

# A Tale of Two Networks: Common Ownership and Product Market Rivalry

Florian Ederer<sup>†</sup>    Bruno Pellegrino<sup>‡</sup>

<sup>†</sup>Yale, ECGI & NBER    <sup>‡</sup>UMD Smith

January 27, 2023

<b>Delta Air Lines</b>	<b>[%]</b>	<b>Southwest Airlines Co.</b>	<b>[%]</b>	<b>American Airlines</b>	<b>[%]</b>
Berkshire Hathaway	8.25	PRIMECAP	11.78	T. Rowe Price	13.99
BlackRock	6.84	Berkshire Hathaway	7.02	PRIMECAP	8.97
Vanguard	6.31	Vanguard	6.21	Berkshire Hathaway	7.75
State Street Global Advisors	4.28	BlackRock	5.96	Vanguard	6.02
J.P. Morgan Asset Mgt.	3.79	Fidelity	5.53	BlackRock	5.82
Lansdowne Partners Limited	3.60	State Street Global Advisors	3.76	State Street Global Advisors	3.71
PRIMECAP	2.85	J.P. Morgan Asset Mgt.	1.31	Fidelity	3.30
AllianceBernstein L.P.	1.67	T. Rowe Price	1.26	Putnam	1.18
Fidelity	1.54	BNY Mellon Asset Mgt.	1.22	Morgan Stanley	1.17
PAR Capital Mgt.	1.52	Egerton Capital (UK) LLP	1.10	Northern Trust Global Inv	1.02

<b>United Continental Holdings</b>	<b>[%]</b>	<b>Alaska Air</b>	<b>[%]</b>	<b>JetBlue Airways</b>	<b>[%]</b>
Berkshire Hathaway	9.20	T. Rowe Price	10.14	Vanguard	7.96
BlackRock	7.11	Vanguard	9.73	Fidelity	7.58
Vanguard	6.88	BlackRock	5.60	BlackRock	7.33
PRIMECAP	6.27	PRIMECAP	4.95	PRIMECAP	5.91
PAR Capital Mgt.	5.18	PAR Capital Mgt.	3.65	Goldman Sachs Asset Mgt.	2.94
State Street Global Advisors	3.45	State Street Global Advisors	3.52	Dimensional Fund Advisors	2.42
J.P. Morgan Asset Mgt.	3.35	Franklin Resources	2.59	State Street Global Advisors	2.40
Altimeter Capital Mgt.	3.26	BNY Mellon Asset Mgt.	2.34	Wellington	2.07
T. Rowe Price	2.25	Citadel	1.98	Donald Smith Co.	1.80
AQR Capital Management	2.15	Renaissance Techn.	1.93	BarrowHanley	1.52

# The Rise of Common Ownership

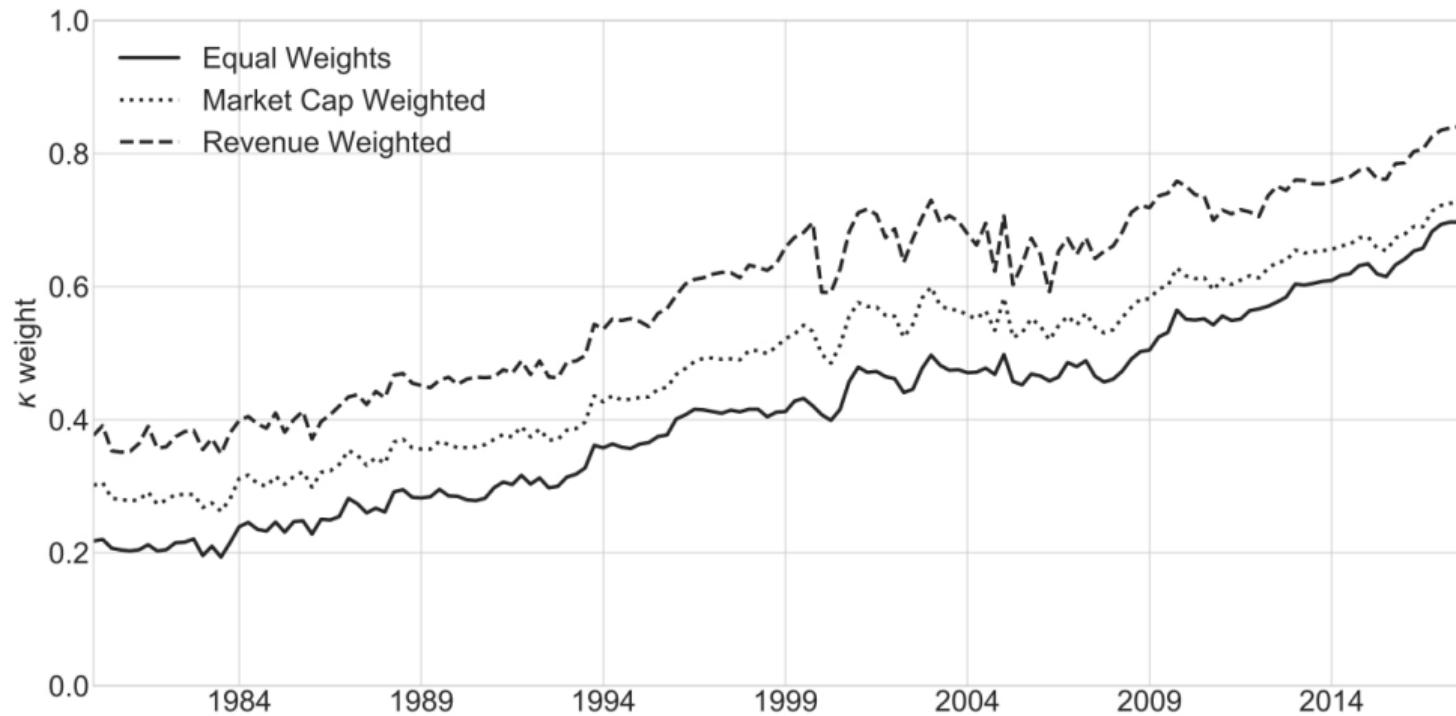


Figure: Common ownership profit weights  $\kappa$  over time (Backus et al., 2021)

## The Common Ownership Hypothesis

- “When large investors own shares in many firms within the same industry, those firms may have reduced incentives to compete.”
  - ▶ Firms produce fewer units, raise prices, reduce investment, innovate less, limit entry, ...
  - ▶ Long intellectual history starting with theoretical contribution by [Rotemberg \(1984\)](#)
  - ▶ But tremendous increase in common ownership over the past 3 decades
  - ▶ Empirical evidence is growing and varies across industries, firm choices, methodologies, ...
- Is this a problem for competition, aggregate welfare, and the distribution of surplus?

# Policy Importance

SEC

## Common Ownership: The Investor Protection Challenge of the 21st Century



Commissioner Robert J. Jackson Jr.

