

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

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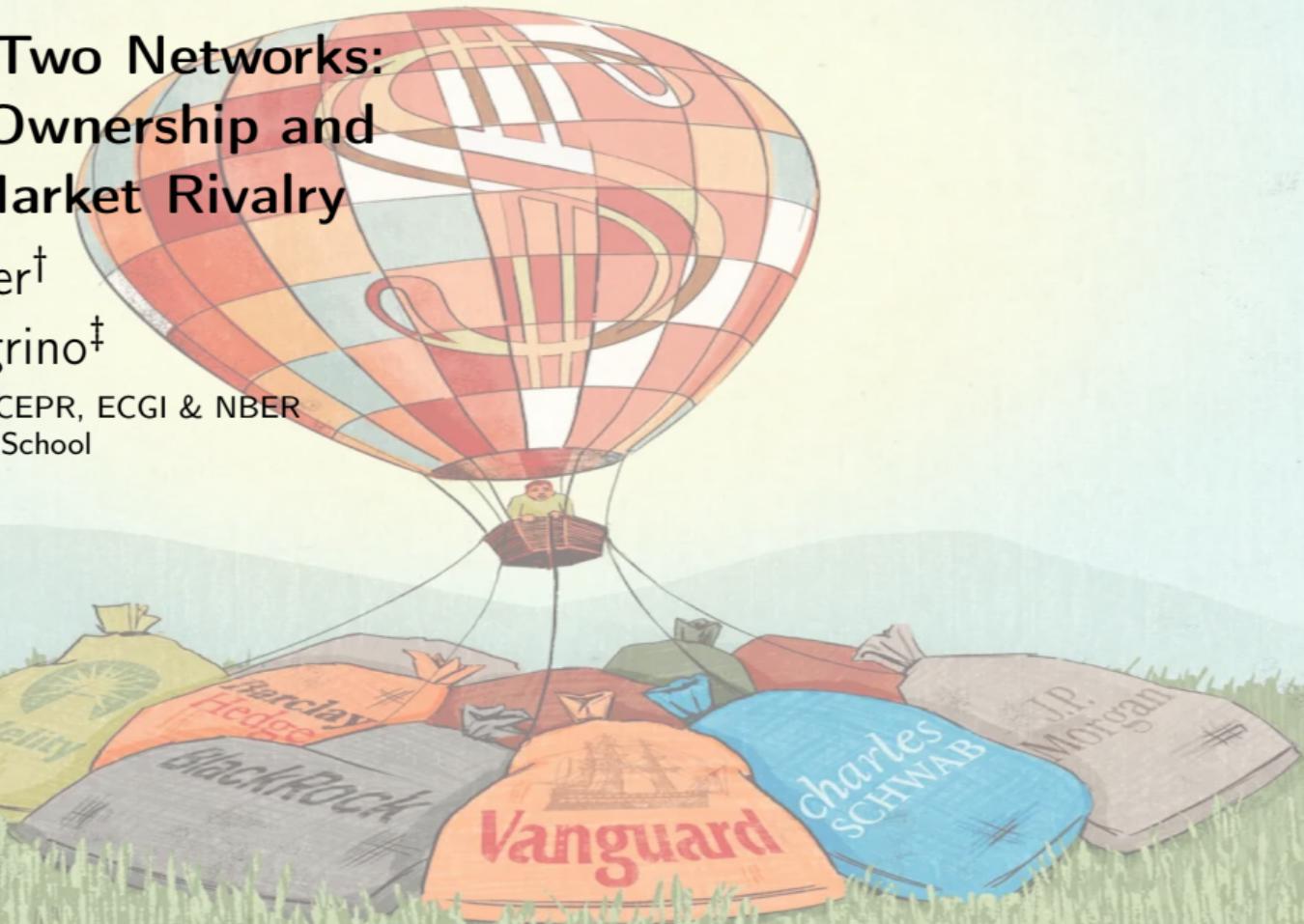
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CMA

June 27, 2024



Delta Air Lines	[%]	Southwest Airlines Co.	[%]	American Airlines	[%]
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

United Continental Holdings	[%]	Alaska Air	[%]	JetBlue Airways	[%]
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

