Anti-Competitive Effects of Common Ownership

José Azar
Charles River Associates

Martin Schmalz
University of Michigan

Isabel Tecu
Charles River Associates

FTC Microeconomics Conference 2015
Motivation

- **Theory**: Firms owned by overlapping sets of investors have reduced incentives to compete

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- Strong (but unexamined) prior: no, because diversified institutions are just small minority shareholders, so firms ignore diversified investors' interests

This paper informs this debate with facts
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This talk

• **Facts** about ownership of firms

• **Overview** of empirical setting and results

• **Theory**
  ▶ Competition under common ownership (O’Brien & Salop, 2000)

• **Empirics**
  1. Measure concentration due to common ownership
  2. Identify effect of common ownership on prices

• **Potential mechanisms & legal implications**
Facts about corporate ownership
## Technology

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Who are these investors? Example: BlackRock

- **Large**: BlackRock has $4.7\text{tn} \text{ Assets under Management}
  - NYSE market capitalization: $19\text{tn}$
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- **Growing**: Size doubled by acquiring BGI in 2009
  - Continued growth through index funds / ETFs (iShares)

- **Powerful**: largest shareholder of 15 of all public US firms
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Vanguard’s CEO & Chairman F. William McNabb

- **Passive investor, not passive owner**
- Some have mistakenly assumed that our predominantly passive management style suggests a passive attitude with respect to corporate governance. Nothing could be further from the truth.
- By involvement in hundreds of direct discussions every year ... we can accomplish much more than through voting ... we put issues on the table that aren’t on the proxy ballot.
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Passive investment, active ownership

Most large mutual fund companies

- Have central corporate governance & proxy voting offices that “engage” with portfolio firms “behind the scenes”
- Pool votes across funds in family (few within-family fights)
Passive investment, active ownership

- Most large mutual fund companies
  - Have central corporate governance & proxy voting offices that “engage” with portfolio firms “behind the scenes”
  - Pool votes across funds in family (few within-family fights)
- All of the large asset managers are active in corporate governance – even if they have passive investment strategies
Corporate ownership by institutional investors

- Is not small
- Is not undiversified
- Is not passive
Facts on corporate ownership: summary

- Corporate ownership by institutional investors
  - Is not small
  - Is not undiversified
  - Is not passive

- We therefore find it not entirely absurd to ask...
Questions

1. Do current levels of common ownership significantly increase market concentration?
   - How to quantify?

2. Does higher common ownership concentration cause higher product prices?
   - How to identify?
What we do
What we do

Airline 1
Airline 2

Market shares determine $HHI_i$

$HHI_{JFK-BOS}$

$HHI_{DCA-BOS}$

Airline 2
Airline 3

Airline 1
Airline 3
What we do

t=0

Fund B
owns
Airline 2

Fund A
owns
Airline 1

Fund C
owns
Airline 3

DCA
JFK
BOS

Airline 1
Airline 2

Airline 2
Airline 3

HHI JFK-BOS
HHI JFK-DCA
HHI DCA-BOS

Airline 1
Airline 3
What we do
What we do

Airline 1

Airline 2

Airline 3

Price increase


t=0

Fund B

owns

Airline 2

Fund A

owns

Airline 1

Fund C

owns

Airline 3


t=1

Fund B

Fund A

Fund C

Airline 2

Airline 3

Airline 1

Airline 3

HHI

JFK-BOS

HHI

JFK-DCA

HHI

DCA-BOS
What we do

<table>
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<td>Fund B</td>
<td>Fund B</td>
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<td>owns Airline 2</td>
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<tr>
<td>Fund A</td>
<td>Fund A</td>
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<tr>
<td>owns Airline 1</td>
<td>owns Airline 1</td>
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<tr>
<td>Fund C</td>
<td>Fund C</td>
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<tr>
<td>owns Airline 3</td>
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Price increase

compared to these routes

Airline 1
Airline 2
Airline 1
Airline 3

DCA

JFK

BOS
What we do

In the initial state at t=0, Fund B owns Airline 2, Fund A owns Airline 1, and Fund C owns Airline 3.