New York, NY

Dec. 6, 2018

Testimony Before the Federal Trade Commission  
Hearing on Competition and Consumer Protection

FTC, DOJ, OECD, EC

Institutional investors often hold shares of competing firms. Recent scholarship has considered whether such common ownership has anticompetitive effects. Antitrust theorists have long suggested that the interests of a common concentrated owner (CCO) differ from those of an owner of a single firm and that a CCO might be able to induce firms in which it holds a stake to further these interests.<sup>1</sup> Recent empirical evidence, finding that CCOs are associated with higher prices and lower output, seems to support this theory.<sup>2</sup>

This new evidence, along with the dramatic growth in institutional investors' holdings over the last several decades, has stimulated a major rethinking of antitrust enforcement. The Department of Justice has acknowledged concerns about the anticompetitive effects of common ownership and investigated common ownership of competing airlines.<sup>3</sup> In 2018, the Federal Trade Commission took these concerns a step further, conducting an all-day hearing on the subject.<sup>4</sup> In Europe, antitrust enforcers have taken a more aggressive approach: in addi-

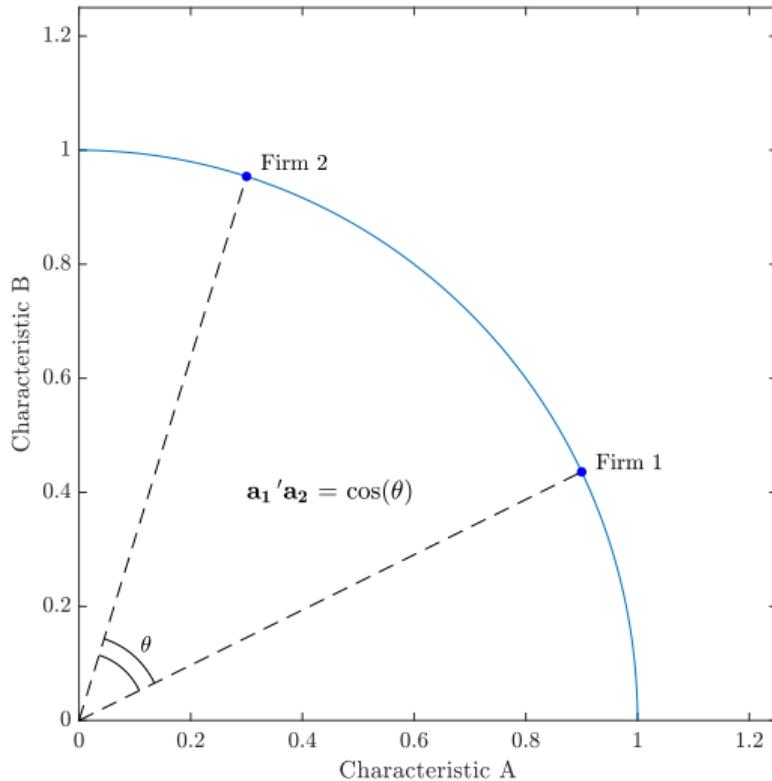
## This Paper

- What are the welfare and distributional implications of common ownership?
- How do corporate governance assumptions affect these conclusions?
- Theory
  - ▶ A novel structural IO-style general equilibrium model of oligopoly with common ownership
  - ▶ Hedonic demand to model competition among differentiated oligopolists with market power
  - ▶ Different objective functions for firms based on ownership and corporate governance arrangements
- Empirical Results
  - ▶ Deadweight loss of common ownership increased from 0.3% in 1994 to 4% in 2018
    - ★ Alternative governance assumptions: deadweight loss ranges between 1.9% and 4.4% in 2018
  - ▶ Rise of common ownership resulted in a significant reallocation of
    - ★ profits across firms
    - ★ surplus from consumers to producers

## Generalized Hedonic Linear (GHL) Demand

- $i = 1, 2, \dots, n$  oligopolistic firms
  - ▶ No industry boundaries
  - ▶ Product differentiation and productivity differences
- Hedonic demand
  - ▶ Each firm's product is a bundle of characteristics ([Lancaster, 1966](#); [Rosen, 1974](#); [Epple, 1987](#))
- 1 unit of product  $i$  provides
  - ▶ 1 unit of an idiosyncratic characteristic  $i$
  - ▶ a unit-length vector  $a_i$  of  $k$  common characteristics

## A Basic Example: 2 firms, 2 (common) characteristics



## Aggregating Common Characteristics

$$\begin{array}{c} \text{Characteristics} \\ (\text{Nutrient Intake}) \end{array} \quad \left[ \begin{array}{c} x_1 \\ x_2 \\ \vdots \\ x_m \end{array} \right] \quad \begin{array}{c} = \\ \text{Matrix of Coordinates} \\ (\text{Nutrition Facts}) \end{array} \quad \left[ \begin{array}{cccc} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{array} \right] \quad \begin{array}{c} \text{Product} \\ \text{Bundle} \end{array} \quad \left[ \begin{array}{c} q_1 \\ q_2 \\ \vdots \\ q_n \end{array} \right]$$

$A$

## Representative Agent Utility

- Representative agent with quadratic utility

$$U(\mathbf{x}, \mathbf{q}, H) \stackrel{\text{def}}{=} \alpha \cdot \sum_{j=1}^m \left( b_j^x x_j - \frac{1}{2} x_j^2 \right) + (1 - \alpha) \sum_{i=1}^n \left( b_i^q q_i - \frac{1}{2} q_i^2 \right) - H$$

- $b_j^x$  and  $b_i^q$  are characteristic-specific preference shifters determining *vertical differentiation*
  - ▶  $\alpha \in [0, 1]$  is the utility weight of common characteristics determining *horizontal differentiation*
- Representative agent has a budget constraint  $H + \sum_{i=1}^n \pi_i \geq \sum_{i=1}^n p_i q_i$ 
  - ▶  $H$  are hours worked in perfectly competitive labor market
  - ▶ Total firm profits  $\sum_{i=1}^n \pi_i$  accrue to the representative agent
- Because  $\mathbf{x} = \mathbf{A}\mathbf{q}$ , this can be rewritten in terms of  $\mathbf{q}$
- Representative agent faces price vector  $\mathbf{p}$  and chooses  $\mathbf{q}$

## Inverse Demand

$$\mathbf{p} = \mathbf{b} - (\mathbf{I} + \Sigma)\mathbf{q}$$

where

$$\Sigma \stackrel{\text{def}}{=} \alpha(\mathbf{A}'\mathbf{A} - \mathbf{I})$$

- $\mathbf{A}'\mathbf{A}$  is the matrix of *cosine similarities* for common characteristics between firms
  - ▶ We assume  $\mathbf{A}'\mathbf{A}$  to be exogenous (but time-varying).
  - ▶ Market structure and common ownership may (in practice) influence product positioning.
- Hoberg and Phillips (2016) dataset provides an estimate of this object.
  - ▶ Presence of the idiosyncratic characteristics adds a degree of freedom to the demand system

## Adding Common Ownership

- Ownership is assumed to be exogenous (but time-varying).
- There are  $z = 1, 2, \dots, Z$  investment vehicles through which the representative consumer owns shares  $s_{iz}$  in company  $i$ .

$$V_z \stackrel{\text{def}}{=} \sum_{i=1}^n s_{iz} \pi_i \quad \text{and} \quad \sum_{z=1}^Z s_{iz} = 1$$

- Firm  $i$  maximizes weighted portfolio profits of its investment vehicles ([Rotemberg, 1984](#))

$$\phi_i \stackrel{\text{def}}{=} \sum_{z=1}^Z s_{iz} V_z \quad \text{thus} \quad \phi_i \propto \pi_i + \sum_{j \neq i} \kappa_{ij} \pi_j$$

where the common ownership weights  $\kappa_{ij} = \frac{\mathbf{s}_i' \mathbf{s}_j}{\mathbf{s}_i' \mathbf{s}_i}$

- ▶ Standard macro assumption that firms ignore consumption effect of their production decisions

## Foundations for the Firm Objective Function

- Corporate manager  $i$  chooses  $q_i$  for firm  $i$ 
  - ▶ Investment funds align compensation with portfolio profits  $\omega_i = \varepsilon \sum_{z=1}^Z s_{iz} V_z$
  - ▶ See [Antón et al. \(2021\)](#)
- Corporate managers only consume a luxury good (e.g., yachts or private jets)
  - ▶ Setup reminiscent of [Veblen \(1899\)](#) and recent evidence by [Hubmer \(2022\)](#)
  - ▶  $\varepsilon$  small so that labor used to produce the luxury good is a negligible share of total labor in the economy
- Relax assumption about completely distinct consumption baskets
  - ▶ With consumption basket overlap corporate manager  $i$  maximizes  $(1 - \gamma)\phi_i + \gamma W$
  - ▶ Weight  $\gamma$  depends on consumption basket similarity
  - ▶ Endogenous ESG concerns ([Hart and Zingales, 2017](#); [Condon, 2020](#))

## Cournot Common Ownership

The *Cournot Common Ownership* allocation  $\mathbf{q}^\Phi$  is defined as

$$\mathbf{q}^\Phi \stackrel{\text{def}}{=} \arg \max_{\mathbf{q}} \Phi(\mathbf{q})$$

and is given by

$$\mathbf{q}^\Phi = (2I + \underbrace{\Delta}_{\text{Scale Economies}} + \underbrace{\Sigma}_{\text{Network Position}} + \underbrace{K \circ \Sigma}_{\text{Common Ownership}})^{-1} \underbrace{(b - c)}_{\text{Marginal Surplus at } q_i = 0}$$

Ballester et al. (2006) show that another way to interpret this equation is as the Katz-Bonacich network centrality measure.

