Do Board Connections Between Product Market Peers Impede Competition?

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Motivation

- Board connections between product market peers have the potential to impede competition and hurt consumer welfare
- In the US, the Clayton Antitrust Act of 1914 prohibits a person's presence on the boards of two rival companies
- Historically, the enforcement of the ban has been limited to the context of merger reviews
- Before the current administration, regulators seldomly proactively searched for potential Section 8 violations in the broader economy

Background

US regulators raise pressure on board members at competing companies

Federal Trade Commission joins Department of Justice antitrust division in scrutiny of 'interlocking directorates'

Lina Khan, chair of the Federal Trade Commission, left, and Jonathan Kanter, head of the Department of Justice antitrust division © FT montage/Graeme Sloan/Sipa USA/Reuters/Win McNamee/Getty Images

Motivation

"We are ramping up efforts to identify violations across the broader economy, and we will not hesitate to bring Section 8 cases to break up interlocking directorates."

(The DOJ's recent crackdown on interlocking boards) "in many aspects it's probably the most effective way of deconcentrating the United States economy today."

- Jonathan Kanter

Role of Board Connections in Tacit Coordination

- Tacit coordination equilibrium is difficult to sustain especially when the communication channels are imperfect
  - Public signals might be misinterpreted
  - Difficulties in understanding rivals' decision-making process and the constraints they face
- How can board connections stabilize tacit coordination arrangements between firms?
  - Potential for direct communication between competing firms
  - More trust and less likely deviation from coordination
  - Indirect information about each others' Cournot reaction functions when directors observe how other directors vote/behave in the third-firm boardrooms