At t=1, Fund A-B owns Fund C, and we observe a price increase compared to these routes.

The diagram illustrates the ownership and the price increase across different routes.
What we find

1. Measure market ownership-adjusted concentration
   - Anti-competitive incentives due to common ownership in the average US airline route: **2,200 HHI points**
   - 10 times larger than what DoJ/FTC horizontal merger guidelines presume “likely to enhance market power”

2. Identify price effect
   - Prices 3-11% higher, compared to separate ownership
   - Single merger of asset managers causes 0.6% price increase
     - Compares to 1-4% profit margins (IATA)
Theory
Competition under common ownership
(Salop & O’Brien, 2000)

- **Assumption**: firm $j$ maximizes a weighted average of its owners’ economic interests

\[
\max \sum_i \gamma_{ij} \sum_k \beta_{ik} \pi_k \propto \pi_j + \sum_{k \neq j} \sum_i \gamma_{ij} \beta_{ik} \pi_k
\]

Result: Cournot ⇒ markup $\propto MHHI = HHI + MHHI \delta$

Unilateral effects ⇒ no coordination or communication
Competition under common ownership

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  - Weights: control rights $\gamma_{ij}$, cash flow rights $\beta_{ik}$

  $$\max_{x_j} \Pi_j = \sum_{i=1}^{M} \gamma_{ij} \sum_{k=1}^{N} \beta_{ik} \pi_k$$

Result: Cournot $\Rightarrow$ markup $\propto MHHI + HHI \Delta \eta \sum_{j} s_j \frac{P - C'}{x_j}$

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- **Result**: Cournot \(\Rightarrow\) markup \(\propto\) MHHI = HHI + MHHI delta
  
  \[
  \eta \sum_{j} s_{j} \frac{P - C'_{j}(x_{j})}{P} = \sum_{j} s_{j}^2 + \sum_{j} \sum_{k \neq j} s_{j}s_{k} \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}}
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- **Unilateral effects**: no coordination or communication
Symmetric example: 2 firms, 50/50 market share

- Separate ownership: fund A owns firm 1, fund B owns firm 2
  - $HHI = 5,000$; $MHHI = 5,000$; $MHHI \text{ delta} = 0$

![Diagram showing separate ownership](image)
Symmetric example: 2 firms, 50/50 market share

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- Funds diversify (or A buys B)
  - $HHI = 5,000$; $MHHI = 10,000$; $MHHI$ delta = 5,000
Distribution of MHII delta across routes

The graph shows the distribution of MHII delta across routes for two different periods: 2001Q1 and 2013Q1. The x-axis represents the MHII delta values, while the y-axis represents the density. The data is visualized using bars, with different colors indicating the respective quarters.
Average MHHI and HHI over time

BlackRock acquires BGI
Average MHHI and HHI over time

- Horizontal merger guidelines: +200 “presumed likely to enhance market power” & shifts burden of proof
Average MHHI and HHI over time

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- 2,200 additional HHI points due to common ownership: worse than going from $4 \rightarrow 2$ competitors
Average MHHI and HHI over time

- Horizontal merger guidelines: +200 “presumed likely to enhance market power” & shifts burden of proof
- 2,200 additional HHI points due to common ownership: worse than going from 4 → 2 competitors, w/o DoJ/FTC involvement
Price effect of common ownership
Empirical hypotheses

- H0: Common ownership concentration (MHHI delta) does not affect prices
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  - Corporate governance frictions
  - Informational frictions (too complex)
  - ...

