Innovation: The Bright Side of Common Ownership

Miguel Antón
IESE

Florian Ederer
Yale SOM

Mireia Giné
IESE

Martin Schmalz
University of Michigan

WAP FIN @ Stern

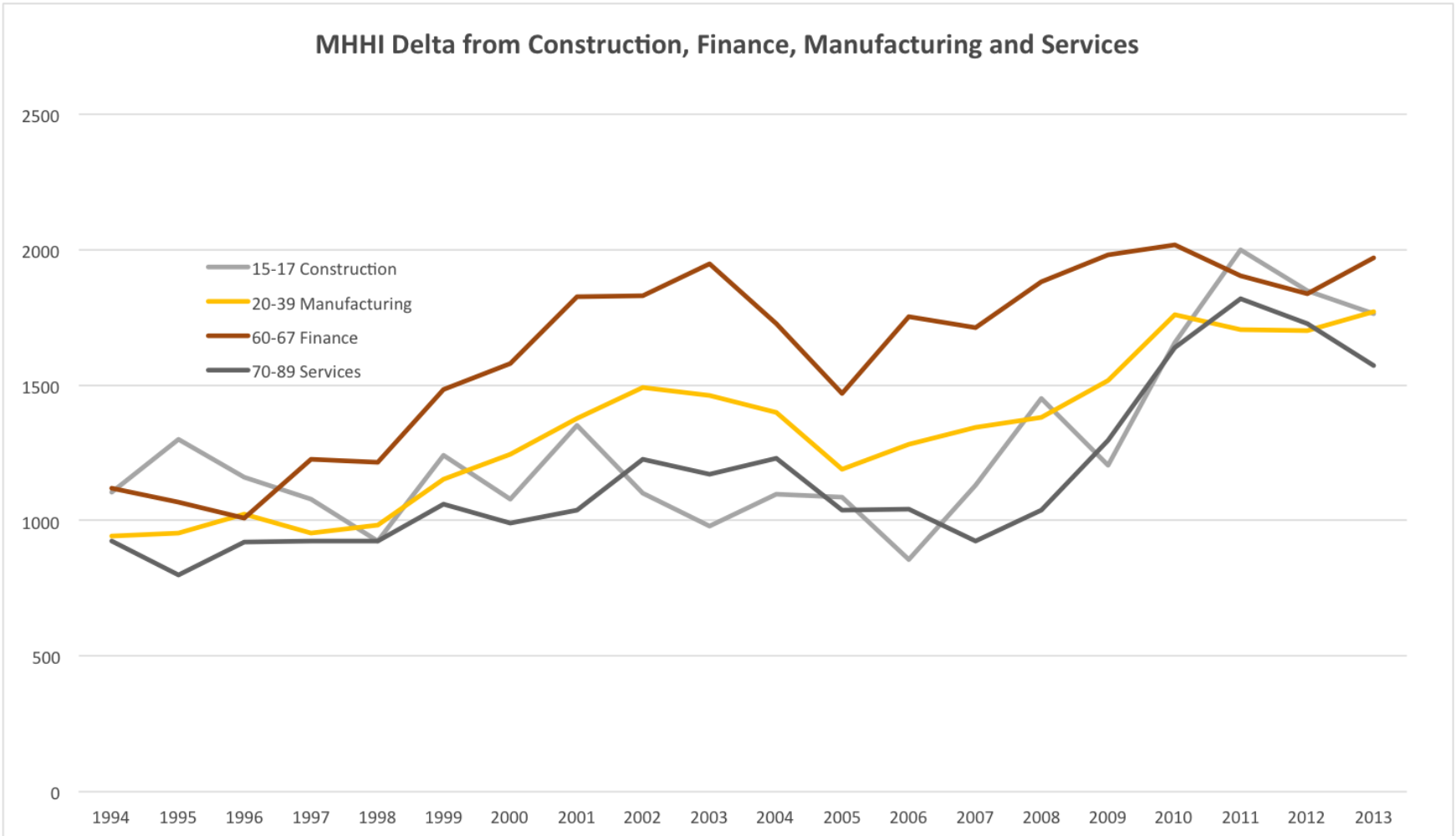
What is "common ownership"?

