- Main objections:
 - Labor share of typical firm rising (Autor et al. 2020; Kehrig-Vincent 2021)

Response: for a variety of reasons, mostly large firms automate (Hubmer-Restrepo 2024; Acemoglu et al. 2021)

Output-to-capital elasticity:
manufacturing firms in Compustat



From "Not a Typical Firm: Capital-Labor Substitution and Firms' Labor Shares"
Hubmer-Restrepo 2024

OTHER CANDIDATE FORCES

OTHER CANDIDATE FORCES

- Changes in market structure

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:
 - **Increased competition** (aka *good concentration*)

OTHER CANDIDATE FORCES

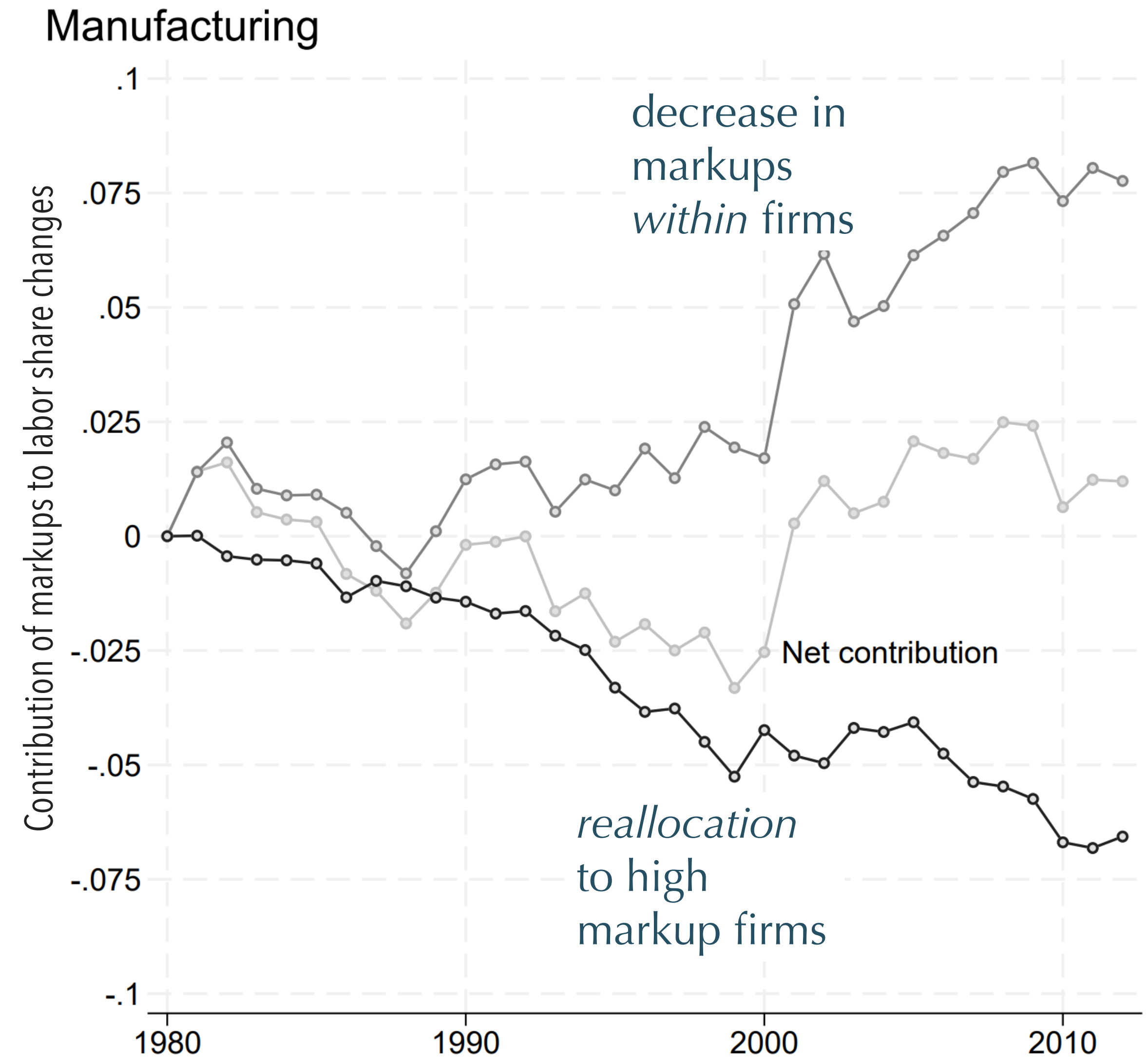
- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:
 - **Increased competition** (aka *good concentration*)
 - Rising barriers to entry and lax anti-trust (aka *bad concentration*)

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:
 - **Increased competition** (aka *good concentration*)
 - Rising barriers to entry and lax anti-trust (aka *bad concentration*)
 - Rising productivity dispersion

