The rise of market power and the macroeconomic implications

Jan de Loecker, Jan Eeckhout & Gabriel Unger
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Antonio Martner
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Motivation

Question: What is the evolution of market power in the US for the 1955-2016 period?

What this paper does:
- (a) Measures markups for different for a US big firms detailed data base (COMPUSTAT).
- (b) Measures markups using firm census for 3 industries.
- (c) Computes profitability measures.
- (d) Describe effects on labor and capital share together with labor market dynamics decrease.

Key take away: Market power has (almost) constantly rise over since the 80s in the US mainly due to big firms at the top of the markup distribution charging higher margins.

Empirical Framework: The production approach (1)

Firm i at period t minimize the cost a production given by their productivity (Ω_{it}), technology (Q_{it}), capital stock (K_{it}) and inputs of production (V_{it}).

All variables are firm and time specific, where the inputs of production variable adjust frictionless.

The expenditure minimization problem yields:

$$\frac{\partial \mathcal{L}}{\partial V_{it}} = P_{it}^{V} - \lambda_{it} \frac{\partial Q(.)}{\partial V_{it}}$$

Rearranging and multiplying by $\frac{V_{it}}{Q_{it}}$:

$$\theta_{it}^{V} = \frac{\partial Q(.)}{\partial V_{it}} \frac{V_{it}}{Q_{it}} = \frac{1}{\lambda_{it}} \frac{P_{it}^{V} Q_{it}}{Q_{it}}$$

Empirical Framework: The production approach (2)

Define the markup as the price-marginal cost ratio: $\mu = \frac{P}{\lambda}$

$$\theta_{it}^V = \underbrace{\frac{1}{\lambda_{it}}}_{\lambda = \text{MC}} \frac{P_{it}^V Q_{it}}{Q_{it}}$$

Thus:

$$\mu = \theta_{it}^V \frac{P_{it} Q_{it}}{P_{it}^V V_{it}}$$

Two key ingredients:

- θ_{it}^V: output elasticity of variable input V (need to estimate it).
- Inverse of the share of the variable input V (usually observed: cost of goods sold, wagebill).

$\implies$ Not need to assume any conduct or demand system

Data

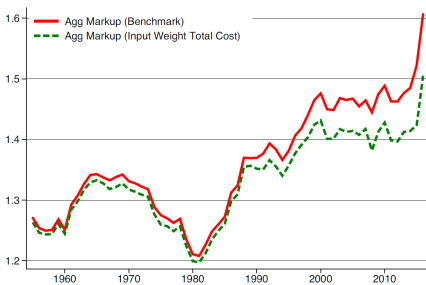COMPUSTAT: Firm level info on financial statements.

- Sales.
- Cost of goods sold (COGS).
- Capital stock.
- General and administrative expenses.
- Wage bill and level of employment.

ECONOMIC CENSUSES: Manufacturing-Retail-Wholesale. Different variables per census, not as comprehensive as COMPUSTAT.

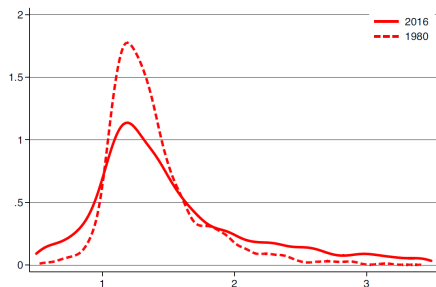# Evolution of markups (BMK=revenue wighted)
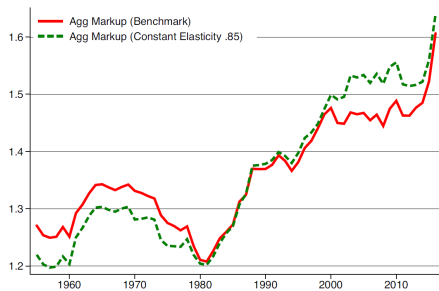
(A) Constant elasticity

(B) Input weighted (total cost)

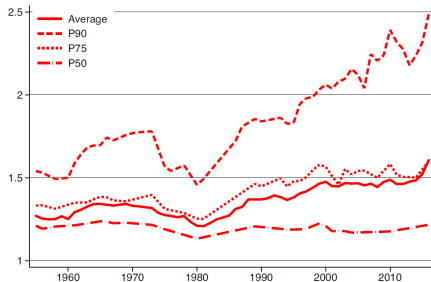Agg. markup can change due to: 1. Inverse cost share ratio, 2. Output elasticity and 3. Weights.

$\implies$ Markup is NOT changing due to technology (θ)

$\implies$ Must be then explained by the share of sales to COGS.

Distribution of markups

(A) Kernel density (unweighted)

(B) Percentiles markup distribution (revenue weight)

$\implies$ Most firms see no increase in markups over 60 years.

$\implies$ The increase in the average markup comes entirely from the firms with markups in the top half of the markup distribution.

Double click: Reallocation of economic activity (1)

A Within change: $\sum_i m_{i,t-1} \left(\mu_{i,t} - \mu_{i,t-1} \right)$

B Market share change: $\sum_i (\mu_{i,t-1} - \mu_{t-1}) \, \Delta m_{i,t}$

C Cross term change: $\sum_i (\mu_{i,t} - \mu_{i,t-1}) \, \Delta m_{i,t}$

D Firm entry: $\sum_{i \in \text{Entry}} (\mu_{i,t} - \mu_{t-1}) m_{i,t}$

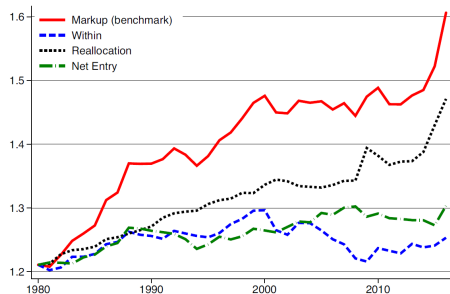**E** Firm exit: $\sum_{i \in \text{Exit}} (\mu_{i,t-1} - \mu_{t-1}) m_{i,t-1}$

$$\Delta \mu_t = A + \underbrace{B + C}_{\text{Reallocation}} + \underbrace{D - E}_{\text{Net entry}}$$

$\implies$ Theoretically firms that have higher market power also increase their market share.

