Common Ownership, Competition, and Top Management Incentives

Miguel Antón† Florian Ederer‡ Mireia Giné† Martin Schmalz§

†IESE ‡Yale SOM §Michigan Ross

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**Motivation**

- Goal: incentivize good behavior, but filter out *exogenous* shocks

- Relative performance evaluation (RPE)!
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- RPE gives incentives to improve own-firm performance – but also to sabotage/compete aggressively with performance peers.
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  - *When firms strategically interact, common owners want to encourage cooperation, not competition!*
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- RPE gives incentives to improve own-firm performance – but also to sabotage/compete aggressively with performance peers.
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  - RPE gives incentives to improve own-firm performance – but also to sabotage/compete aggressively with performance peers.
  - **When firms strategically interact, common owners want to encourage cooperation, not competition!** ⇒ **Use less RPE.**

- We examine Holmstrom (1982) × Hart (1979), also empirically
  - Holmstrom: assume firms want to maximize own profit. Use RPE with exogenous benchmark.
  - Hart: when firms interact (i.e., industry performance endogenous), own-profit maximization no longer the unanimous objective.
Which questions do we ask?

“But more importantly ... to what extent will the conduct of firms be different from the assumed profit maximization behavior in classical theory; and if it differs, what ramifications does that have for market outcomes...”

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1. In theory, what are the optimal managerial incentives when
   - firms interact strategically (Aggarwal & Samwick, 1999), and
   - are commonly owned → internalize externalities on each other?
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(Hart & Holmstrom, 1987)

1 In theory, what are the optimal managerial incentives when
- firms interact strategically (Aggarwal & Samwick, 1999), and
- are commonly owned → internalize externalities on each other?

2 Is there evidence for the model predictions in the data?
- Identification with panel; Antón & Polk (2014) mutual fund shock
- Bonus: common ownership for all industries
Related literature on RPE

- Empirical lack of RPE, pay for luck, and explanations


- Financial contracts and product market competition

- Moral hazard and product market competition
Related literature on RPE

- **Empirical lack of RPE, pay for luck, and explanations**


- **Financial contracts and product market competition**

- **Moral hazard and product market competition**

- **We add: what do shareholders actually want managers to optimize?**
Contribution to the common ownership literature?

- Theory on common ownership and product market competition

- Empirics: common ownership...
Contribution to the common ownership literature?

- Theory on common ownership and product market competition

- Empirics: common ownership...

- We add: theory and empirics on executive compensation under common ownership, thus offering a mechanism.
Who are these common owners?
### Who are these common owners?

<table>
<thead>
<tr>
<th>JP Morgan Chase</th>
<th>%</th>
<th>Bank of America</th>
<th>%</th>
<th>Citigroup</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BlackRock</td>
<td>6.4</td>
<td>Berkshire Hathaway*</td>
<td>6.9</td>
<td>BlackRock</td>
<td>6.1</td>
</tr>
<tr>
<td>Vanguard</td>
<td>4.7</td>
<td>BlackRock</td>
<td>5.3</td>
<td>Vanguard</td>
<td>4.4</td>
</tr>
<tr>
<td>State Street</td>
<td>4.5</td>
<td>Vanguard</td>
<td>4.5</td>
<td>State Street</td>
<td>4.2</td>
</tr>
<tr>
<td>Fidelity</td>
<td>2.7</td>
<td>State Street</td>
<td>4.3</td>
<td>Fidelity</td>
<td>3.6</td>
</tr>
<tr>
<td>Wellington</td>
<td>2.5</td>
<td>Fidelity</td>
<td>2.1</td>
<td>Capital World Investors</td>
<td>2.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wells Fargo</th>
<th>%</th>
<th>US Bancorp</th>
<th>%</th>
<th>PNC Bank</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkshire Hathaway</td>
<td>8.8</td>
<td>BlackRock</td>
<td>7.4</td>
<td>Wellington</td>
<td>8.0</td>
</tr>
<tr>
<td>BlackRock</td>
<td>5.4</td>
<td>Vanguard</td>
<td>4.5</td>
<td>BlackRock</td>
<td>4.7</td>
</tr>
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<td>4.6</td>
</tr>
<tr>
<td>Fidelity</td>
<td>3.5</td>
<td>Berkshire Hathaway</td>
<td>4.3</td>
<td>Barrow Hanley</td>
<td>4.0</td>
</tr>
</tbody>
</table>

