

# Product Market Competition in a World of Cross-Ownership

## Evidence from Institutional Blockholdings

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April 11, 2024

# Motivation

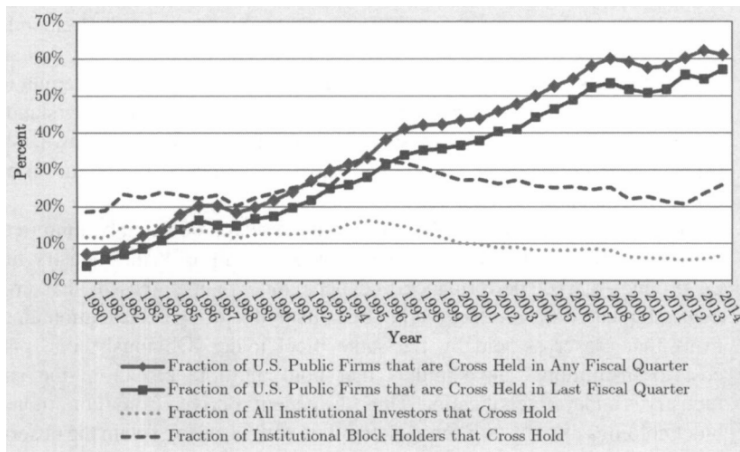


Figure: Patterns of institutional cross-ownership over time

# Research Questions

- ▶ What are the economic consequences of same-industry institutional cross-ownership?
  - ▶ Cost of under-diversification vs. Benefit of information production and the impact on the product market strategies.
  - ▶ Cost > Benefit: Limited incentives and ability to push for changes in firms' product market strategies; Too busy to focus on each portfolio company.
  - ▶ Benefit > Cost: Facilitates product market coordination and improves the firms' product market performance.

# Cross-Ownership Measurement

Ownership: Define a holding as a block if it exceeds 5% of the outstanding shares. To gauge a firm's ownership status:

- ▶ *CrossDummy*: equals 1 if the firm is cross-held in any of the four quarters in a fiscal year.
- ▶ *NumConnected*: the number of same-industry peers that share any common institutional blockholder with the focal firm.
- ▶ *NumCross*: the number of unique institutions that cross-held the firm.
- ▶ *AvgNum*: the number of same-industry peers block-held by the average cross-holding institutions.
- ▶ *TotalCrossOwn*: the sum of all cross-holding institution's percentage holdings in the firm itself.

# Baseline Regression

$$\text{MktShareGrow}_{i,t+1} = \alpha + \beta \text{CrossMeasure}_{i,t} + \gamma Z_{i,t} + \text{Year}_t + \text{Firm}_i + \varepsilon$$

- ▶ *MktShareGrow*: the difference in market share (sales in a year divided by the same industry's total sales in that year) between the current year and the previous year.
- ▶ Controls include:
  - ▶ Firm characteristics that may affect the future market share growth (e.g., total assets, Tobin's q, etc.)
  - ▶ Related to institutional investors (e.g., avg fractional ownership by institutional blockholders.)
  - ▶ Factors to control investor activism

# Effect of Cross-Ownership: Baseline Estimation

Dep. variable	<i>MktShareGrow<sub>t+1</sub></i>			
	(1)	(2)	(3)	(4)
<i>CrossDummy</i>	0.004*** (5.641)	0.004*** (5.588)	0.005*** (5.784)	0.005*** (4.172)
<i>LnAssets</i>		-0.002*** (-3.909)	-0.001** (-2.518)	-0.002** (-2.073)
<i>Tobin q</i>		0.001*** (3.815)	0.001*** (4.002)	0.001*** (3.513)
<i>CashAssets</i>		0.002 (1.051)	0.002 (1.144)	0.002 (0.715)
<i>Leverage</i>		0.002 (1.105)	0.002 (1.024)	0.006* (1.698)
<i>ROA</i>		-0.002 (-1.095)	-0.001 (-0.924)	-0.002 (-1.179)
<i>R&amp;DCapital</i>		0.001 (0.461)	0.001 (0.461)	-0.001 (-0.359)
<i>CapexAssets</i>		-0.006 (-1.157)	-0.003 (-0.657)	-0.015** (-2.084)
<i>AcqAssets</i>		0.028*** (5.286)	0.030*** (5.589)	0.027*** (4.130)
<i>PPEGrowth</i>		0.002*** (3.678)	0.002*** (3.295)	0.002*** (2.828)
<i>BlockOwn</i>		0.001 (0.250)	0.006 (1.341)	0.005 (1.031)
<i>InstOwn</i>			-0.004 (-1.214)	-0.006 (-1.408)
<i>BlockDummy</i>			-0.002** (-2.154)	-0.002 (-1.337)
<i>LnNum13D</i>				0.003** (2.285)
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Observations	103,512	103,512	100,280	59,353
R-squared	0.099	0.100	0.100	0.119

# Endogeneity Concerns

1. **Omitted variable:** correlated with both a firm's cross-holding status and its future product market performance
  - ▶ Upward bias: e.g., unobserved firm quality (which makes the firm more likely to gain market share in the future)
  - ▶ Downward bias: e.g., conservative corporate culture. Positively related to cross-holding but negatively related to future market share growth
2. **Reverse Causality:** A firm with better prospects for future product market growth may attract more institutional cross-holders.

