Shelving or developing? The acquisition of potential competitors under financial constraints

Chiara Fumagalli
Bocconi University

Massimo Motta
ICREA-UPF & Barcelona GSE

Emanuele Tarantino
Luiss & EIEF

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Motivation

The acquisition of potential competitors (start-ups) is a widespread phenomenon.

- Exit via M&A:
  - Since mid-90s, dramatic shift from IPOs to acquisitions (Pellegrino, 2021).

**Figure 6: Venture Capital Startup Exits by Type**

**Figure Notes:** The figure above plots the number of successful venture capital exits in the United States by year and type (Initial Public Offering v/s Acquisition). The data is sourced from the National Venture Capital Association (NVCA).
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  - Hundreds of start-ups bought in recent years by the “big five”.
  - Google, between Feb 2010 and Feb 2020, acquired one company every 18 days.
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- **But extends beyond the digital industry:**
  - Cunningham et al. (2021), Eliason et al. (2020): similar patterns in pharma, healthcare.
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Motivation and research question

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- In the few cases in which AAs opened an investigation, the acquisitions were mostly cleared.
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- In the few cases in which AAs opened an investigation, the acquisitions were **mostly cleared**.

- Even though things may **change**:  
  - Facebook/Giphy blocked by the CMA (2021).
  - Visa/Plaid (US DoJ sued, deal abandoned, 2020).
  - Illumina/PacBio (FTC challenged, deal abandoned, 2019).
Traditional approach to horizontal mergers (involving actual competitors) trades off costs of market power and benefits of cost efficiencies (Williamson, 1968; Farrell and Shapiro, 1990).
Research Question

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- The acquisition of potential competitors triggers an additional trade-off:
  - The acquirer may engage in the takeover to shelve S’s project (“killer acquisition”).
  - The acquirer may develop a project that would otherwise never reach the market.
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We ask: what merger policy should the antitrust authority follow?
Preview of the Results

- Takeover price and acceptance decision convey key information for AA.
  
  ▶ A high takeover price signals that the acquisition may not be indispensable for the success of the start-up → high chances that it is anti-competitive.

The merger policy can exert a selection effect:

- Pushes towards takeovers that target only start-ups that are unable to succeed on their own and are superior in terms of welfare.

- The stricter the merger policy, the stronger the selection effect.

- The optimal merger policy might commit to standards of review that prohibit takeovers that are expected to increase welfare.

→ Despite the possible pro-competitive effect, the optimal merger policy should not be lenient towards takeovers of potential competitors.

Need to change current approach towards acquisitions of potential competitors.
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A simplified model: ingredients

**PLAYERS:**

- Incumbent (monopolist);
- Start-up;
- Antitrust Authority;

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**Asymmetric information:**
- $S$ knows own type. $I$ and AA **unsure** whether, absent takeover, start-up is able to succeed on its own. They know prior probability $= p$.
- “I think the decision we made at the time, with what we knew, was a good decision. It’s laughable to say that now, I suppose” (former Excite’s CEO on decision to turn down Google’s takeover offer in 1999).
Unsuccessful $S$ is **financially constrained**.

- $S$ funded if (and only if) $B \leq \bar{B}$.
- $S$ and financiers observe $B$. $I$ and $AA$ know the distribution and $F(\bar{B})$.
- $I$ is never constrained.
Micro-foundations

1. Unsuccessful $S$ is financially constrained.
   - $S$ funded if (and only if) $B \leq \bar{B}$.
   - $S$ and financiers observe $B$. $I$ and $AA$ know the distribution and $F(\bar{B})$.
   - $I$ is never constrained.

2. Unsuccessful $S$ lacks managerial/implementation skills.
   - Development cost is high, i.e. $cK$ with $c > 1$, for $S$ poor in managerial/implementation skills, and low, i.e. $= K$ with $c = 1$ for $S$ rich in managerial/implementation skills.
   - Development profitable if (and only if) $c = 1$.
   - $S$ observes $c$. $I$ and $AA$ know the distribution.
   - $I$ has development cost $= K$. 
Model: time-line

Early takeover (Potential competitor)