* Warrants without voting rights.
Mutual funds support non-benchmarked comp

- Big funds engage on pay in 45% of 1,000s of meetings per year
  - Support then-proposed pay packages 96% of the time, Melby (2016)

- BlackRock claims “Engagement in the carrot, voting is the stick”
The biggest funds coordinate their strategies on pay ...

... with the result of supporting high, performance-insensitive pay
Theory
Model objectives and ingredients

- Objective: incentivize manager, in the cheapest possible way, such that s/he sets the desired product market strategy
Model objectives and ingredients

Objective: incentivize manager, in the cheapest possible way, such that s/he sets the desired product market strategy

Ingredients

1. Imperfect competition: managers can affect industry profits
   - Strategic complements (differentiated Bertrand)
   - Strategic substitutes (differentiated Cournot)

2. Diversified shareholders: incentivize managers to maximize shareholder value, not own-firm profits in isolation
Setup of the baseline model

- Two firms, symmetric marginal cost $c$
  - Inverse demand: $P_i(q_i, q_j) = A - bq_i - aq_j$

- Two risk-neutral managers set prices / quantities
  - Linear contract: $w_i = k_i + \alpha_i \pi_i + \beta_i \pi_j$
  - Compensation ratio of $\alpha_i$ and $\beta_i$ determines managerial behavior
  - What’s the optimal $\alpha_i$ and $\beta_i$ as a function of ownership?

- Two shareholders
  - A owns $x \geq 1/2$ of firm 1 and $1 - x$ of firm 2
  - B owns $1 - x$ of firm 1 and $x$ of firm 2
Shareholder’s problem

- Shareholder A’s maximization problem is given by

\[
\max_{k_i, \alpha_i, \beta_i} \ x (\pi_i - w_i) + (1 - x) (\pi_j - w_j)
\]

subject to \( w_i \geq w_i' \)

and \( p_i^* \in \arg \max w_i \) or \( q_i^* \in \arg \max w_i \)
Optimal incentive contract

\[ C: \quad \beta_i^* = \frac{-a + 2(a + b)x - \sqrt{a^2 + 4b^2x^2 - 4ab(2 - 3x)}}{2a(1 - x)} \alpha_i^* \]

\[ B: \quad \beta_i^* = \frac{-e - 2(d - e)x + \sqrt{e^2 + 4ed(2 - 3x) + 4d^2x^2}}{2e(1 - x)} \alpha_i^* \]

Proposition (Common Ownership and Incentives)

An increase in common ownership \( 1 - x \) increases the inverse compensation ratio \( \frac{\beta^*}{\alpha^*} \) for both forms of competition.
Empirics
Empirics

Data

1. ExecuComp (S&P1500 + 500)
   - Flow pay as baseline; capitalized stocks & options for robustness

2. Compustat
   - Sales → market shares

3. CRSP
   - Industry definition (4-digit SIC)
   - Performance = market cap increase
   - Rival performance = VW market cap increase (Aggarwal & Samwick 1999)

4. 13Fs: ownership, MHHI Delta.
Common ownership is rising, with no end in sight
Baseline regression

\[ \omega_{ijt} = k_i + \]
\[ + [\alpha_1 + \alpha_2 F(HHI_{jt}) + \alpha_3 F(MHHID_{jt})] \times \pi_o + \]
\[ + [\beta_1 + \beta_2 F(HHI_{jt}) + \beta_3 F(MHHID_{jt})] \times \pi_r + \]
\[ + \gamma_1 F(HHI_{jt}) + \gamma_2 F(MHHID_{jt}) + \varepsilon_{ijt} \]  \hspace{1cm} (1)

