

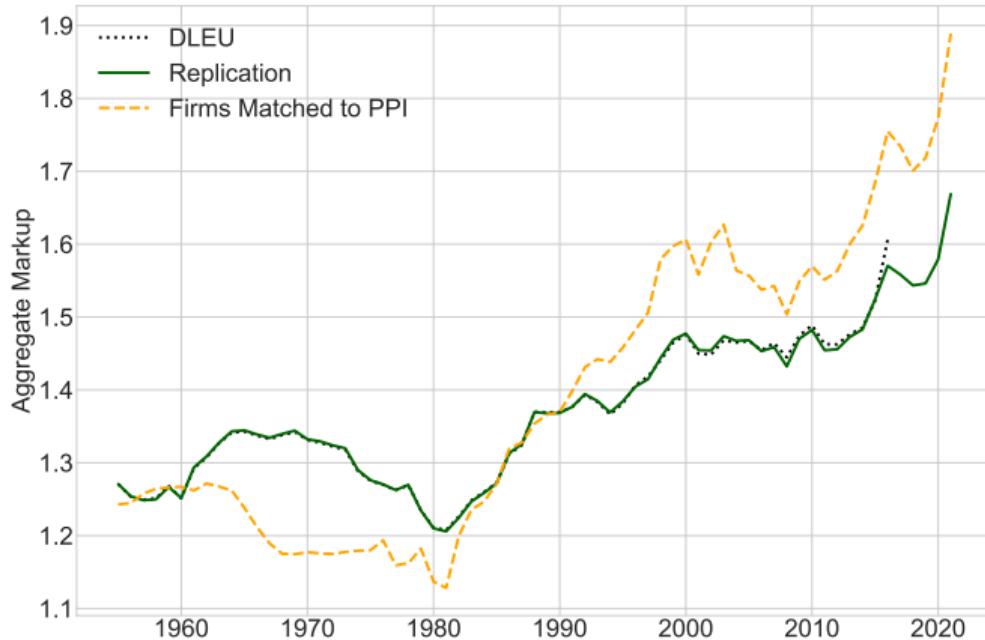
Rising Markups, Rising Prices?

Christopher Conlon, Nathan H. Miller, Tsolmon Otgon and Yi Yao

AEA 2023

NYU Stern and NBER; Georgetown University (x3).

