Anti-Competitive Effects of Common Ownership

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Charles River Associates

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University of Michigan

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Charles River Associates

Julis-Rabinowitz Center for Public Policy & Finance
Motivation

- **Theory**: Firms owned by overlapping sets of investors have reduced incentives to compete.
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  - FTC as an antitrust agency

Could that also happen today? Strong (but unexamined) prior: no, because most shareholdings are undiversified. Diversified institutions are just small minority shareholders (i.e., they don’t vote), so firms ignore diversified investors’ economic interests.

This paper informs this prior with facts.
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- **This paper informs this prior with facts**
This talk

- **Facts** about ownership of firms

- **Overview** of what we do & what we find

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

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

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

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## Pharmacies

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## Banks (Azar, Raina & Schmalz, 2016)

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**Why can Larry Fink do what Warren Buffett can’t?**
Who are these investors? Example: BlackRock

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- **Growing:** Size doubled by acquiring BGI in 2009
  - Especially “passive” index funds / ETFs (iShares) grow

- Especially powerful, largest shareholder of 15 of all public US firms
- Also largest shareholder of BNP Paribas, Deutsche Bank...
- And of course they vote (and not only that)
- Unanimously, small, passive shareholder
  - Active in corporate governance
  - Centralized corporate governance & proxy voting office that "engages" with portfolio firms "behind the scenes"
  - E.g., BlackRock’s COO is an Apple board member
  - Incentives are aligned: fees a % of AuM
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Is BlackRock an exception?

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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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**?
Why we care

- A robust “yes” would
  - Trigger a change of antitrust policy
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  ★ So far, common ownership is assumed to reduce competition (only) if it’s you or me (or Warren Buffett)

▸ Shake the foundations of corporate finance
  ★ Fisher Separation Theorem: perfect competition ⇒ firms’ objective is to maximize their own profits, unanimously
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    - Fisher Separation Theorem: perfect competition $\Rightarrow$ firms’ objective is to maximize their own profits, unanimously

- More implications: common ownership also predicts
  - rising inequality
  - rising capital share
  - record corporate profits amid sluggish macro growth$^1$
  - failure of relative performance evaluation
  - the rise of delegated asset management

---

$^1$ “Goldman Sachs says it may be forced to fundamentally question how capitalism is working.” “There are broader questions to be asked about the efficacy of capitalism.” (Bloomberg 2/3/16)
What we do
What we do

Market shares determine HHI_\text{i} at t=0:

- HHI_{JFK-DCA}
- HHI_{JFK-BOS}
- HHI_{DCA-BOS}

Airline 1
Airline 2
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 3

HHI JFK-BOS

HHI JFK-DCA

HHI DCA-BOS

Airline 1
Airline 2
Airline 3
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At $t=0$:
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- Fund A owns Airline 1
- Fund C owns Airline 3

At $t=1$:
- Fund B
- Fund A
- Fund C

Airline 1
Airline 2
Airline 3

DCA
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What we do

\[ \text{Airline 1} \]
\[ \text{Airline 2} \]
\[ \text{Airline 3} \]

\[ \text{HHI} \text{ JFK-BOS} \]
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\[ t=0 \]
\[ \text{Fund B owns Airline 2} \]
\[ \text{Fund C owns Airline 3} \]

\[ t=1 \]
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What we do

At time $t=0$:
- Fund B owns Airline 2
- Fund A owns Airline 1
- Fund C owns Airline 3

At time $t=1$:
- Fund B
- Fund A
- Fund C

Price increase... compared to these routes.

Airline 1
Airline 2
Airline 1
Airline 3
Airline 2
Airline 3
What we do

**t=0**
- **Fund B** owns Airline 2
- **Fund A** owns Airline 1
- **Fund C** owns Airline 3

**t=1**
- **Fund A-B**
- **Fund C**

**Price increase**
- Compared to these routes
- Airline 1
- Airline 2
- Airline 3
- Airline 1
- Airline 3

---

The network diagram illustrates the ownership of airlines by various funds at different time points. At t=0, Fund B owns Airline 2, Fund A owns Airline 1, and Fund C owns Airline 3. At t=1, there is a suggested price increase compared to these routes, potentially influenced by the ownership structure.
What we find

1. Ownership-adjusted concentration index (MHHI) is **2,200 HHI points** higher than standard concentration index (HHI)
   - DoJ/FTC horizontal merger guidelines presume additional 200 HHI points “likely to enhance market power”

