Rising Markups, Rising Prices?

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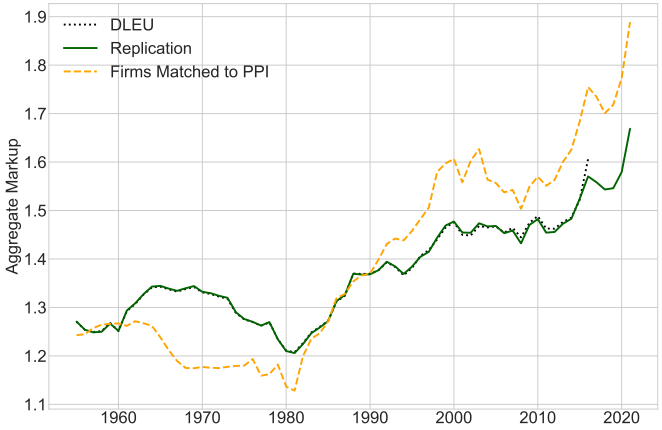
NYU Stern and NBER; Georgetown University (x3).

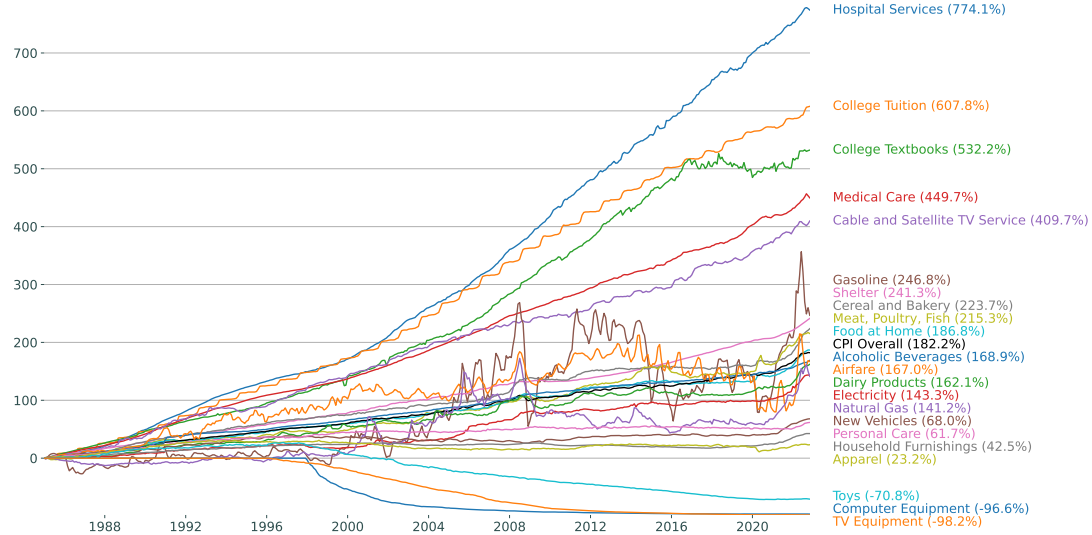
Extending a Famous Plot



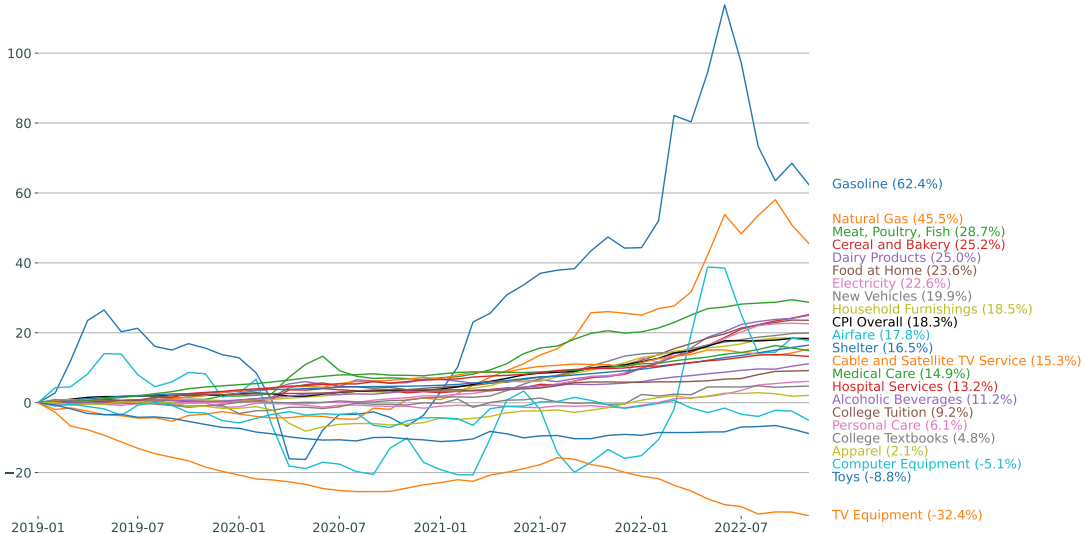
What did we do?

