Diversification vs. Monopolization: A Laboratory Experiment

Jonas Frey (Saïd Business School, University of Oxford & University of Münster), Axel Ockenfels (University of Cologne), Martin Schmalz (Saïd Business School, University of Oxford, CEPR, ECGI, University of Cologne)

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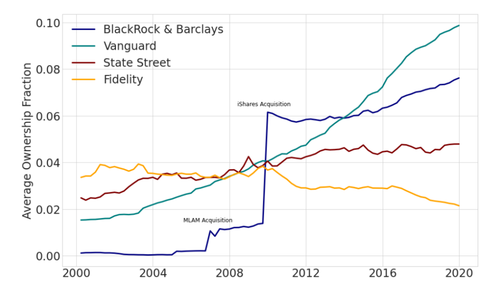
Motivation & Research Design

Motivation

1. Most large public firms' largest shareholders also own large blocks in their competitors
   - Aggressive competition may be optimal for one firm in isolation but imposes negative externalities on competitors
2. Amel-Zadeh et al. show increase in common ownership over time



Research questions

1. Is executive compensation a causal mechanism by which common ownership of competitors induces reduced product market competition?
    - Azar, Schmalz & Tecu (JF 2018) & others since show likely causal links from common ownership to higher product prices
    - Antón, Ederer, Giné & Schmalz (WP 2022) show causal link from common ownership to management incentives and a theoretical link from incentives to product market outcomes
    - No causal link from compensation to product market outcomes in empirical work
2. Do shareholders actively choose such compensation schemes?
3. Do shareholders diversify in order to incentivise their future self's to set anti-competitive compensation schemes?

Why is this important?

> *"... areas of research that I, as an antitrust enforcer, would like to see developed before shifting policy on common ownership [are]: Whether a clear mechanism of harm can be identified ..."*

FTC Commissioner Noah J. Phillips, FTC Hearing on Common Ownership, December 6, 2018

Experiment

- To answer these questions, we run a series of lab experiments.
  - Cournot market with 2 managers and 2 shareholders
  - Managers decide to either produce the Cournot quantity or half of the monopoly quantity
  - Shareholders can incentivize managers
  - Shareholders can choose if they want to be separate or common owners

Why an Experiment?

- Concern: our experimental market is heavily abstracted from the real world
- However, there are also significant advantages as the experiment allows us to ...
    - observe if shareholders diversify across competitors even if there is no risk reduction or industry specific skill
    - test the channels through which common ownership influences production outcomes
- Some of the external validity effects are mitigated because ..
    - Real top managers are highly skilled and experienced so they may figure out the optimal strategy in the complex real market
    - Some potential mechanism such as an intrinsic feeling of duty for the managers to act in the interest of their shareholders presumably stem from human psychology shared by lab subjects and real world managers

Treatment Variables

1. Initial diversification status
   - Separate (T1, T2 & T4)
   - Common (T3)
2. Incentivization method
   - Shareholders can pay managers a bonus after observing the market outcome (T1)
   - Shareholders can decide the incentive structure of the manager ex ante (T2, T3 & T4)
3. Communication (T4)
   - Between shareholders during the exchange decision
   - Between each shareholder and all managers of the firms in which she owns shares before the production decision

Incentives

- For the presentation, I will focus on the treatments with ex ante incentives
- In the ex ante incentive treatments shareholders choose between...
  1. Fixed incentives
  2. Bonus if profit is at least as high as other firm's (incentivizes high production)
  3. Bonus if margin is at least as high as other firm's (incentivizes low production)

What do we find?

- Managers respond to (anti)competitive incentives
- Shareholders are more likely to incentivise anti-competitive behavior when they are diversified
- The majority of shareholders vote to diversify
- Communication leads to more diversification, lower production choices and higher shareholder profits

Analysis

Descriptive Statistics

	Full	T2	T3	T4
Share Low Quantity	47.09%	40.0%	38.81%	75.82%
Manager Salary	299.7	286.97	289.88	342.65
Shareholder Profit	265.35	259.29	256.19	293.51
Manger Bonus	-	-	-	-
Share (Fixed, Profit, Margin) Incentives	24.0%, 36.45%, 39.55%	22.59%, 37.56%, 39.85%	18.27%, 35.65%, 46.07%	36.73%, 35.51%, 27.76%
Share (No Exchange Occured, Exchange Occured)	62.57%, 37.43%	59.9%, 40.1%	82.62%, 17.38%	33.67%, 66.33%
Share (Not Voted Exchange, Voted Exchange)	40.6%, 59.4%	35.62%, 64.38%	56.19%, 43.81%	24.08%, 75.92%
N	4670	2010	1680	980

Production Decisions with Incentives (T2+T3)

Dependent variable: A dummy that is 1 if the manager produced the low quantity and 0 otherwise