# DiD Specification

- ▶ Quasi-natural experiment of financial institution mergers that generates exogenous variation in a firm's cross-ownership.
  - ▶ Financial institutions merging is often a result of consolidation in the financial sector in response to deregulations.
  - ▶ Commercial banks are allowed to acquire existing investment banks (1997); Gramm-Leach-Bliley Act (1999)
- ▶ A firm is block-held by  $A$ , and one of its same-industry peers is block held by  $B$ . After the merger of  $A$  and  $B$ , both firms would be cross-held by the same (merged) institution.
- ▶ Affect a firm's subsequent product market performance only through their effect on the firm's cross-holding status.



# DiD Specification

$$\text{AvgMktShareGrow}_{i,j,t} = \alpha + \beta_1 \text{Treat} * \text{Post} + \beta_2 \text{Post} + \beta_3 \text{Treat} + \gamma' \text{Control}_{i,t-1} + \text{Fixed}_{i,j} + \varepsilon_{i,j,t},$$

- ▶ *AvgMktShareGrow*: three-year average annual market share growth for firm  $i$  either in the pre-merger or the post-merger period
- ▶ *Treat*: equals 1 for the treatment firms
  - ▶ Treatment: firms that are likely to experience an increase in the number of ownership linkages with rival firms in the same industry due to institution mergers
  - ▶ Control: same merger but different industries; same-industry peers but held by non-merging institutions.
- ▶ *Post*: equals 1 for the post-merger period

# Effect of Cross-Ownership: DiD Estimation

Dep. variable	<i>AvgMktShareGrow</i>				
	(1)	(2)	(3)	(4)	(5)
<i>Treat * Post</i>	0.008*** (3.190)	0.007** (2.409)	0.008** (2.429)	0.007** (2.046)	0.009** (2.245)
<i>Post</i>	-0.004*** (-5.477)	-0.003** (-2.301)	-0.003** (-2.414)	-0.003** (-2.439)	-0.004*** (-3.514)
<i>Treat</i>			-0.003* (-1.719)	-0.003 (-1.344)	
Firm-merger FEs	Yes	Yes	No	No	Yes
Firm FEs	No	No	Yes	Yes	No
Merger FEs	No	No	Yes	Yes	No
Industry FEs	No	No	No	Yes	No
Observations	9,230	8,326	8,326	8,326	5,125
R-squared	0.520	0.521	0.407	0.442	0.499

# Premise Verification

The premise: Institution mergers should, on average, lead to an increase in cross-ownership for the treatment group.

Dep. variable	<i>CrossDummy</i>		<i>LnNumConnected</i>	
	(1)	(2)	(3)	(4)
<i>Treat * Post</i>	0.244*** (5.825)	0.271*** (5.743)	0.258*** (4.014)	0.303*** (4.779)
<i>Post</i>	0.045 (1.101)	0.046 (1.066)	0.069 (1.276)	0.067 (1.151)
Controls	No	Yes	No	Yes
Firm-merger FEs	Yes	Yes	Yes	Yes
Firm FEs	No	No	No	No
Merger FEs	No	No	No	No
Industry FEs	No	No	No	No
Observations	9,230	8,326	9,230	8,326
R-squared	0.874	0.873	0.915	0.912

# Parallel Trend Assumption Verification

- ▶ Directly compare the trends of market share growth between treatment and control firms before the event
  - ▶ No significant difference
- ▶ Placebo test using the starting year (3 years before the merger) as the hypothetical event year.
  - ▶ The coefficient estimates before  $Treat * Post$  are insignificant.

There are no observable divergent trends in the market share growth between treatment and control firms before the exogenous shock.

# Explicit Product Market Collaborations

- ▶ Explicit collaborative activities: same-industry joint ventures, strategic alliances, and acquisitions
- ▶ Data comes from Security Data Company's (SDC) Mergers and Acquisitions database.
- ▶ *LnNumSame*: Log of one plus the total number of instances of explicit collaborations.
- ▶ All positive and significant results. Multivariate DiD estimates of **0.14** are economically sizable, given that *LnNumSame* has a mean of 0.0003 and a standard deviation of 0.048

# Innovation Productivity & Operating Profitability

## Innovation Productivity

- ▶ Innovation productivity (following Hirshleifer, Hsu, and Li 2012): # patents per dollar of its lagged R&D expenditures.
- ▶ Data comes from USPTO's granted patent database.
- ▶ All positive and significant results. Multivariate DiD estimates of **0.012** are economically nontrivial, given that innovation productivity has a standard deviation of 0.131.

## Operating Profitability

- ▶ Operating profitability: NOP, NPM, and ROA
- ▶ Coefficient estimates of  $Treat*Post$  are positive and significant in five of the six specifications. e.g., the DiD estimate for ROA is **0.8 percent**, given that ROA has a standard deviation of 7.1 percent.

# Conclusion

**Research Question:** What are the economic consequences of same-industry institutional cross-ownership?

1. Cross-held firms experience significantly higher market share growth than non-cross-held firms.
2. Several forms of product market coordination facilitated by cross-ownership
  - ▶ Explicit coordination: within industry joint venture, strategic alliances, and acquisitions
  - ▶ Implicit coordination: innovation productivity and operating profit margins.

# Discussion

## Comments

1. A plus to the existing literature
  - ▶ Existing literature focuses almost exclusively on direct cross-ownership by same-industry firms.
2. A solid quasi-natural experiment for causal analysis.
  - ▶ Little clustering of the merger deals in particular years.
  - ▶ Multiple shocks that affect different firms at exogenously different times.

## Extension

- ▶ What about one firm/institution directly investing in another firm?
  - ▶ Motivated by NVIDIA's investment portfolio...
  - ▶ Are there any benefits beyond financial return (support) for investing companies (firms being invested)?
  - ▶ What are the differences between being invested by a firm and an institution?