Empirical hypotheses

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- **H1**: MHHI delta has a positive effect on ticket prices
  - Economic incentives matter for economic outcomes
  - Firms act (to some extent) in their owners’ economic interest
Empirical strategy: fixed-effects panel

- Route $i$, carrier $j$, quarter $t$

$$\log (p_{ijt}) = \beta \cdot MHHI \_ delta_{it}$$

$$+ \gamma \cdot HHI_{it} + \theta \cdot X_{ijt} + \alpha_t + \nu_{ij} ( + \nu_{jt} ) + \varepsilon_{ijt}$$

Results

- $\beta > 0$: 5% higher prices compared to $MHHI \_ delta = 0$
- $\beta \approx \gamma$: Magnitude driven by large $MHHI \_ delta$, not by a high $\beta$
- Quantity (# passengers) is lower ($\beta < 0$)
- Implied $\eta = -1.3$ (IATA: -1.4)
Empirical strategy: fixed-effects panel

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\[
\log (p_{ijt}) = \beta \cdot \text{MHHI delta}_{it} + \gamma \cdot \text{HHI}_{it} + \theta \cdot X_{ijt} + \alpha_t + v_{ij} (v_{jt}) + \epsilon_{ijt}
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- Results
  - $\beta > 0$: 5% higher prices compared to $MHHI \text{ delta} = 0$
  - $\beta \approx \gamma$
    - Magnitude driven by large MHHI delta, not by a high $\beta$
Empirical strategy: fixed-effects panel

- Route $i$, carrier $j$, quarter $t$

$$\log(p_{ijt}) = \beta \cdot MHHI\ delta_{it}$$

$$+ \gamma \cdot HHI_{it} + \theta \cdot X_{ijt} + \alpha_t + \nu_{ij} ( + \nu_{jt}) + \epsilon_{ijt}$$

- Results

  - $\beta > 0$: 5% higher prices compared to $MHHI\ delta = 0$
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\[
\log(p_{ijt}) = \beta \cdot MHHI\ \text{delta}_{it} + \gamma \cdot HHI_{it} + \theta \cdot X_{ijt} + \alpha_t + \nu_{ij} ( + \nu_{jt}) + \epsilon_{ijt}
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  - $\beta > 0$: 5% higher prices compared to $MHHI\ \text{delta} = 0$
  - $\beta \approx \gamma$
    - Magnitude driven by large MHHI delta, not by a high $\beta$
  - Quantity (# passengers) is lower ($\beta < 0$)
  - Implied $\eta = -1.3$ (IATA: -1.4)
## Price effect of MHHI delta

<table>
<thead>
<tr>
<th></th>
<th>Market-carrier level</th>
<th>Market-level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>MHHI delta</td>
<td>0.201***</td>
<td>0.128***</td>
</tr>
<tr>
<td></td>
<td>(0.0251)</td>
<td>(0.0232)</td>
</tr>
<tr>
<td>HHI</td>
<td>0.208***</td>
<td>0.150***</td>
</tr>
<tr>
<td></td>
<td>(0.0209)</td>
<td>(0.0182)</td>
</tr>
<tr>
<td>Controls</td>
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</tr>
<tr>
<td>Year-Quarter FE</td>
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<td>Market-Carrier FE</td>
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<td>Market FE</td>
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<tr>
<td>Observations</td>
<td>1,115,482</td>
<td>1,089,818</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.095</td>
<td>0.144</td>
</tr>
<tr>
<td>Number of Market-Carrier Pairs</td>
<td>50,659</td>
<td>49,057</td>
</tr>
<tr>
<td>Number of Markets</td>
<td>7,391</td>
<td>7,081</td>
</tr>
</tbody>
</table>
## Price effect of MHHI delta

<table>
<thead>
<tr>
<th></th>
<th>Dependent Variable: Log(Average Fare)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Market-carrier level</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>
Panel-IV: BlackRock buys BGI
Testing for reverse causality with panel-IV

- BlackRock announces acquisition of BGI in 2009:Q2, consummated in 2009:Q4
Testing for reverse causality with panel-IV