- $\alpha_1$ is pay-performance-sensitivity, $\beta_1$ is pay-for-rival-performance sensitivity
- We are mainly interested in $\alpha_3$ and $\beta_3$ (Proposition 1) ...
- $H_0$: $\alpha_3 = \beta_3 = 0$
Top management pay panel regressions

<table>
<thead>
<tr>
<th>PANEL A</th>
<th>Dependent Variable: Top Management Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A&amp;S)</td>
</tr>
<tr>
<td>Own * MHHID</td>
<td>-0.117**</td>
</tr>
<tr>
<td></td>
<td>(-2.057)</td>
</tr>
<tr>
<td>Rival * MHHID</td>
<td>0.148**</td>
</tr>
<tr>
<td></td>
<td>(2.451)</td>
</tr>
<tr>
<td>MHHID</td>
<td>888.2***</td>
</tr>
<tr>
<td></td>
<td>(9.007)</td>
</tr>
<tr>
<td>Own * HHI</td>
<td>0.137***</td>
</tr>
<tr>
<td></td>
<td>(4.473)</td>
</tr>
<tr>
<td>Rival * HHI</td>
<td>-0.128***</td>
</tr>
<tr>
<td></td>
<td>(-3.345)</td>
</tr>
<tr>
<td>HHI</td>
<td>-74.42</td>
</tr>
<tr>
<td></td>
<td>(-0.815)</td>
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<tr>
<td>Own</td>
<td>0.226***</td>
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<tr>
<td></td>
<td>(15.43)</td>
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<tr>
<td>Rival</td>
<td>0.325***</td>
</tr>
<tr>
<td></td>
<td>(18.65)</td>
</tr>
<tr>
<td>Controls</td>
<td>No</td>
</tr>
<tr>
<td>Industry FE</td>
<td>Yes</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>192,110</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.160</td>
</tr>
</tbody>
</table>
Hypothesis test

\[ S = \frac{\partial (\beta / \alpha)}{\partial F(MHHID)} = \frac{(\alpha_1 \beta_3 - \alpha_3 \beta_1) + (\alpha_2 \beta_3 - \alpha_3 \beta_2) \ast F(HHI)}{(\alpha_1 + \alpha_2 F(HHI) + \alpha_3 F(MHHID))^2} \]
Hypothesis test

\[ S = \frac{\partial (\beta / \alpha)}{\partial F(MHHID)} = \frac{(\alpha_1 \beta_3 - \alpha_3 \beta_1) + (\alpha_2 \beta_3 - \alpha_3 \beta_2) * F(HHI)}{(\alpha_1 + \alpha_2 F(HHI) + \alpha_3 F(MHHID))^2} \]

<table>
<thead>
<tr>
<th>PANEL B</th>
<th>(NoCtrls)</th>
<th>(Ctrls)</th>
<th>(CEOs)</th>
<th>(Non-CEOs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis test at the median (F(HHI)=0.5 and F(MHHID)=0.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inverse Comp. Ratio Test</td>
<td>0.242***</td>
<td>0.147***</td>
<td>0.306**</td>
<td>0.150***</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.006</td>
<td>0.008</td>
<td>0.041</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The more common ownership, the less RPE!
## Alternative Specifications