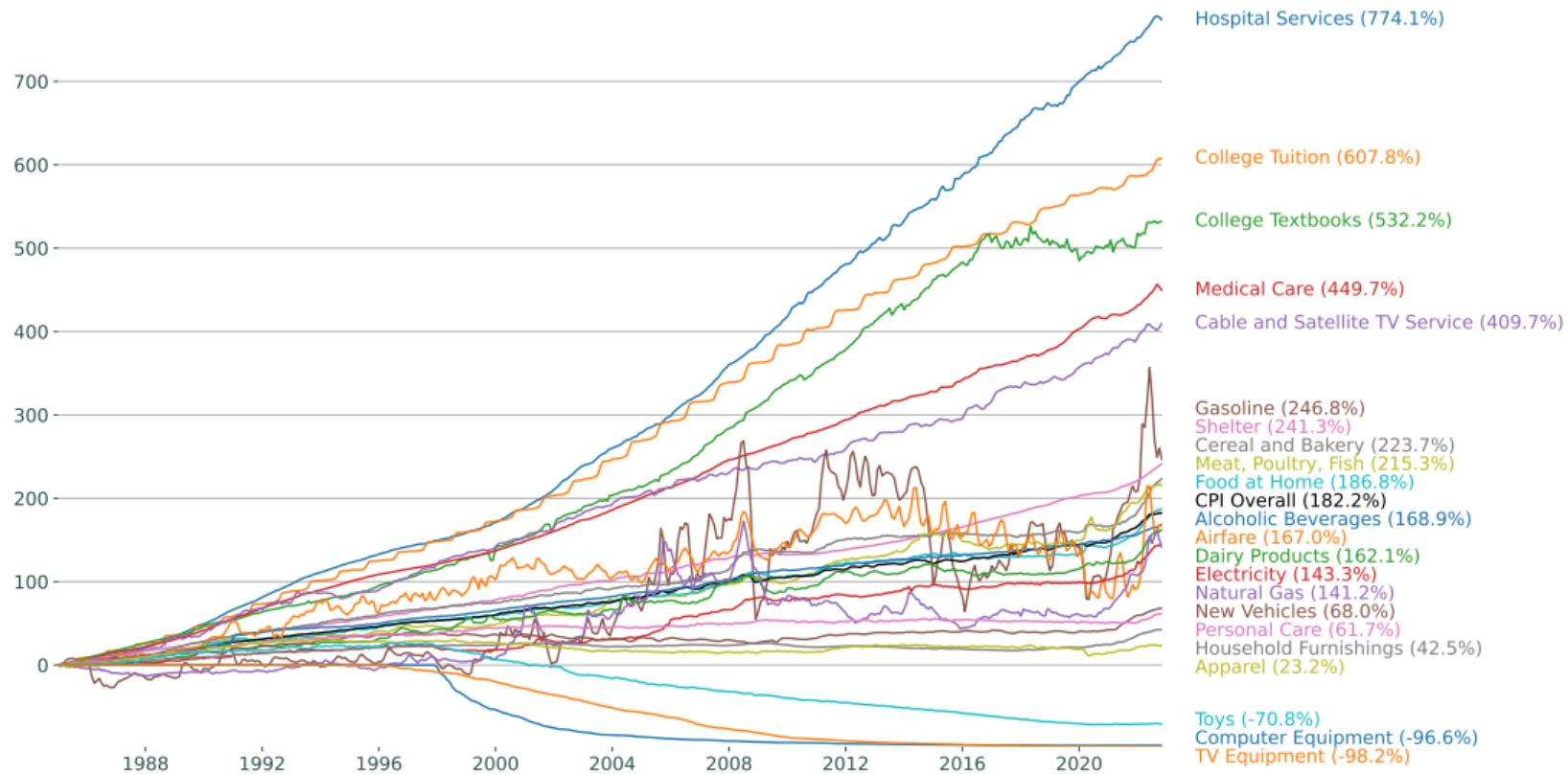
Extending a Famous Plot



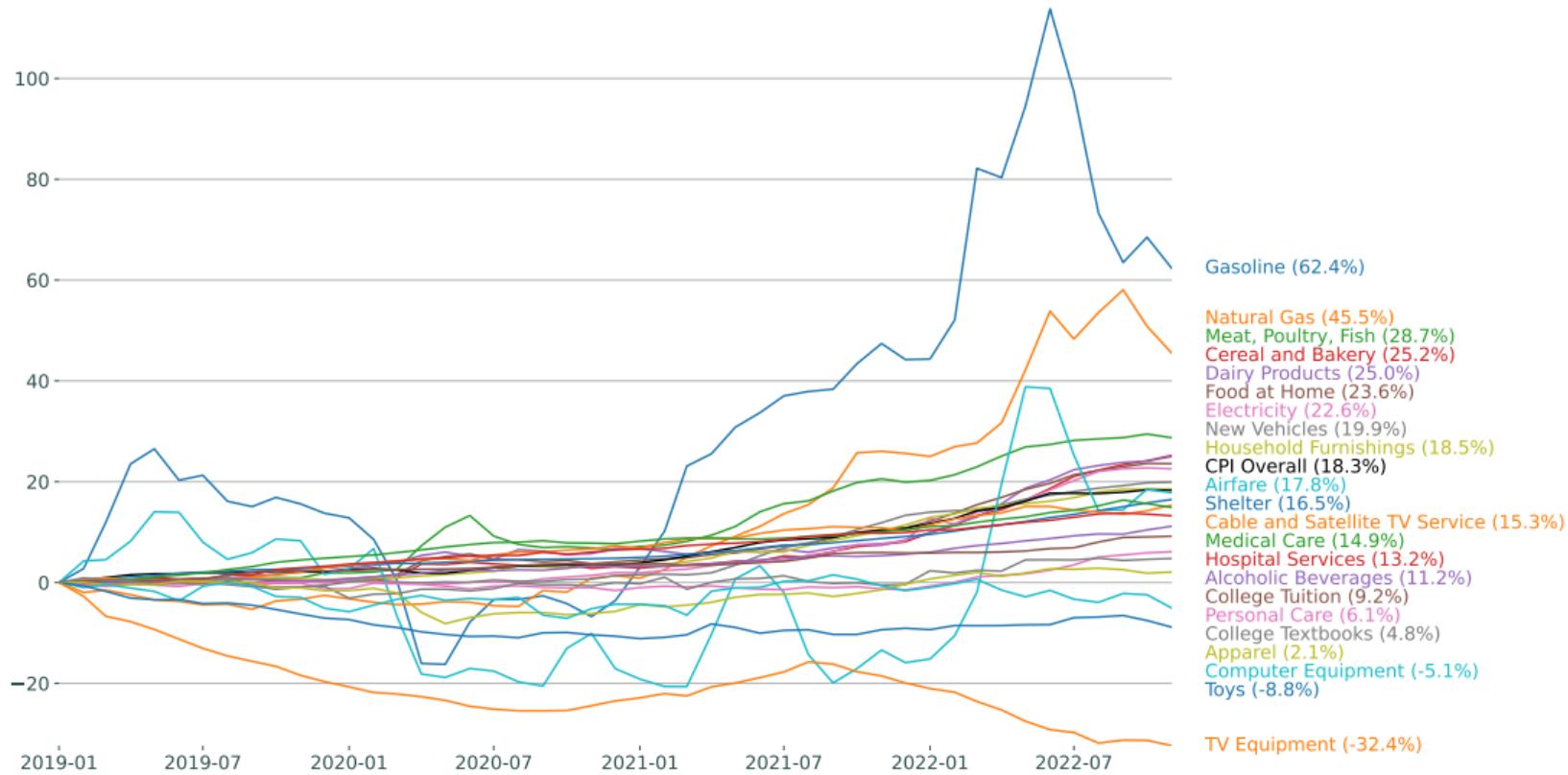
What did we do?