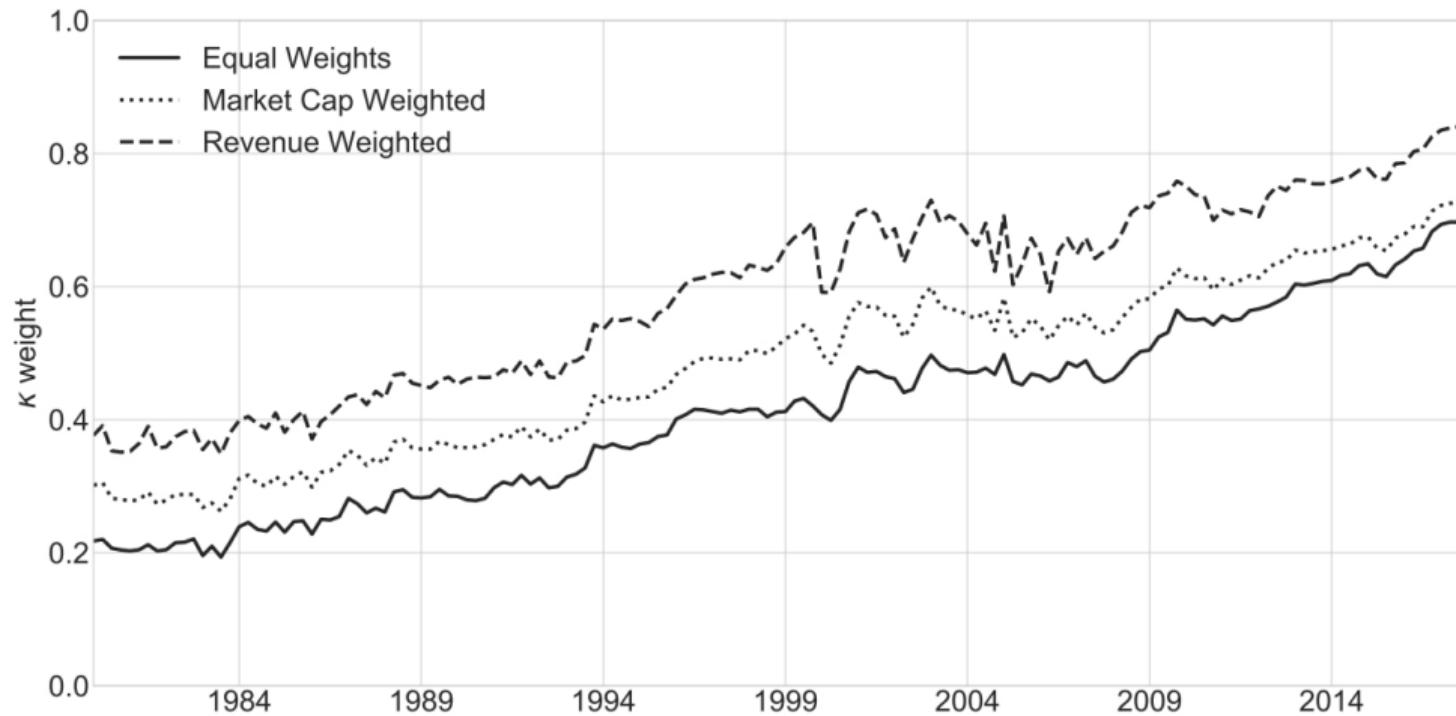


Figure: Common ownership profit weights κ over time (Backus et al., 2021)

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 contributions by [Rubinstein and Yaari \(1983\)](#) and [Rotemberg \(1984\)](#)
 - ▶ But only empirically relevant due to tremendous increase in common ownership over the past 3 decades ([Backus et al., 2021](#))
 - ▶ Empirical evidence is growing and varies across industries, firm choices, methodologies, ...
- How big of a problem is common ownership for competition, aggregate welfare, and the distribution of surplus?
 - ▶ ~~“Does common ownership affect corporate conduct?”~~
 - ▶ ~~“How do common owners influence firm strategy?”~~

Common Owners Influence Strategy (Shekita, 2022)

Interventions by Common Owners

[Get access >](#)

Nathan Shekita 

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<https://doi.org/10.1093/joclec/nhab006>

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Abstract

Common ownership exists when investors concurrently hold partial and significant shares in related firms. In this paper, I compile, document, and taxonomize 30 separate cases of intervention to demonstrate how common owners influence firm behavior. Although previous literature has identified a

A portfolio manager at Hodges Capital Management noted he would "like to see [Southwest Airlines] boost their fares but also cut capacity. That's what the market wants. That's what the market is telling everyone." Hodges owned shares in rival airlines including United, Continental, Delta, American, and Southwest. Other investors had also called for airlines to rein in capacity growth. Evidence from earning calls also showed CEOs reiterating the message of capacity reduction.

Some people thought about this problem 30 years ago



**Large Shareholder Activism, Risk Sharing,
and Financial Market Equilibrium**

Anat R. Admati and Paul Pfleiderer

Stanford University

Josef Zechner

University of Vienna

One fundamental issue concerns what is or should be the objective function of the firm in an economy in which investors hold diversified portfolios and in which some investors might be able to affect managerial decisions in several firms. Suppose, for example, that all investors hold the market portfolio. Then firms that act in the interests of shareholders might well refrain from competing against each other in the product market. Note, however, that the shareholders are also consumers and might therefore be hurt by such behavior. Moreover, stakeholders in the firm include its employees, suppliers, and so forth.

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.¹ Recent empirical evidence, finding that CCOs are associated with higher prices and lower output, seems to support this theory.²

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.³ In 2018, the Federal Trade Commission took these concerns a step further, conducting an all-day hearing on the subject.⁴ In Europe, antitrust enforcers have taken a more aggressive approach: in addi-

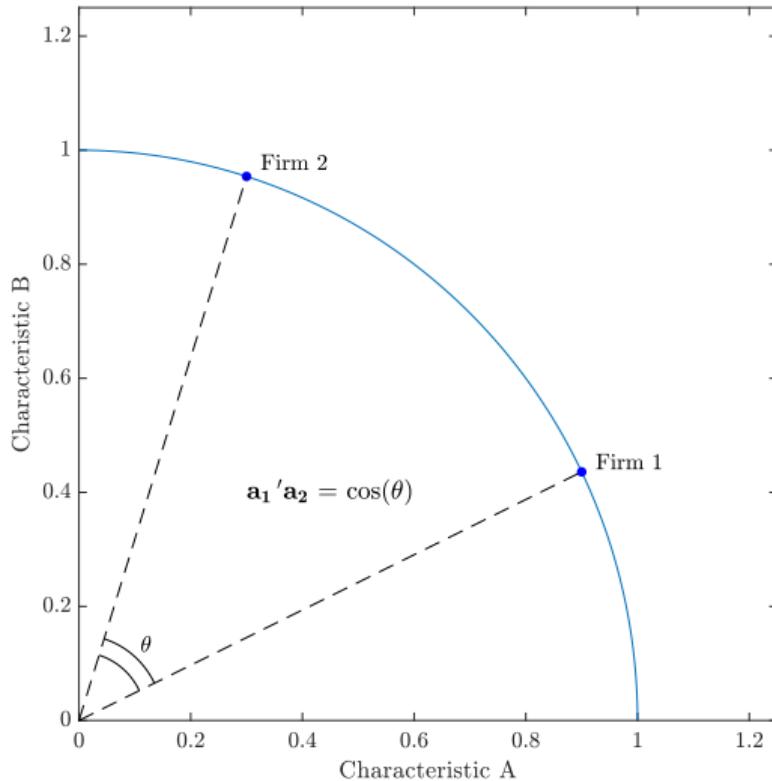
This Paper

- 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 firm objective functions based on ownership and corporate governance arrangements
- Empirical Results
 - ▶ Deadweight loss of common ownership increased from 1.4% in 1995 to 12.4% in 2021
 - ★ Alternative governance assumptions: deadweight loss ranges between 3.5% and 13.2% in 2021
 - ★ Results hold for private and foreign firms, multi-product firms, physical complements, overlap in consumption baskets, decreasing returns to scale, non-tradables ...
 - ▶ Rise of common ownership resulted in a significant reallocation of
 - ★ profits across firms
 - ★ surplus from consumers to producers