## Extensions

- Private and foreign firms
  - ▶ Aggregation result à la [Hopenhayn \(1992\)](#) which adds competitive fringes of atomistic firms
  - ▶ Use firm sector similarity from [Frésard et al. \(2020\)](#)
- Differentiated Bertrand competition
  - ▶ Qualitatively similar but incremental anticompetitive effect of common ownership relative to the standard oligopoly solution is more pronounced under Bertrand than under Cournot competition
- Multi-product firms
  - ▶ Add additional product lines, augment  $\Sigma$  and  $K$  matrices
  - ▶ Empirical implementation using Compustat segments ([Frésard et al., 2020](#))
- Input-output linkages
  - ▶ Firms behave as price-takers in input markets and combine labor and intermediate inputs using a Leontief production function
  - ▶ Empirical implementation using [Atalay et al. \(2011\)](#)

## Data

- Compustat Firm Financials
- Text-based Product Similarity ([Hoberg and Phillips, 2016](#))
  - ▶ Based on text analysis of SEC form 10-K product description
  - ▶ Who competes with whom
- Profit Weights
  - ▶ Obtained from parsing SEC forms 13(f)
  - ▶ Who is owned by whom

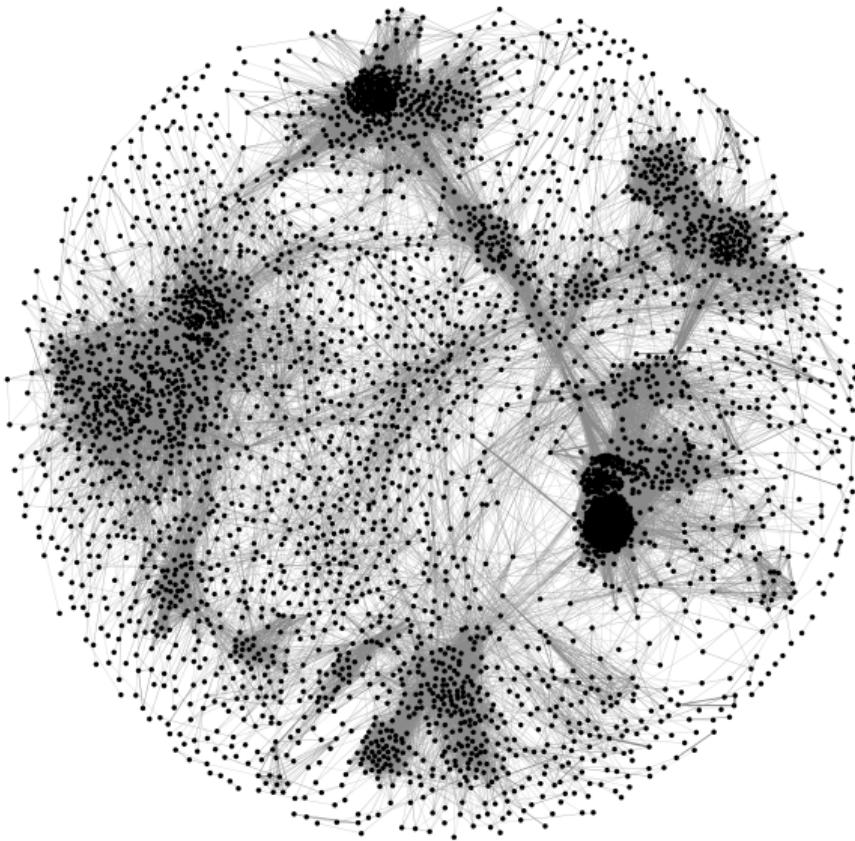
## Product Similarity Data

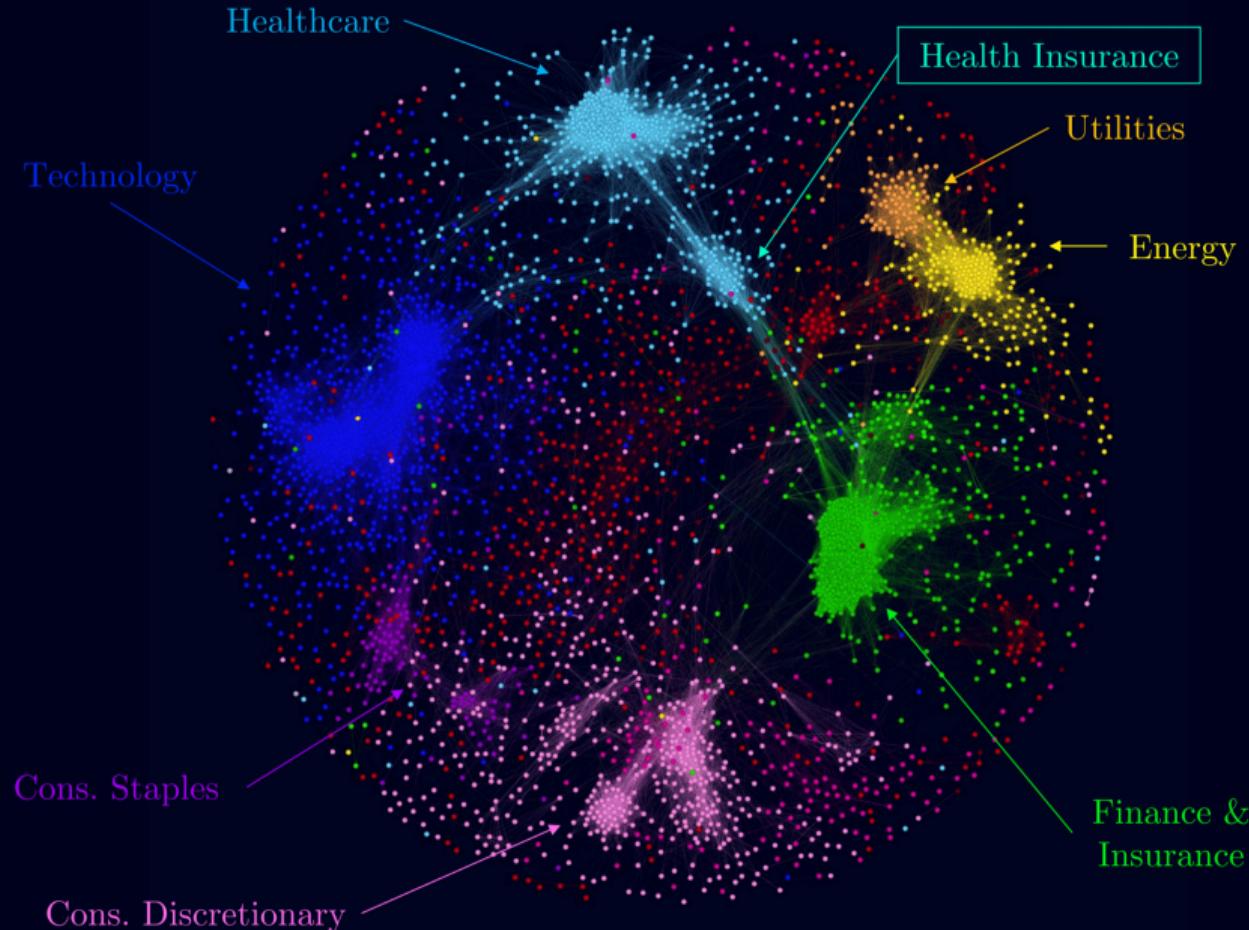
- Hoberg and Phillips (2016) construct similarity scores by text mining the “Business Description” section of 10-K filings
  - ▶ Already standard practice in financial economics to use for (binary) industry classification
  - ▶ We use **raw scores** rather than binary HP industry classifications.
- Approach solves long-standing problems with NAICS/SIC
  - ▶ Static, binary, and do not really reflect product market competition (not used in IO)
- Construction and normalization to obtain empirical counterpart of  $\mathbf{a}_i$ :