- ▶ Restricted to COMPUSTAT data (US listed public firms). Couldn't get Census in time.
- ▶ For very recent data, will rely on **quarterly** data.
- ▶ Later will restrict to set of firms we can match to PPI by NAICS/SIC. (tougher than it looks!)
- ▶ Recent rise: Finance/Insurance (2021) and Manufacturing (2022).

Consumer Prices since 1985



Consumer Prices since 2019: tell a different story...



Today's Question

- ▶ Are these two sets of plots related?
- ▶ For either time horizon?
 - The DLEU period (1980-2018)
 - The current inflationary episode (2019-2022)
- ▶ At best we're going to look for an **association** between changes in μ and P .
- ▶ The lurking policy/political question: are recent increases inflation **caused** by increasing markups → this isn't evidence either way!

But first, let's step back...

Review: Where do markups come from?

In an ideal world we would observe $\mu = \frac{p}{mc}$.

- ▶ In 10-K's and accounting statements we observe neither, but we do see **Revenue** and **Cost of Goods Sold** (mostly variable cost?) and **Selling, General, and Administrative Expenses** (maybe fixed costs?)
- ▶ Building on a long literature: Hall (1988, 2018), De Loecker Warzynski (2012), De Loecker Eeckhout Unger (2020) use **cost minimization** to try and map observable accounting data onto firm-level markups:

$$\mu_{it} \equiv \frac{P_{it}}{MC_{it}} = \theta_{it}^v \frac{P_{it} Q_{it}}{P_{it}^V V_{it}} \approx \theta_{it}^v \frac{\text{Revenue}_{it}}{\text{COGS}_{it}}$$

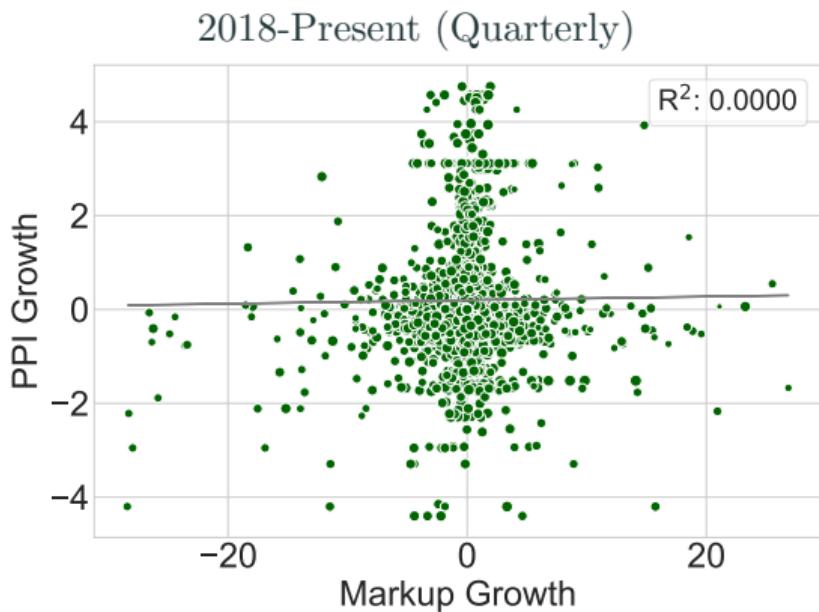
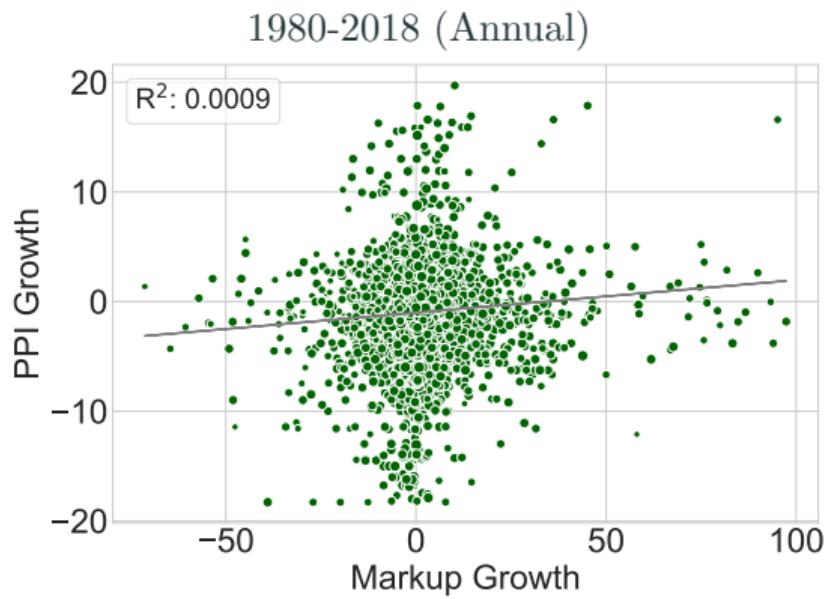
- ▶ The key parameter θ_{it}^v is the **output elasticity**, which can be estimated from the production function (separately for industry and year).