Generalized Hedonic Linear (GHL) Demand (Pellegrino, 2019)

- $i = 1, 2, \dots, n$ 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



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 $\kappa_{ij} = \frac{\mathbf{s}_i' \mathbf{s}_j}{\mathbf{s}_i' \mathbf{s}_i}$

- ▶ Firms ignore consumption effect of their production decisions

Cournot Common Ownership

The *Cournot Common Ownership* allocation \mathbf{q}^Φ 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.

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**

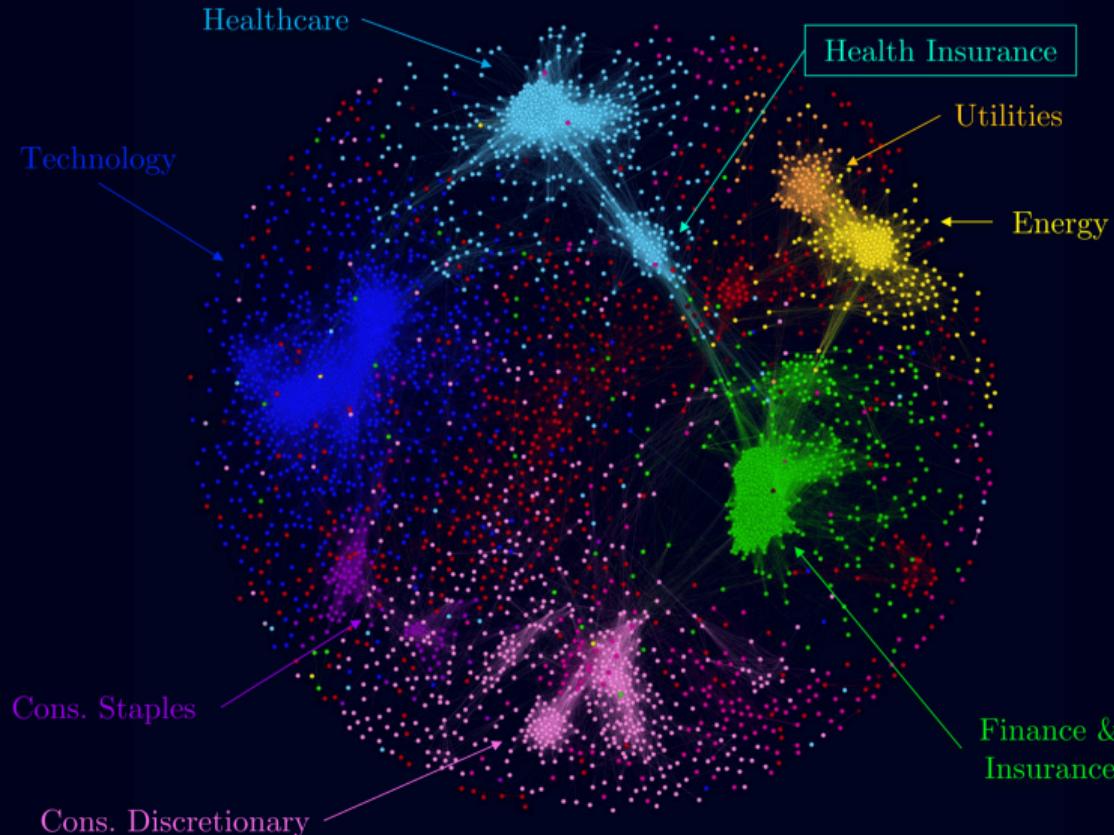
Product Similarity Data

- 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
- Construction and normalization to obtain empirical counterpart of \mathbf{a}_i :

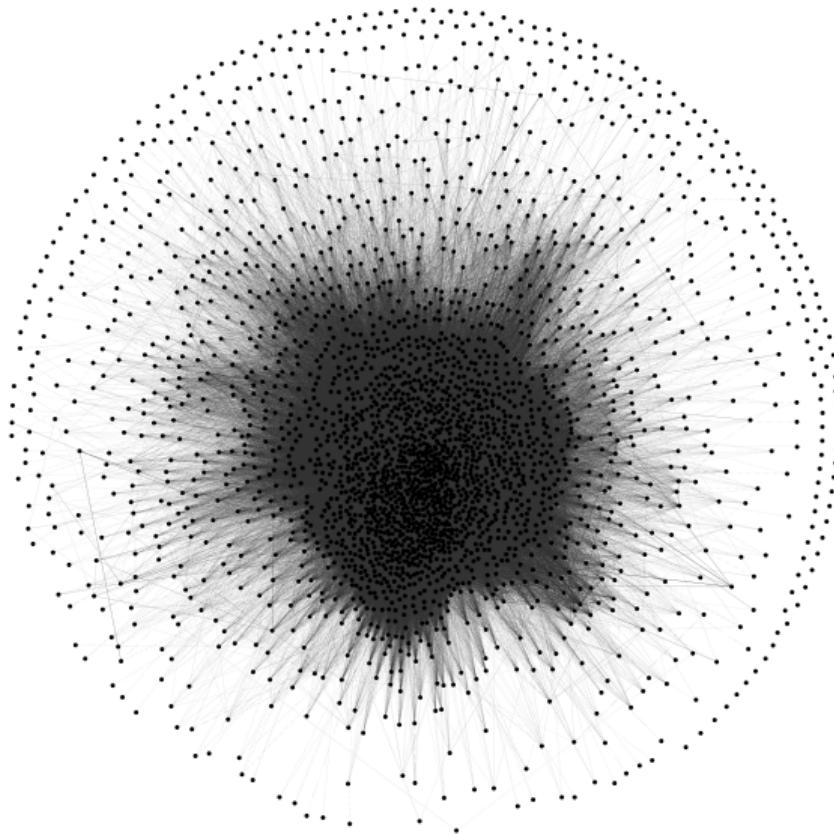
$$\mathbf{v}_i = \begin{bmatrix} v_{i,1} \\ v_{i,2} \\ \vdots \\ v_{i,61146} \end{bmatrix}, \quad \mathbf{a}_i = \frac{\mathbf{v}_i}{\|\mathbf{v}_i\|}.$$