- $t=0$: Commitment to merger policy: ex-ante standards of review.
- $t=1$: Early takeover.
  - With probability $\alpha$, $I$ makes a take-it-or-leave-it offer. With probability $1-\alpha$, $S$ does.
  - The AA decides on the proposed deal.
    (If $I$ and AA do not know whether absent takeover, $S$ is able to succeed on its own.)
A simplified version of the model

Ingredients of the model

**Model: time-line**

- **Early takeover** *(Potential competitor)*

  - **t = 0**: AA establishes $\bar{H}$
  - **t = 1(a)**: Takeover offer
  - **t = 1(b)**: AA blocks/approves
  - **t = 2**: Owner decides on project development
  - **t = 3**: Payoffs

**t = 0**: Commitment to merger policy: ex-ante standards of review.

- $\bar{H}$: if $> 0$ correspond to “tolerated levels of harm”.

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Ingredients of the model

Model: time-line

$\textit{Early takeover (Potential competitor)}$

$t=0$: Commitment to merger policy: ex-ante standards of review.

- $\bar{H}$: if $\bar{H} > 0$ correspond to “tolerated levels of harm”.

$t=1$: Early takeover.

- With probability $\alpha$, $I$ makes a take-it-or-leave-it offer. With probability $1 - \alpha$, $S$ does.
- The $AA$ decides on the proposed deal.
  
  ($I$ and $AA$ do not know whether absent takeover, $S$ is able to succeed on its own)
If $S$ independent company and develops, competition: $\pi_S^d, \pi_I^d; W^d$. 
Model: payoffs (gross of $K$)

- If $S$ independent company and develops, competition: $\pi^d_S, \pi^d_I; W^d$.
- If no development, $I$ single-product (or less efficient) monopolist: $\pi^m_I; W^m$. 
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- If $I$ develops, two-product (or more efficient) monopolist: $\pi^M_I$; $W^M$. 

We assume:

- $\pi^M_I > \pi^m_I > \pi^d_I$;
- $W^m > W^M > W^d$.

Project development is privately and socially efficient:

- ▶ NPV of the project is positive for $S$: $\pi^d_S > K$.
- ▶ Net social value is positive when project developed by $I$: $W^M - W^m > K$.
- ▶ A fortiori when developed by $S$: $W^d - W^m > K$. 

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Development decision (at $t = 2$).

- $S = S_s$ always invests in project development: $\pi^d_S > K$. 

The incumbent invests iff $\pi^M_I - \pi^m_I \geq K$.

→ The incumbent may shelve projects that a successful start-up would develop.

→ Killer acquisitions.
Development decision (at $t = 2$).

- $S = S_s$ always invests in project development: $\pi_S^d > K$.

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Early takeover game (at $t = 1$)

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- $AA, I$ update their priors $p$ using Bayes’ rule, whenever possible: posteriors $\phi(\cdot)$. 
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- $AA, I$ update their priors $p$ using Bayes’ rule, whenever possible: posteriors $\phi(\cdot)$.
- Posteriors coincide with priors when actions do not reveal type (on and off path).
Early takeover
Decision of the AA

Given $\bar{H}$, having observed the takeover price and the acceptance decision, the AA authorises the takeover if it assigns a sufficiently low probability to the start-up successful on its own:

$$\phi(\Omega) \leq F_W(\pi^A_I, \bar{H}).$$
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- If $S = S_s$, takeover welfare detrimental:
  - If $I$ develops, it suppresses product market competition.
  - If $I$ shelves, it also suppresses innovation.

Remark 1: Lower $\bar{H}$ → lower $F_W$: more difficult for the takeover to be approved.

Remark 2: If, given $\Omega$, AA is certain that $S = S_u$ ($\phi(\Omega) = 0$), takeover approved.

Remark 3: If $I$ develops: easier for the takeover to be approved.
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  - Takeover welfare neutral if $I$ shelves: the start-up would die anyway.
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Given $\tilde{H}$, having observed the takeover price and the acceptance decision, the AA authorises the takeover if it assigns a **sufficiently low probability to the start-up successful on its own**:

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In any pure-strategy PBE, independently of bargaining-power, we find the following:

- **Low price** \((P < S_s's \text{'s outside option}):**
  - Only unsuccessful \(S\) willing to accept \(P\) / offer \(P \rightarrow \phi(\Omega) = 0\).
  - The deal is authorised by the \(AA\).