- BlackRock announces acquisition of BGI in 2009:Q2, consummated in 2009:Q4

- Airlines a small fraction of both firms’ portfolios
  - Assume acquisition was not caused by differences across routes in expected ticket price changes
Testing for reverse causality with panel-IV

- BlackRock announces acquisition of BGI in 2009:Q2, consummated in 2009:Q4
- Airlines a small fraction of both firms’ portfolios
  - Assume acquisition was not caused by differences across routes in expected ticket price changes
- Route-level treatment variable:

  \[2009:\text{Q1-Implied change in MHHI delta}_i\]
  
  \[= \text{Hypothetically-combined MHHI}_{2009:\text{Q1},i} - \text{Separate MHHI}_{2009:\text{Q1},i}\]
Treatment: Implied \textbf{change} in MHHI delta

![Histogram showing implied change in MHHI delta with density on the y-axis and implied change in MHHI on the x-axis. The histogram includes bars for Control, Treatment, and Unassigned groups. The mean implied change is indicated as 91.3.]
Treatment: Implied **change** in MHHI delta

- **H0**: constant relative price across treated & control routes
Treatment vs. control prices

BlackRock announces acquisition of BGI

Consummation of acquisition

Log of Average Price (Normalized)
Treatment vs. control prices

- $\beta^{IV}$: up to 11% higher prices due to total common ownership
- BlackRock-BGI-implied increase in common ownership alone caused 0.6% higher prices
## Panel-IV first stage

<table>
<thead>
<tr>
<th>Post-period:</th>
<th>2011Q1</th>
<th>2012Q1</th>
<th>2013Q1</th>
<th>2011-2013 Q1</th>
<th>2011Q1</th>
<th>2012Q1</th>
<th>2013Q1</th>
<th>2011-2013 Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td></td>
</tr>
</tbody>
</table>

| Treat × Post | 0.0651*** (0.00504) | 0.0885*** (0.00508) | 0.0879*** (0.00519) | 0.0749*** (0.00447) |
| Impl Chg (MHHI delta) × Post | 4.050*** (0.291) | 5.756*** (0.295) | 5.740*** (0.313) | 4.742*** (0.273) |
| HHI          | -0.365*** (0.0273) | -0.377*** (0.0213) | -0.376*** (0.0225) | -0.354*** (0.0162) |

| Controls | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Year FE   | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market-Carrier FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| Within-R-squared | 0.562 | 0.659 | 0.710 | 0.590 | 0.534 | 0.647 | 0.715 | 0.584 |
| # of Market-Carrier Pairs | 7,414 | 7,414 | 7,414 | 7,414 | 11,667 | 11,667 | 11,667 | 11,667 |
## Panel-IV second stage: price effect

<table>
<thead>
<tr>
<th>Post-period:</th>
<th>2011Q1</th>
<th>2012Q1</th>
<th>2013Q1</th>
<th>2011-2013 Q1</th>
<th>2011Q1</th>
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<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
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<tr>
<td>MHHI delta</td>
<td>-0.0150</td>
<td>0.519***</td>
<td>0.521***</td>
<td>0.299**</td>
<td>-0.149</td>
<td>0.483***</td>
<td>0.440***</td>
<td>0.245*</td>
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<tr>
<td></td>
<td>(0.174)</td>
<td>(0.143)</td>
<td>(0.147)</td>
<td>(0.141)</td>
<td>(0.173)</td>
<td>(0.131)</td>
<td>(0.141)</td>
<td>(0.138)</td>
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<td>HHI</td>
<td>0.0632</td>
<td>0.296***</td>
<td>0.299***</td>
<td>0.226***</td>
<td>0.0118</td>
<td>0.260***</td>
<td>0.254***</td>
<td>0.206***</td>
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<tr>
<td></td>
<td>(0.0822)</td>
<td>(0.0672)</td>
<td>(0.0697)</td>
<td>(0.0605)</td>
<td>(0.0768)</td>
<td>(0.0573)</td>
<td>(0.0617)</td>
<td>(0.0553)</td>
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<td>✓</td>
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</tr>
<tr>
<td>Year FE</td>
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<tr>
<td>Market-Carrier FE</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>R-squared</td>
<td>0.375</td>
<td>0.432</td>
<td>0.414</td>
<td>0.321</td>
<td>0.351</td>
<td>0.411</td>
<td>0.395</td>
<td>0.305</td>
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<tr>
<td># of Market-Carrier Pairs</td>
<td>7,414</td>
<td>7,414</td>
<td>7,414</td>
<td>7,414</td>
<td>11,667</td>
<td>11,667</td>
<td>11,667</td>
<td>11,667</td>
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</table>
## Panel-IV second stage: price effect

