

Horizontal Minority Shareholdings and Innovation Incentives

Emilie Feyler¹

¹CERNA, Mines ParisTech

May 17, 2023



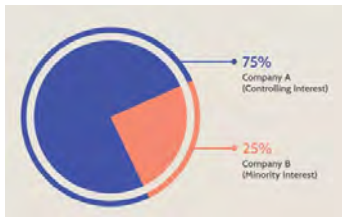
Introduction

What Are Horizontal Minority Shareholding Acquisitions?

When a firm acquires less than 50% of the voting rights or equity rights in a target competitor.

Research Question:

What is the effect of a minority stake acquisition in a competitor on innovation incentives?



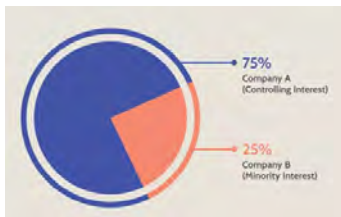
Introduction

What Are Horizontal Minority Shareholding Acquisitions?

When a firm acquires less than 50% of the voting rights or equity rights in a target competitor.

Research Question:

What is the effect of a minority stake acquisition in a competitor on innovation incentives?



Why Is It Important?

- MS acquisitions represent **more than 30 %** of the overall M&A activity globally.
- Competition authorities fear that MS acquisitions in rival firms **may lessen competition too**.
- Competition authorities fear that M&As **may decrease innovation**.

Why Is It Important?

- MS acquisitions represent **more than 30 %** of the overall M&A activity globally.
- Competition authorities fear that MS acquisitions in rival firms **may lessen competition too.**
- Competition authorities fear that M&As **may decrease innovation.**

Why Is It Important?

- MS acquisitions represent **more than 30 %** of the overall M&A activity globally.
- Competition authorities fear that MS acquisitions in rival firms **may lessen competition too**.
- Competition authorities fear that M&As **may decrease innovation**.

There Is A Growing Concern that MS Acquisitions in Rival Firms Harm Competition



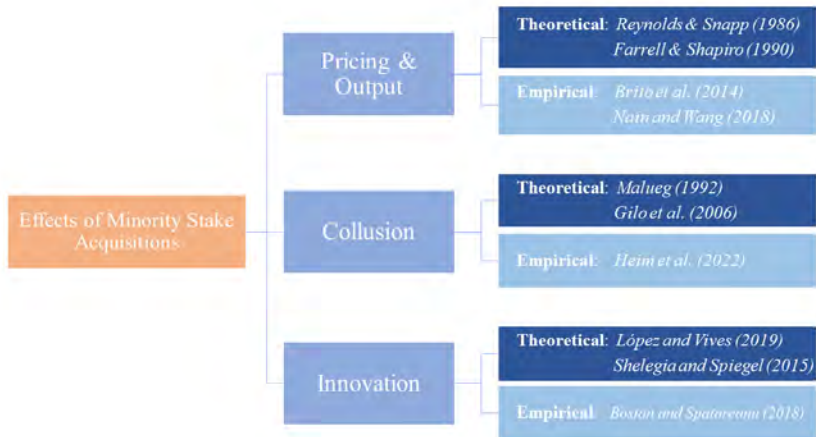
*“The Commission’s experience, the experiences of Member States and third countries, but also economic research show that in some instances the acquisition of a **noncontrolling minority stake**, such as one firm acquiring a 25% stake in a competitor, can harm competition and consumers.”* (European Commission, 2014)

*“[E]ven if a **partial-interest acquisition** does not result in effective control, it may nonetheless change a competitor’s incentives post-acquisition in a way that substantially lessens competition.”*
(FTC, 2016)



Literature on Competition and Structural Links

Most papers on MS acquisitions have focused on pricing or collusive behaviors, and have not explored the effect on innovation incentives.



Economic Theory on MS and Innovation

Two forces go in opposite direction:

- On one hand, a MS acquisition would **lessen the competitive pressure** and therefore reduce innovation from the parties, who have less incentives to outperform.
- On the other hand, a MS acquisition would help internalizing the positive technology spillover externality, and therefore would **increase innovation incentives**.

Economic Theory on MS and Innovation

Two forces go in opposite direction:

- On one hand, a MS acquisition would **lessen the competitive pressure** and therefore reduce innovation from the parties, who have less incentives to outperform.
- On the other hand, a MS acquisition would help internalizing the positive technology spillover externality, and therefore would **increase innovation incentives**.

What Did Trigger these Concerns from Competition Authorities?

Historical Case Law

- Aluminum cartel (1923)
- Taiwanese Cable TV cartel (2003)
- Ryanair's minority stake in Aer Lingus (2012)
- Brazilian cement cartel (2014)



First Paper: Empirical Strategy and Data

Empirical Strategy

- A **treatment evaluation** can explore the movements in innovation before and after a MS acquisition (“the treatment”).
- The empirical strategy needs to address endogeneity and selection bias issues.
- We use a **matching method** and we apply a **difference-in-difference** analysis.

Data

- MS Acquisitions: Zephyr (Bureau van Dijk)
- R&D expenses: Orbis (Bureau van Dijk)

▶ MS Identification

First Paper: Empirical Strategy and Data

Empirical Strategy

- A **treatment evaluation** can explore the movements in innovation before and after a MS acquisition (“the treatment”).
- The empirical strategy needs to address endogeneity and selection bias issues.
- We use a **matching method** and we apply a **difference-in-difference** analysis.