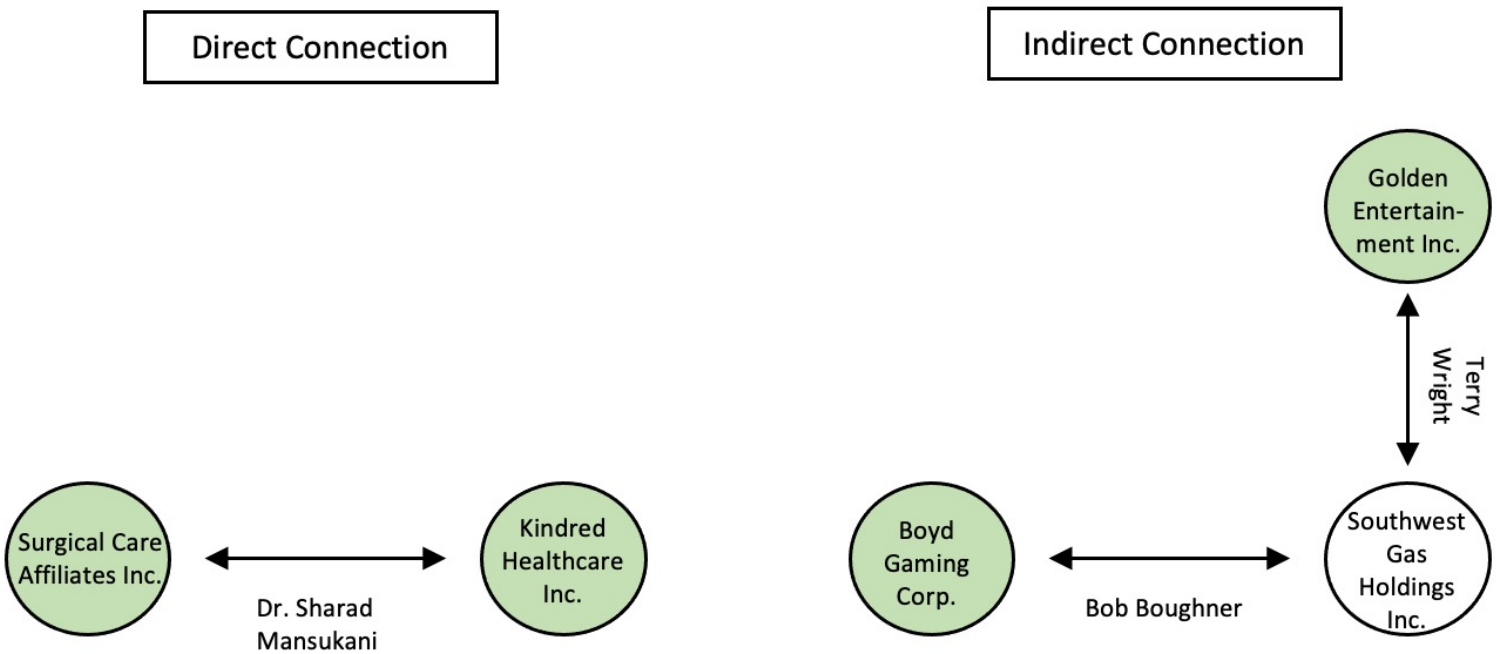
Research Questions

Academic evidence on anti-competitive effects of board connections is rare

- **How prevalent are board connections between competing firms?**
- **Do board connections between competing firms impede competition?**

Sample Construction

- We use firms in the intersection of Compustat and BoardEx and the Hoberg-Phillips Industry Classification
- We study events of new (incremental) board connections



Sample Description

- In our sample:
  - 1,493 events of new direct connections to product market peers
  - 4,085 events of new indirect connections to product market peers via an intermediate firm
- Controls:
  - In the same FF-17 industry as the treated firm, the non-treated firm that is closest in terms of size, gross margin, and Tobin's Q
  - In the year prior to the event, treated and control firms are balanced in terms of matching co-variates
- Diff-in-diff:
  - Treated and control cohort stacks with 7-year window

Main Specification

$$
\begin{aligned}
Y_{i,j,c,t} = {} & \alpha_1 \times Post_{c,t} + \alpha_2 \times DirectTreated_{i,c} + \alpha_3 \times IndirectTreated_{i,c} \\
& + \beta_1 \times DirectTreated_{i,c} \times Post_{c,t} + \beta_2 \times IndirectTreated_{i,c} \times Post_{c,t} \\
& + \theta_i + \theta_{j,t} + e_{i,j,c,t}
\end{aligned}
$$

- i: firm; j: industry; c: cohort; t: calendar year
- $Post_{c,t}$: 0 for prior the treatment and 1 for post
- $DirectTreated_{i,c}$: 1 for treated firms that form a direct board connection to a product market peer
- $IndirectTreated_{i,c}$: 1 for treated firms that form an indirect board connection to a product market peer
- θ_i: firm fixed effects; $\theta_{j,t}$: industry $\times$ year fixed effects
- β_1, β_2: average treatment effects

Main Results

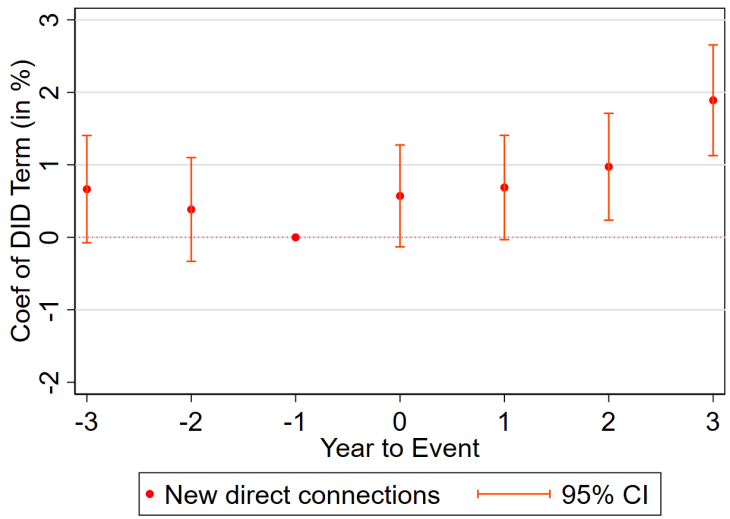
- Relative to matched controls, a firm's gross margin rises
  - by 0.8 p.p. after forming a new direct connection to a peer
  - by 0.4 p.p. after forming a new indirect connection