OTHER CANDIDATE FORCES

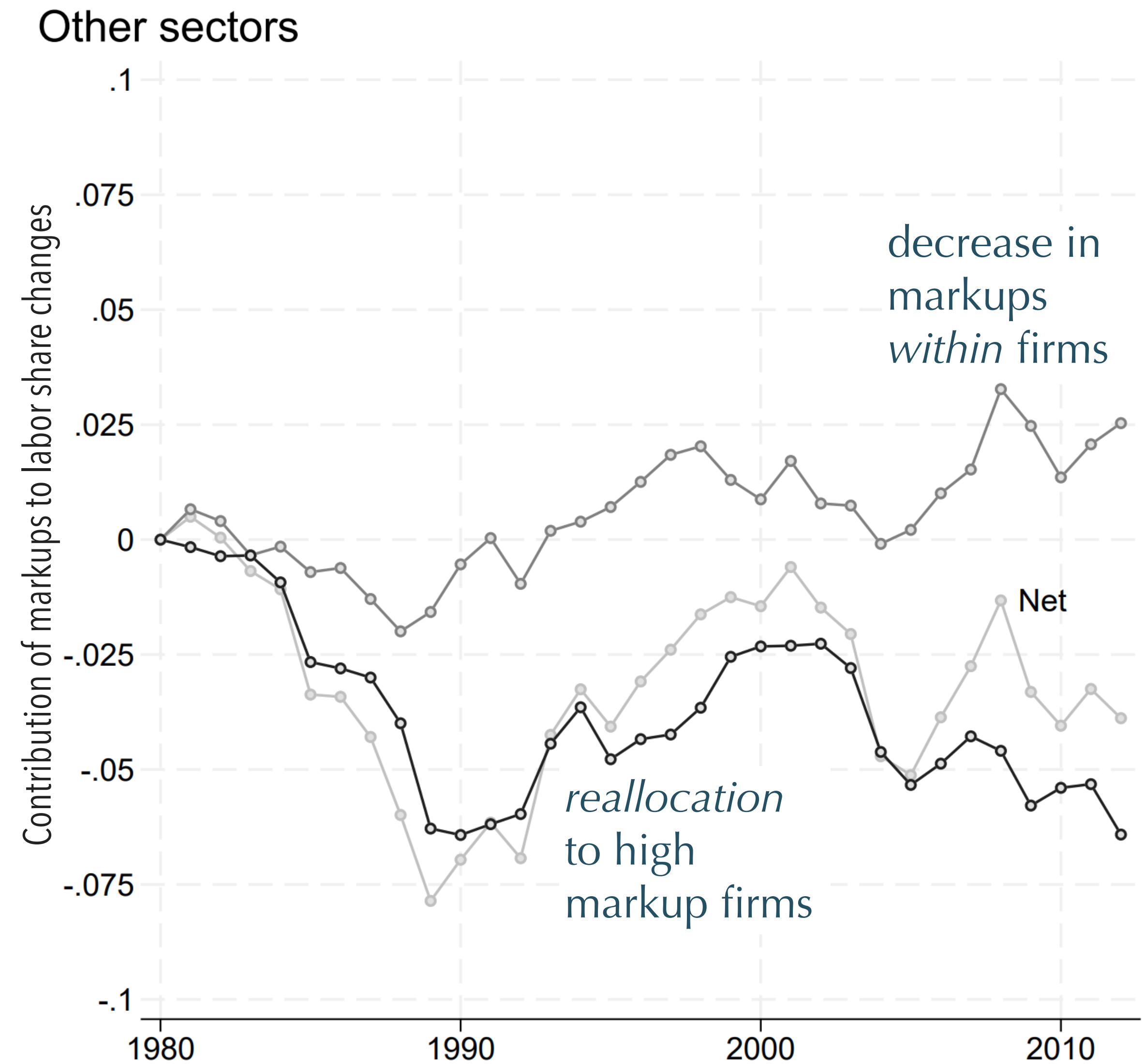
- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:
 - **Increased competition** (aka *good concentration*)
 - Rising barriers to entry and lax anti-trust (aka *bad concentration*)
 - Rising productivity dispersion



From "Not a Typical Firm: Capital-Labor Substitution and Firms' Labor Shares"
Hubmer-Restrepo 2024

OTHER CANDIDATE FORCES

- Changes in market structure
 - Labor markets and monopsony (If anything, *raised* labor share by 3 pp, Berger et al. 2022)
 - Rising *national* sales concentration (Autor et al. 2022)
- Three explanations for rising concentration:
 - **Increased competition** (aka *good concentration*)
 - Rising barriers to entry and lax anti-trust (aka *bad concentration*)
 - Rising productivity dispersion



From "Not a Typical Firm: Capital-Labor Substitution and Firms' Labor Shares"
Hubmer-Restrepo 2024