Data

- MS Acquisitions: Zephyr (Bureau van Dijk)
- R&D expenses: Orbis (Bureau van Dijk)

▶ MS Identification

Difference-in-Difference

Main Preliminary Results

- Horizontal MS acquisitions tend to reduce R&D expenses and R&D intensity of targets in the 3 years following the acquisition
- The effect seems to disappear in the long-run for acquirors
- The effect on targets seems stronger for R&D-intensive industries

Results

Average Treatment Effects: 3 Years Post Acquisition

- Effect on R&D Expenses:

	Coeff	Std. err.	P-value
Targets	-0.20*	0.121	0.095
Acquirors	-0.07	0.122	0.575

- Effect on R&D Ratio:

	Coeff	Std. err.	P-value
Targets	-0.07*	0.050	0.068
Acquirors	-0.04	0.048	0.241

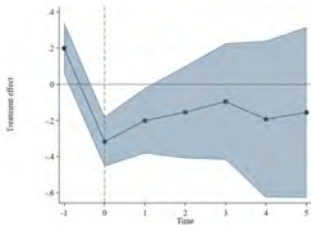
Significance values are as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results

Annual Treatment Effects: 5 Years Post Acquisition

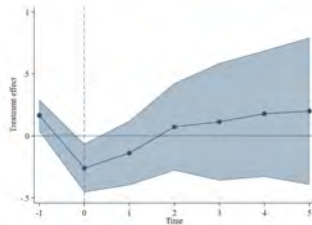
Targets

R&D Expenses:

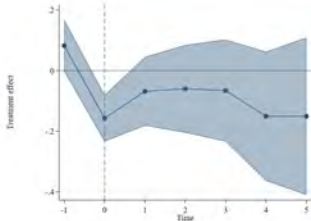


Acquirors

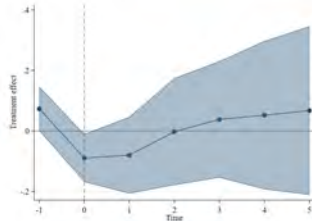
R&D Expenses:



R&D Ratio:

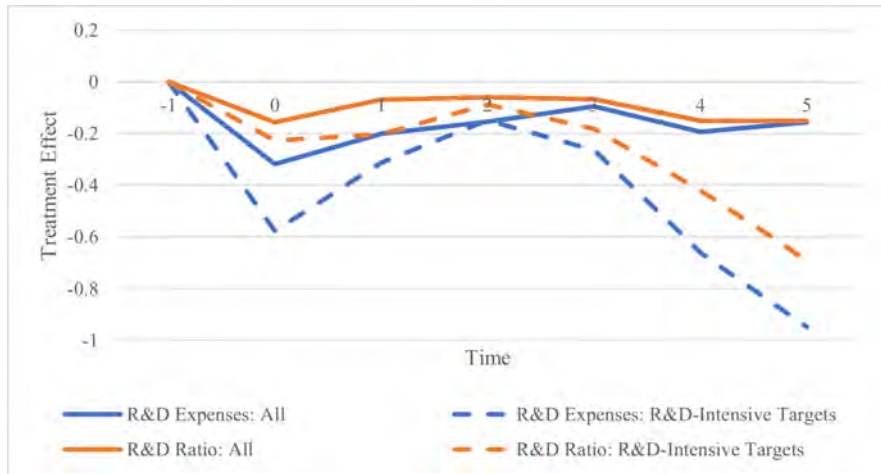


R&D Ratio:



Results

Treatment Effects on Targets: R&D-Intensive Industries



Discussion and Further Research

- Include data on patents & publications (as a measure of R&D outputs)
- Develop a theoretical framework

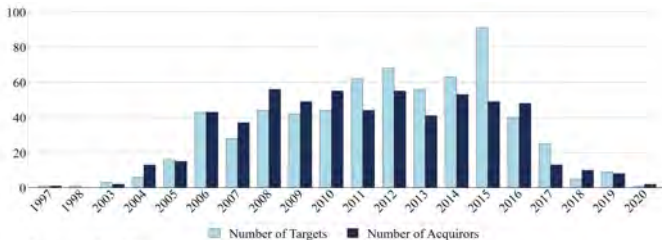
Thank You

Appendix

Identification of Horizontal MS Targets and Acquirors

▶ back

- **Step 1:** Identify all completed MS in Orbis with final stake <50%
- **Step 2:** Eliminate MS where the acquiror or target is an investor
- **Step 3:** Eliminate non-horizontal MS (with no overlap between the SIC, NAICS, NACE codes of the target and the acquiror/parent)
- **Step 4:** Eliminate firms involved in majority acquisitions (within 5 years of the MS)



Sources: Zephyr, Orbis.

Appendix

Propensity Score Estimation

▶ back

	(1) Targets	(2) Acquirors
Log of R&D Expenses(t-1)	0.025** (0.010)	0.046*** (0.011)
Log of R&D Ratio(t-1)	-0.021 (0.018)	-0.051** (0.021)
Log of Sales(t-1)	0.177*** (0.010)	0.275*** (0.012)
Liquidity Ratio(t-1)	0.005* (0.003)	0.010*** (0.003)
Medium Sized Company	-0.050 (0.062)	-0.072 (0.093)
Small Company	-0.252** (0.127)	-0.060 (0.183)
Very Large Company	0.618*** (0.048)	0.491*** (0.057)
Constant	-6.742*** (0.379)	-7.370*** (0.440)
Observations N	2,160,080	2,145,189
Pseudo R^2	0.43	0.53
Country FE	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes

- The **Propensity Score** $Pr(Z_i|X_{i,t-1})$ predicts the probability that a firm receives the treatment based on pre-treatment observable characteristics
- Treated and control observations are then matched based on their propensity scores

Matching:

- Probit Model
- PSM with 3 nearest neighbors, with replacement
- Exact matching for:
 - year
 - 3-digit NAICS codes
- Common support assumption

Parallel Trends

▶ back

Targets



Acquirors