2. Identify price effect
   - Prices 3-11% higher due to common ownership
   - Single merger of asset managers caused 0.6% price increase
Theory
The standard model of competition

- **Assumption**: firm $j$ maximizes a weighted average of its undiversified owners’ economic interests
The standard model of competition

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  - Control rights $\gamma_{ij}$, cash flow rights $\beta_{ij}$

  $$\max_{x_j} \Pi_j = \sum_{i=1}^{M} \gamma_{ij} \beta_{ij} \cdot \pi_j = \pi_j$$
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- **Result**: Cournot \( \Rightarrow \) markup \( \propto \) HHI
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  \end{align*}
  \]

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  \[
  \eta \sum_j s_j \frac{P - C'_j(x_j)}{P} = \sum_j s_j^2
  \]
Competition under general ownership structures

**Assumption**: firm $j$ maximizes a weighted average of diversified owners’ economic interests
Competition under general ownership structures

**Assumption**: firm $j$ maximizes a weighted average of diversified owners’ economic interests: their *portfolio* profits
Competition under general ownership structures

**Assumption**: firm $j$ maximizes a weighted average of diversified owners’ economic interests: their portfolio profits

- 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
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Competition under general ownership structures

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  $$\max_{x_j} \Pi_j = \sum_{i=1}^{M} \gamma_{ij} \sum_{k=1}^{N} \beta_{ik} \pi_k \propto \pi_j + \sum_{k \neq j} \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}} \pi_k$$
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- **Result**: Cournot \( \Rightarrow \) markup \( \propto \) MHHI
Competition under general ownership structures

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**Result**: Cournot $\Rightarrow$ markup $\propto$ MHHI $=$ HHI $+$ MHHI delta
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  $$\eta \sum_{j} s_j \frac{P - C'_j(x_j)}{P} = \sum_{j} s_j^2 + \sum_{j} \sum_{k \neq j} s_j s_k \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}}$$
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- **Result**: Cournot $\Rightarrow$ markup $\propto$ MHHI = HHI + MHHI delta

  $\eta \sum_{j} s_j \frac{P - C_j'(x_j)}{P} = \sum_{j} s_j^2 + \sum_{j} \sum_{k \neq j} s_j s_k \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}}$

- **Unilateral effects** $\Rightarrow$ no coordination or communication needed
Empirics
Distribution of MHMI delta across routes
Distribution of MHHI delta across routes

- Horizontal merger guidelines: +200 “presumed likely to enhance market power” & shifts burden of proof
Distribution of MHHI delta across routes

- 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
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
Empirical hypotheses

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  - Corporate governance frictions
  - Informational frictions (too complex)
  - ...

- 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 hypotheses

- **H0**: Common ownership concentration (MHHI delta) does not affect prices
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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 $t$

\[
\log (p_{ijt}) = \beta \cdot MHHI\; delta_{it} \\
+ \gamma \cdot HHI_{it} + \theta \cdot X_{ijt} + \alpha_t + \nu_{ij} ( + \nu_{jt}) + \epsilon_{ijt}
\]
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- 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 $MHHI\ delta = 0$
Empirical strategy: fixed-effects panel

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

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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}) + \varepsilon_{ijt}
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- Results
  - $\beta > 0$: 5% higher prices compared to $MHHI\ delta = 0$
  - $\beta \approx \gamma$
Empirical strategy: fixed-effects panel

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

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- Results
  - $\beta > 0$: 5% higher prices compared to $MHHI \ delta = 0$
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    - $\Rightarrow$ magnitude driven by large MHHI delta, not by a high $\beta$
  - Quantity (# passengers) is associated with lower MHHI delta
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- Results

  - $\beta > 0$: 5% higher prices compared to $MHHI \ delta = 0$
  - $\beta \approx \gamma$
    - $\Rightarrow$ magnitude driven by large MHHI delta, not by a high $\beta$
  - Quantity (# passengers) is associated with lower MHHI delta
  - 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><strong>Dependent Variable: Log(Average Fare)</strong></td>
<td></td>
<td></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>
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<tr>
<td>Controls</td>
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<td>✓</td>
</tr>
<tr>
<td>Year-Quarter FE</td>
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<td>Market-Carrier FE</td>
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<tr>
<td>Market FE</td>
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<td>✓</td>
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<tr>
<td>Observations</td>
<td>1,115,482</td>
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<tr>
<td>R-squared</td>
<td>0.095</td>
<td>0.144</td>
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<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>
Panel-IV: BlackRock buys BGI
Testing for reverse causality with panel-IV