Points out an obvious identity $p \equiv \mu \cdot MC$ and the implication that:

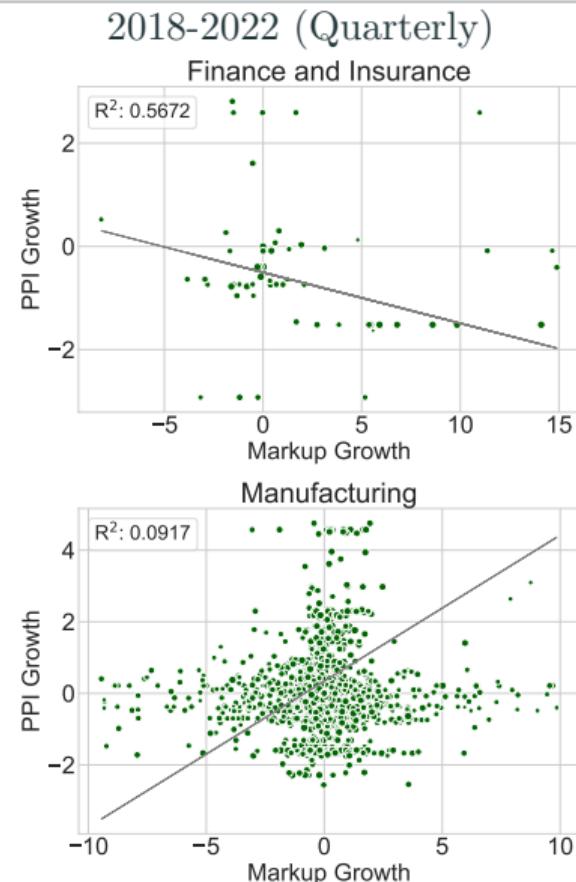
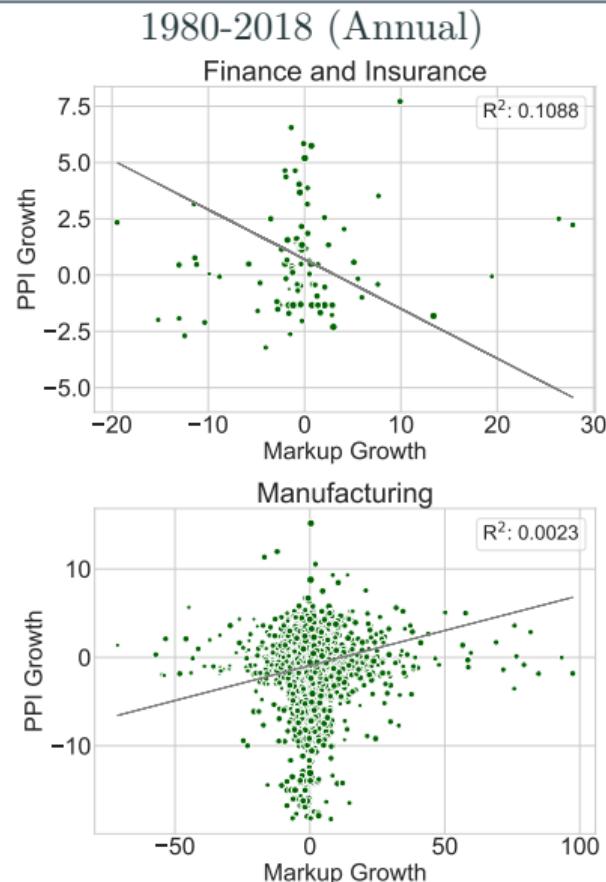
$$\underbrace{\text{Growth in } P}_{\text{We get from PPI}} \approx \underbrace{\text{Growth in } \mu}_{\text{Estimate like DLEU}} + \text{Growth in MC}$$

- ▶ We can get changes in P from matching the PPI to NAICS/SIC code for each firm in COMPUSTAT.
 - This is both time consuming and imperfect
 - Many firms unmatched (we don't see PPI for every NAICS).
 - Many firms have multiple codes, etc.
- ▶ Markups are estimated with all the same caveats as usual.

All Firms: Markup Growth/ PPI Growth (Geometric Average)



By 2 digit Industry (Geometric Average)