<table>
<thead>
<tr>
<th>Post-period:</th>
<th>Discrete Treatment</th>
<th>Continuous Treatment</th>
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<tr>
<td></td>
<td>2011Q1 (1)</td>
<td>2012Q1 (2)</td>
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<tr>
<td><strong>MHHI delta</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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<td><strong>Controls</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
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<td>Year FE</td>
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</table>

Dependent Variable: Log(Average Fare)
Summary and conclusions
Summary of results

1. Common ownership is ubiquitous
Summary of results

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2. Portfolio firms lack incentives to compete
   ▶ More than 10 times larger than what DoJ/FTC horizontal merger guidelines presume “likely to enhance market power”
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   - 3 - 11% higher prices, compared to separate ownership
   - Magnitudes & timing similar to unregulated mergers
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3. When firms lack incentives to compete, they don’t
   - 3 - 11% higher prices, compared to separate ownership
   - Magnitudes & timing similar to unregulated mergers

4. Consolidation in the asset management industry affects portfolio firms’ product market competition
   - 0.6% on the average route, from one acquisition alone
Conclusion: a policy “trilemma”

- Neo-classical economics is internally inconsistent. It is impossible to design an economic system in which:
  1. Shareholders are diversified (e.g., CAPM)
  2. Firms act in shareholders’ interest (good governance)
  3. Product market competition prevails (efficiency)
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  - Reducing voting power of “passive” investors (or is separation of ownership and control a bigger concern)?
  - Or is there just enough competition with present-day ownership structures (but what about the future)?
Potential mechanisms and legal implications
“What is the mechanism?”

- Showed incentives and outcomes, as typical in IO
“What is the mechanism?”

- Showed incentives and outcomes, as typical in IO

- Comforting to know plausible mechanisms exist
  1. Direct channel
  2. Indirect channel
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- Comforting to know plausible mechanisms exist
  1. Direct channel
  2. Indirect channel
1. Direct channel

How do institutional investors affect corporate policies?
1. Direct channel

How do institutional investors affect corporate policies?

- Just as we teach it
1. Direct channel

How do institutional investors affect corporate policies?

- Just as we teach it
  - They elect directors
1. Direct channel

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  - Set pay/turnover: industry-sensitive (Bebchuk & Fried; Jenter & Kanaan)
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  - “Engagement is the carrot, voting is the stick.”
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How do institutional investors affect corporate policies?

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  - They elect directors (sometimes themselves)
  - Set pay/turnover: industry-sensitive (Bebchuk & Fried; Jenter & Kanaan)
  - "Engagement is the carrot, voting is the stick."