	(1) Gross Margin	(2) Operating Margin	(3) ROA	(4) Sales Growth
Post	-0.007***	-0.008***	-0.007***	-0.020***
	(-4.27)	(-4.77)	(-6.12)	(-5.23)
DirectTreated X Post	0.008**	0.014***	0.009***	-0.023***
	(2.45)	(3.86)	(3.52)	(-2.60)
IndirectTreated X Post	0.004*	0.008***	0.007***	-0.004
	(1.88)	(3.59)	(4.01)	(-0.75)
Observations	68,690	68,534	68,602	67,033
Firm FE	Yes	Yes	Yes	Yes
FF48 X Year FE	Yes	Yes	Yes	Yes
Clustering	Firm	Firm	Firm	Firm
# of Matched Controls	1	1	1	1

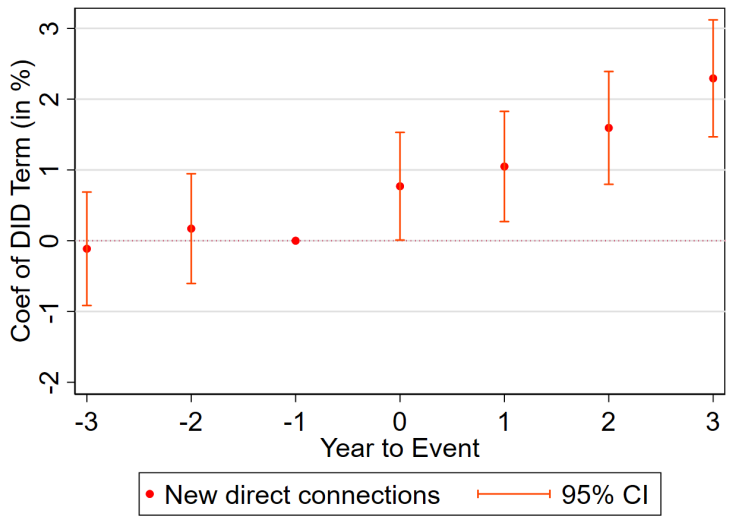
Dynamics: Direct Connections

- It takes a few years for the effect to pick up:

Gross margin, direct

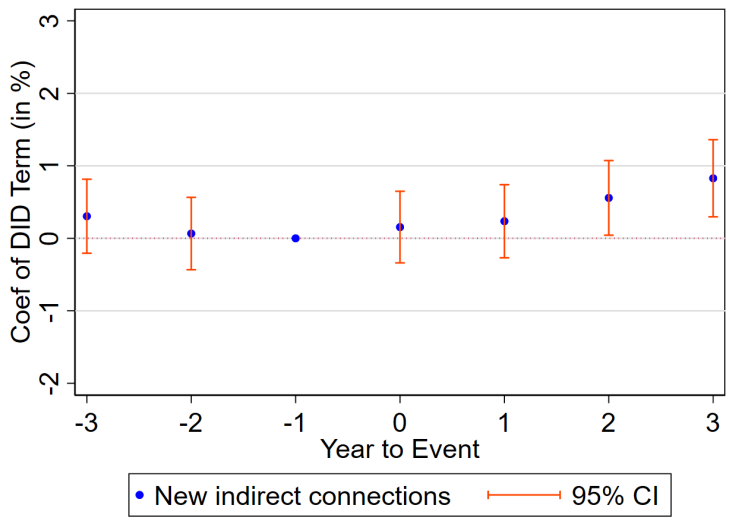


Operating margin, direct

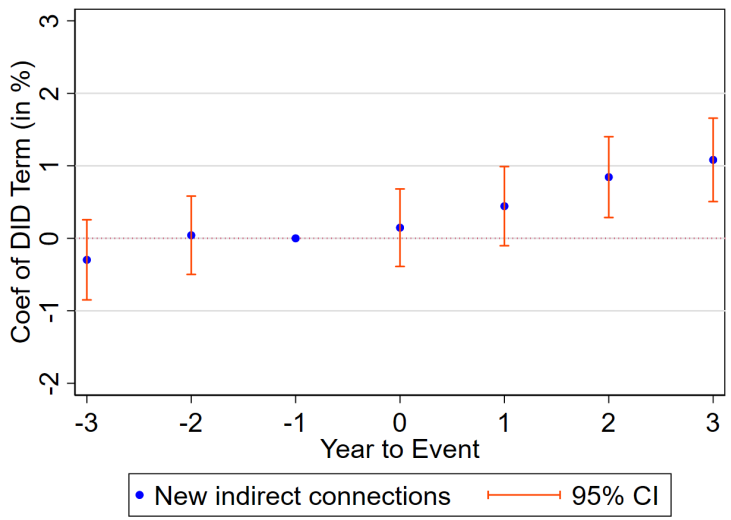


Dynamics: Indirect Connections

Gross margin, indirect



Operating margin, indirect



Challenge to Causality

- Identifying assumption for a causal interpretation of prior results:

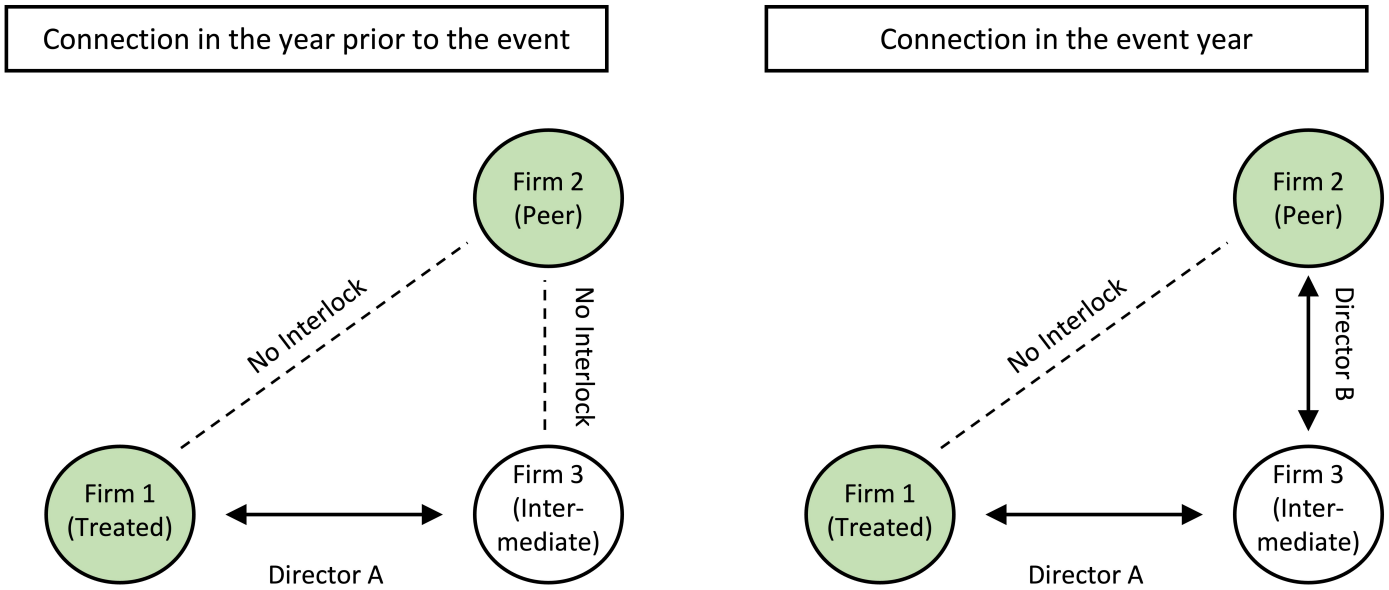
  "New board connections are unrelated to future prospects of the treated firm"

- Can this hold?