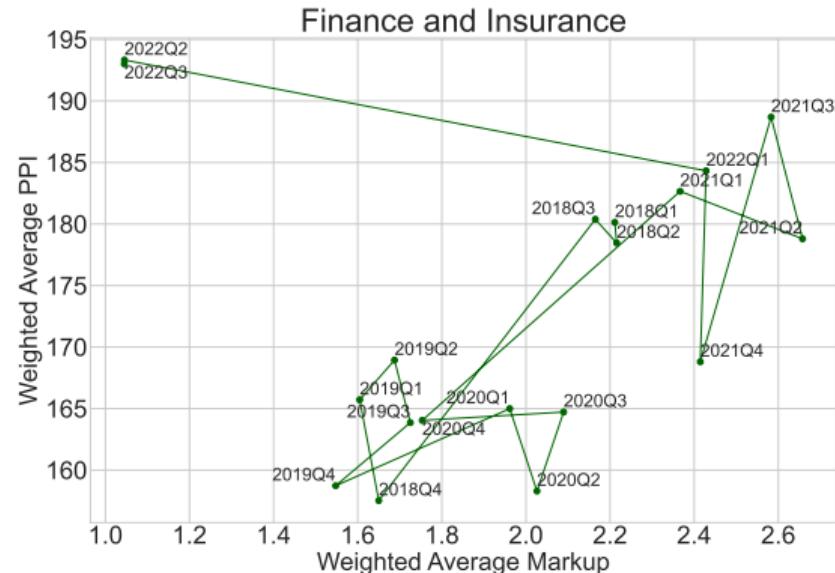
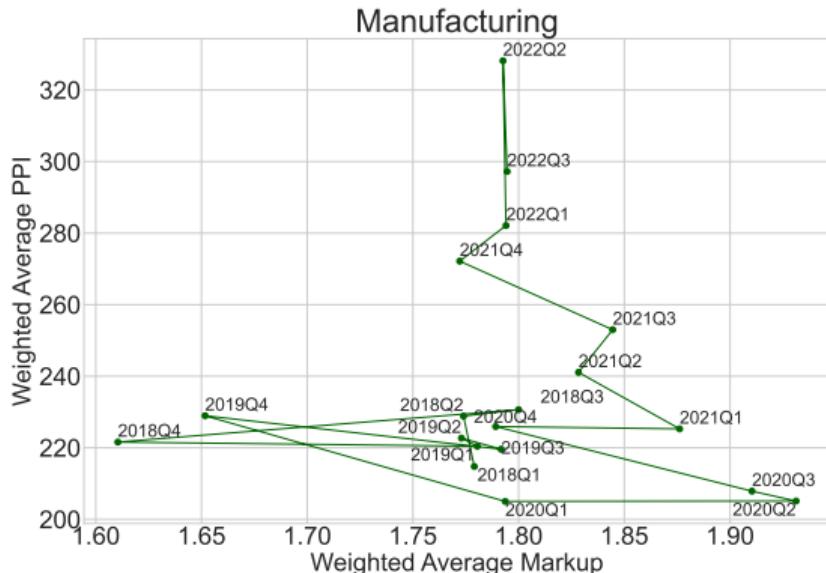


Panel A: 1980-2018						
Industry	$\hat{\beta}$	SE	R ²	Obs	% Coverage	
All sectors	0.05	0.02	0.00	6277	51	► Turn each scatterplot into a separate regression
All sectors (with Category Fixed Effects)	0.02	0.01	0.00	6277	51	
Accommodation and Food Services	-0.01	0.04	0.00	44	19	
Finance and Insurance	-0.26	0.06	0.16	92	58	► Only Manufacturing looks positive and significant
Health Care and Social Assistance	-0.12	0.07	0.05	62	20	
Information	-0.08	0.02	0.02	463	43	
Manufacturing	0.00	0.03	0.00	4523	70	
Mining, Quarrying, and Oil and Gas Extraction	0.11	0.02	0.04	782	69	
Professional, Scientific, and Technical Services	0.02	0.04	0.01	54	10	► Finance has largest increase in markups in 2021 (but negative in 2022).
Real Estate and Rental and Leasing	0.02	0.05	0.00	123	48	
Retail Trade	0.09	0.29	0.00	47	4	
Utilities	-0.33	0.12	0.20	31	37	

Panel B: 2018Q1-2022Q3

Industry	$\hat{\beta}$	SE	R ²	Obs	% Coverage
All sectors	0.08	0.02	0.01	2610	59
All sectors (with Category Fixed Effects)	0.13	0.02	0.02	2610	59
Finance and Insurance	-0.10	0.01	0.50	57	77
Information	-0.02	0.01	0.03	397	72
Manufacturing	0.46	0.03	0.10	1665	86
Mining, Quarrying, and Oil and Gas Extraction	0.11	0.06	0.01	250	73
Real Estate and Rental and Leasing	-0.28	0.04	0.00	78	31

Evolution of Industry Averages: “Phillips Curve”



Prices lag markups quite a bit in manufacturing

Finance/Insurance has a great 2021 and terrible 2022 (like my 401(k))

Where does this leave us?

Back to Syverson (2019)

$$\mu \equiv \frac{P}{MC} = \frac{P}{AC} \cdot \underbrace{\frac{AC}{MC}}_{\text{Scale Elasticity?}}$$