	(1)	(2)	(3)
Constant	0.3088***	0.2797***	0.4107***
	(SD=0.0262)	(SD=0.0679)	(SD=0.0737)
	($p<0.001$)	($p<0.001$)	($p<0.001$)
Relative Profit	-0.0304	-0.0246	-0.0342
	(SD=0.0300)	(SD=0.0292)	(SD=0.0296)
	($p=0.311$)	($p=0.401$)	($p=0.249$)
Relative Margin	0.2271***	0.2293***	0.2231***
	(SD=0.0337)	(SD=0.0332)	(SD=0.0335)
	($p<0.001$)	($p<0.001$)	($p<0.001$)
Session Fixed Effects	no	yes	yes
Round Fixed Effects	no	no	yes
Adjusted R^2	0.0622	0.0912	0.0947
N	3690	3690	3690

- Relative margin incentives lead to lower production

Production Decisions without Incentives (T2+T3)

Dependent variable: A dummy that is 1 if the manager produced the low quantity and 0 otherwise

	(1)	(2)	(3)
Constant	0.2521***	0.2463***	0.4163***
	(SD=0.0365)	(SD=0.0773)	(SD=0.1362)
	(p<0.001)	(p=0.001)	(p=0.002)
CommonOwnership	0.1079**	0.1309***	0.1254***
	(SD=0.0468)	(SD=0.0441)	(SD=0.0451)
	(p=0.021)	(p=0.003)	(p=0.005)
Session Fixed Effects	no	yes	yes
Round Fixed Effects	no	no	yes
Adjusted R^2	0.0123	0.1084	0.1065
N	761	761	761

- Relative margin incentives lead to lower production

Shareholders' choice of ex ante incentives (T2+T3)

Dependent variable: A dummy that is 1 if the shareholder set relative profit incentives, 0 if she set fixed incentives and -1 if she set relative margin incentives

	(1)	(2)	(3)
Constant	0.0261	0.0047	0.1715
	(SD=0.0408)	(SD=0.1088)	(SD=0.1221)
	(p=0.523)	(p=0.966)	(p=0.160)
CommonOwnership	-0.1446***	-0.1299**	-0.1473***
	(SD=0.0511)	(SD=0.0540)	(SD=0.0550)
	(p=0.005)	(p=0.016)	(p=0.007)
Session Fixed Effects	no	yes	yes
Round Fixed Effects	no	no	yes
Adjusted R^2	0.0061	0.0160	0.0162
N	3690	3690	3690

- There is a link between being diversified and setting incentives to produce the low quantity

Shareholders' choice of ownership

- The share of people who want to exchange shares is 64.38% in Treatment 2 (separate default), which is significantly different from 50% ($p < 0.001$)
  - The majority of shareholders votes to become common owners
- In Treatment 3 (common default) 44% of shareholders vote to exchange shares i.e. 56% vote to remain common owners which is significantly different from 50% ($p = 0.029$)
  - The majority of shareholders votes to remain common owners
- Despite more people actively voting for common ownership with the divided default compared to the common default, the share of common ownership outcomes is much larger (83%) with the common default than with the divided default (40%)
  - This is because both shareholders need to agree to an exchange

Communication

Dependent variable: A dummy that is 1 if the shareholder voted to exchange shares and 0 otherwise

	(1)	(2)
Constant	0.6627***	0.7719***
	(SD=0.0180)	(SD=0.0245)
	($p<0.001$)	($p<0.001$)
Communication	0.0965***	0.0848**
	(SD=0.0345)	(SD=0.0346)
	($p=0.005$)	($p=0.014$)
Round Fixed Effects	no	yes
Adjusted R^2	0.0068	0.0107
N	4790	4790

- The fraction of shareholders who vote for an ownership exchange is significantly higher with communication

Communication, Incentives and Production

Dependent variable: A dummy that is 1 if the manager produced the low quantity and 0 otherwise

	(1)	(2)	(3)
Constant	0.3088***	0.2797***	0.3563***
	(SD=0.0262)	(SD=0.0680)	(SD=0.0723)
	(p<0.001)	(p<0.001)	(p<0.001)
Relative Profit	-0.0304	-0.0246	-0.0300
	(SD=0.0300)	(SD=0.0293)	(SD=0.0295)
	(p=0.311)	(p=0.401)	(p=0.310)
Relative Margin	0.2271***	0.2293***	0.2258***
	(SD=0.0337)	(SD=0.0332)	(SD=0.0335)
	(p<0.001)	(p<0.001)	(p<0.001)
Communication	0.4829***	0.4122***	0.4098***
	(SD=0.0474)	(SD=0.0712)	(SD=0.0717)
	(p<0.001)	(p<0.001)	(p<0.001)
Relative ProfitXCommunication	-0.1435**	-0.0774	-0.0831
	(SD=0.0661)	(SD=0.0608)	(SD=0.0609)
	(p=0.030)	(p=0.203)	(p=0.173)
Relative MarginXCommunication	-0.1254**	-0.1042**	-0.1037**
	(SD=0.0533)	(SD=0.0510)	(SD=0.0513)
	(p=0.019)	(p=0.041)	(p=0.043)
Session Fixed Effects	no	yes	yes
Round Fixed Effects	no	no	yes
Adjusted R^2	0.1451	0.1847	0.1851
N	4670	4670	4670

Conclusion

- A majority of shareholders votes for common ownership
- Shareholders with common ownership set more anti-competitive incentives
- Managers respond to incentives
- Communication leads to more common ownership and has a direct effect on production decisions that does not come from incentives