$$\mathbf{v}_i = \begin{bmatrix} v_{i,1} \\ v_{i,2} \\ \vdots \\ v_{i,61146} \end{bmatrix}, \quad \mathbf{a}_i = \frac{\mathbf{v}_i}{\|\mathbf{v}_i\|}.$$

- Plenty of validation in Hoberg and Phillips (2016) that this predicts competitive interactions

# Network Visualization of the HP dataset: $A'A$ ( $5,000 \times 5,000$ )

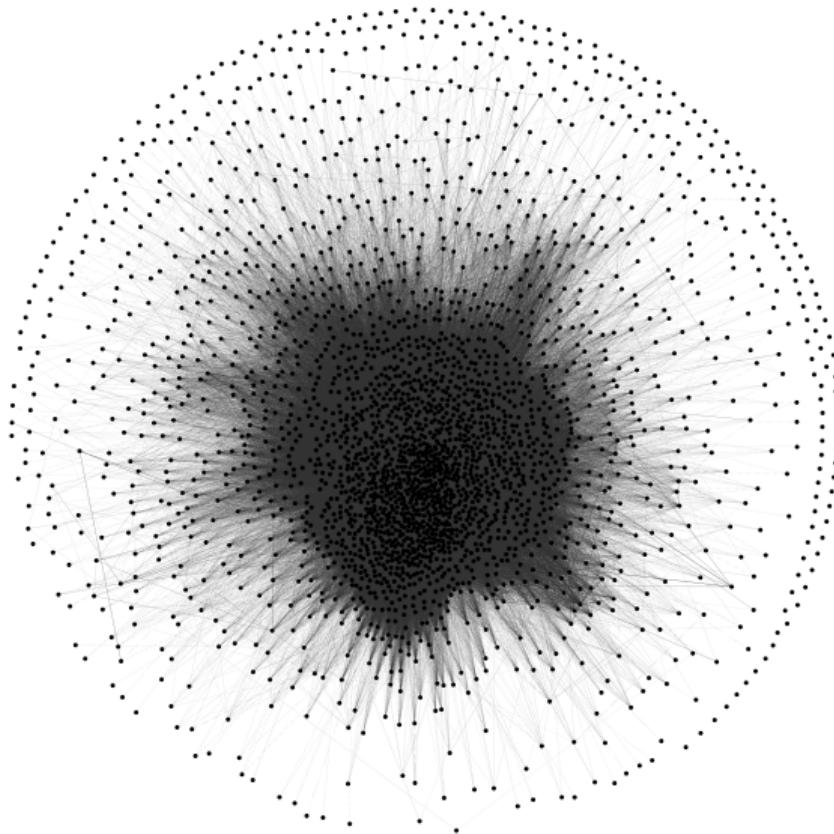




## Ownership Data

- Institutional investors with AUM > \$ 100 million are legally required to disclose securities holdings in SEC form 13(f).
- 13(f) mutual fund holdings data were historically sold by Thomson/WRDS
- However, it has become increasingly clear that these data contain several errors.
- We scrape and clean all the ownership data for all public companies from 1994 to 2018.
- We use a correction to address the bias in  $\kappa_{ij}$  due to unobserved investor holdings.

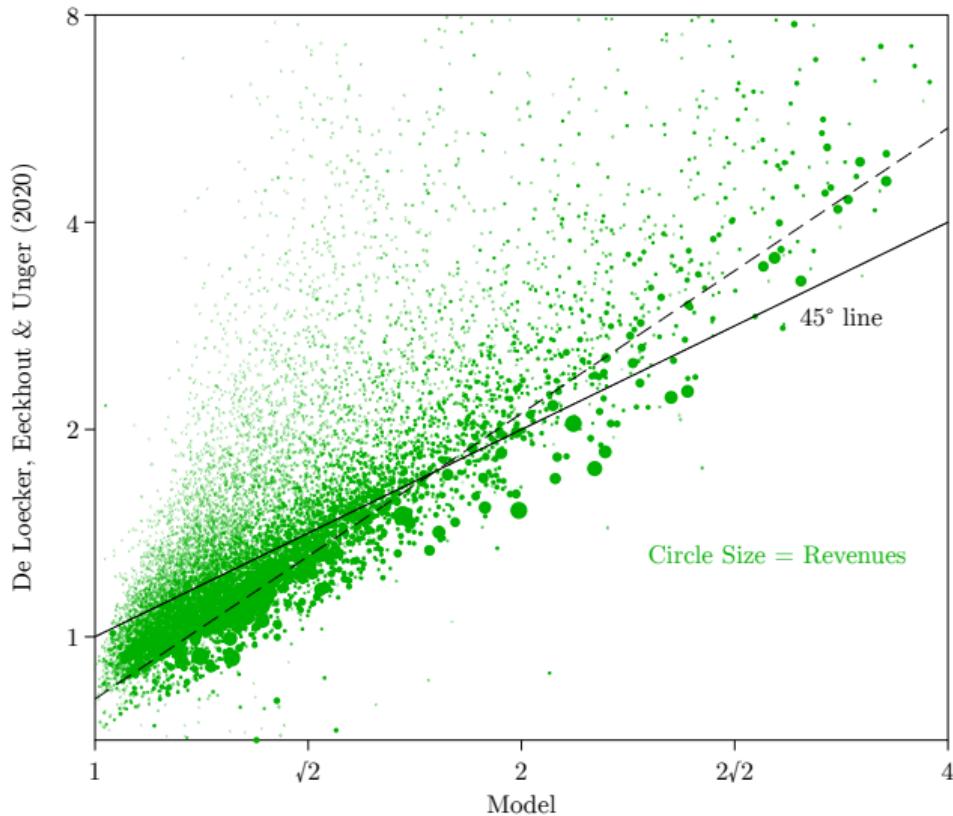
# Network Visualization of the Ownership Matrix: $\mathbf{K}$ ( $5,000 \times 5,000$ )