- What is discussed in engagement meetings? We don’t know.
- But even in earnings calls, investors openly discuss capacity decisions with airlines
1. Direct channel: discussion of capacity

- Direct discussion of capacity
  - “Southwest dials back on growth to appease investors” (Bloomberg)
1. Direct channel: discussion of capacity

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    SWA jumps 2.2%, airline index jumps 3.2%
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    ★ “When you add capacity, particularly into other airlines’ hubs, it diminishes shareholder confidence; jeopardizes the likelihood of earning a multiple closer to that of high-quality industrial transport. [...] in fairness, I’m going to ask others this season. So this is not uniquely directed.”
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  - Route-specific comments
    - “What is funding growth initiatives in certain regions, like the trans-Atlantic, like in Seattle, and perhaps like in LA?”
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- Firms need to be pushed to compete hard, or they will enjoy a “quiet life” with high margins, profits (Bertrand & Mullainathan, 2003)
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- The Trian / Dupont Case ▶ Details
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  - Large diversified investors don’t have the incentives
  - Small undiversified “activists” don’t have the power

- The Trian / Dupont Case

- Same conclusion
  - Institutional investors actively influence product pricing
  - Common ownership causes higher product prices
Legal implications

- Collusion case (Sherman Act Sec 1) requires communication
- Clayton Act Sec 7 doesn’t require communication/mechanism
  - Prohibits stock acquisitions that lessen competition.
Legal implications

- Collusion case (Sherman Act Sec 1) requires communication
- Clayton Act Sec 7 doesn’t require communication/mechanism
  - Prohibits stock acquisitions that lessen competition.
- Elhauge (HLR 2016)
Appendix
Robustness checks

- Quantity as dependent variable
  - 6%*** given current level of MHHI delta

- Include carrier-year fixed effects $\nu_{jt}$
  - Effect remains highly significant

- Instrument market shares with lagged $s_i$
  - Coefficients double
More robustness checks

- Consider only top 10/5/3/1 owners for control
  - **
  - progressively smaller point estimate

- Consider only < 0.5% for control (Placebo)
  - Effect of MHHI delta disappears

- Add $f^2(HHI)$, $f^5(HHI)$ as controls
  - Similar coefficient on MHHI delta
Open Questions

- Other industries (horizontal)
- Vertical common ownership
- Efficiency stories in vertical or horizontal common ownership
- Mechanism, incl. pay structures, turnover
- Endogeneity of ownership
- Relationship to mergers
- Monopsony power
- Inequality
- ...
Driven by more concentrated markets

![Average Marginal Effects of MHII_delta with 95% CIs](image-url)
Common ownership of banks

- 938/3206 counties have MHHI delta > 200 (raw)
- 76% of deposits face MHHI delta > 200 (weigh.)
- Average deposit-weighted MHHI delta = 1232
Bankruptcies mitigate the effect

Average Marginal Effects with 95% CIs

Effects on Linear Prediction

Year

MHHI_delta
HHI

Average Marginal Effects with 95% CIs

Effects on Linear Prediction

Year

MHHI_delta
HHI
Responses to FAQ

- Isn’t that implausibly complicated?
  - No more complex than known from IO literature

- Aren’t the ownership stakes too small to matter?
  - United Airlines: top 5 = 49.5%
  - An activist hedge fund needs 2% to matter

- How much ownership do you think you need to matter, over and above being the largest shareholder?

- How much common ownership are you comfortable with?

- Who matters for governance if not the largest shareholders? ("[BlackRock, the] 800-pound gorilla in the room")
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Example

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## Dupont and Monsanto

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Seed Sales, 2011 US$ millions</th>
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<td>8,953</td>
<td>26</td>
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<tr>
<td>2</td>
<td>DuPont Pioneer (USA)</td>
<td>6,261</td>
<td>18.2</td>
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<td>4</td>
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### Dupont (DD) %

- Vanguard: 5.5
- BlackRock: 5.0
- State Street global Advisors: 4.9
- Capital Research & Management Co.: 4.0
- Trian Fund Management LP: 2.7
- Fidelity: 2.5

### Monsanto (MON) %

- Vanguard: 6.4
- BlackRock: 5.5
- Fidelity: 4.7
- State Street global Advisors: 4.6
- Capital Research & Management Co.: 3.3
- Sands Capital Management LLC: 2.7