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

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

  \[ \text{2009:Q1-Implied change in MHHI delta}_i \]

  \[ = \text{Hypothetically-combined MHHI}_{2009:Q1,i} - \text{Separate MHHI}_{2009:Q1,i} \]
<table>
<thead>
<tr>
<th>Actual 2009Q1</th>
<th>Ownership</th>
<th>Rank</th>
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<tbody>
<tr>
<td>AirTran Airways Corporation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAR Capital Management</td>
<td>10.11%</td>
<td>1</td>
</tr>
<tr>
<td>Fidelity</td>
<td>6.36%</td>
<td>2</td>
</tr>
<tr>
<td>Comvest Investment Partners</td>
<td>6.20%</td>
<td>3</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>5.67%</td>
<td>4</td>
</tr>
<tr>
<td>BARCLAYS BANK PLC</td>
<td>5.64%</td>
<td>5</td>
</tr>
<tr>
<td>Fred Alger Management</td>
<td>5.05%</td>
<td>6</td>
</tr>
<tr>
<td>Wellington</td>
<td>4.05%</td>
<td>7</td>
</tr>
<tr>
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<td>3.65%</td>
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</tr>
<tr>
<td>Peninsula Cap Partners</td>
<td>2.93%</td>
<td>9</td>
</tr>
<tr>
<td>Dimensional Fund Advisers</td>
<td>2.89%</td>
<td>10</td>
</tr>
<tr>
<td>BLACKROCK INC</td>
<td>1.29%</td>
<td>17</td>
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</table>

<table>
<thead>
<tr>
<th>BlackRock-BGI Combined 2009Q1</th>
<th>Ownership</th>
<th>Rank</th>
</tr>
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**An unaffected airline**

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<td>11.73%</td>
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<td>Capital Research</td>
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<tr>
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**Compare**

- **“treated”** routes, served predominantly by affected airlines
  (e.g., Airtran, ...)
- **“control”** routes, served predominantly by unaffected airlines
  (e.g., American, ...)
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)

0 0.05 0.1 0.15 0.2
2009q1 2010q1 2011q1 2012q1 2013q1

Control  Treatment
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
Is there a corporate governance mechanism that could plausibly implement these outcomes?
Is there a corporate governance mechanism that could plausibly implement these outcomes?

(Corporate finance audiences find it implausible that managers would act in their largest shareholders’ economic interest, to some extent.)
Mechanism 1: do nothing / crowd out activists

- Who has power and incentives to push for more competition?
  - Diversified mutual funds have power, but no incentives
  - Undiversified activists have incentives, but little power
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- **Index funds replace activists ⇒ managers live “quiet life” with high margins, no price wars**
  - Bill Ackman believes growth of index funds will lead to “keiretsu”-style corporate governance failures in the US
Mechanism 2: “passive” funds out-vote activists

- Diversified funds vote against undiversified activist hedge funds that push for more competition

For example, Trian’s failed proxy fight at DuPont focused on:

- Relative performance evaluation (vs. Monsanto)
- Steeper CEO incentives
- Higher R&D investment, market share
- Stop “paying competitors” (Monsanto)

ISS thought that made sense. So did the market: DuPont fell 6% on the news that Trian lost. At the same time, Monsanto shares jumped 3.6%. Huh?
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  - ... b/c of Vanguard, BlackRock, and State Street’s vote
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**Mechanism 2: “passive” funds out-vote activists**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Seed Sales, 2011 US$ millions</th>
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<tr>
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DuPont (DD)  %  Monsanto (MON)  %
Vanguard  5.5  Vanguard  6.4
BlackRock  5.0  BlackRock  5.5
State Street global Advisors  4.9  Fidelity  4.7
Capital Research & Management Co.  4.0  State Street global Advisors  4.6
Trian Fund Management LP  2.7  Capital Research & Management Co.  3.3
Fidelity  2.5  Sands Capital Management LLC  2.7
### Mechanism 3: CEOs are paid to not compete

w/ Miguel Antón, Florian Ederer, Mireia Giné

<table>
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<th>CEO &amp; top executive pay</th>
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| own performance         | 0.355***  
|                         | (0.0137)  
| peer performance        | -0.0123***  
|                         | (0.00328)  
| MHHI Delta * own perf.  | -0.0850***  
|                         | (0.0147)  
| MHHI Delta * peer perf. | 0.00960***  
|                         | (0.00360)  
| MHHI Delta              | 599.9***  
|                         | (28.20)  
| HHI                     | 182.0***  
|                         | (27.94)  
| HHI * own perf.         | -0.0646***  
|                         | (0.0132)  
| HHI * peer perf.        | 0.00423  
|                         | (0.00342)  
| Year FE                 | Y  
| Industry FE             | Y  
| Observations            | 178,318  
| R-squared               | 0.339  