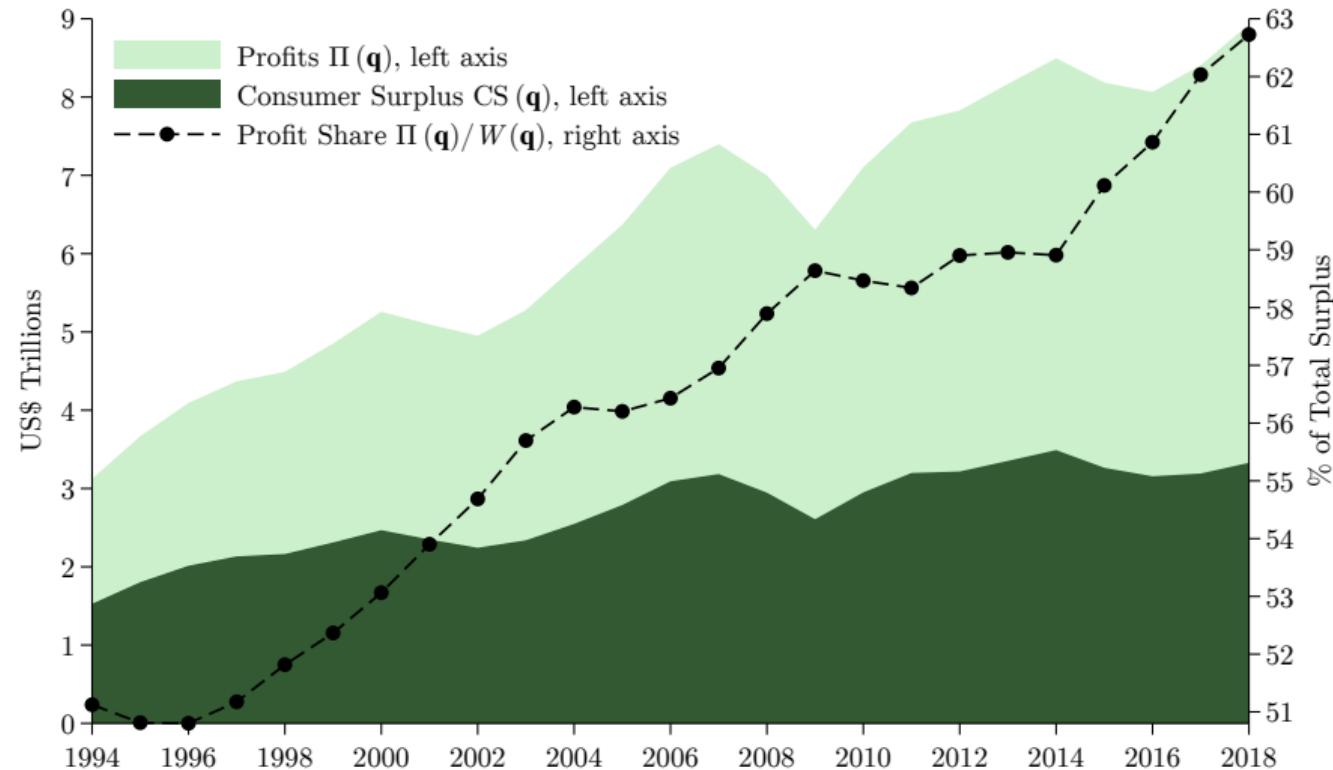
## IO vs GHL Elasticities

Market	Firm <i>i</i>	Firm <i>j</i>	IO	GHL
Auto	Ford	Ford	-4.320	-5.197
Auto	Ford	General Motors	0.034	0.056
Auto	Ford	Toyota	0.007	0.017
Auto	General Motors	Ford	0.065	0.052
Auto	General Motors	General Motors	-6.433	-4.685
Auto	General Motors	Toyota	0.008	0.005
Auto	Toyota	Ford	0.018	0.025
Auto	Toyota	General Motors	0.008	0.008
Auto	Toyota	Toyota	-3.085	-4.851
Cereals	Kellogg's	Kellogg's	-3.231	-1.770
Cereals	Kellogg's	Quaker Oats	0.033	0.023
Cereals	Quaker Oats	Kellogg's	0.046	0.031
Cereals	Quaker Oats	Quaker Oats	-3.031	-1.941
Computers	Apple	Apple	-11.979	-8.945
Computers	Apple	Dell	0.018	0.025
Computers	Dell	Apple	0.027	0.047
Computers	Dell	Dell	-5.570	-5.110

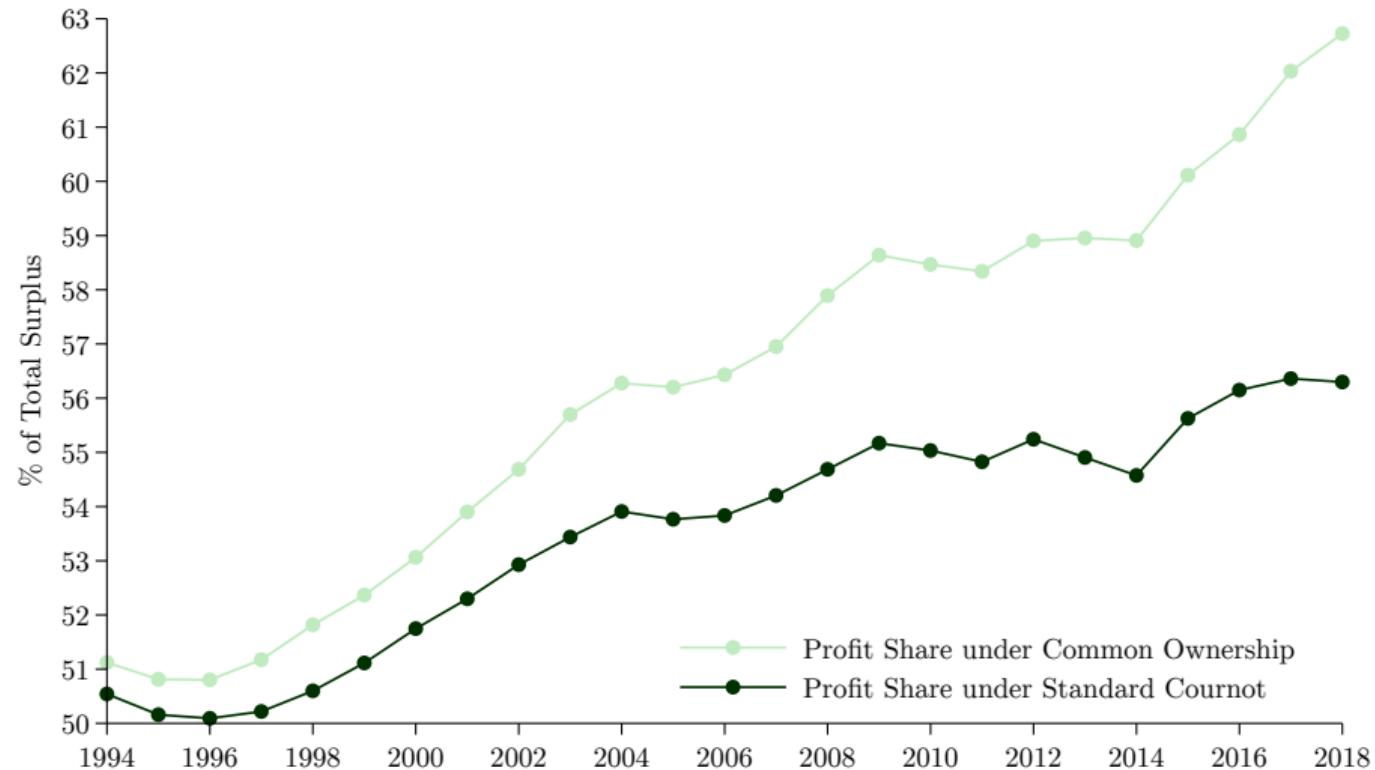
## Comparison with Cross-sectional Markups



# Profits and Consumer Surplus over Time



# Profit Share



## Why does common ownership differentially affect corporate profits?

- Common ownership raises aggregate profits by \$378 billion from \$5.261 trillion to \$5.639 trillion in 2018
  - Aggregate increase obscures that common ownership differentially affects corporate profits ... but why?
    - ▶ Vast majority of companies (98.04%) has higher profits
    - ▶ Small minority (1.96%) has *lower* profits under common ownership
- ① Different companies have different levels of common ownership
  - ② Position in network of product market rivalry matters
  - ③ Common ownership reallocates market shares towards more productive firms