Challenge to Causality

- Board connections are endogenous
  - A firm appoints a director who cross-sits on the board of a competitor when anticipating an expansion of its business opportunities
  - Directors of a firm with improving potential are more valued in the labor market and more likely to be appointed to the board of an industry peer
  - In these scenarios, new board connections to product market peers correlate with unobservable future firm prospects
- We look at non-focal-firm initiated changes that are less likely to be correlated with the focal firm's future prospects

Non-Focal-Firm Initiated Appointments



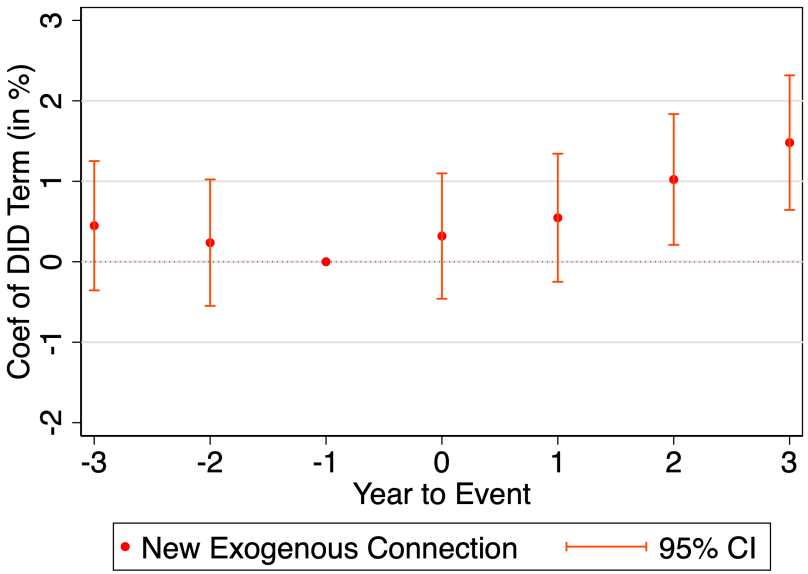
Non-Focal-Firm Initiated Appointments

- We identify a subset of 2,114 events of this kind
- In this case, the identifying assumption is:

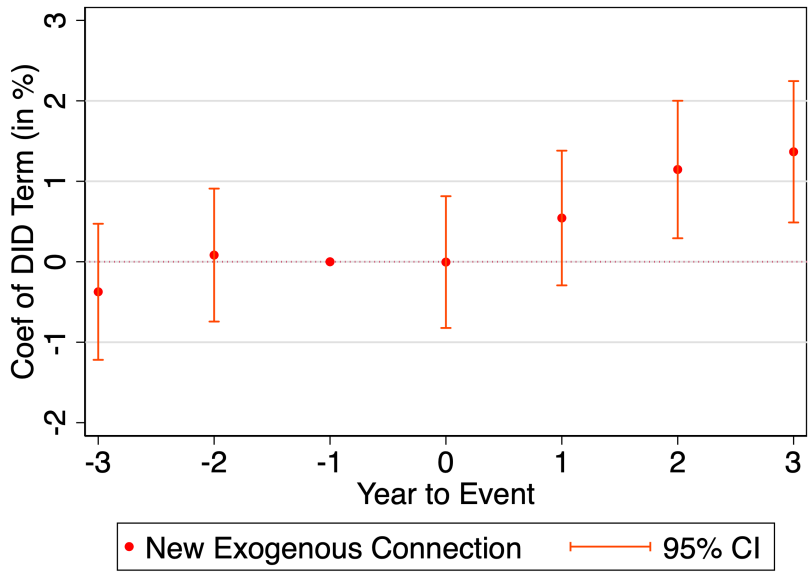
  "New board connections which arise for reasons outside of any changes on the board of the treated firm are unrelated to future prospects of the treated firm"

Non-Focal-Firm Initiated Appointments: Dynamics

Gross margin



Operating margin



Channels: Coordination vs Experience?