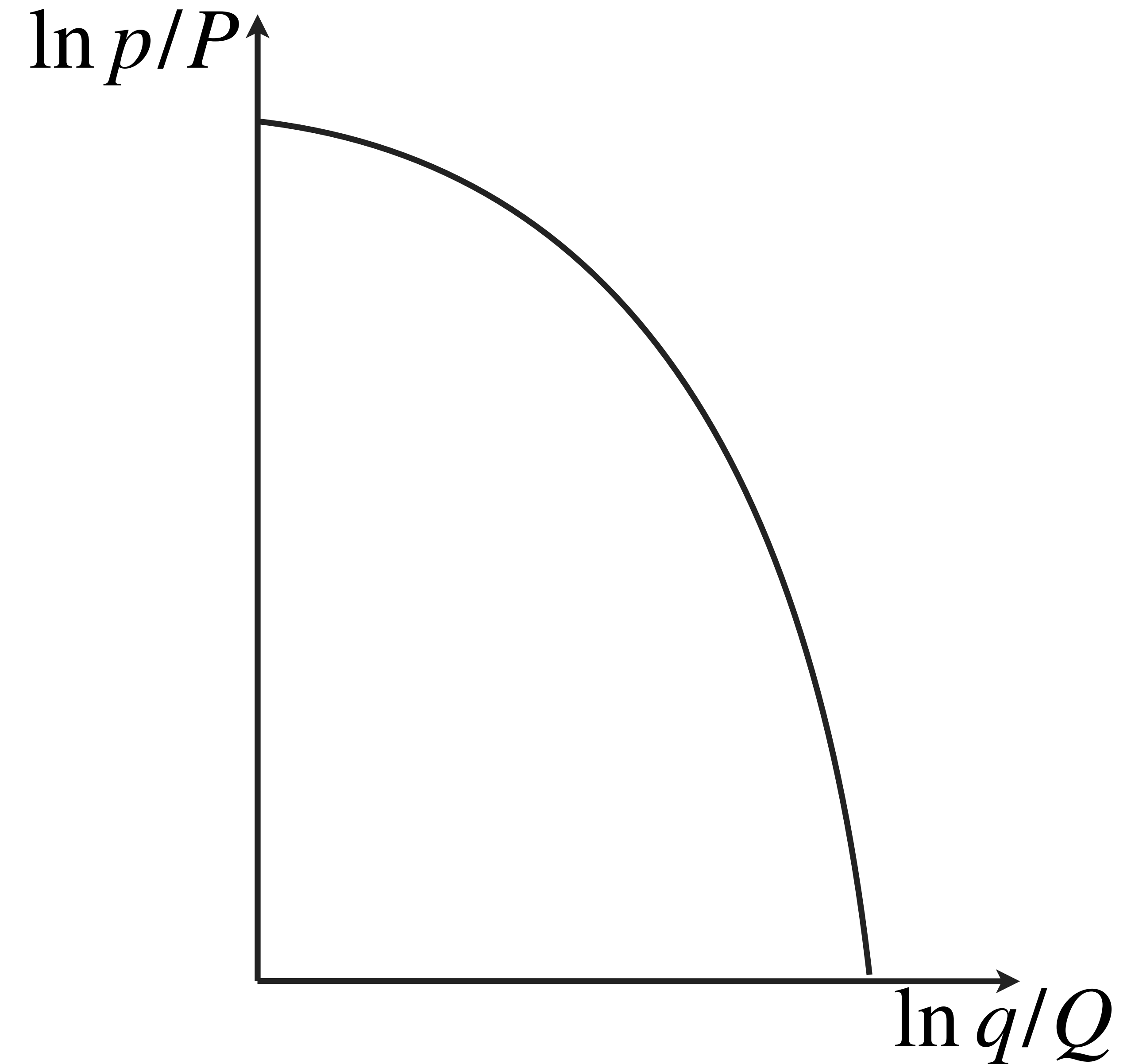
THE CASE FOR INCREASED COMPETITION

THE CASE FOR INCREASED COMPETITION

- Basic workings

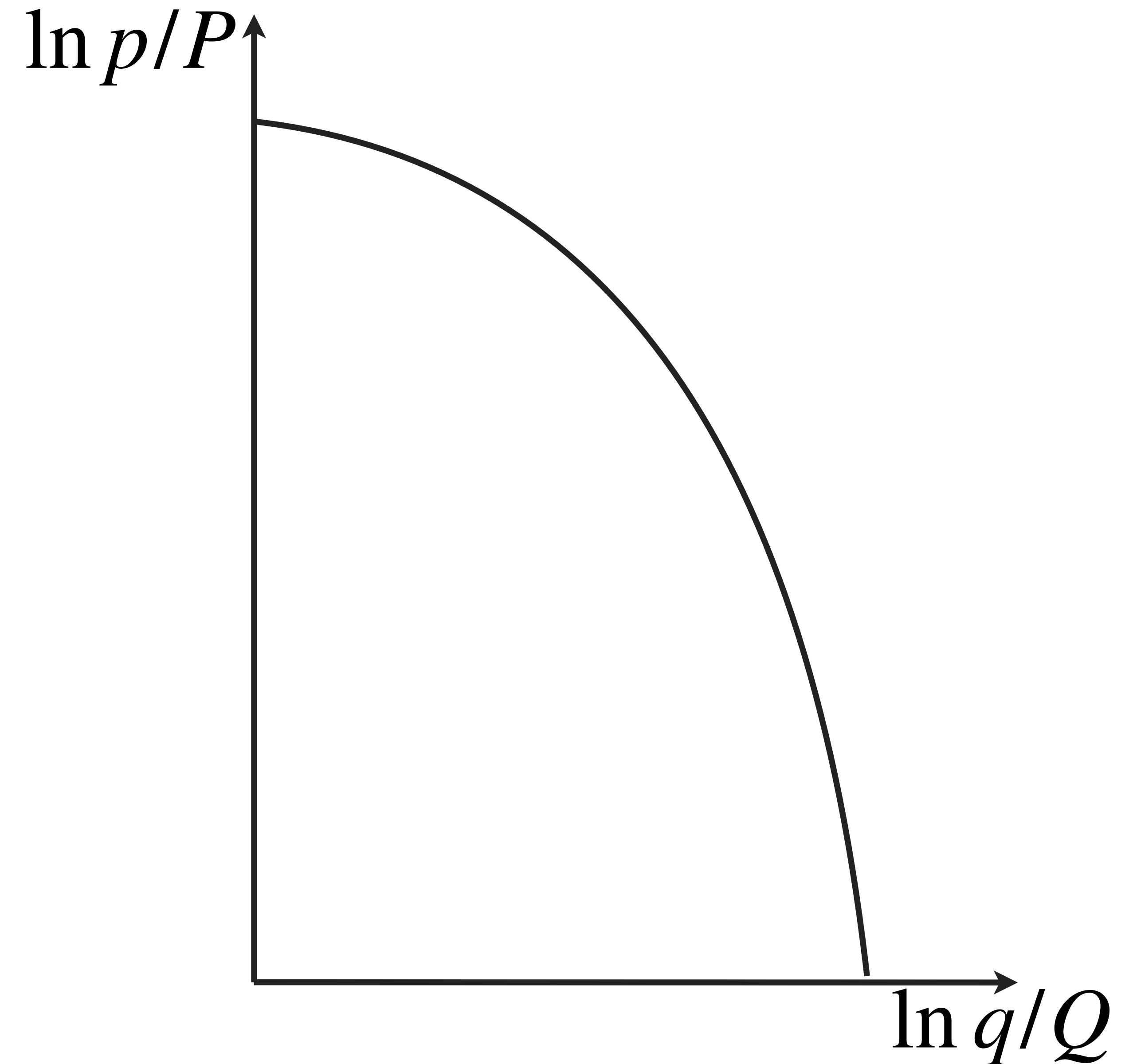
THE CASE FOR INCREASED COMPETITION

- Basic workings
 - Log-concave demand system satisfying Marshall's laws (more productive and larger firms face more inelastic demand and have lower passthroughs)



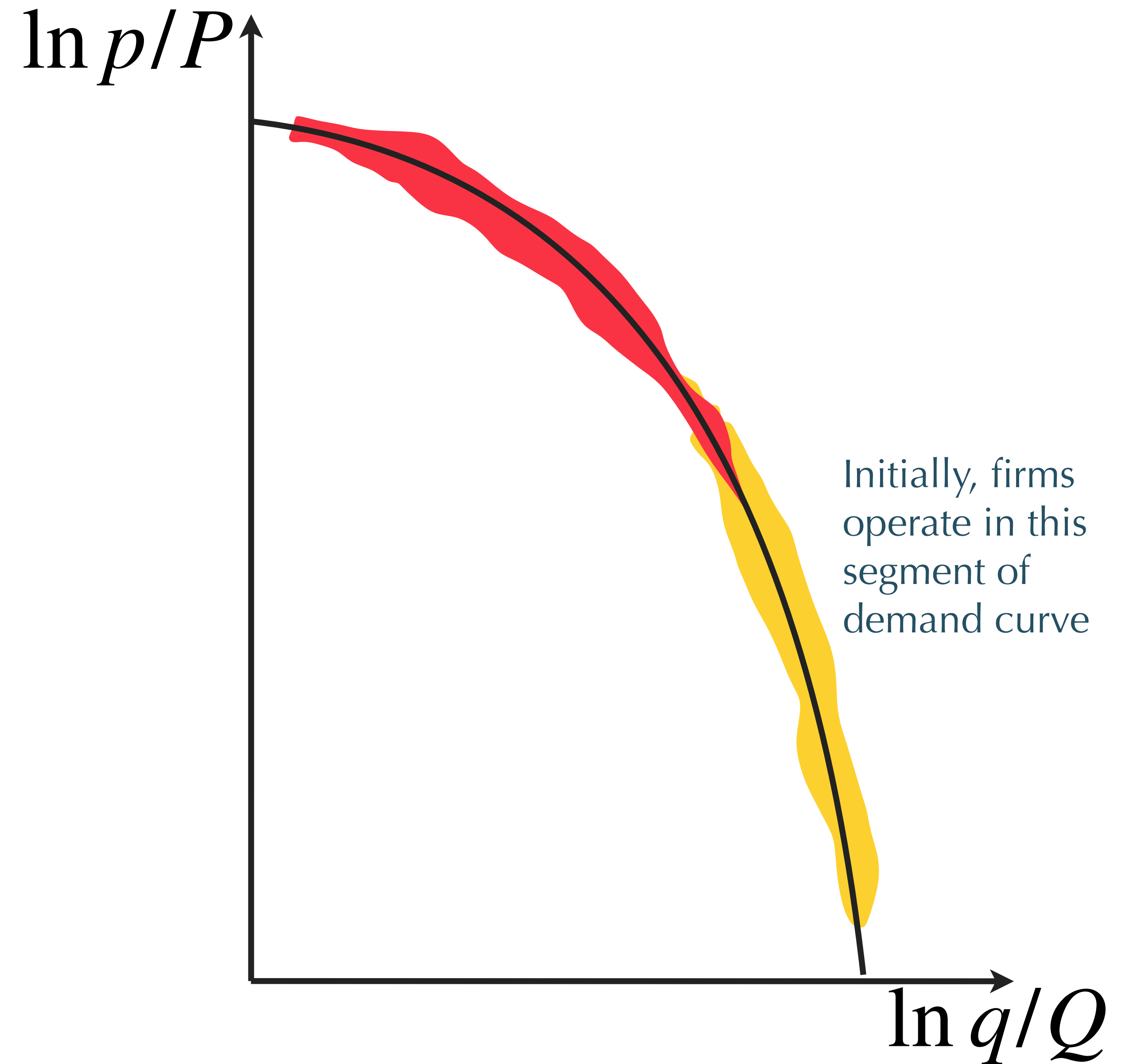
THE CASE FOR INCREASED COMPETITION

- Basic workings
 - Log-concave demand system satisfying Marshall's laws (more productive and larger firms face more inelastic demand and have lower passthroughs)
 - Increases in **market size** leads to:
 - ▶ Competition for workers
 - ▶ Efficient expansion of large firms
 - ▶ **Ambiguous effect on markups:** within firm decline in markups and reallocation to firms with larger markups