- Validation in Hoberg and Phillips (2016) that this predicts competitive interactions

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



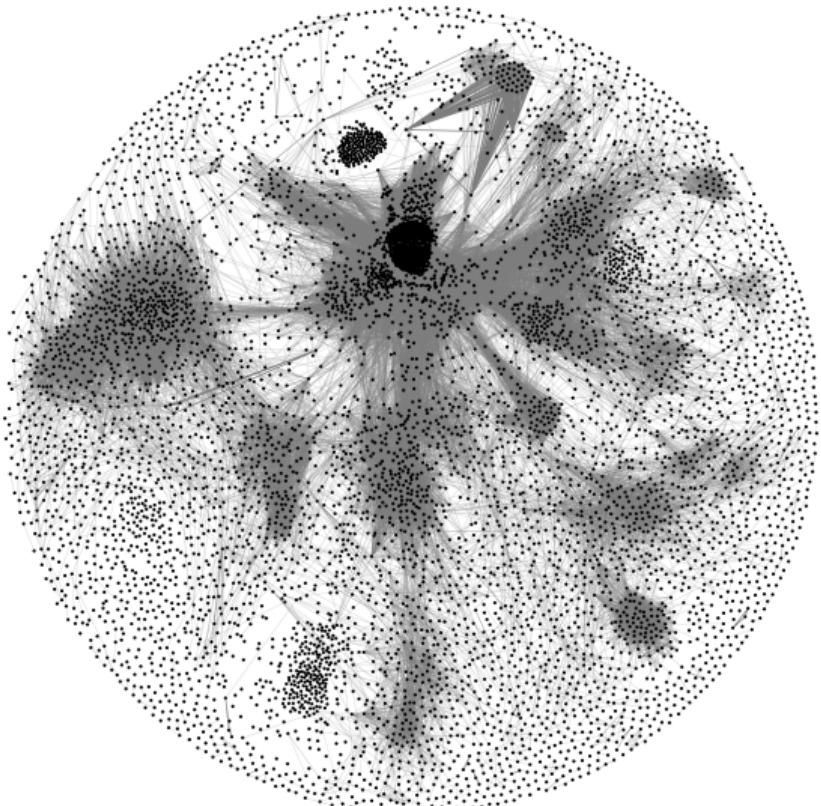
Network Visualization of the Ownership Matrix: \mathbf{K} ($5,000 \times 5,000$)