- Board connections can enable anti-competitive practices in a wide variety of forms, strategies, and markets
  - Market segmentation vs price fixing
  - Pure information exchange vs building trust
  - Also, raw materials and labor markets
- But: prior research suggests board connections can also enhance firm's internal efficiency
  - E.g., Bouwman (2011): good corporate governance practices can propagate across firms via the network of directors
  - Board connections can also enable technology spillovers and adoption of common standards
- Four tests: (1) Evidence from the consumer goods sector (2) Dectected cases (3) Heterogeneities (4) Spillover effects on rivals

Evidence from Consumer Goods Sector

- We use Nielsen Retail Scanner Dataset
  - Product prices of consumer goods at the week $\times$ store $\times$ UPC level

A bar-code scanner

UPC "021000055357"

Evidence from Consumer Goods Sector

- We construct events of board connections among firms in the same product category
  - Using "product module", we find 52 pairs of peers that form direct connections and 735 that form indirect ones

- We zoom into each zip-3 area and put a threshold on the market share of connected firms
  - We say the sales of connected firms in an area are treated if their joint market share in this area exceeds a threshold

Effects on Product Market Prices

- We construct price index p_{ijzt} by collapsing data to firm $\times$ product category $\times$ zip-3 area $\times$ quarter level (Aslan, 2023)
- We observe p_{ijzt} of treated firms in a [-6,+8] quarters window around the treatment and use all untreated firms as control
- We estimate the following regression

$$\begin{aligned} Y_{i,c,z,t} = \alpha_1 \times DirectTreated_{i,c,z} \times Post_{i,c,z,t} \\ + \alpha_2 \times IndirectTreated_{i,c,z} \times Post_{i,c,z,t} \\ + \theta_{i,c,z} + \theta_{c,t} + \theta_{i,t} + \theta_{z,t} + e_{i,c,z,t} \end{aligned}$$

  - $\theta_{i,c,z}$: firm $\times$ product category $\times$ zip-3 area fixed effects
  - $\theta_{c,t}$: product category $\times$ quarter fixed effects
  - $\theta_{z,t}$: zip-3 area $\times$ quarter fixed effects
  - $\theta_{i,t}$: firm $\times$ quarter fixed effects

Effects on Product Market Prices

- Post direct board connections, the per-quarter increase in product price is 0.22 p.p. faster for treated relative to untreated
  - This corresponds to a 0.88 p.p. annualized difference

	(1) Price Index	(2) Price Index	(3) Price Index
DirectTreated × Post	0.00220***	0.00174*	0.00166*
	(2.73)	(1.89)	(1.80)
IndirectTreated × Post	0.00066***	0.00059***	0.00058***
	(2.61)	(2.58)	(2.54)
Observations	42,737,380	42,714,241	42,650,014
Firm X Product Module X Zip3 FE	Yes	Yes	Yes
Product Module X Quarter FE	Yes	Yes	Yes
Firm X Quarter FE	Yes	Yes	Yes
Zip3 X Quarter FE	Yes	Yes	Yes
Clustering	Firm	Firm	Firm
Threshold on Market Share	10%	5%	3%

Effects on Market Division

- Besides price and quantity, we also examine market division, i.e., firms adjusting their product offerings to avoid direct competition (Belleflamme and Bloch, 2004; Sullivan, 2020; De Leverano, 2023)
- We construct firm-pair similarity in the geographic distribution of sales

$$s_{i,j,t} = \frac{v_{i,t} \cdot v_{j,t}}{\|v_{i,t}\| \|v_{j,t}\|}$$

- We estimate the following regression

$$\begin{aligned} s_{i,j,t} = {} & \alpha_1 \times DirectTreated_{i,j} \times Post_{i,j,t} \\ & + \alpha_2 \times IndirectTreated_{i,j} \times Post_{i,j,t} \\ & + \theta_t + \theta_{i,j} + e_{i,j,t} \end{aligned}$$

Effects on Market Division

Cosine similarity score falls by 0.0037 after firm-pairs form indirect board connections

- 3.69% of the within-firm-pair standard deviation (0.1004)