**PANEL A**  
Dependent: Log(TDC1), Performance: returns

<table>
<thead>
<tr>
<th></th>
<th>SIC-4</th>
<th>SIC-4</th>
<th>Hoberg-Philips</th>
<th>Hoberg-Philips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own * MHHID</td>
<td>-0.112**</td>
<td>-0.0874**</td>
<td>-0.114**</td>
<td>-0.0766**</td>
</tr>
<tr>
<td></td>
<td>(-2.471)</td>
<td>(-2.558)</td>
<td>(-2.497)</td>
<td>(-2.226)</td>
</tr>
<tr>
<td>Rival * MHHID</td>
<td>0.0888*</td>
<td>0.0437</td>
<td>0.0207</td>
<td>0.0139</td>
</tr>
<tr>
<td></td>
<td>(1.839)</td>
<td>(1.230)</td>
<td>(0.347)</td>
<td>(0.297)</td>
</tr>
<tr>
<td>MHHID</td>
<td>0.0392</td>
<td>0.0381**</td>
<td>0.187***</td>
<td>0.0698***</td>
</tr>
<tr>
<td></td>
<td>(1.374)</td>
<td>(2.085)</td>
<td>(5.807)</td>
<td>(3.491)</td>
</tr>
<tr>
<td>Own * HHI</td>
<td>-0.106**</td>
<td>-0.0546*</td>
<td>-0.0467</td>
<td>-0.0624*</td>
</tr>
<tr>
<td></td>
<td>(-2.525)</td>
<td>(-1.696)</td>
<td>(-1.097)</td>
<td>(-1.951)</td>
</tr>
<tr>
<td>Rival * HHI</td>
<td>0.0947**</td>
<td>0.0360</td>
<td>0.0780</td>
<td>0.0613</td>
</tr>
<tr>
<td></td>
<td>(2.155)</td>
<td>(1.061)</td>
<td>(1.330)</td>
<td>(1.296)</td>
</tr>
<tr>
<td>HHI</td>
<td>-0.158***</td>
<td>-0.0186</td>
<td>0.0253</td>
<td>0.00829</td>
</tr>
<tr>
<td></td>
<td>(-5.292)</td>
<td>(-0.774)</td>
<td>(0.760)</td>
<td>(0.391)</td>
</tr>
<tr>
<td>Own</td>
<td>0.284***</td>
<td>0.195***</td>
<td>0.268***</td>
<td>0.196***</td>
</tr>
<tr>
<td></td>
<td>(7.004)</td>
<td>(6.337)</td>
<td>(6.292)</td>
<td>(6.174)</td>
</tr>
<tr>
<td>Rival</td>
<td>-0.103**</td>
<td>-0.0549</td>
<td>-0.0584</td>
<td>-0.0506</td>
</tr>
<tr>
<td></td>
<td>(-2.327)</td>
<td>(-1.642)</td>
<td>(-1.013)</td>
<td>(-1.117)</td>
</tr>
</tbody>
</table>

- Observations: 184,079 184,079 166,037 166,037  
- R-squared: 0.514 0.166 0.502 0.139  
- Industry FE: Yes Yes Yes Yes  
- Year FE: Yes Yes Yes Yes  
- Executive-Firm FE: No Yes No Yes
Hypothesis test (alternative industries)

<table>
<thead>
<tr>
<th>PANEL B</th>
<th>SIC-4</th>
<th>SIC-4</th>
<th>Hoberg-Philips</th>
<th>Hoberg-Philips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis test at the median ((F(HHI)=0.5 \text{ and } F(MHHID)=0.5))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inverse Comp. Ratio Test</td>
<td>0.147***</td>
<td>0.133***</td>
<td>0.978</td>
<td>0.173***</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.008</td>
<td>0.003</td>
<td>0.172</td>
<td>0.005</td>
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</table>