Three counterfactual experiments: take each component as it was the only one that took place.


SECTORAL DECOMPOSITION OF 10-YEAR CHANGE IN MARKUP

	Markup	Δmarkup	Δwithin	Δbetween	Δcross
1966	1.337	0.083	0.057	-0.017	0.041
1976	1.270	-0.067	-0.055	0.002	-0.014
1986	1.312	0.042	0.035	0.010	-0.003
1996	1.406	0.094	0.098	0.004	-0.008
2006	1.455	0.049	0.046	0.007	-0.005
2016	1.610	0.154	0.133	0.014	0.007

$\implies$ Two forces at work happening in ALL sectors and industries:

- Increase in pricing power of firms (within).
- Reallocation of sales from low to high markup firms.

Market Power and profitability

- Starting in 1980 firms average profitability grow due to the increase in the upper tail of the profit distribution.
- Firm market values and dividends confirm the same pattern.
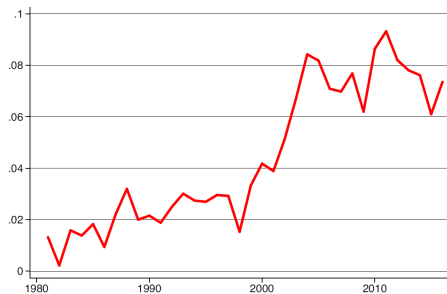
(A) Average profit rate (revenue weighted)
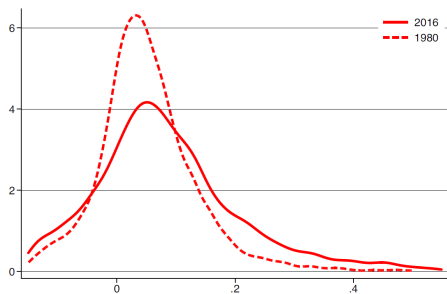
(B) Kernel density profit rate (unweighted)

Also, aggregate markup and profitability increase is not exclusively explained by rise in fixed or overhead costs.

In sum: Δ^+ Aggregate markups, Δ^+ profitability $\implies$ evidence of the rise in market power.

Macro implications: Decline in the Labor Share

Rewriting firm minimization problem FOC, Labor share is inversely proportional to markup:

$$\frac{w_t L_{it}}{P_t Q_t} = \frac{\theta_{it}^L}{\mu_{it}}$$

REGRESSIONS: LOG (LABOR SHARE) ON LOG (MARKUP)

	Labor share (log)					
	(1)	(2)	(3)	(4)	(5)	(6)
Markup (log)	−0.24	−0.23	−0.20	−0.24	−0.68	−0.73
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Cost share (log)					0.91	0.96
					(0.01)	(0.01)
Year FE		X	X	X	X	X
Industry FE			X		X	
Firm FE				X		X
R^2	0.02	0.08	0.21	0.88	0.93	0.99
N			24,838			

2/3 of the rise in market power is due to reallocation toward high-markup firms $\implies$ labor share change driven by a few large firms with high markups and a low labor share.

Also, market power $\implies$ decrease in low-skill wages and labor force participation, and on the decrease in labor market dynamism and migration rates.

Macro implications: Decline in the Capital Share

The labor share and the capital share sum up to 1 minus the profit share minus the overhead share.

$$1 - \underbrace{\frac{P^X X}{PQ}}_{\Delta^+} - \underbrace{\frac{\Pi}{PQ}}_{\Delta^+} = \frac{P^V V}{PQ} + \underbrace{\frac{rK}{PQ}}_{\implies \Delta^-}$$

REGRESSIONS: LOG(CAPITAL SHARE) ON LOG(MARKUP)

	Capital share (log)					
	(1)	(2)	(3)	(4)	(5)	(6)
Markup (log)	0.03	0.03	−0.02	−0.14	−0.90	−0.86
	(0.02)	(0.02)	(0.01)	(0.02)	(0.00)	(0.00)
Cost Share (log)					1.13	1.11
					(0.00)	(0.00)
Year FE		X	X	X	X	X
Industry FE			X		X	
Firm FE				X		X
R^2	0.00	0.02	0.31	0.83	0.98	1.00
N			242,692			

With a long enough horizon, K adjusts and hence there will be a reduction in K as markups increase.

Personal comments

The paper propose brilliant answers paths to so many important edges that is hard to evaluate it as a whole

Amazing stuff:

- Explanation about the suitable approach to measure markups.
- One can discuss the mechanism of market power increase, but the robust evidence of the increase is there.
- Plausible evidence-based answers about production share variations puzzles.

Not that amazing data treatment stuff:

- I am aware that they take into account of the omitted price variable bias, but still is hard to swallow that the quantities proxy is reliable and thus the θ and thus firms markup point estimations.
- Maybe I misunderstood the code, but if they are dropping the 1 and 99 pctile of input shares wouldn't that change the top distribution of markups? that is the main reallocation argument right?