JP Morgan Chase	**%**	**Bank of America**	**%**	**Citigroup**	**%**
BlackRock	6.4	Berkshire Hathaway*	6.9	BlackRock	6.1
Vanguard	4.7	BlackRock	5.3	Vanguard	4.4
State Street	4.5	Vanguard	4.5	State Street	4.2
Fidelity	2.7	State Street	4.3	Fidelity	3.6
Wellington	2.5	Fidelity	2.1	Capital World Investors	2.4

Wells Fargo	**%**	**US Bancorp**	**%**	**PNC Bank**	**%**
Berkshire Hathaway	8.8	BlackRock	7.4	Wellington	8.0
BlackRock	5.4	Vanguard	4.5	BlackRock	4.7
Vanguard	4.5	Fidelity	4.4	Vanguard	4.6
State Street	4.0	State Street	4.4	State Street	4.6
Fidelity	3.5	Berkshire Hathaway	4.3	Barrow Hanley	4.0

* Warrants without voting rights.

Common ownership is rising, with no end in sight



What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?
    - ⋆ CO helps overcome free-rider problem

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?
    - ⋆ CO helps overcome free-rider problem amid high spillovers (β)

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?
    - ⋆ CO helps overcome free-rider problem amid high spillovers (β)
    - ⋆ CO can also discourage innovation: no incentive to invest in ability to steal market share from competitors

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ★ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?
    - ★ CO helps overcome free-rider problem amid high spillovers (β)
    - ★ CO can also discourage innovation: no incentive to invest in ability to steal market share from competitors
    - ★ Which effect prevails depends on parameters

What's the question?

- Are there welfare-enhancing effects of common ownership (CO)?
  - We know $\exists$ anti-competitive effects (Azar et al., 2015, 2016)
    - ⋆ Firms internalize competitive externalities on other firms $\Rightarrow$ choose lower q, higher p $\Rightarrow$ deadweight loss
  - What if firms can also choose (cost-reducing) innovation?
    - ⋆ CO helps overcome free-rider problem amid high spillovers (β)
    - ⋆ CO can also discourage innovation: no incentive to invest in ability to steal market share from competitors
    - ⋆ Which effect prevails depends on parameters
  - **Does common ownership lead to more innovation?**

Why is that interesting?

1. People care about (determinants of) innovation
   - at the firm level:
     - ★ e.g., does common ownership help explain why public firms innovate less (Bernstein, 2015)?
     - ★ Why did innovation activity move from public to private firms (Itenberg, 2015)?

Why is that interesting?

1. People care about (determinants of) innovation
   - at the firm level:
     - ★ e.g., does common ownership help explain why public firms innovate less (Bernstein, 2015)?
     - ★ Why did innovation activity move from public to private firms (Itenberg, 2015)?
   - at the macro level: e.g. is there a link between the secular decline in productivity growth and the increase in common ownership?

Why is that interesting?

1. People care about (determinants of) innovation
   - at the firm level:
     - ★ e.g., does common ownership help explain why public firms innovate less (Bernstein, 2015)?
     - ★ Why did innovation activity move from public to private firms (Itenberg, 2015)?
   - at the macro level: e.g. is there a link between the secular decline in productivity growth and the increase in common ownership?

2. People care about the welfare effects of common ownership
   - There can be pro-competitive effects **only** if CO $\rightarrow$ innovation
   - Today: is there evidence for that necessary condition?

Literature

- HHI and innovation:
  - d'Aspremont & Jacquemin (AER 1988)
  - Kamien et al (AER 1992)
  - Leahy & Neary (AER 1997)
- ... and common ownership, in Cournot:
  - Lopez & Vives (2016)
- We generalize Lopez & Vives to accommodate
  1. product differentiation
  2. strategic complements (i.e., Bertrand)

Overview of the model

1. Imperfect competition

Overview of the model

1. Imperfect competition
2. Potentially diversified shareholders

Overview of the model

1. Imperfect competition
2. Potentially diversified shareholders
3. Variation in the degree of product market closeness a
   - a decreases incentives to compete (and innovate) when common ownership increases (that's the anti-competitive effect)

Overview of the model

1. Imperfect competition
2. Potentially diversified shareholders
3. Variation in the degree of product market closeness a
   - a decreases incentives to compete (and innovate) when common ownership increases (that's the anti-competitive effect)
4. Innovation
   - Requires investment, but reduces marginal cost c
   - Technological spillovers β: reduce other firms' marginal costs
   - β increases incentives to innovate amid high common ownership

Overview of the model

1. Imperfect competition
2. Potentially diversified shareholders
3. Variation in the degree of product market closeness a
   - a decreases incentives to compete (and innovate) when common ownership increases (that's the anti-competitive effect)
4. Innovation
   - Requires investment, but reduces marginal cost c
   - Technological spillovers β: reduce other firms' marginal costs
   - β increases incentives to innovate amid high common ownership

- Exciting result: comparative statics of innovation w.r.t. common ownership do not depend on the form of competition (B or C)!