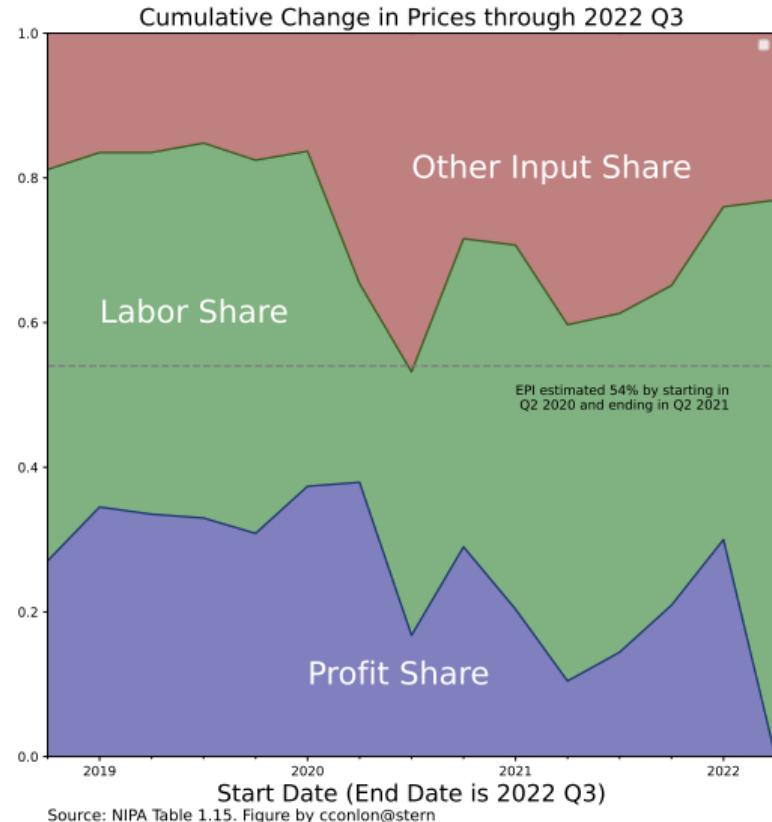
- ▶ If markups don't explain price changes, surely it is all costs?
- ▶ COGS is already in the markup: $\mu_{it} \approx \theta_{it}^v \frac{\text{Revenue}_{it}}{\text{COGS}_{it}}$ (mechanical negative correlation).
- ▶ COGS is something like $TVC(Q)$ and conflates **unit costs** and **output**.
- ▶ Maybe scale is messing things up?

Can we get unitized costs?

- We can get them from NIPA tables
(but how are they constructed?)
- Another accounting identity:

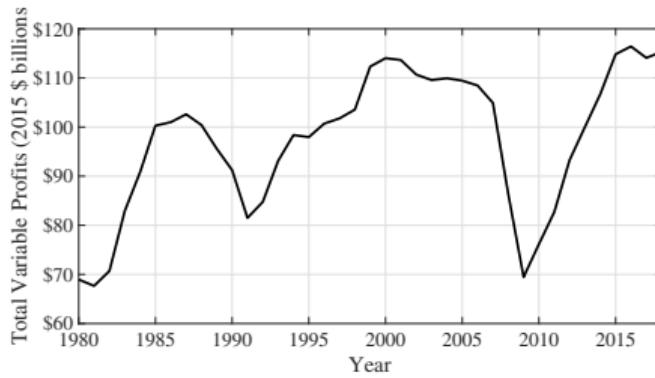
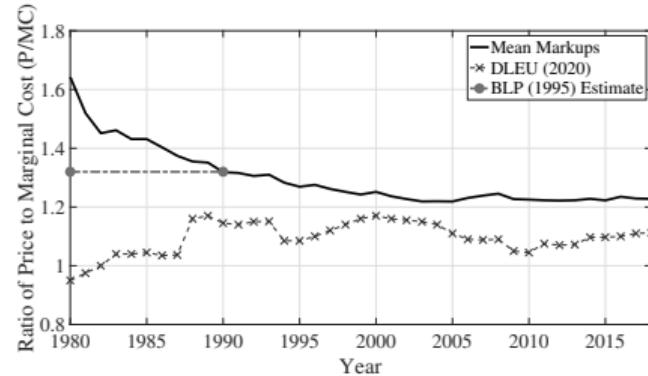
$$\Delta p_t = \Delta \text{other inputs}_t + \Delta \text{wage bill}_t + \Delta \text{profits}_t$$

- A much quoted EPI study started in 2020Q2 (during lockdown) and ended in 2021 to claim rising profits *caused* 54% of inflation.
- Extending to today, hard to estimate profit share $> \frac{1}{3}$.

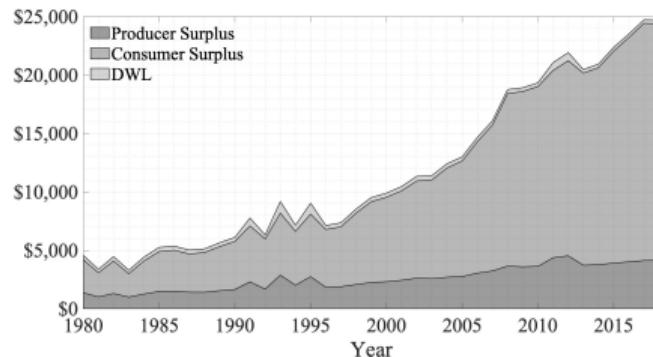


What have single industry
studies taught us about
markups/scale?