The more common ownership, the less RPE.
Capitized stock and option compensation

- **Dependent variable is wealth-performance sensitivity from Edmans, Gabaix & Landier (2009)**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
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<tbody>
<tr>
<td><strong>Dep. variable</strong></td>
<td>ln(B1)</td>
<td>ln(B1)</td>
<td>ln(B1)</td>
<td>ln(B1)</td>
<td>ln(B2)</td>
<td>ln(B3)</td>
</tr>
<tr>
<td>MHHID</td>
<td>-0.372***</td>
<td>-0.598***</td>
<td>-0.367***</td>
<td>-0.598***</td>
<td>-0.447***</td>
<td>-0.444***</td>
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<tr>
<td></td>
<td>(-4.117)</td>
<td>(-5.936)</td>
<td>(-3.989)</td>
<td>(-5.496)</td>
<td>(-4.414)</td>
<td>(-4.129)</td>
</tr>
<tr>
<td>HHI</td>
<td>-0.338***</td>
<td>-0.337***</td>
<td>-0.197*</td>
<td>-0.436***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.331)</td>
<td>(-3.139)</td>
<td>(-1.957)</td>
<td>(-3.979)</td>
<td></td>
<td></td>
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<tr>
<td>Log(Sale)</td>
<td></td>
<td></td>
<td>-0.00831</td>
<td>-0.000520</td>
<td>-0.480***</td>
<td>0.414***</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>(-0.488)</td>
<td>(-0.0295)</td>
<td>(-29.18)</td>
<td>(24.37)</td>
</tr>
</tbody>
</table>

- **Observations**: 26,430  
- **R-squared**: 0.075  
- **Industry FE**: Yes  
- **Year FE**: Yes
Other robustness checks

- Endogeneity of $s$: $1/n$ instead of true $s$

- Different measures of ownership concentration
Idea of Antón-Polk’s JF 2014 shock

- Mutual funds are firms’ largest owners
- 2003 trading scandal (market timing, late trading) led to outflows from implicated funds and inflows at non-implicated families
  - Unrelated to portfolio firm’s future compensation structures
Idea of Antón-Polk’s JF 2014 shock

- Mutual funds are firms’ largest owners
- 2003 trading scandal (market timing, late trading) led to outflows from implicated funds and inflows at non-implicated families
  - Unrelated to portfolio firm’s future compensation structures
- Formally, the instrument is

\[
\left( \frac{Scandalous \ MHHID}{MHHID} \right)_{i};
\]

| PANEL B |
|-------------------------|------------------------|------------------------|------------------------|
| Hypothesis test at the median (F(HHI)=0.5 and F(MHHID)=0.5) | Inverse Comp. Ratio Test | P-Value |
| 0.497** | 0.392** | 0.044 |
| 0.661** | 0.561*** | 0.023 |
| 0.044 | 0.005 |  |
Interpretation of results

- Fact: common ownership associated with top management incentives that may encourage less competition and more cooperation

- That does **not** imply that common owners set up pay packages with the conscious goal of reducing competition
  - Index funds’ presence → activists’ absence (Trian loses proxy fight against DuPont, main funds vote against)
  - Index funds don’t push pro-competitive policies like activists
**Interpretation of results**

- Fact: common ownership associated with top management incentives that may encourage less competition and more cooperation.

- That does **not** imply that common owners set up pay packages with the conscious goal of reducing competition.
  - Index funds’ presence $\rightarrow$ activists’ absence (Trian looses proxy fight against DuPont, main funds vote against).
  - Index funds **don’t** push pro-competitive policies like activists.

- That’s the benign interpretation ... but we also know:
  - 45% of “engagement” meetings feature compensation.
  - “Passive Investors, not passive owners” (Appel, Gormley & Keim 2016).
  - Several examples of “misbehavior”: secret meeting with executives from several pharmaceutical companies about pricing strategy, actively advising airlines to cut capacity (Chen 2016).
Next Steps

- Stronger focus on wealth-performance sensitivity
  - WPS is a better measure of incentives than PPS
  - Less about PPS, but additional predictions about strength of incentives and product market business stealing

- Firm-level common ownership measure
  - MHHID used to be the only measure, but that’s no longer true!

- ISS Incentive Lab Data
  - Direct observation of contract terms rather than estimation
  - But contracts leave a discretionai amount (50%), hence important to look (as we do) at ex-post compensation
Conclusions
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- Economic incentives rationalize why broadly diversified investors endorse relative-performance-insensitive compensation
  - CEOs in more commonly owned industries are rewarded relatively less for own performance and more for rival performance
Conclusions

- Economic incentives rationalize why broadly diversified investors endorse relative-performance-insensitive compensation
  - CEOs in more commonly owned industries are rewarded relatively less for own performance and more for rival performance
Thank You!