	(1) Similarity by Zip-3	(2) Similarity by County
DirectTreated × Post	0.0048	0.0033
	(0.87)	(0.64)
IndirectTreated × Post	-0.0037**	-0.0051***
	(-2.35)	(-3.91)
Observations	23,051,386	23,051,386
Firm-Pair FE	Yes	Yes
Quarter FE	Yes	Yes
Clustering	Firm-Pair	Firm-Pair
Within R-squared	0.000	0.000

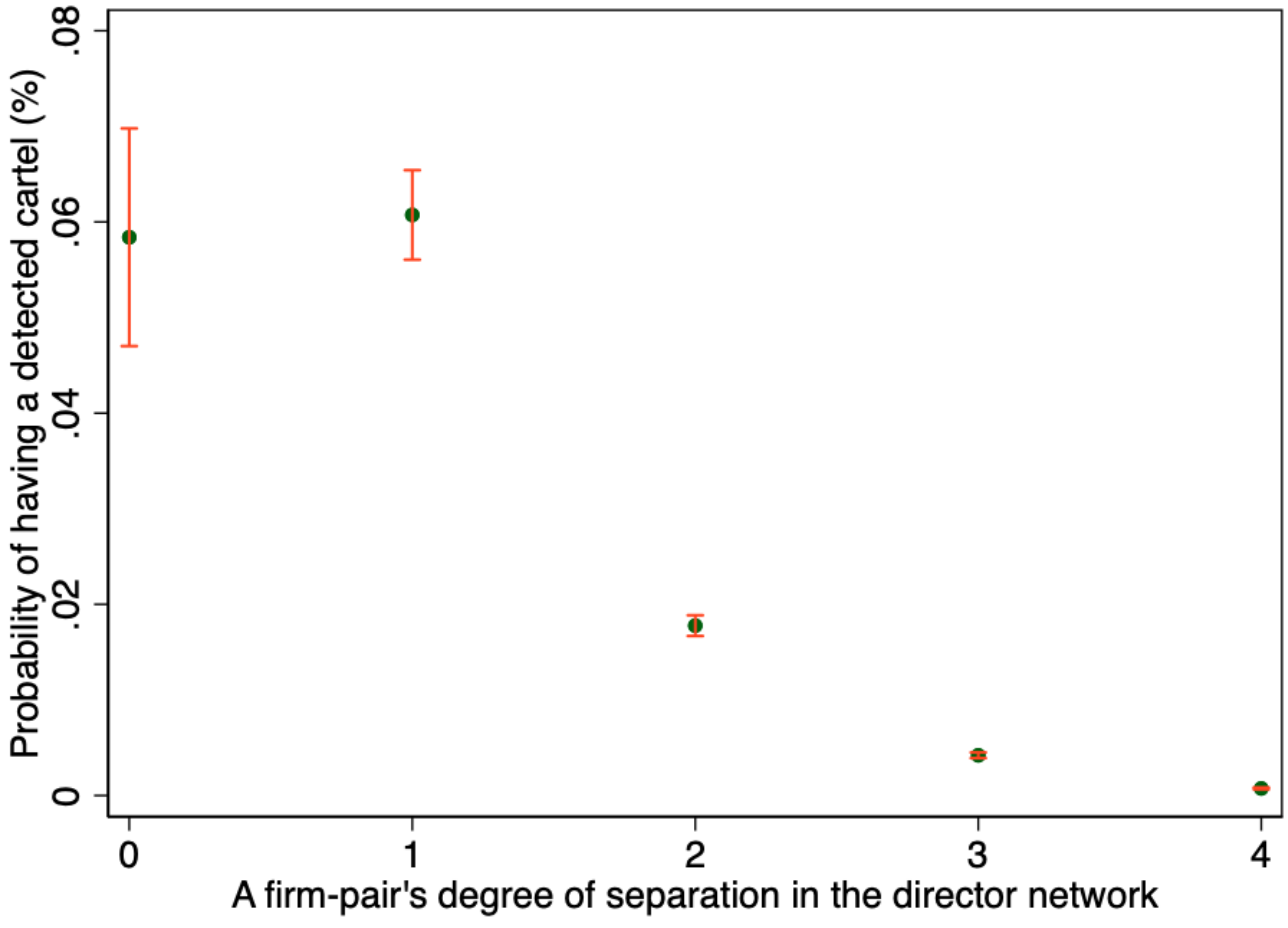
Evidence from Consumer Goods Sector

Differential mechanisms of direct and indirect board connections

- Direct connections have much stronger effects on product market prices
- Indirect connections are related to the tendency to avoid direct competition, which is a relatively more indirect anti-competitive practice

Detected Cases

- Distance in the director network and detected cases of cartel



Heterogeneities

- Triple-difference regressions based on:
  - Whether connected firms share major common customers
  - Similarity in businesses descriptions between new connections
  - Geographical distance between new connections
  - HHI of the treated firm's industry
  - Returns to scale of the treated firm's industry

Effect on Rivals

- Two mechanisms generate distinct predictions over effects on rival firms not involved in the newly-formed director network
  - Anti-competitive mechanism: rival firms could also benefit ✓
  - Internal efficiency mechanism: rival firms might suffer because they are at a relative disadvantage compared to the newly connected firms

Robustness

- A placebo test using "pseudo industry classification"
- Main results are robust to alternative matching schemes
  - Two or three controls for each treated firm
  - Match additionally on # of new board appointments
  - Match on other covariates
  - Require control firms not to be treated over [-3,3]
  - Require control firms to be never treated before (Baker et al., 2022)
- And to alternative specifications
  - Firm-cohort fixed effects
  - Alternative industry $\times$ year fixed effects
- Control for common ownership
- Control for customer-supplier relationships

Board Connections And/Or Common Ownership?

- Active discussion on the potential anti-competitive role of common ownership