- 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 $\longrightarrow$ 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:

$$\mu_{it} \equiv \frac{P_{it}}{MC_{it}} = \theta^v_{it} \frac{P_{it} Q_{it}}{P^V_{it} V_{it}} \approx \theta^v_{it} \frac{\text{Revenue}_{it}}{\text{COGS}_{it}}$$

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

Syverson (JEP 2019)

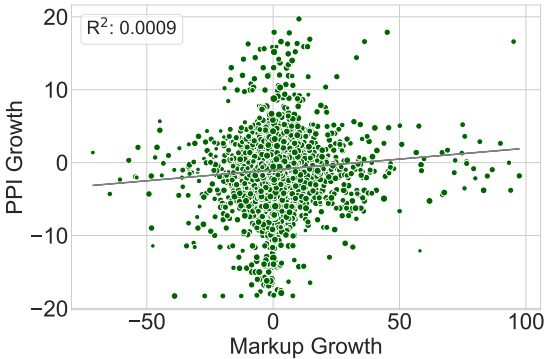
Points out an obvious identity $p \equiv \mu \cdot MC$ and the implication that:

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

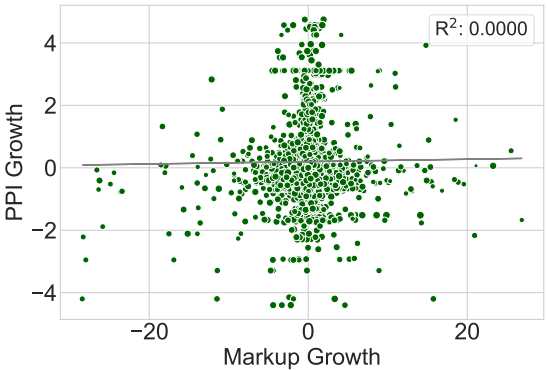
- We can get changes in P from matching the PPI to NAICS/SIC code for each firm in `COMPUSTAT`.
  - This is both time consuming and imperfect
  - Many firms unmatched (we don't see PPI for every NAICS).
  - Many firms have multiple codes, etc.
- Markups are estimated with all the same caveats as usual.

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

1980-2018 (Annual)

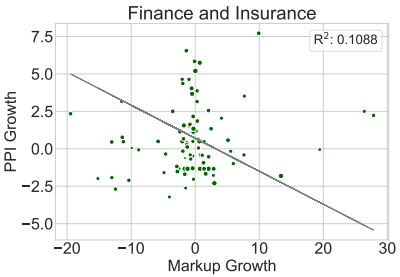


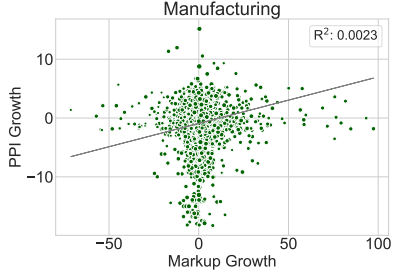
2018-Present (Quarterly)



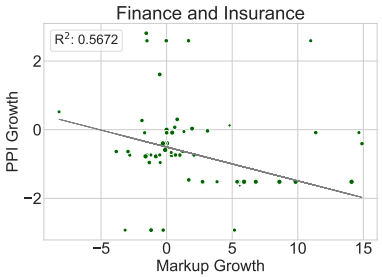
By 2 digit Industry (Geometric Average)

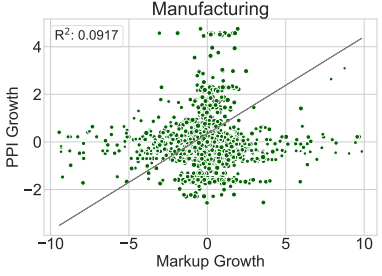
1980-2018 (Annual)





2018-2022 (Quarterly)