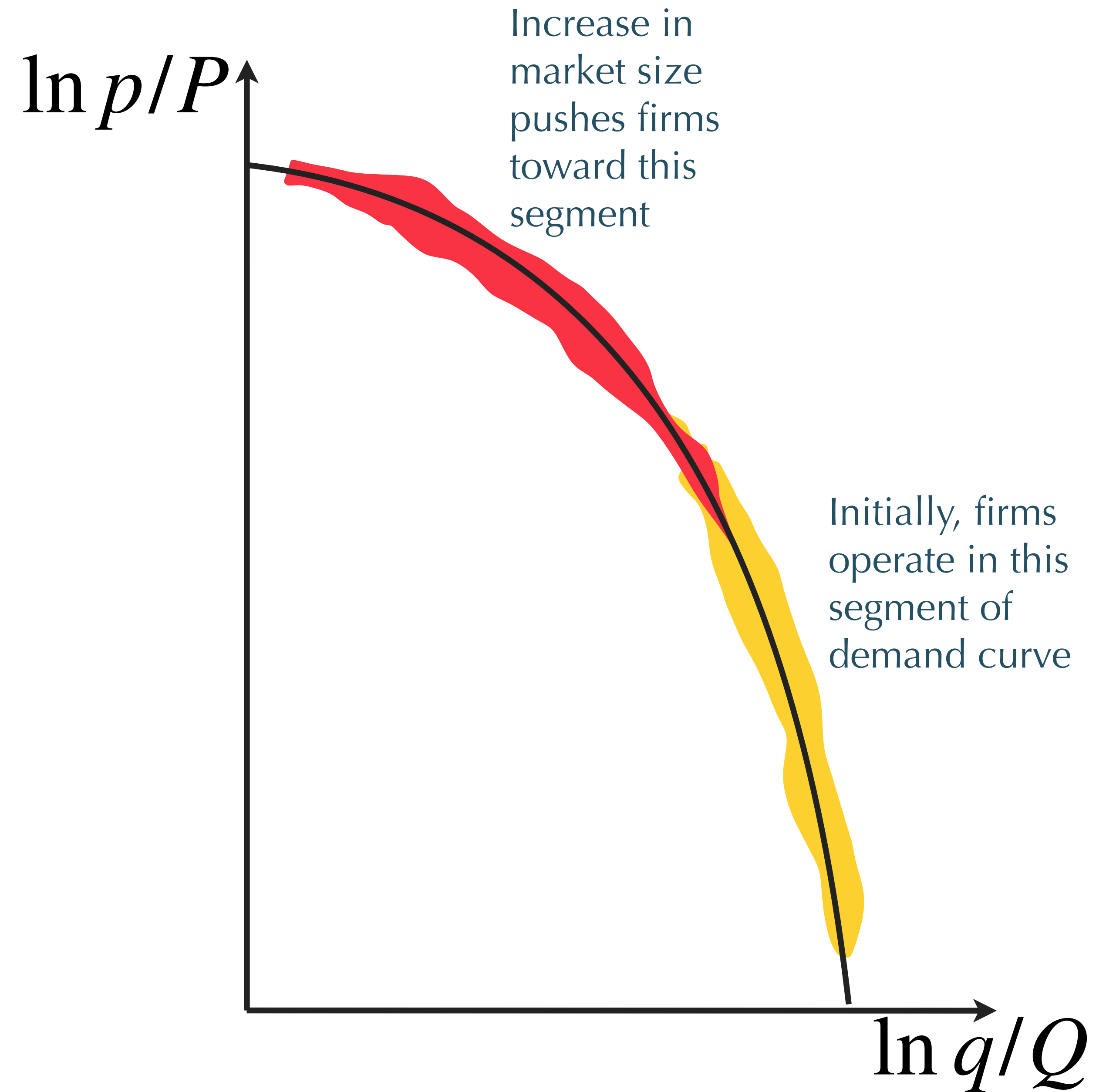
THE CASE FOR INCREASED COMPETITION

- Basic workings
 - Log-concave demand system satisfying Marshall's laws (more productive and larger firms face more inelastic demand and have lower passthroughs)
 - Increases in **market size** leads to:
 - ▶ Competition for workers
 - ▶ Efficient expansion of large firms
 - ▶ **Ambiguous effect on markups:** within firm decline in markups and reallocation to firms with larger markups