- Could it be that we are capturing the potential anti-competitive effects of common ownership here?
  - Indeed, an associative relationship between new board connections and an increase in within-industry common ownership
  - Our treated firms experience a larger increase in common ownership with its product market peers than control firms around the treatment year (with a two-sample t-test of 2.20)

Board Connections And/Or Common Ownership

- Let's run a horse race of concurrent changes in board interlocks and common ownership
  - Based on Gilje, Gormley, and Levit (2020) measures
- Profitability effects can be seen for both effects, suggesting some independence:

	(1) Gross Margin	(2) Operating Margin	(3) ROA
Treated X Post	0.004	0.009***	0.008***
	(1.39)	(3.22)	(3.57)
Δ(Common Ownership) X Post	0.003**	0.005***	0.004***
	(2.49)	(3.93)	(3.71)
Observations	40,408	40,302	40,343
Firm FE	Yes	Yes	Yes
FF48 X Year FE	Yes	Yes	Yes

Conclusion

- Board connections between product market peers, including indirect connections, increase profits
- Evidence from product market data support the anti-competitive interpretation
- The full extent of the role of boards in anti-competitive practices might be much greater $\rightarrow$ we focus on incremental vs the stock of connections

References

Aslan, H. (2023): "Common Ownership and Creative Destruction: Evidence from US Consumers," *Review of Finance*, Forthcoming.

Baker, A. C., D. F. Larcker, and C. C. Wang (2022): "How Much Should We Trust Staggered Difference-in-Differences Estimates?" *Journal of Financial Economics*, 144, 370–395.

Belleflamme, P. and F. Bloch (2004): "Market Sharing Agreements and Collusive Networks," *International Economic Review*, 45, 387–411.

De Leverano, A. (2023): "Collusion Through Market Sharing Agreements: Evidence from Québec's Road Paving Market," Working paper.

Gilje, E. P., T. A. Gormley, and D. Levit (2020): "Who's Paying Attention? Measuring Common Ownership and its Impact on Managerial Incentives," *Journal of Financial Economics*, 137, 152–178.

Sullivan, C. (2020): "The Ice Cream Split: Empirically Distinguishing Price and Product Space Collusion," Working paper.