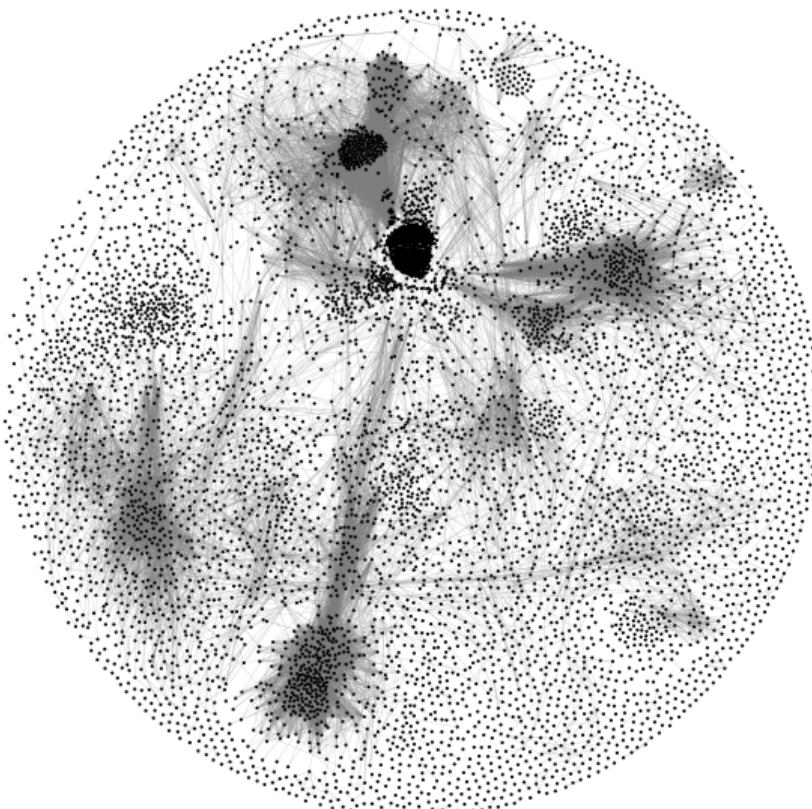
IO vs GHL Elasticities

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

Network Evolution - Product Similarity

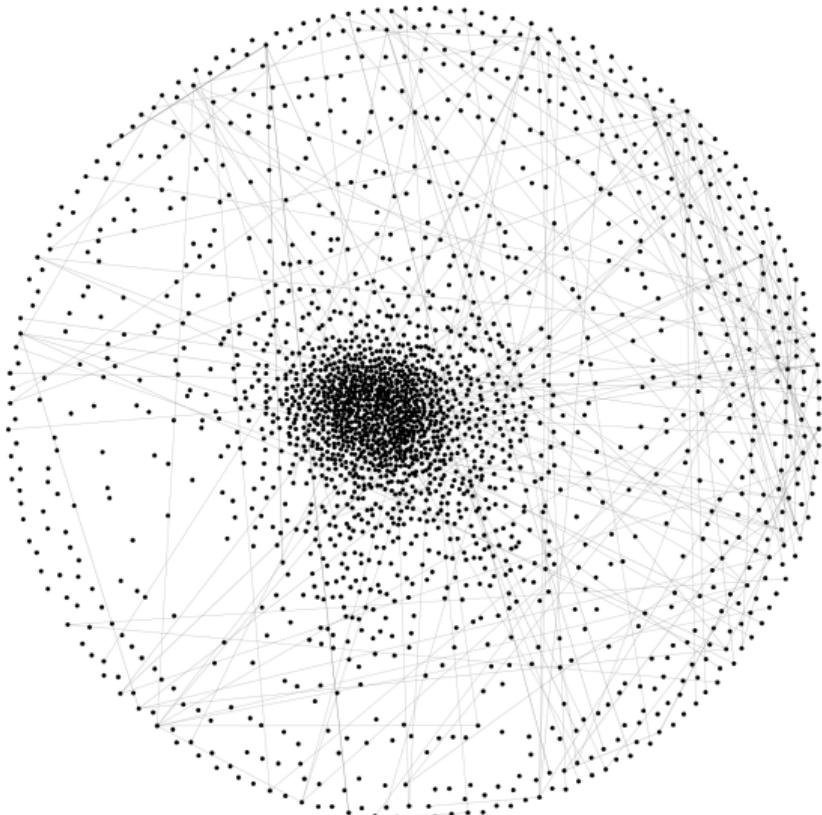


1995

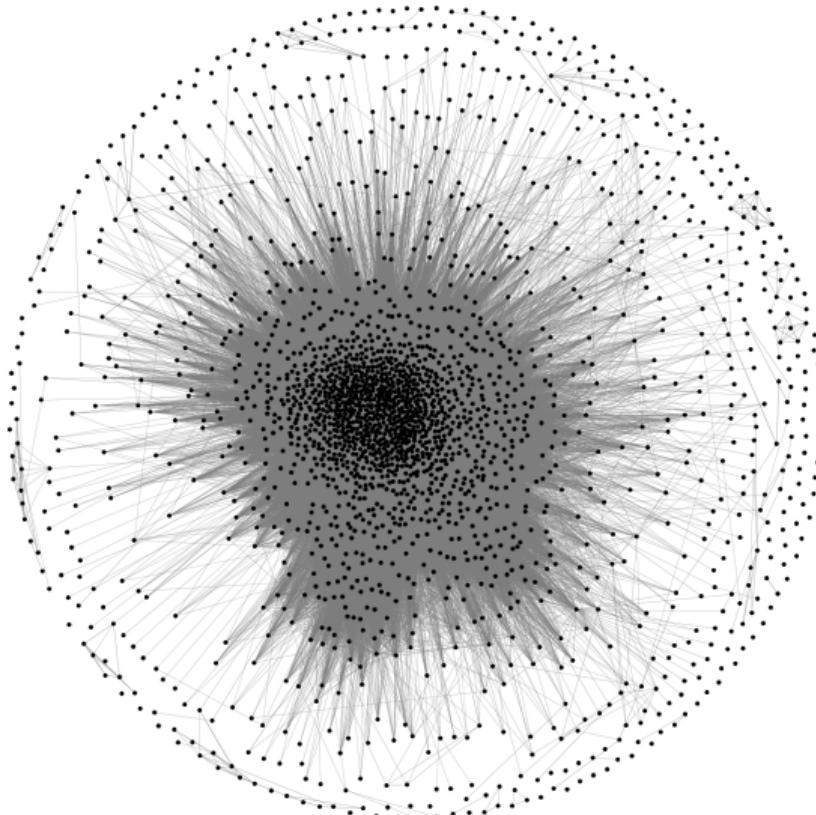


2021

Network Evolution - Ownership