Data and specifications

- Ownership from 13Fs
- R&D from Compustat
- Patents and value of innovation from Seru et al. (QJE, forth.)
- Technological spillovers (β) from Bloom et al. (Etra, 2013)
- Sample constrained by the above
  - SIC Compustat begins in 1987
  - Bloom-spillovers by firm-year: 1980 to 2001
  - Seru-patents until 2010; R&D input until 2015
- Industry and year FE. Firm-level clustering. Aghion, Van Reenen & Zingales (2013) controls, capital intensity, market cap, age

Innovation input (industry level)

	LOG(1 + R&D / ASSETS)								
	SPILLOVER FIRM YEAR			SPILL using 2000 SPILLOVERS FIRM			SPILL using 2000 SPILL AVG INDUSTRY		
	LOW	MID	HIGH	LOW	MID	HIGH	LOW	MID	HIGH
MHHID	0.000925	0.0235***	0.0241***	-0.0109*	0.0106*	0.0177**	-0.00708	0.0485***	0.0307***
	(0.139)	(3.323)	(2.739)	(-1.966)	(1.895)	(2.393)	(-1.188)	(7.985)	(5.837)
HHI	-0.0220*	-0.0114	-0.0199*	-0.0261**	-0.0193**	-0.0262***	-0.0115	-0.0182***	-0.0491***
	(-1.722)	(-1.186)	(-1.781)	(-2.217)	(-2.048)	(-2.766)	(-1.584)	(-3.192)	(-8.707)
Log(1+Mkt Value)	0.000442	-0.000724	0.00127	-0.000148	-0.000258	0.000211	-0.00215***	-0.00828***	-0.00734***
	(0.316)	(-0.471)	(0.703)	(-0.0857)	(-0.175)	(0.108)	(-3.295)	(-10.14)	(-9.385)
Log(1+Capital/Labor)	-0.00902***	-0.00410	-0.00938**	-0.00853*	-0.00279	-1.40e-05	-0.00648***	-0.0117***	-0.00893***
	(-2.754)	(-1.191)	(-2.314)	(-1.876)	(-0.833)	(-0.00368)	(-3.050)	(-6.017)	(-5.253)
Log(1+Firm Age)	-0.00797	-0.00583	-0.0182***	-0.00765	-0.0124**	-0.0188***	-0.00703***	-0.0133***	-0.0113***
	(-1.627)	(-1.392)	(-4.968)	(-1.432)	(-2.122)	(-5.015)	(-5.536)	(-9.901)	(-9.138)
Observations	1,575	2,097	2,354	2,272	2,941	3,332	10,198	25,706	25,764
R-squared	0.309	0.316	0.391	0.270	0.282	0.327	0.351	0.289	0.223
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Innovation output (industry level)

	LOG(1 + Tsm) (Total stock market value of patents)								
	SPILLOVER FIRM YEAR			SPILL FIRM Extrap 2000			SPILL INDUSTRY Extrap 2000		
	LOW	MID	HIGH	LOW	MID	HIGH	LOW	MID	HIGH
MHHID	0.145	0.329	0.618***	0.0189	-0.0127	0.326*	0.135	-0.0376	0.166*
	(0.700)	(1.450)	(3.119)	(0.0810)	(-0.0630)	(1.701)	(0.932)	(-0.333)	(1.653)
HHI	-0.123	0.386	0.504**	-0.206	-0.0156	0.158	0.325*	0.0571	0.138
	(-0.588)	(1.638)	(2.378)	(-0.787)	(-0.0722)	(0.739)	(1.865)	(0.493)	(1.242)
Log(1+Mkt Value)	0.757***	0.974***	1.154***	0.886***	1.046***	1.187***	0.792***	0.838***	0.950***
	(17.04)	(21.98)	(34.79)	(16.03)	(22.80)	(31.17)	(29.75)	(45.14)	(57.65)
Log(1+Capital/Labor)	-0.109	-0.0196	0.138	-0.181	0.188*	0.158	-0.00670	0.124***	0.195***
	(-0.920)	(-0.188)	(1.591)	(-1.559)	(1.700)	(1.523)	(-0.114)	(3.855)	(5.964)
Log(1+Firm Age)	0.270***	0.119	0.212***	0.219**	0.0412	0.170**	0.0905**	0.132***	0.213***
	(3.308)	(1.136)	(3.390)	(2.053)	(0.377)	(2.203)	(2.354)	(4.979)	(8.052)
Observations	991	1,587	2,069	1,239	1,977	2,514	3,505	10,111	10,916
R-squared	0.784	0.822	0.883	0.797	0.822	0.879	0.747	0.762	0.804
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Innovation input (firm-level)