# Differential Impact of Common Ownership on Profits

Top 10 Companies ranked by \$ profit difference (in millions), 2018

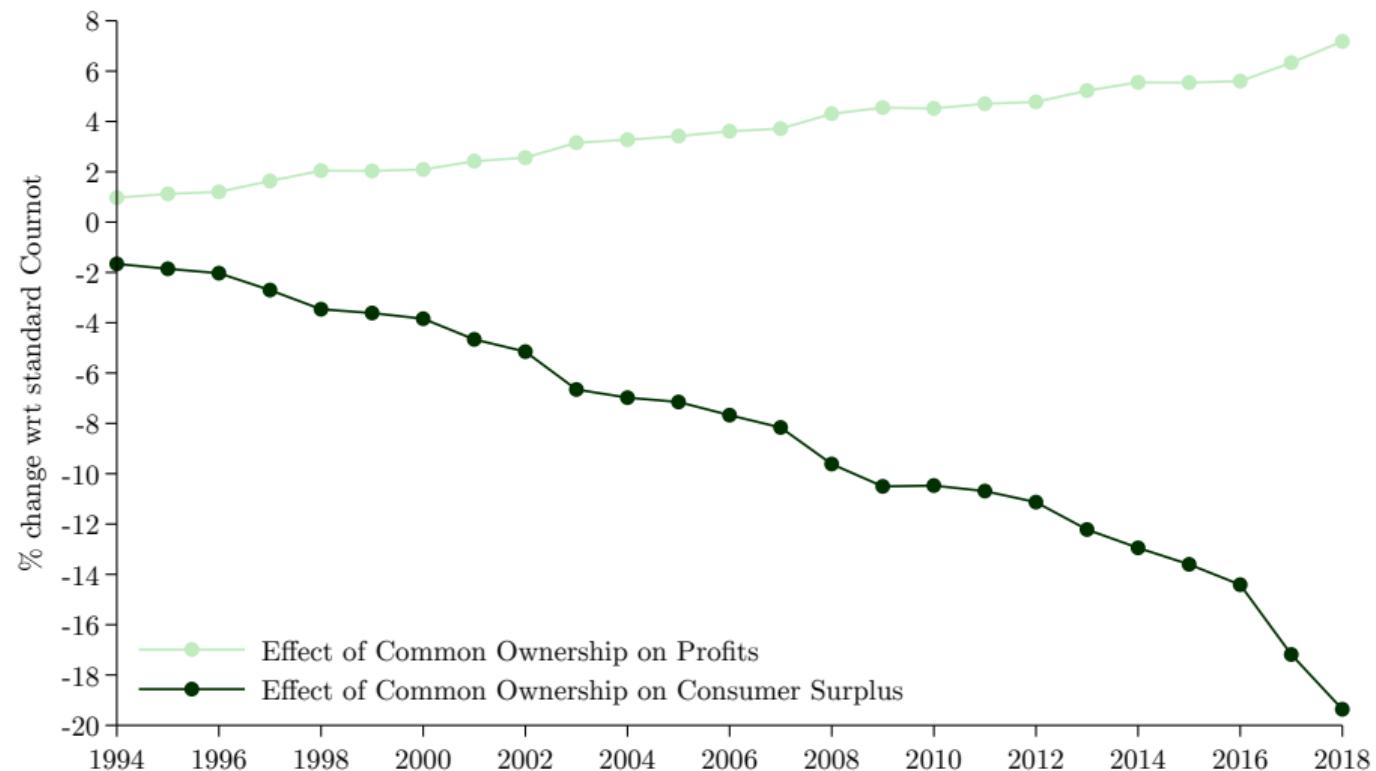
Company Name	CCO Profits	Cournot Profits	Difference	% Diff.
Wells Fargo & Co	\$ 84,543.8	\$ 80,947.0	+\$ 3,596.7	+4.4%
JPMorgan Chase & Co	\$ 104,375.4	\$ 100,902.6	+\$ 3,472.8	+3.4%
Bank of America	\$ 88,779.1	\$ 85,979.4	+\$ 2,799.6	+3.3%
Verizon Communications	\$ 75,700.7	\$ 73,000.2	+\$ 2,700.5	+3.7%
Walmart	\$ 133,912.6	\$ 131,642.8	+\$ 2,269.8	+1.7%
Microsoft	\$ 81,894.8	\$ 79,643.0	+\$ 2,251.8	+2.8%
Alphabet	\$ 86,288.4	\$ 84,378.8	+\$ 1,909.6	+2.3%
AT&T	\$ 91,397.4	\$ 89,514.2	+\$ 1,883.2	+2.1%
Apple	\$ 112,506.4	\$ 110,657.7	+\$ 1,848.7	+1.7%
Goldman Sachs Group	\$ 26,997.7	\$ 25,227.9	+\$ 1,769.8	+7.0%

## Differential Impact of Common Ownership on Profits

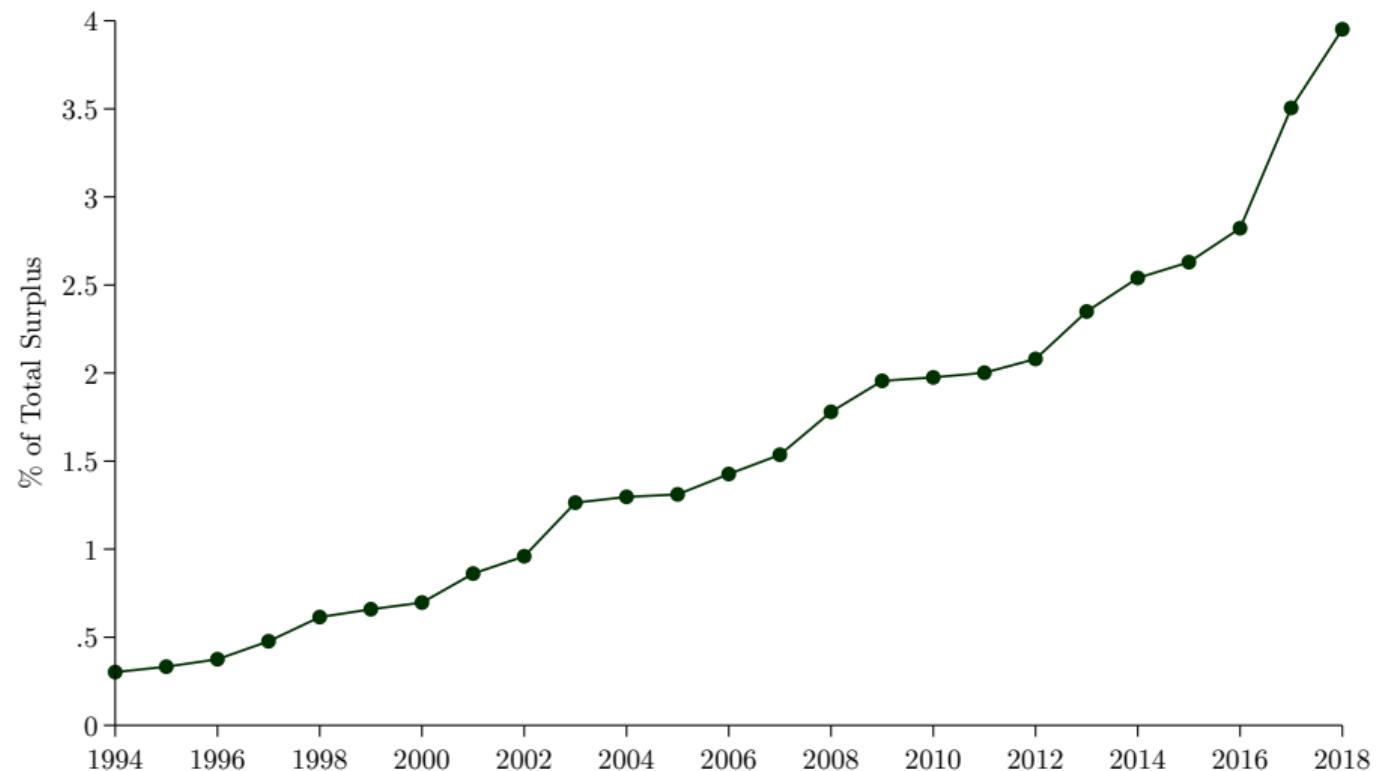
Bottom 10 Companies ranked by \$ profit difference (in millions), 2018