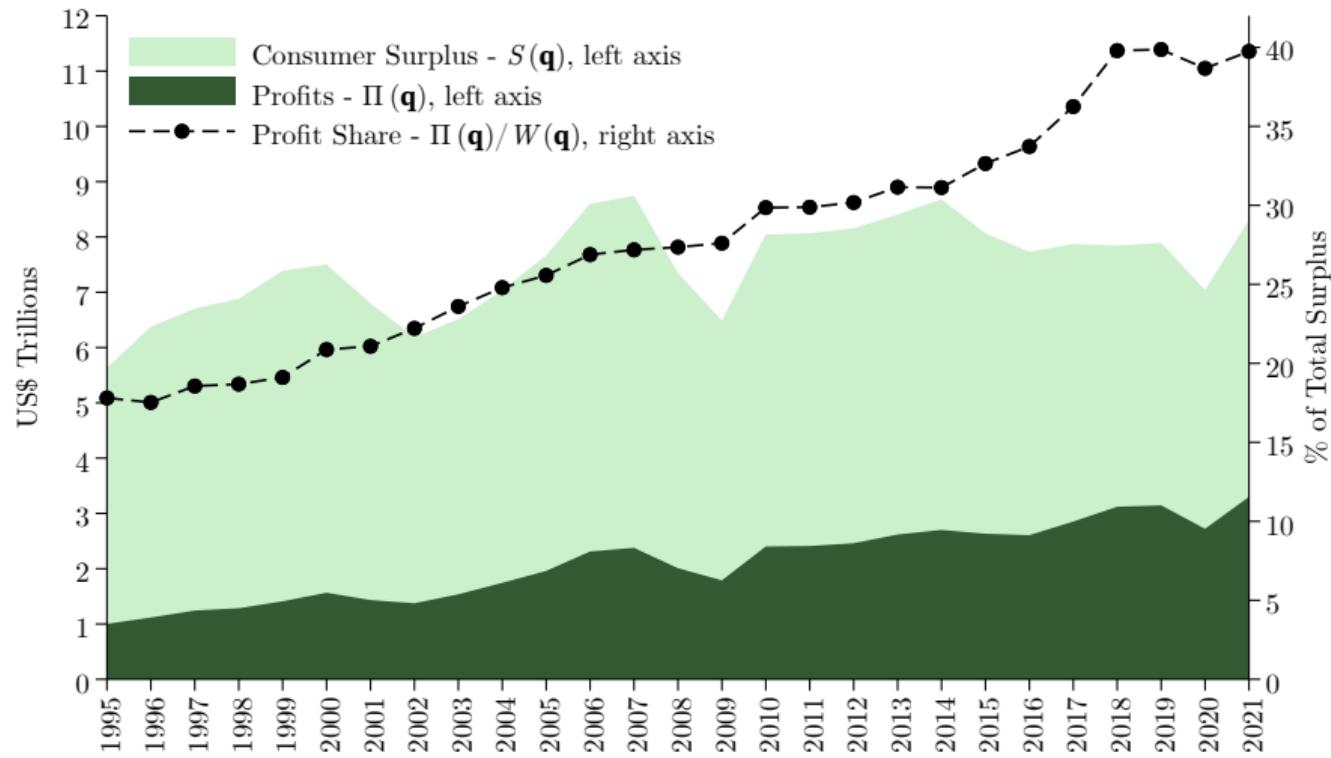


1995



2021

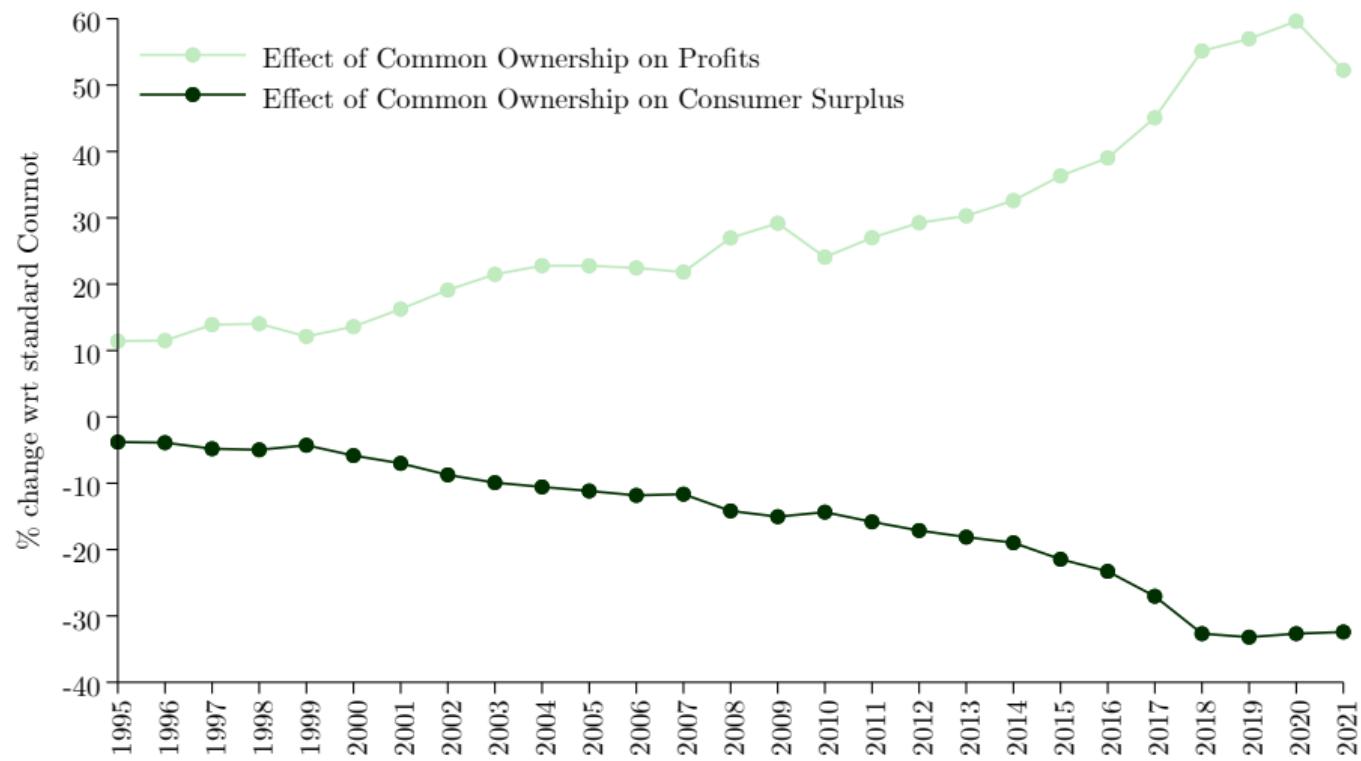
Profits and Consumer Surplus over Time



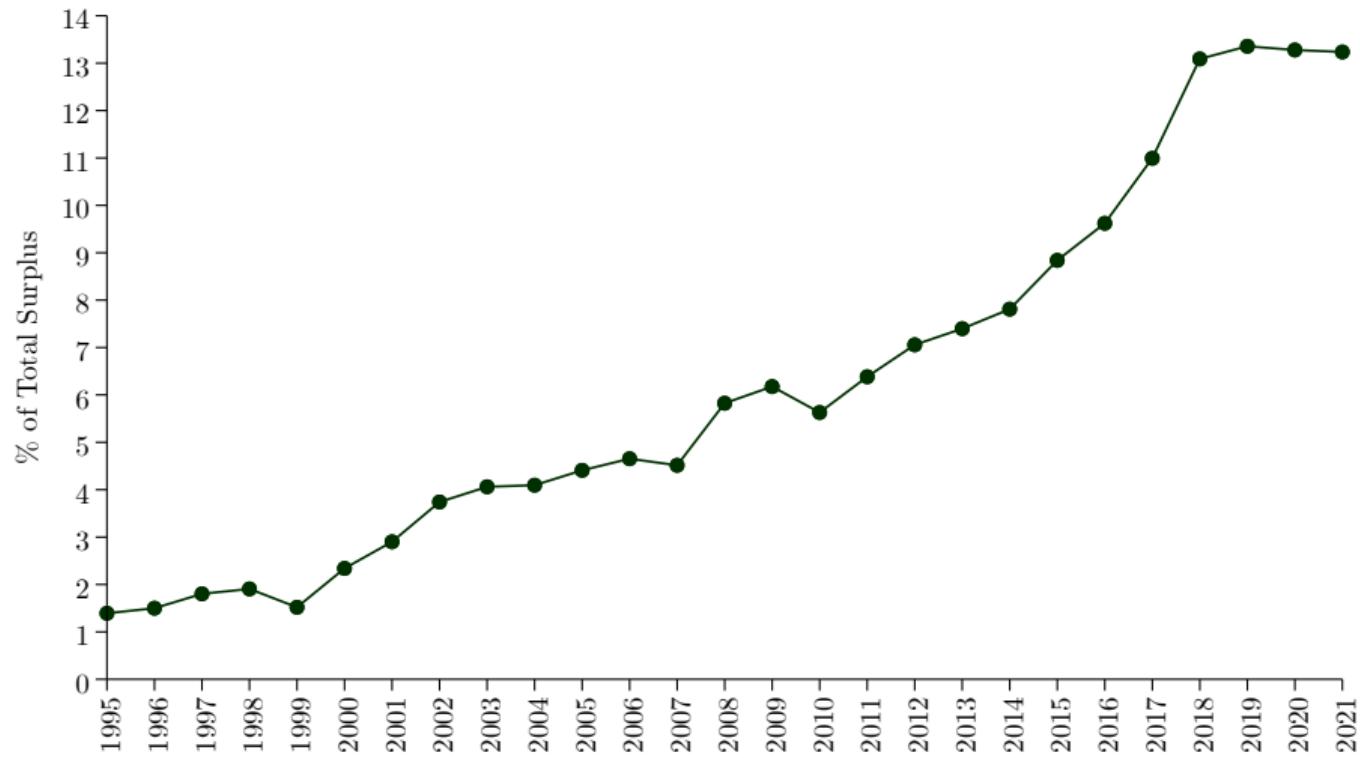
Common ownership differentially affects corporate profits

- Common ownership raises aggregate profits by \$1.133 trillion from \$2.167 trillion to \$3.300 trillion.
- Aggregate increase obscures that common ownership differentially affects corporate profits
 - ▶ Vast majority of companies has higher profits
 - ▶ Small minority (around 1%) 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