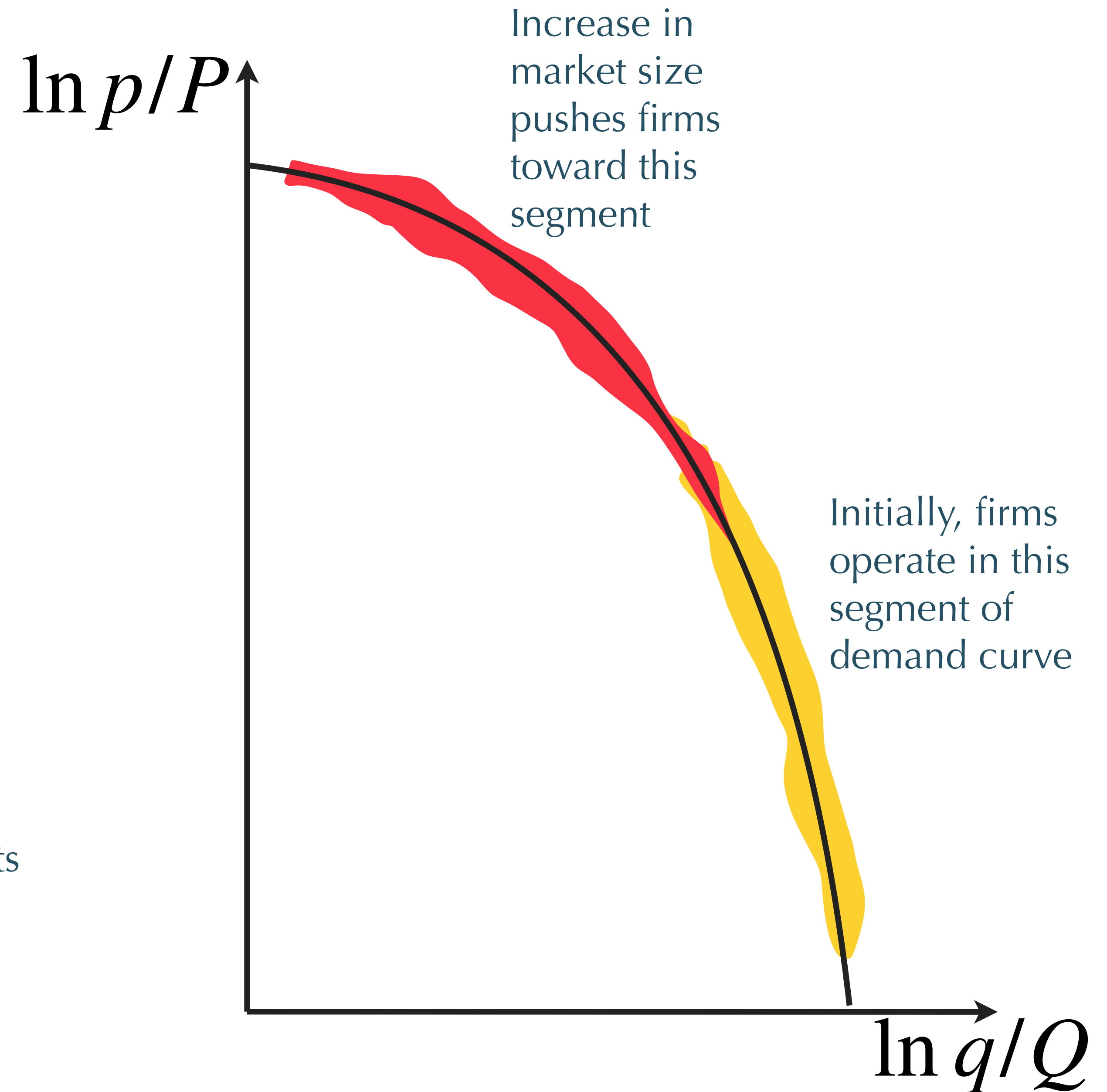
THE CASE FOR INCREASED COMPETITION

- Basic workings
 - Log-concave demand system satisfying Marshall's laws (more productive and larger firms face more inelastic demand and have lower passthroughs)
 - Increases in **market size** leads to:
 - ▶ Competition for workers
 - ▶ Efficient expansion of large firms
 - ▶ **Ambiguous effect on markups:** within firm decline in markups and reallocation to firms with larger markups



THE CASE FOR INCREASED COMPETITION

- Basic workings
 - Log-concave demand system satisfying Marshall's laws (more productive and larger firms face more inelastic demand and have lower passthroughs)
 - Increases in **market size** leads to:
 - ▶ Competition for workers
 - ▶ Efficient expansion of large firms
 - ▶ **Ambiguous effect on markups:** within firm decline in markups and reallocation to firms with larger markups
- In line with data
 - Sectors with rising concentration saw growing markets
 - In line with markup estimates



IMPLICATIONS FOR MONETARY POLICY

IMPLICATIONS FOR MONETARY POLICY

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t

IMPLICATIONS FOR MONETARY POLICY

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- Baseline: CRS and CES demand with elasticity σ

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \hat{m}_t$$

- Employment (and output) changes by

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

IMPLICATIONS FOR MONETARY POLICY

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- Baseline: CRS and CES demand with elasticity σ

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \hat{m}_t$$

- Employment (and output) changes by

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

Resulting Phillips curve:
$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \hat{y}_t$$

IMPLICATIONS FOR MONETARY POLICY

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- Baseline: CRS and CES demand with elasticity σ

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \hat{m}_t$$

- Employment (and output) changes by

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

Resulting Phillips curve: $\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \hat{y}_t$

Baseline PC slope

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation:** firms face more severe DRS in short run. They go from $y = \ell$ to $y = k^\alpha \ell^{1-\alpha}$ where k fixed in short run)

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation:** firms face more severe DRS in short run. They go from $y = \ell$ to $y = k^\alpha \ell^{1-\alpha}$ where k fixed in short run)

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \left[\hat{m}_t + \alpha \hat{\ell}_t^* \right]$$

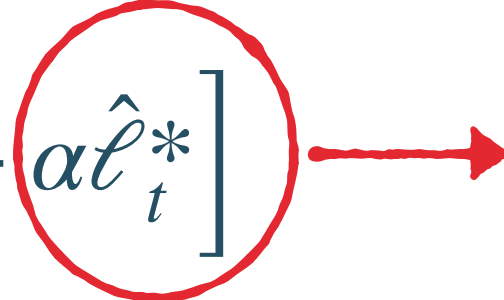
- Employment changes by

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation:** firms face more severe DRS in short run. They go from $y = \ell$ to $y = k^\alpha \ell^{1-\alpha}$ where k fixed in short run)

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \left[\hat{m}_t + \alpha \hat{\ell}_t^* \right]$$


How does employment change at firm that adjust prices during expansion?