Notes: *** p < 0.01, ** p < 0.05, * p < 0.1
Mechanism 4: direct discussions of competition

- Engagement meetings between mutual funds and portfolio firms:
  “Competitive policy high on the list of topics”

- Antitrust considerations not on the radar

Even in public earnings calls, investors press for less capacity

- "Southwest dials back on growth to appease investors" (Bloomberg)

- SWA increases 2.2%, airline index jumps 3.2%

- Delta’s and SWA’s 2nd largest shareholder “asks”:
  “When you add capacity, particularly into other airlines’ hubs, it diminishes shareholder confidence; jeopardizes [your stock price]”

- Route-specific comments
  "What is [the reason for your] growth initiatives in ... the trans-Atlantic, like in Seattle, and perhaps like in LA?"
  "Will you cut some of those routes ... like Miami – Frankfurt?"

1 July 2015: DoJ investigates. 10 July 2015: 15+ suits
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- Clayton Act Section 7
  - Prohibits stock acquisitions that lessen competition.
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  - Prohibits stock acquisitions that lessen competition.
    - No mention of intent or mechanism

- Acquisitions are illegal (BLK-BGI; index funds)
  - “All it requires is the will to bring cases” (Elhauge, HLR 2016)

- So, should common ownership be prevented?
  - Of course not based on only one study of one industry
  - Banking deposit prices are higher because of common ownership
  - But even theoretically, the answer is necessarily complicated
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See also Crane (CLR), Baker (reply), O’Brien (ABA)...

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- 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)

Quantitative question: can we improve welfare by
- Reducing within-industry diversification (which potentially improves governance and competition)?
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Appendix
Driven by more concentrated markets
Bankruptcies mitigate the effect

Average Marginal Effects with 95% CIs

Year

Effects on Linear Prediction

MHHI_delta

HHI
“In March 2002, AA raised prices by 10%. Most airlines refused to follow except for Continental. AA rolled back the fare increase in most markets, and shot back by putting $199 one-way fares in 10 markets flown by Northwest (NW), United, Delta and US Airways, while excluding Continental from this revenge. In turn, NW fought back ... which triggered another round of fight where AA expanded its cheap fares to 20 NW markets, and NW escalated the war to 160 markets.”

Li and Netessine (2011)
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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What do we find?

1. Fees and thresholds are at an all-time high, and exhibit substantial cross-sectional variation.

2. HHI is **not** correlated with prices.

   \[ Y_{ijbt} = \beta \cdot HHI_{it} + \theta \cdot X_{it} + \zeta \cdot Q_{bt} + \nu_j + \epsilon_{ijbt} \]

3. MHHI is consistently related to fees, thresholds, and rate spreads.

   \[ Y_{ijbt} = \beta \cdot MHHI_{it} + \theta \cdot X_{it} + \zeta \cdot Q_{bt} + \nu_j + \epsilon_{ijbt} \]

4. Index fund growth is related to higher prices of deposit products.
Fees vary in the cross-section
HHI does not explain the variation of prices
Largest shareholders of Delta Air Lines

- Wellington Management Co, LLP 6.3%
- Vanguard Group, Inc. 5.2%
- Capital Research & Mgmt Co 4.9%
- BlackRock Investment Mgmt, LLC 4.7%
- Lansdowne Ptnr Limited 4.1%
- Wayzata Invt Partners, LLC 4.0%
- Janus Capital Management, LLC 3.7%
- Fidelity Management & Research 2.7%
Largest shareholders of Southwest Airlines

Primecap Management Company 11.2%
Vanguard Group, Inc. 6.2%
T. Rowe Price Associates, Inc. 5.3%
BlackRock Investment Mgmt, LLC 4.5%
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(You saw all of these names on the previous two slides.)
By the way: “…minority shareholders”?

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