Distributional Effects of Common Ownership



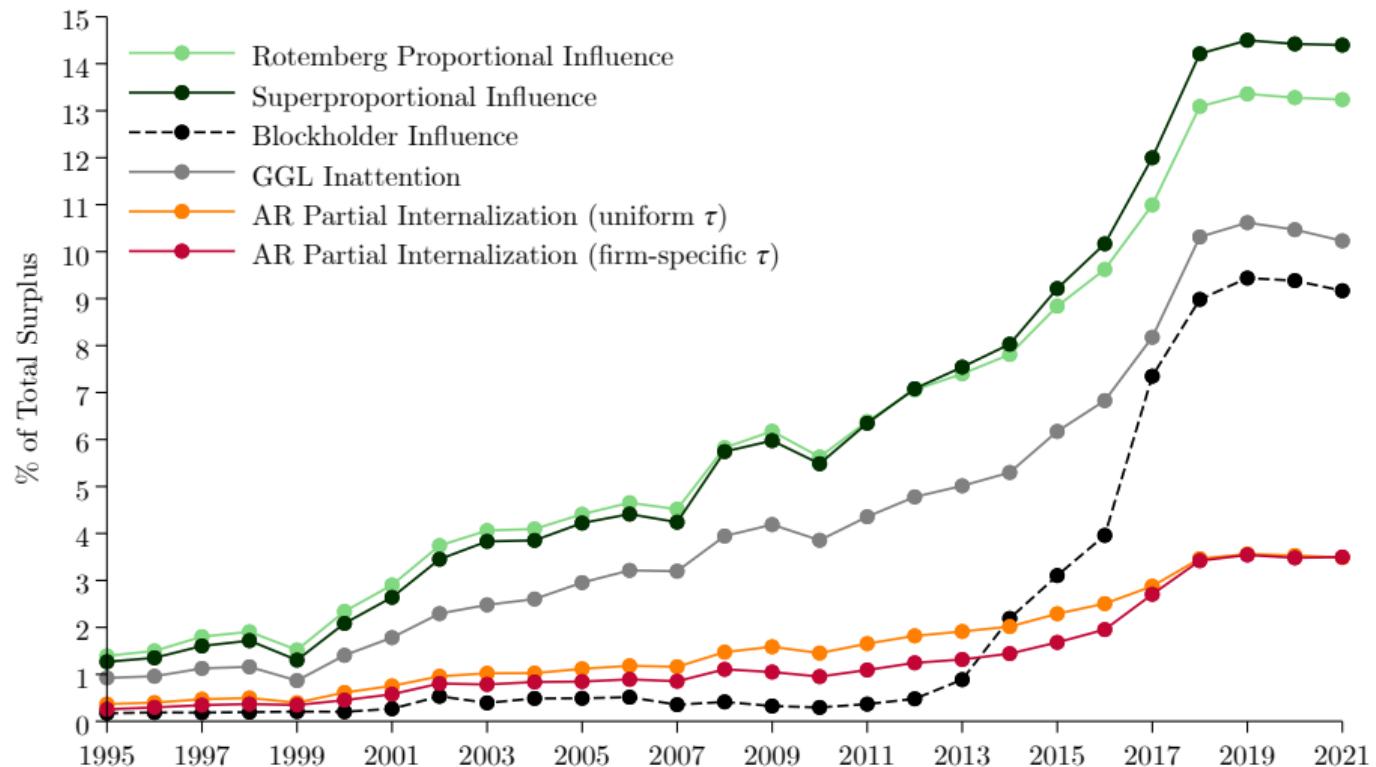
Deadweight Loss of Common Ownership



Alternative Corporate Governance Assumptions

- Baseline model assumes that each firm i fully internalizes the **proportional** profit weights κ_{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 alternative versions of the model with different objective functions.
 - ▶ Super-proportional weights
 - ▶ Blockholder weights ([Edmans and Holderness, 2017](#))
 - ▶ Investor inattention ([Gilje et al., 2020](#))
 - ▶ Firm-specific mitigation parameter due to managerial entrenchment ([Azar and Ribeiro, 2022](#))

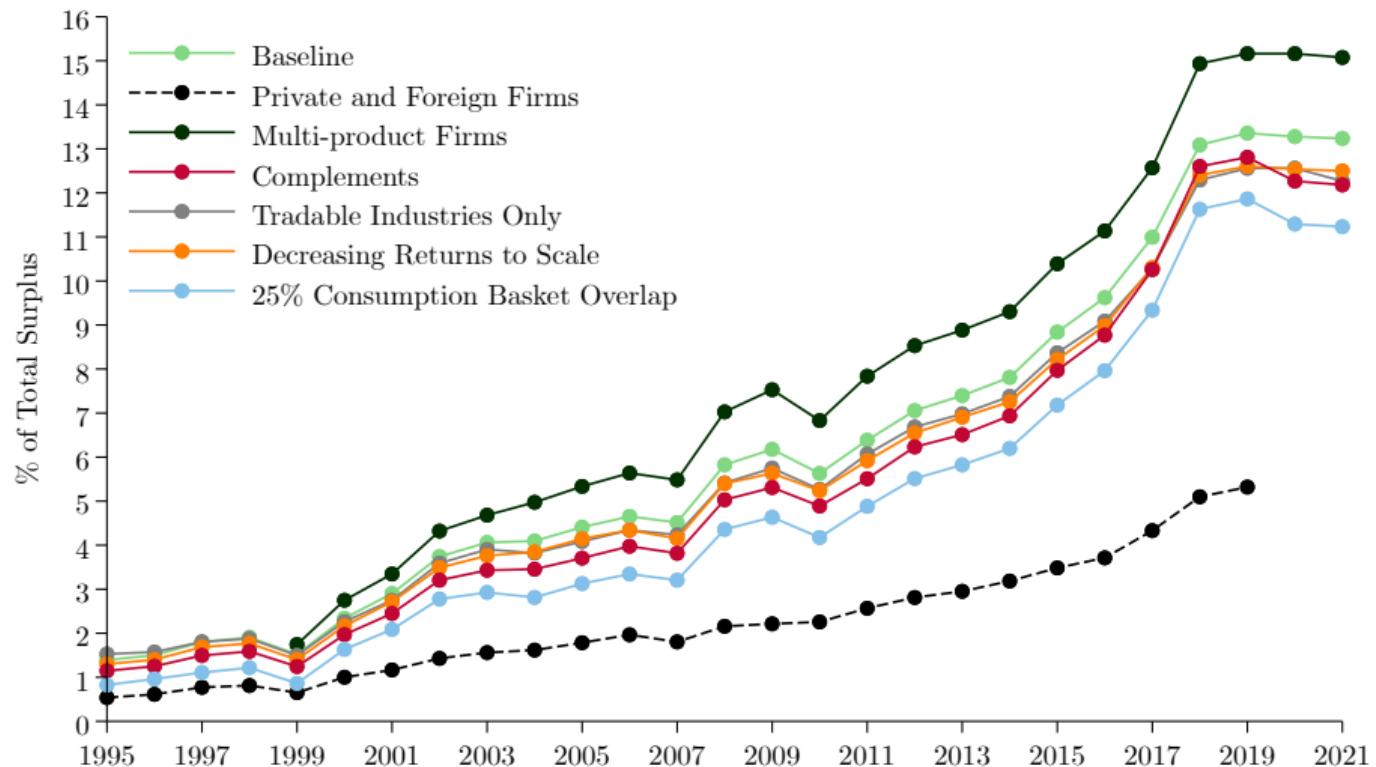
Common Ownership DWL: Alternative Governance



Extensions

- Private and foreign firms ✓
- Multi-product firms ✓
- Physical complements ✓
- Overlap in consumption baskets of corporate managers and worker-consumers ✓
- Decreasing returns to scale ✓
- Excluding non-tradable industries ✓

Common Ownership DWL: Extensions



Conclusion

- Theory
 - ▶ General equilibrium model of oligopoly with common ownership
 - ▶ Tractable framework makes welfare measurements and counterfactuals possible
- Results
 - ▶ Common ownership leads to **substantial deadweight loss**
 - ▶ **Significant reallocation of surplus** from consumers to firms
 - ▶ Sizeable effects even under **conservative assumptions about corporate governance**
- Caveats
 - ▶ Analysis does **not** consider common ownership effects on endogenous 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 finance and industrial organization
 - ▶ Antitrust policy and financial regulation

Thank You!



Paper available at https://florianederer.github.io/co_welfare.pdf

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