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Rising Markups, Common Ownership, and Technological Capacities

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Research Question & Motivation

What is the effect of common ownership by institutional investors on firm-level markups and innovation?

- Definition: Two or more competing firms held by common institutional investors
- Strategic incentives change due to rival profit internalisation through shareholder value maximisation
  - Anti-competitive tendencies: Cartelisation effect (Azar et al., 2018, JF)
  - Theory predicts pro-competitive effects on innovation (López and Vives, 2019, JPE)
- Recent interest by academics and policy makers
- Institutional investors held on average around 40% of Western European countries' GDP in assets under management in 2018 (OECD, 2019)
- Simultaneous sharp rise of firm markups (De Loecker et al., 2020, QJE)

Results & Contribution

Results

- Cartelisation effect on markups
  - Common ownership increases firm markups
  - Effect is increasing in technological spillovers ranging up to 3.4% in high-spillover industries.
- Positive effect on citation-weighted patents
  - for firms directly affected by common ownership up to 9.5% in high-spillover industries.

Contribution

- Large scale study of common ownership in European markets.
- Heterogeneous effects for different degrees of spillovers and technological capacities.
- Rising markup pattern.

Related Literature (not exhaustive)

Theory

- Common ownership measures (Bresnahan and Salop, 1986, Salop and O'Brien, 2000)
- Innovation: Theoretical foundation from López and Vives (2019)

Empirical studies

- Industry studies: Banking (Azar et al., 2016); Airline (Azar et al., 2018), Pharma (Newham et al., 2018)
- Broader firm panel
  - Common ownership creates incentives to innovate (Antón et al., 2021)
  - Estimated markup calibration of S&P 500 firms (Backus et al., 2019)
  - Product differentiation, investment, and markups of publicly quoted US firms (Kini et al., 2019)

Data and Methodology

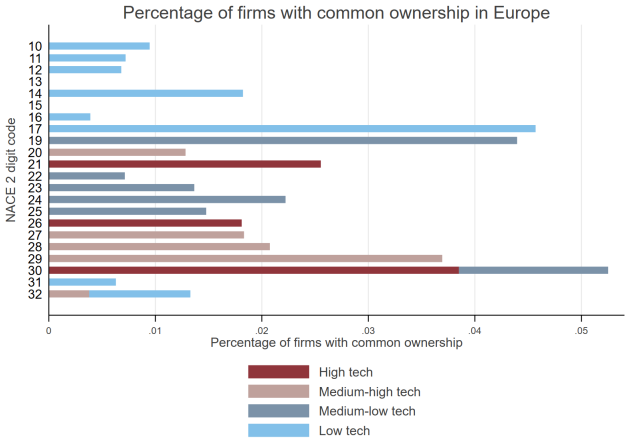
Data

- Bureau van Dijk's Amadeus firm-level panel data, 2005 to 2016
- Accounting, ownership, and patent data for listed and non-listed European firms
- Measure of technological spillovers from Bloom et al. (2013)

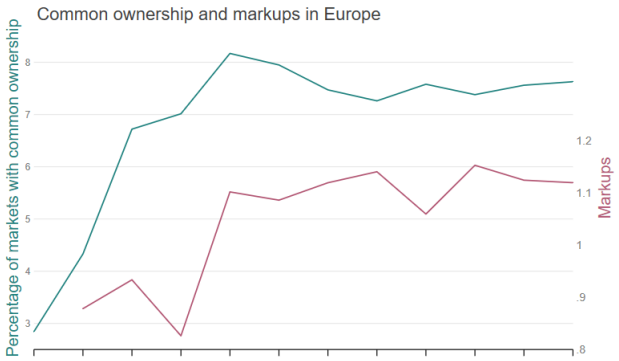
Method

- Structural production function estimation (Ackerberg et al., 2015, Econometrica)
  - Recovering markups from material elasticities and material expenditure shares (De Loecker and Warzynski, 2012, AER)
- Propensity score reweighting estimator
  - Treatment definition: Markets' first exposure to common ownership
- Treatment intensity using the MHHI