Griego, Murry, Yurukoglu (2021): Automobiles

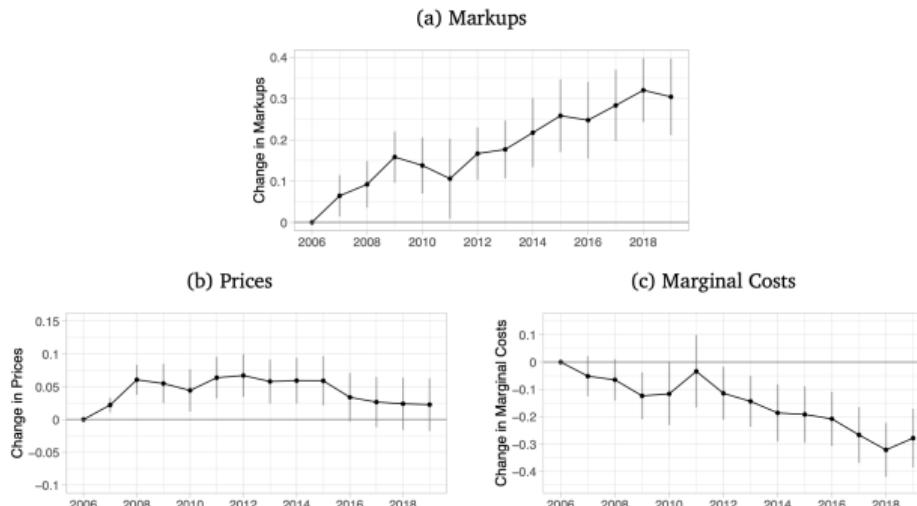


- ▶ Costs rise faster than prices → Markups decline
- ▶ Quality is improving rapidly → most of the gains are captured by consumers.
- ▶ (Total) Variable Profits rise with output.
- ▶ Why? Competition from abroad + Durability.



Döpper, MacKay, Miller, Stiebale (2022) / Brand (2021): Supermarkets

Figure 5: Product-Level Changes in Markups, Prices, and Marginal Costs



Notes: This figure shows coefficients and 95 percent confidence intervals of a regressions of the log of the Lerner index, real prices, and real marginal costs at the product-chain-DMA-quarter-year level on year dummies controlling for product-chain-DMA and quarter fixed effects. The year 2006 is the base category.

- ▶ Prices rise slowly, and marginal costs decline slowly → Markups up.
 - Demand becomes **less elastic** over time.
 - $\frac{p-mc}{p} \propto \frac{1}{\varepsilon}$ is growing over time.
- ▶ Output and CS are rising (especially at top)
- ▶ Why? Maybe niche consumption and variety (especially for higher income households)
 - Organic Fruit in the Winter
 - Greek Yogurt

Ganapati (2021): Wholesalers

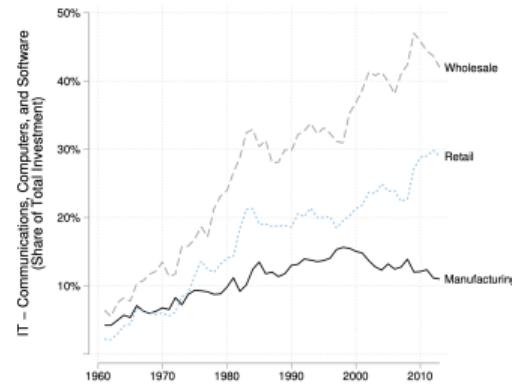
Table 6: Supply Estimation Statistics

Panel A: Wholesaler Marginal Costs (\$ per \$1 of producer output)			
	1997	2002	2007
Full Model With Local Market Power	1.093	1.077	1.061
National-Level Market Power Only	1.150	1.151	1.155
Monopolistic Competition	1.163	1.171	1.180

Panel B: Markups (Price/Marginal Cost)			
	1997	2002	2007
Full Model With Local Market Power	1.268	1.297	1.326
National-Level Market Power Only	1.206	1.213	1.218
Monopolistic Competition	1.193	1.193	1.193

Panel C: Wholesaler Operating Profits (Real 2007 Billion USD)			
	1997	2002	2007
Full Model With Local Market Power	408	543	832
National-Level Market Power Only	325	396	569
Monopolistic Competition	307	353	496

Figure 3: Information Technology Share of Total Investment

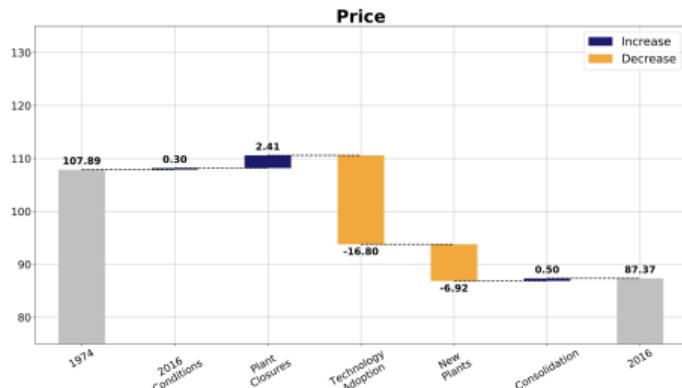
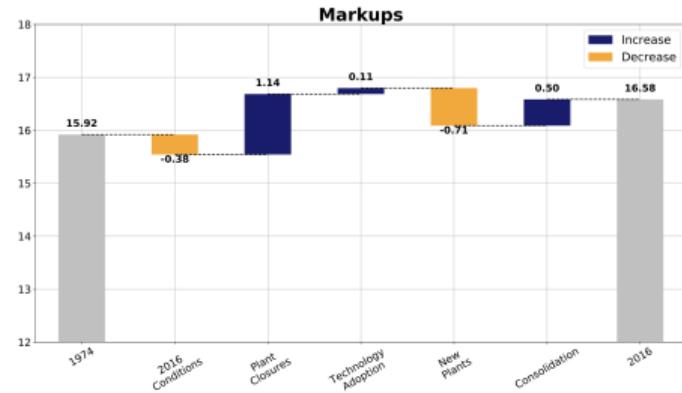


Source: BEA Investment Data

- ▶ Costs **declining** faster than prices → Markups Increase.
- ▶ Profits, Output, and Concentration all up.
- ▶ Firms trade **higher Fixed Costs** for lower marginal costs → lower AC.
- ▶ Why? Huge change in IT driven **economies of scale**.