(-) Reallocation away from price-adjusters (governed by σ)

- Employment changes by

(+) Increased employment overall (governed by ε)

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation:** firms face more severe DRS in short run. They go from $y = \ell$ to $y = k^\alpha \ell^{1-\alpha}$ where k fixed in short run)

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \left[\hat{m}_t + \alpha \hat{\ell}_t^* \right]$$

How does employment change at firm that adjust prices during expansion?

(-) Reallocation away from price-adjusters (governed by σ)

- Employment changes by

(+) Increased employment overall (governed by ε)

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

Resulting Phillips curve:
$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \frac{1 + \alpha\varepsilon}{1 + \alpha(\sigma - 1)} \cdot \hat{y}_t$$

AUTOMATION AS GENERATING DRS IN SHORT RUN

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation:** firms face more severe DRS in short run. They go from $y = \ell$ to $y = k^\alpha \ell^{1-\alpha}$ where k fixed in short run)

- Price-level changes

$$\pi_t = (1 - \theta) \cdot \left[\hat{m}_t + \alpha \hat{\ell}_t^* \right]$$

How does employment change at firm that adjust prices during expansion?

(-) Reallocation away from price-adjusters (governed by σ)

- Employment changes by

(+) Increased employment overall (governed by ε)

$$\hat{\ell}_t = \varepsilon \cdot (\hat{m}_t - \hat{p}_t)$$

Resulting Phillips curve:
$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \frac{1 + \alpha\varepsilon}{1 + \alpha(\sigma - 1)} \cdot \hat{y}_t$$

DRS due to automation reduce price response if $\sigma - 1 > \varepsilon$

AUTOMATION AS SHIFT IN INPUT MIX

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation (and offshoring):** firms produce with domestic labor (share $1 - s$) and imported equipment or intermediates (share s)

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation (and offshoring):** firms produce with domestic labor (share $1 - s$) and imported equipment or intermediates (share s)
 - Domestic labor has elasticity ε and offshored labor (or equipment) has short-run elasticity ε_o
 - Elasticity of substitution between these is γ
 - Price-level changes

$$\pi_t = (1 - \theta) \cdot [(1 - s)\hat{m}_t + s\hat{\omega}_t]$$

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
 - **Automation (and offshoring):** firms produce with domestic labor (share $1 - s$) and imported equipment or intermediates (share s)
 - Domestic labor has elasticity ε and offshored labor (or equipment) has short-run elasticity ε_o
 - Elasticity of substitution between these is γ
 - Price-level changes
- $\pi_t = (1 - \theta) \cdot [(1 - s)\hat{m}_t + s\hat{\omega}_t]$
- How does expansion affect price of equipment or intermediates?
Less than proportional increase if $\varepsilon_o > \varepsilon$

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation (and offshoring):** firms produce with domestic labor (share $1 - s$) and imported equipment or intermediates (share s)
 - Domestic labor has elasticity ε and offshored labor (or equipment) has short-run elasticity ε_o
 - Elasticity of substitution between these is γ
 - Price-level changes

$$\pi_t = (1 - \theta) \cdot \left[(1 - s)\hat{m}_t + s\hat{\omega}_t \right]$$

How does expansion affect price of equipment or intermediates?
Less than proportional increase if $\varepsilon_o > \varepsilon$

Resulting Phillips curve:
$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \left(1 + s \frac{\varepsilon - \varepsilon_o}{\gamma + \varepsilon_o} \right) \cdot \hat{\ell}_t$$

AUTOMATION AS SHIFT IN INPUT MIX

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Automation (and offshoring):** firms produce with domestic labor (share $1 - s$) and imported equipment or intermediates (share s)
 - Domestic labor has elasticity ε and offshored labor (or equipment) has short-run elasticity ε_o
 - Elasticity of substitution between these is γ
 - Price-level changes

$$\pi_t = (1 - \theta) \cdot [(1 - s)\hat{m}_t + s\hat{\omega}_t]$$

How does expansion affect price of equipment or intermediates?
Less than proportional increase if $\varepsilon_o > \varepsilon$

Resulting Phillips curve:
$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \left(1 + s \frac{\varepsilon - \varepsilon_o}{\gamma + \varepsilon_o} \right) \cdot \hat{\ell}_t$$

Shift in input mix due to automation/offshoring reduces price response if $\varepsilon_o > \varepsilon$

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

- Price-level changes

$$\pi_t = (1 - \theta) \cdot [\bar{\rho}\hat{m}_t + (1 - \bar{\rho})\hat{p}_t^c]$$

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

- Price-level changes

$$\pi_t = (1 - \theta) \cdot [\bar{\rho}\hat{m}_t + (1 - \bar{\rho})\hat{p}_t^c]$$

Real rigidities:
firm deviates
from
competitors'
price with
passthrough $\bar{\rho}$

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

- Price-level changes

$$\pi_t = (1 - \theta) \cdot [\bar{\rho}\hat{m}_t + (1 - \bar{\rho})\hat{p}_t^c]$$

Real rigidities:
firm deviates
from
competitors'
price with
passthrough $\bar{\rho}$

Resulting Phillips curve:

$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \frac{\bar{\rho} + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)}{1 + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)} \cdot \hat{\ell}_t$$

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

- Price-level changes

$$\pi_t = (1 - \theta) \cdot [\bar{\rho}\hat{m}_t + (1 - \bar{\rho})\hat{p}_t^c]$$

Real rigidities:
firm deviates
from
competitors'
price with
passthrough $\bar{\rho}$