	LOG(1 + R&D / ASSETS)								
	SPILLOVER FIRM YEAR			SPILL using 2000 SPILLOVERS FIRM			SPILL using 2000 SPILL AVG INDUSTRY		
	LOW	MID	HIGH	LOW	MID	HIGH	LOW	MID	HIGH
NewCO_Top (firm leve	-0.00862	-0.00162	0.0131*	-0.00934*	-0.00231	0.00862	-0.0101**	0.00199	0.0128***
	(-1.555)	(-0.232)	(1.825)	(-1.704)	(-0.406)	(1.392)	(-1.983)	(0.432)	(2.854)
HHI	-0.0457	-0.105***	-0.0724*	-0.0154	-0.0748**	-0.156***	0.0360*	-0.0425**	-0.212***
	(-1.152)	(-2.619)	(-1.919)	(-0.505)	(-2.395)	(-5.135)	(1.776)	(-1.965)	(-10.93)
HHI2	0.0202	0.0940**	0.0497	-0.00528	0.0554**	0.133***	-0.0449**	0.00549	0.194***
	(0.600)	(2.446)	(1.354)	(-0.187)	(2.036)	(4.294)	(-2.328)	(0.239)	(8.644)
Log(1+Mkt Value)	-0.000756	-0.000252	0.000247	-0.000584	-0.000182	-0.000530	-0.00247***	-0.00978***	-0.00897***
	(-0.480)	(-0.155)	(0.134)	(-0.306)	(-0.120)	(-0.265)	(-3.150)	(-10.70)	(-10.41)
Log(1+Capital/Labor)	-0.00761**	-0.00683*	-0.00817*	-0.00845*	-0.00296	-0.00146	-0.00601**	-0.0127***	-0.00916***
	(-2.172)	(-1.862)	(-1.971)	(-1.690)	(-0.865)	(-0.379)	(-2.556)	(-5.848)	(-4.960)
Log(1+Firm Age)	-0.00922	-0.00663	-0.0210***	-0.0115*	-0.0119*	-0.0196***	-0.00655***	-0.0144***	-0.0120***
	(-1.546)	(-1.456)	(-4.683)	(-1.729)	(-1.870)	(-4.596)	(-4.504)	(-9.161)	(-8.716)
Observations	1,119	1,505	1,690	1,892	2,429	2,769	8,250	21,362	21,296
R-squared	0.306	0.362	0.407	0.276	0.312	0.353	0.366	0.297	0.245
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Future work

1. Explore comparative static w.r.t. product market spillovers a
   - $a \times \beta$ matrix

Future work

1. Explore comparative static w.r.t. product market spillovers a
   - $a \times \beta$ matrix

2. Address endogeneity of parameters modeled as exogenous?
   - Of common ownership λ (omitted industry trends)
     - ⋆ Add industry-time FE?
   - Of the level of spillovers a, β (type of innovation; strategic positioning of the firm)

Conclusions

- Common ownership encourages innovation in *some* firms
  - Specifically, in high-spillover industries
  - Consistent with (and necessary for!) pro-competitive effects

Conclusions

- Common ownership encourages innovation in *some* firms
  - Specifically, in high-spillover industries
  - Consistent with (and necessary for!) pro-competitive effects

- However, the effect is non-positive on average [not shown]
  - Implies: on average, common ownership reduces output $\Rightarrow$ anti-competitive effects dominate

Conclusions

- Common ownership encourages innovation in *some* firms
  - Specifically, in high-spillover industries
  - Consistent with (and necessary for!) pro-competitive effects
- However, the effect is non-positive on average [not shown]
  - Implies: on average, common ownership reduces output $\Rightarrow$ anti-competitive effects dominate
- Message to policy makers
  - Focus on socially wasteful forms of common ownership
  - E.g. let it go in tech, but tackle airlines, banking, ...