Miller, Osborne, Sheu, Sileo (2022): Cement

- Prices Up, Costs Down → Markups Increase.
- Profits, Output, and Concentration all up.
- Higher fixed costs and much lower marginal costs → lower AC.
- Why? Huge change in efficient scale due to new technology.



Collard-Wexler De Loecker (2015): Steel - Minimills

- Prices Down, Costs Down → TFP Up. **Markups Decline.**
- Much **lower fixed costs**
- Lots of entry and reallocation → Less Concentrated.
- New technology has **opposite effect on scale(!)**

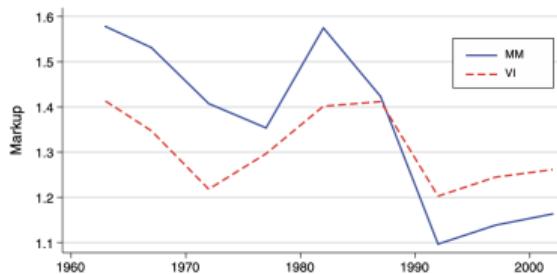


FIGURE 4. MARKET SHARE WEIGHTED MARKUPS

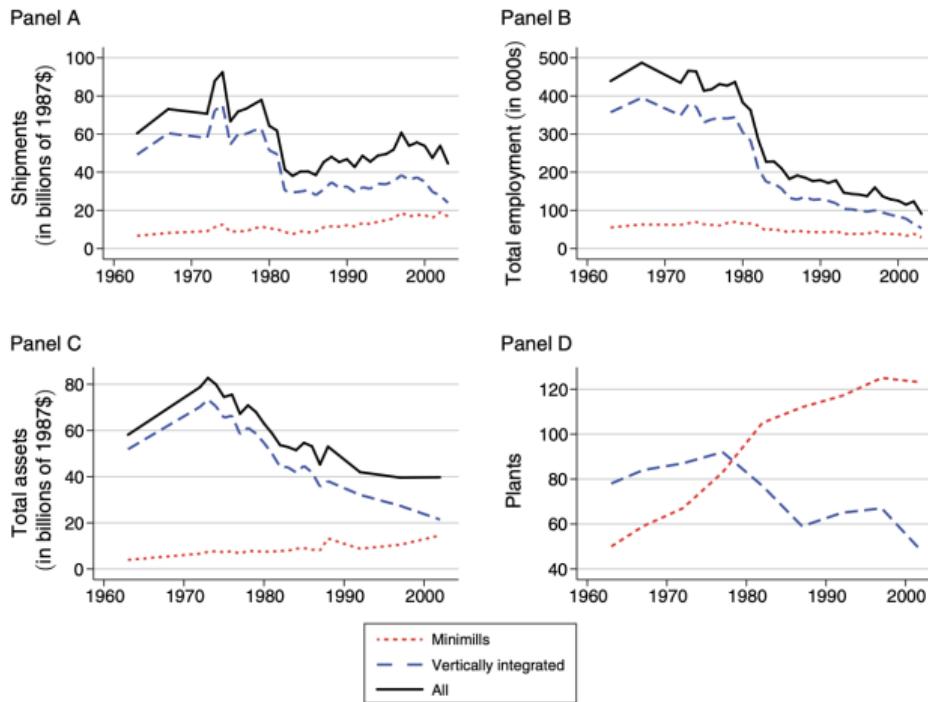


FIGURE 1. EVOLUTION OF THE STEEL INDUSTRY AND VERTICALLY INTEGRATED MILLS AND MINIMILLS

The public policy / political debate

Think tanks have really run with rising markups (for better or worse):

- ▶ “54% of inflation caused by corporate profits”: EPI study using NIPA tables and accounting identity (Previous slide).
- ▶ Roosevelt (Konczal, Lusiani): Look at increases in $\frac{\text{Revenue}_{it}}{\text{COGS}_{it}}$ (no output elasticity) through 2021.
- ▶ Groundwork: CEO’s brag about raising prices on earnings calls.

A common theme “firms are taking advantage of inflation to increase markups” → not strong demand → accommodative interest rate policy + price controls as solution.

Takeaways

- ▶ We find very little relationship between price changes (PPI) and markup changes over either the short run (2019-today) or the long-run (1980-2018).
 - Are changes in prices largely about changes in input costs?
 - Or have we mismeasured something (markups, matching firms to corresponding PPI, etc.)?
- ▶ Even with a strong correlation, we wouldn't be able to explain **why** markups $\mu = \frac{p}{mc}$ changed (ie: supply? or demand?)
- ▶ Single industry studies provide clear pictures, but paint very different pictures for different industries (particularly about markups, concentration, and scale).
- ▶ Nuance may not be favored in policy debates, but IO economists need to engage more.