Panel A: 1980-2018

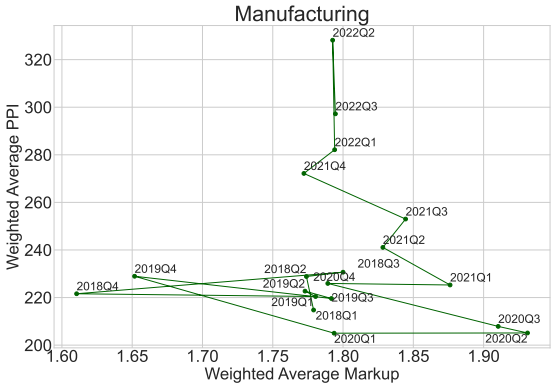
Industry	$\hat{\beta}$	SE	R^2	Obs	% Coverage
All sectors	0.05	0.02	0.00	6277	51
All sectors (with Category Fixed Effects)	0.02	0.01	0.00	6277	51
Accommodation and Food Services	-0.01	0.04	0.00	44	19
Finance and Insurance	-0.26	0.06	0.16	92	58
Health Care and Social Assistance	-0.12	0.07	0.05	62	20
Information	-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
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

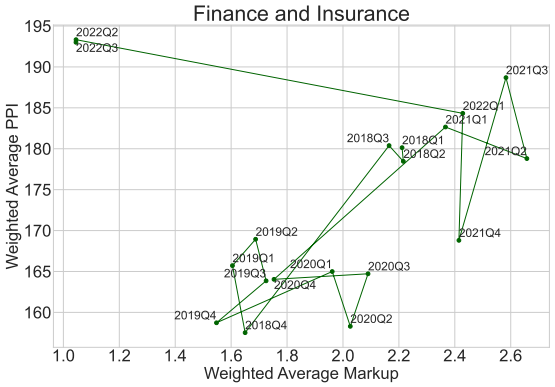
Panel B: 2018Q1-2022Q3

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

- Turn each scatterplot into a separate regression
- Only Manufacturing looks positive and significant
- Finance has largest increase in markups in 2021 (but negative in 2022).

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)

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

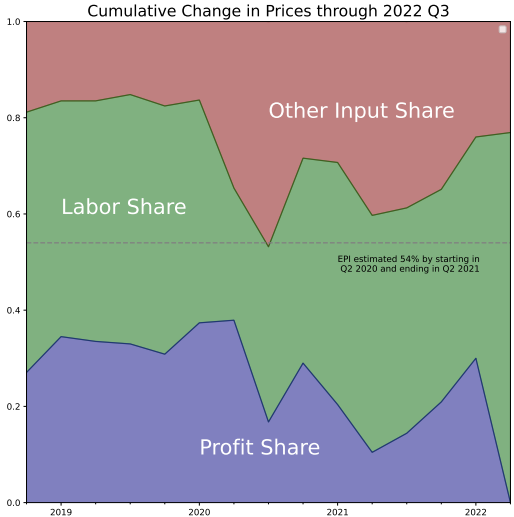
- If markups don't explain price changes, surely it is all costs?
- COGS is already in the markup: $\mu_{it} \approx \theta_{it}^{v} \frac{\text{Revenue}_{it}}{\text{COGS}_{it}}$ (mechanical negative correlation).
- COGS is something like $TVC(Q)$ and conflates unit costs and output.
- Maybe scale is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

Can we get unitized costs?

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

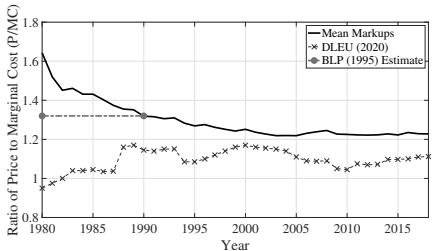
$$\Delta p_t = \Delta\text{other inputs}_t + \Delta\text{wage bill}_t + \Delta\text{profits}_t$$

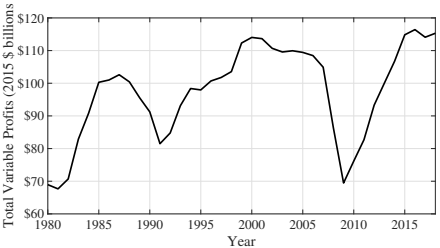
- A much quoted EPI study started in 2020Q2 (during lockdown) and ended in 2021 to claim rising profits *caused* 54% of inflation.
- Extending to today, hard to estimate profit share $> \frac{1}{3}$.