Company Name	CCO Profits	Cournot Profits	Difference	% Diff.
Regenxbio	\$ 113.2	\$ 136.2	-\$ 23.0	-16.9%
Natural Gas Services Group	\$ 18.5	\$ 42.4	-\$ 23.8	-56.2%
Limelight Networks	\$ 118.5	\$ 143.7	-\$ 25.1	-17.5%
Liveperson	\$ 152.3	\$ 178.5	-\$ 26.2	-14.7%
Enterprise Financial Services	\$ 160.8	\$ 190.8	-\$ 30.0	-15.7%
Boingo Wireless	\$ 235.0	\$ 272.6	-\$ 37.7	-13.8%
Triple-S Management	\$ 60.9	\$ 101.0	-\$ 40.0	-39.6%
Tilly's	\$ 210.9	\$ 252.4	-\$ 41.5	-16.4%
Pnm Resources	\$ 312.9	\$ 355.1	-\$ 42.2	-11.9%
Callon Petroleum	\$ 375.3	\$ 477.6	-\$ 102.3	-21.4%

# Distributional Effects of Common Ownership



# Deadweight Loss of Common Ownership



## Alternative Corporate Governance Assumptions

- Baseline model assumes that each firm  $i$  fully internalizes the **proportional** profit weights  $\kappa_{ij}$  of its investors when choosing  $q_i$  ([Rotemberg, 1984](#))
- Alternative corporate governance assumptions (due to agency conflicts, voting models, or investor inattention) lead to different firm objective functions
- We investigate 3 alternative versions of the model with different objective functions.
  - ▶ Super-proportional weights
  - ▶ Blockholder weights ([Edmans and Holderness, 2017](#))
  - ▶ Investor inattention ([Gilje et al., 2020](#))
- Other governance assumptions (work in progress)
  - ▶ Conduct parameter  $\tau = 0.28$  from [Azar and Ribeiro \(2022\)](#) that scales down  $\kappa_{ij}$
  - ▶ Consumption basket of managers does not just consist of luxury good ([Hubmer, 2022](#))

## Superproportional Influence and Blockholder Thresholds

- Influence-adjusted common ownership weights  $\tilde{\kappa}_{ij}$  are given by

$$\tilde{\kappa}_{ij} \stackrel{\text{def}}{=} \frac{\mathbf{s}'_i \mathbf{G}'_i \mathbf{s}_j}{\mathbf{s}'_i \mathbf{G}'_i \mathbf{s}_i}$$

where  $\mathbf{G}_i \stackrel{\text{def}}{=} \text{diag}(\mathbf{s}_i^{0.5})$  is the concave influence function.

- Blockholder-adjusted common ownership weights are given by

$$\hat{\kappa}_{ij} \stackrel{\text{def}}{=} \frac{\mathbf{s}'_i \mathbf{B}'_i \mathbf{s}_j}{\mathbf{s}'_i \mathbf{s}_i}$$

where  $\mathbf{B}_i \stackrel{\text{def}}{=} \mathbf{1}_{s_{iz} \geq 0.05}(\mathbf{I}_n)$  is an indicator function that sets an investor  $z$ 's influence to zero unless their stake in company  $i$  exceeds the blockholder threshold of 5%.

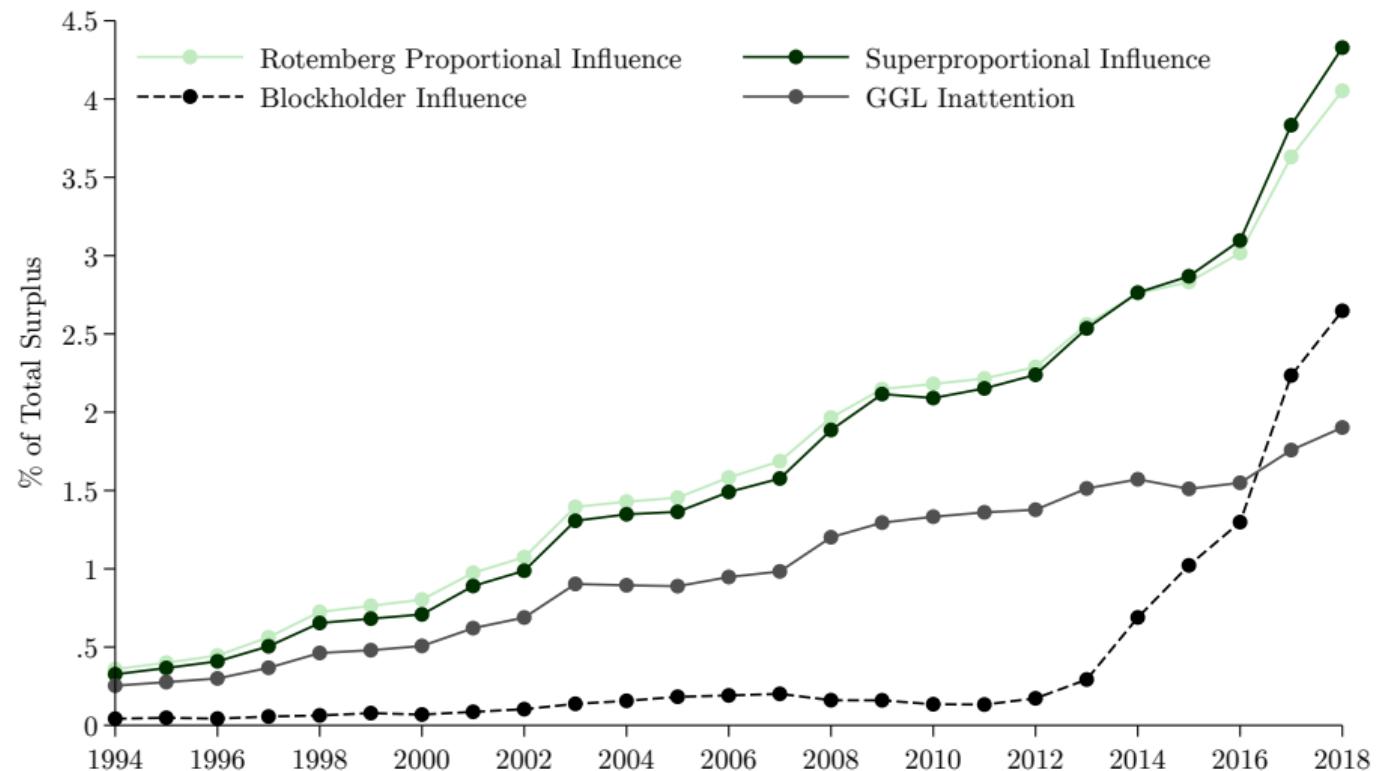
## Rational Investor Inattention

- Agency problems between owners and managers may attenuate or even exacerbate the anticompetitive effects of common ownership ([Antón et al., 2021](#))
- [Gilje et al. \(2020\)](#) highlight importance of investor inattention in evaluating the impact of common ownership
  - ▶ Monitoring firm  $i$ 's management and forcing it to incorporate strategic considerations related to common ownership is costly for investors
  - ▶ May not be optimal to incur such a cost if firm  $i$  constitutes only a small portion of a large, diversified investor's overall portfolio
- Alternative measure of firm  $i$ 's sympathy towards firm  $j$

$$\text{GGL}_{ij}^{\text{fitted}} \quad \stackrel{\text{def}}{=} \quad \sum_{z=1}^Z s_{iz} g_{iz} s_{jz}$$