Common Ownership across industries



Evolution of Markups and Common Ownership



Full sample

Baseline Regression Specification

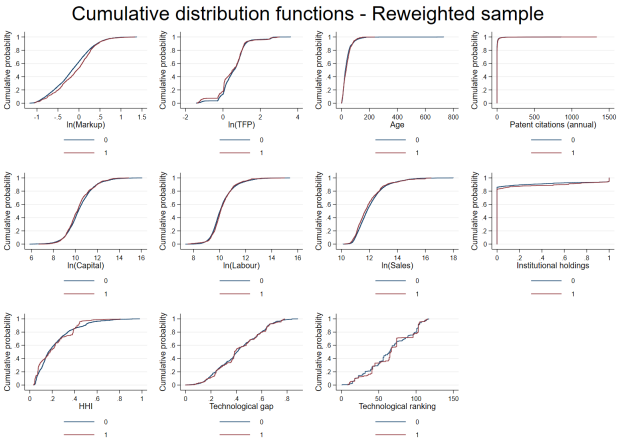
Average Treatment Effect (ATE)

Propensity score reweighting

$$ln(\mu)_{jmt} = \beta_1 \mathbf{1}[\text{MHHI delta} > 0]_{mt} + \beta_2 \text{HHI}_{mt} + \beta_3 \text{Inst}_{jt} + \nu_j + \tau_t + \epsilon_{jmt}$$

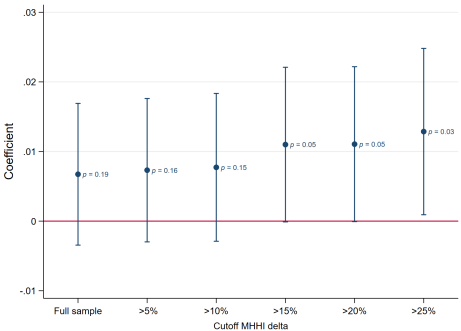
μ	Outcome Variable: Markups, patent citations (extra controls)
$\mathbf{1}[\text{MHHI delta} > 0]_{mt}$	Common ownership treatment indicator variable
HHI_{mt}	Market concentration
ν_j, τ_t	Firm and year-fixed effects
Weights	Treated $\frac{1}{\hat{p}}$, Control $\frac{1}{1-\hat{p}}$

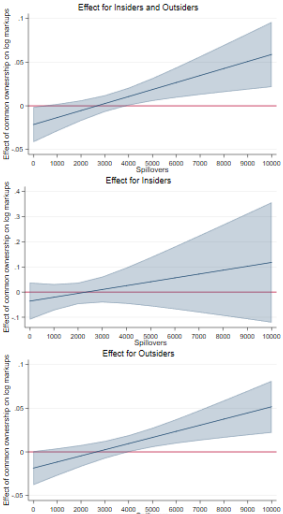
Propensity Score Reweighting



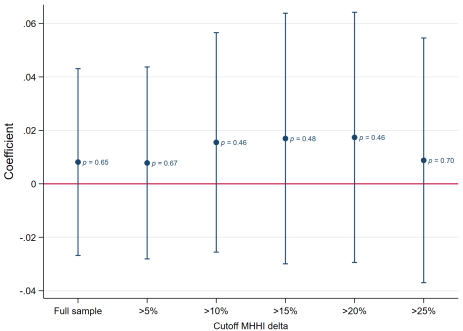
Sample	Balancing: Unweighted	Balancing: Weighted
ln(Markup)	0.149**	0.076
	(0.058)	(0.096)
ln(TFP)	-0.152	-0.076
	(0.136)	(0.147)
Age	1.635	1.469
	(2.174)	(2.681)
Patent citations	3.424**	0.181
	(1.483)	(0.993)
ln(Capital)	-0.284***	-0.038
	(0.104)	(0.193)
ln(Labour)	0.107*	0.043
	(0.059)	(0.076)
ln(Sales)	-0.123*	-0.056
	(0.065)	(0.142)
Inst. Holdings	0.021**	0.023
	(0.010)	(0.020)
HHI	-0.070***	-0.013
	(0.025)	(0.043)
Techn. gap	0.024	0.019
	(0.027)	(0.036)
Techn. ranking	4.746	1.513
	(4.906)	(6.022)