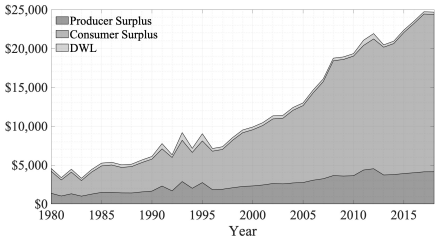
What have single industry studies taught us about markups/scale?

Griego, Murry, Yurukoglou (2021): Automobiles



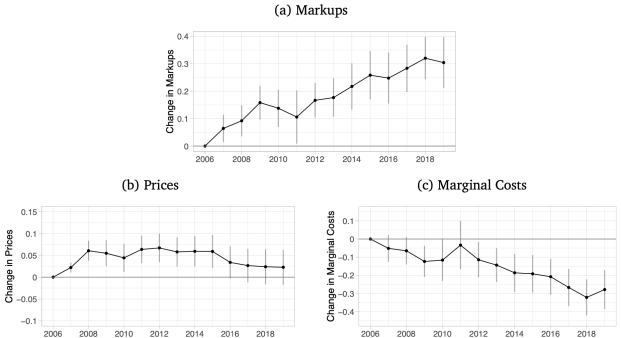


- Costs rise faster than prices → Markups decline
- Quality is improving rapidly → most of the gains are captured by consumers.
- (Total) Variable Profits rise with output.
- Why? Competition from abroad + Durability.



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.

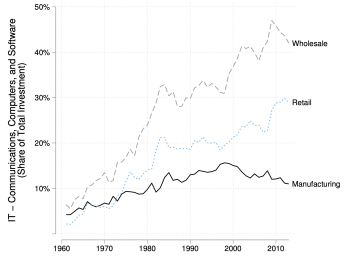
- Prices rise slowly, and marginal costs decline slowly → Markups up.
  - Demand becomes less elastic over time.
  - $\frac{p-mc}{p} \propto \frac{1}{\varepsilon}$ is growing over time.
- Output and CS are rising (especially at top)
- Why? Maybe niche consumption and variety (especially for higher income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

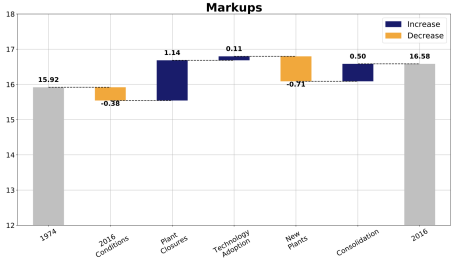


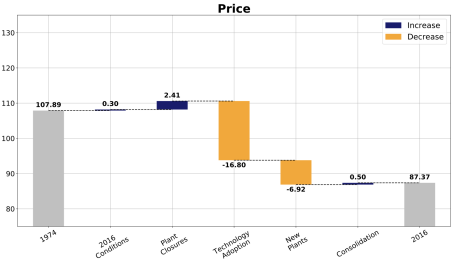
Source: BEA Investment Data

- 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(!)

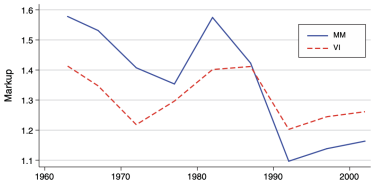


Figure 4. Market Share Weighted Markups

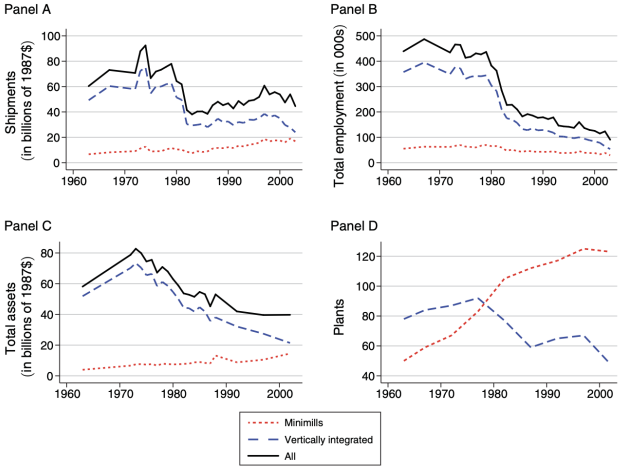


Figure 1. Evolution of the Steel Industry and Vertically Integrated Mills and Minimills

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" $\rightarrow$ not strong demand $\rightarrow$ accomodative 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.