Resulting Phillips curve:

$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \frac{\bar{\rho} + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)}{1 + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)} \cdot \hat{\ell}_t$$

Decline in passthrough
reduces price responses

IMPLICATIONS OF RISING COMPETITION

- **Simple model:** one-period pricing; monopolistic competition; fraction θ of firms cannot adjust prices; response to nominal wage change of \hat{m}_t
- **Log-concave demand and rising competition:** sales weighted passthrough $\bar{\rho} \in (0,1)$

- Price-level changes

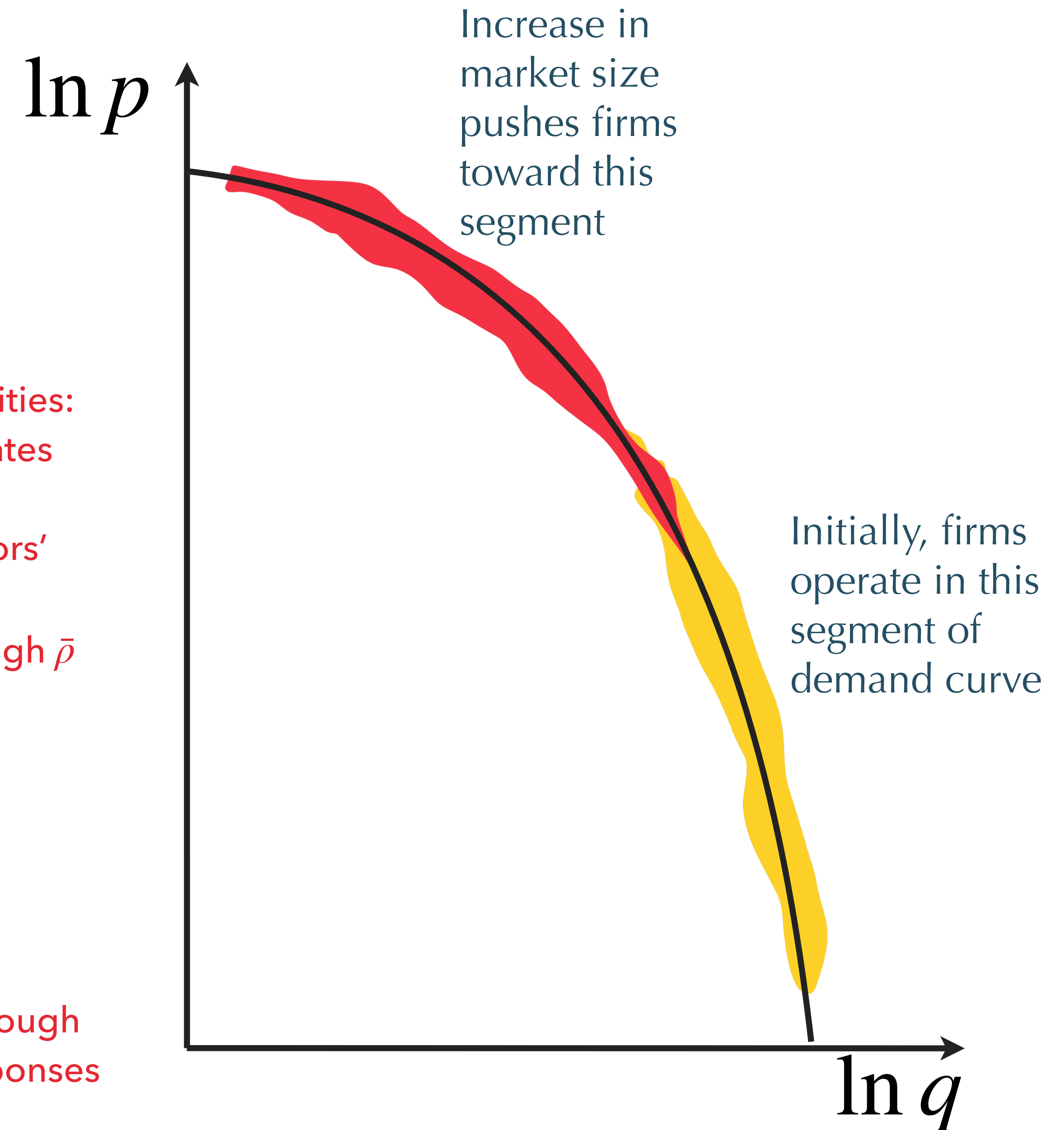
$$\pi_t = (1 - \theta) \cdot [\bar{\rho} \hat{m}_t + (1 - \bar{\rho}) \hat{p}_t^c]$$

Real rigidities:
firm deviates
from
competitors'
price with
passthrough $\bar{\rho}$

Resulting Phillips curve:

$$\pi_t = \frac{1}{\varepsilon} \cdot \frac{1 - \theta}{\theta} \cdot \frac{\bar{\rho} + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)}{1 + (1 - \theta)(\bar{\rho} - \bar{\rho}_\sigma)} \cdot \hat{\ell}_t$$

Decline in passthrough
reduces price responses



TAKEAWAY

- **Two forces**

- Automation (+ offshoring?) and rising competition
- Relevant for labor share and market dynamics, but also for monetary policy:
 - ▶ DRS in short run
 - ▶ Shift to variable inputs of different elasticity
 - ▶ Firms operate in zone of lower markups and higher passthroughs (but also, reallocation toward large firms with lower passthroughs)
- Large firms (more automated, different input mixes, lower passthroughs) vs small firms (more labor intensive and passthroughs close to 1)