Common Ownership along the Supply Chain and Supplier Innovations

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Overview

- **Suppliers' innovation performances** are **improved** when **financial institutions** are holding **both the suppliers and their customers**.
- In particular, institutional common ownership increases suppliers' **investment in innovation** by **mitigating hold-up issues** between suppliers and customers, and enhances their **innovation output** by **improving technological spillovers** between suppliers and customers.
- I provide plausible evidence for **causality** using a difference-in-differences approach based on a quasi-natural experiment in the form of **financial institution mergers and acquisitions**.

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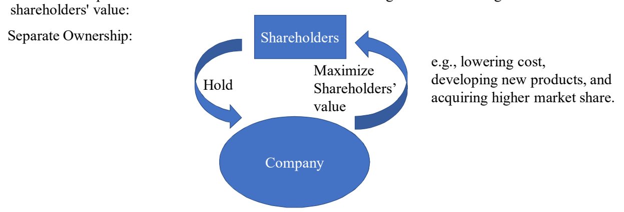
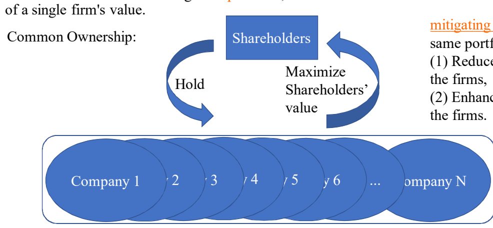
Motivation

Separate Ownership vs. Common Ownership

- A basic assumption in financial economics is that the ultimate goal of firm management is to maximize shareholders' value:



- When shareholders are holding multiple firms, the shareholders will aim to maximize the portfolio value instead of a single firm's value.



mitigating conflicts of the firms in the same portfolio:
(1) Reduce the competitions between the firms,
(2) Enhance the collaborations between the firms.

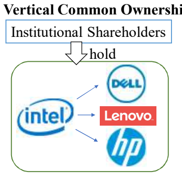
Horizontal Common Ownership vs. Vertical Common Ownership

- **Horizontal Common Ownership**: competitors are held in the same portfolio
e.g. Azar et al. (2018)

Horizontal common ownership in airline industry will lead to higher prices of the airline tickets.

- More evidence for anticompetitive effect due to horizontal common ownership (e.g., He and Huang 2017, Azar et al. 2018).
- Regulatory Implication: Potential anti-trust scrutiny on the institutional investors (e.g., Elhauge 2015, Bebchuk and Hirst 2019).

- **Vertical Common Ownership**: suppliers and their customers are held in the same portfolio



- Vertical common ownership can improve the relationship between suppliers and their customers in the portfolio (Freeman 2019).
- My paper is the first to examine the impact of vertical common ownership on innovation activities.

Hypotheses Development

Hypothesis: Vertical common ownership could improve the suppliers' innovation through two potential channels:

1) **Hold-up Mitigation Channel**
   - Hold-up problems happen when suppliers invest to produce relation-specific products to a customer:
     - It could weaken the bargaining power of the supplier.
     - The customer may act opportunistically to the supplier (e.g., push down the price, threaten to cancel the order).
   - Potential hold-up issues lead to underinvestment in relation-specific investment/innovation by the supplier (Klein et al. 1978).
   - Joint asset ownership attenuates hold-up problems under conditions of asset specificity and ex-ante incomplete contracting. (Grossman and Hart 1986, Hart and Moore 1990).

2) **Technological Spillover Channel**
   - Innovation information exchange can improve corporate innovation performance:
     - Manso (2011)'s principal-agent model
     - Timely feedback from customers to suppliers is one of the potential channels that improve suppliers' innovation performance(Chu et al. 2018).
   - Common ownership of suppliers and customers can improve innovation information exchange between suppliers and customers:
     - Common ownership increases cross citations between the patents assigned to held firms (Kostovetsky and Manconi 2020, Freeman 2019).

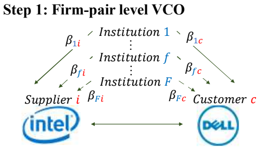
Data

Data Source

- Compustat Segments Customer: suppliers and their principal customers;
- Thomson Reuters 13F: institutional holdings;
- Kogan et al. (2017): patent application, patent market value, and patent citation;
- Capital IQ: mergers and acquisition of financial institutions;
- Compustat Segments: operating segments of each firm;
- Bureau of Economic Analysis (BEA) I/O Table: upstream and downstream industries.

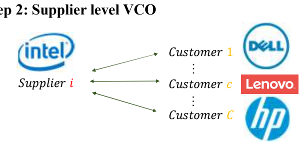
Measure of Vertical Common Ownership: VCO

Step 1: Firm-pair level VCO



$$Pairwise\ VCO:\ \beta_{1i}\cdot\beta_{1c}+\cdots+\beta_{fi}\cdot\beta_{fc}+\cdots+\beta_{Fi}\cdot\beta_{Fc}=\sum_{f=1}^{F}\beta_{fi}\beta_{fc}$$

Step 2: Supplier level VCO



$$VCO:\ w_1\cdot\sum_{f=1}^{F}\beta_{fi}\beta_{f1}+\cdots+w_c\cdot\sum_{f=1}^{F}\beta_{fi}\beta_{fc}+\cdots+w_C\cdot\sum_{f=1}^{F}\beta_{fi}\beta_{fC}=\sum_{c=1}^{C}w_c\sum_{f=1}^{F}\beta_{fi}\beta_{fc}$$

Measure of Innovation Activities

- Investment in innovation/Innovation input: R&D Intensity (R&D/sales)
- Quantity of innovation output: The number of patent applications at firm-year level
- Quality of innovation output: The average market value of patents at firm-year level

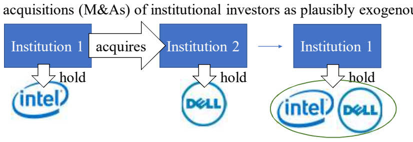
Results of Empirical Analyses

Baseline Regression

- Vertical common ownership are positively associated with suppliers' investment in innovation, quantity and quality of innovation output.

Identification

- Mergers and acquisitions (M&As) of institutional investors as plausibly exogenous positive shocks:



- Exclusion Restriction: M&As of institutional investors are not mainly driven by the purpose to affect corporate innovation.
- I collect 51 events from year 1980 to 2010.

Channel Tests

- Hold-up Mitigation Channel
  - The impact of vertical common ownership on suppliers' investment in innovation is less pronounced when the intensity of hold-up issues for suppliers is weak in the first place, in particular when:
    - suppliers are more vertically integrated, i.e., have more operating segments in the downstream industries (inside customers).
    - suppliers have relatively stronger bargaining power than customers.
    - the input to customers has less asset specificity.
- Technological Spillover Channel
  - The impact of vertical common ownership on suppliers' innovation output is stronger when technological spaces of suppliers and customers are closer.

Other Tests

- The impact of vertical common ownership on innovation input and quality of innovation output is stronger and more robust than that of horizontal common ownership.
- Firm-pair level analyses suggest that vertical common ownership can increase suppliers' relation-specific innovation.

Conclusion

- Institutional common ownership enhances suppliers' innovation performance by improving the relationship between suppliers and their customers.
- Regulators may need to think about the welfare-increasing effect resulting from common ownership before considering potential anti-trust scrutiny on common ownership.

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