- ▶  $g_{iz} \in [0, 1]$  is an “attention weight,” which captures the degree to which investor  $z$  internalizes the product market rivalries of firm  $i$

# Common Ownership DWL: Alternative Governance



# Work in Progress

- Evolution of  $\Sigma$  and  $K$  because entry & exit is substantial
  - ▶ How much is due to change over time in  $\Sigma$  and  $K$ ? ✓
- Different types of firms
  - ▶ Private firms ✓
  - ▶ Multi-product firms ✓
  - ▶ Vertical relationships ✓
- Corporate Governance
  - ▶ Different consumption baskets for corporate managers and worker-consumers ✓
  - ▶ Conduct parameters to capture agency costs ✓

# Conclusion

- Theory
  - ▶ General equilibrium model of oligopoly with common ownership
  - ▶ Calibration allows welfare measurements and counterfactuals
- Results
  - ▶ Common ownership leads to substantial deadweight loss
  - ▶ Significant reallocation of surplus from consumers to firms
  - ▶ Large effects even under conservative assumptions about corporate governance
- Caveats
  - ▶ Analysis does **not** consider common ownership effects on shareholdings, product differentiation, labor market power, innovation, entry, cost efficiencies, or dynamic incentives to collude
- Results have implications for
  - ▶ Future work at the intersection of corporate strategy and industrial organization
  - ▶ Antitrust policy and financial regulation

# Thank You!

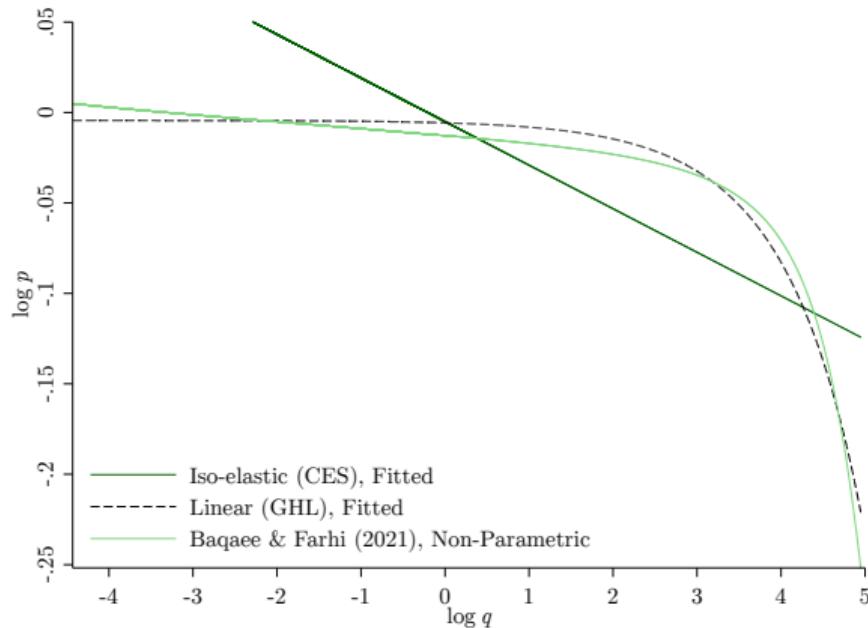
Paper available at [https://florianederer.github.io/co\\_welfare.pdf](https://florianederer.github.io/co_welfare.pdf)

## Advantages of GHL: Complementarities

- Complementarities such that for some products  $\frac{\partial q_i}{\partial p_j} < 0$
- Cross-price elasticity of demand depends on the inverted matrix  $(I + \Sigma)^{-1}$
- Naturally arises from the network structure because “the enemy of my enemy is my friend”
- Matches realistic features of economy-wide substitution patterns (e.g., energy and consumer finance companies)

## Advantages of GHL: Price-Cost Passthrough

- GHL produces linear as opposed to isoelastic residual demands under CES
- GHL matches empirical data much better ([Baqae and Farhi, 2020](#))



## References I

- Antón, Miguel, Florian Ederer, Mireia Giné, and Martin Schmalz**, “Common Ownership, Competition, and Top Management Incentives,” *Yale SOM Working Paper*, 2021.
- Atalay, Enghin, Ali Hortacsu, James Roberts, and Chad Syverson**, “Network structure of production,” *Proceedings of the National Academy of Sciences*, 2011, 108 (13), 5199–5202.
- Azar, José and Ricardo M Ribeiro**, “Estimating Oligopoly with Shareholder Voting Models,” *SSRN Working Paper*, 2022.
- Backus, Matthew, Christopher Conlon, and Michael Sinkinson**, “Common Ownership in America: 1980–2017,” *American Economic Journal: Microeconomics*, 2021, 13 (3), 273–308.
- Ballester, Coralio, Antoni Calvó-Armengol, and Yves Zenou**, “Who’s Who in Networks. Wanted: The Key Player,” *Econometrica*, 2006, 74 (5), 1403–1417.
- Baqae, David and Emmanuel Farhi**, “The Darwinian Returns to Scale,” *NBER Working Paper*, 2020.
- Condon, Madison**, “Externalities and the common owner,” *Wash. L. Rev.*, 2020, 95, 1.

## References II

- Edmans, Alex and Clifford G Holderness**, "Blockholders: A survey of theory and evidence," *The handbook of the economics of corporate governance*, 2017, 1, 541–636.
- Epple, Dennis**, "Hedonic prices and implicit markets: estimating demand and supply functions for differentiated products," *Journal of Political Economy*, 1987, 95 (1), 59–80.
- Frésard, Laurent, Gerard Hoberg, and Gordon M Phillips**, "Innovation activities and integration through vertical acquisitions," *Review of Financial Studies*, 2020, 33 (7), 2937–2976.
- Gilje, Erik P, Todd A Gormley, and Doron Levit**, "Who's paying attention? Measuring common ownership and its impact on managerial incentives," *Journal of Financial Economics*, 2020, 137 (1), 152–178.
- Hart, Oliver and Luigi Zingales**, "Companies Should Maximize Shareholder Welfare Not Market Value," *Journal of Law, Finance, and Accounting*, 2017, 2 (2), 247–274.
- Hoberg, Gerard and Gordon Phillips**, "Text-based network industries and endogenous product differentiation," *Journal of Political Economy*, 2016, 124 (5), 1423–1465.

## References III

- Hopenhayn, Hugo A.**, "Entry, exit, and firm dynamics in long run equilibrium," *Econometrica: Journal of the Econometric Society*, 1992, pp. 1127–1150.
- Hubmer, Joachim**, "The race between preferences and technology," *University of Pennsylvania Working Paper*, 2022.
- Lancaster, Kelvin J.**, "A New Approach to Consumer Theory," *Journal of Political Economy*, 1966, 74 (2), 132–157.
- Rosen, Sherwin**, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy*, 1974, 82 (1), 34–55.
- Rotemberg, Julio**, "Financial transaction costs and industrial performance," *MIT Sloan Working Paper*, 1984.
- Veblen, Thorstein**, *The Theory of the Leisure Class: An Economic Study of Institutions*, New York: Macmillan, 1899.