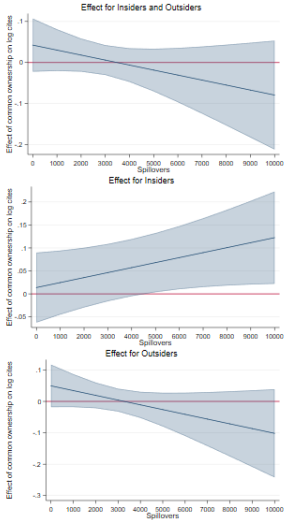
Treatment Intensity and Spillovers - Markups





Treatment Intensity and Spillovers - Innovation





Technological Capacities Markups

Dep. Variable:	**ln(Markup)**			
	(1)	(2)	(3)	(4)
Technology	Low	Medium-Low	Medium-High	High
$1_{(MHHIdelta>0)}$	0.017**	0.005	-0.006	0.021**
	(0.008)	(0.011)	(0.009)	(0.009)
HHI	0.114**	0.037	0.041	-0.029
	(0.057)	(0.047)	(0.039)	(0.051)
Inst. Holdings	-0.033**	0.048***	0.006	-0.028
	(0.014)	(0.017)	(0.023)	(0.047)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.98	0.92	0.95	0.94
N	3633	4978	5117	1664
Market clusters	120	138	158	52

Note: Standard errors in parentheses and clustered at the three-digit industry-country level. * p¡0.10, ** p¡0.05, *** p¡0.01 Market definition: HHI and MHHI delta calculated at the three-digit industry-country level. HHI and MHHI delta are rescaled by division by 10,000, such that the HHI ranges from 0 to 1.

Technological Capacities Innovation

Dep. Variable:	**ln(Patent Citations)**			
	(1)	(2)	(3)	(4)
Technology	Low	Medium-Low	Medium-High	High
$1_{(MHHIdelta>0)}$ × Insider	-0.008	-0.016	0.169**	0.201***
	(0.025)	(0.058)	(0.073)	(0.069)
$1_{(MHHIdelta>0)}$ × Outsider	-0.014	-0.009	0.040	-0.016
	(0.018)	(0.027)	(0.054)	(0.060)
HHI	-0.012	-0.117	0.054	-0.425*
	(0.065)	(0.138)	(0.150)	(0.219)
Inst. Holdings	-0.025	0.334**	0.018	-0.065
	(0.040)	(0.158)	(0.068)	(0.142)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.58	0.77	0.79	0.87
N	3633	4978	5117	1664
Market clusters	120	138	158	52

Note: Standard errors in parentheses and clustered at the three-digit industry-country level. * p<0.10, ** p<0.05, *** p<0.01 Market definition: HHI and MHHI delta calculated at the three-digit industrycountry level. Insiders are defined as directly commonly owned firms. Outsiders are non-commonly owned competitors in the same market. We control for HHI at the three-digit industry country level, ln(TFP), market size measured by average sales at the market level, capital intensity, 1-Lerner index, and age, share of institutional holdings, a dummy for zero citations, firm and year-fixed effects. Zero patent citations are set to one. HHI and MHHI delta are rescaled by division by 10,000, such that the HHI ranges from 0 to 1.

Conclusion

Findings

- Addressing common ownership, innovation, and firm-level markups using broad European manufacturing sample
- Anti-competitive effect on markups that is increasing in technological spillovers.
- Pro-competitive effects on innovation in industries with increasing technological spillovers:
  Common ownership increases patent citations for firms directly commonly owned.
- Contribution to recent findings of rising markups.
- More theoretical and empirical evidence necessary for welfare effects.

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