- **High price** \((P \geq S_s's \text{'s outside option}):**
  - Any \(S\) willing to accept \(P\) / offer \(P \rightarrow \text{no updating of prior beliefs} \rightarrow \phi(\Omega) = p\).
  - \(I\) appropriates project, but overpays for \(S_u\).
  - Risk worth taking iff the probability that \(S\) is successful is high enough \((p > F_I)\).
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Early takeover: PBE in pure strategies
Equilibrium offers

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We now illustrate the equilibrium offers when $I$ makes the offer.
Equilibrium offers
The Incumbent develops

- **NW:** Selection effect of the merger policy.
- The lower $\bar{H}$, the stronger the selection effect, the more likely a low-price takeover occurs instead of a high-price takeover.
Equilibrium offers
The Incumbent shelves

- Since it shelves, I makes no offer for a low-price early takeover.
Equilibrium offers
The Incumbent shelves

- Since it shelves, \( I \) makes no offer for a low-price early takeover.
- High-price takeovers blocked more often by \( AA \) than when \( I \) develops: killer acquisitions.
The optimal merger policy

- Expected welfare lowest when high-price takeovers occur.
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  - Selection effect: by forcing the switch to a low-price takeover, such merger policy makes expected welfare even higher.
- An optimal “information-free” merger policy that does not need to be contingent on i’s decision to shelve or develop and the relative bargaining power.
Extensions

I can acquire S also at a later stage (after development).

- **Lenient policy** toward acquisitions of **committed entrants** optimal iff:
  - Prospects to be acquired at a later stage increases probability that S succeeds on its own.
  - I shelves.
  - Dynamic efficiency > allocative inefficiency.
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Mixed strategies PBE

- Conditions for hybrid PBE to exist, where:
  - $S_s$ always offers $P_H \in \mathcal{P} \subset \mathbb{R}_+$; $S_u$ randomises between $P_L < P_H$ and $P_H$.
  - I accepts $P_L$ with certainty and randomises between accepting and rejecting $P_H$.
  - When observing $P_H$, AA and I update prior beliefs by increasing the probability that the start-up is successful ($\phi(P_H)$).

- **Result 1**: expected welfare at hybrid PBE is lower than with pure strategies.

- **Result 2**: The policy described earlier destroys hybrid PBE and is optimal even when one allows for mixed strategies.
Recent but growing literature on acquisitions of potential competitors:

- Innovation stage: Rasmusen (1988); Cabral (2018); Letina et al. (2020); Katz (2020); Denicolò and Polo (2021); Kamepalli et al. (2021); Bisceglia et al. (2021). This literature relates merger policy to innovation incentives. Takeaway: a restrictive merger policy does not necessarily stifle innovation.

- Development stage: Cunningham et al. (2021): derive conditions for “killer acquisitions”; we focus on optimal merger policy, in setting where acquisitions can also have a bright side. Wang (2021): merger policy exacerbates financial constraints and may lead to underinvestment. Abstracts from impact of investment on product market competition; AA is not a strategic player (no selection effect); no distinction between potential competitors and committed entrants.

- Early v. late acquisitions: Arora et al. (2021): trade-off between capturing more value being acquired late v. running a greater risk of failing due to lacking assets. Norback and Persson (2009): early acquisitions to pre-empt investment by the independent start-up in the prospect of late acquisitions. No role for merger policy; we derive differential merger policy for early & late takeovers.
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Related Literature

- Literature on the **merger approval rules**: 
  - Selection effect similar to Nocke and Whinston (2013): optimal merger policy requires rejecting some welfare-improving deals.
  - They focus on mergers involving actual competitors: the AA knows the impact on welfare of the proposed mergers but has limited information on the alternatives that can be proposed.
  - We consider takeovers targeting potential competitors: the AA has limited information on whether the start-up is able to develop the project absent the takeover.
Conclusions

- Acquisitions of potential competitors particularly debated issue in the last few years.
Concluding Remarks

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- In this paper we acknowledge that such acquisitions can allow for the development of projects that would never reach the market otherwise.

- This does **not** lead, though, to the conclusion that the merger policy should be lenient:
  - Because of the selection effect, optimal to commit to standard of review *strict enough* to prohibit high-price takeovers, even when the latter are welfare beneficial.
Policy implications

- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
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- Use information conveyed by high transaction value to assess the counterfactual to the merger and their effects on competition.
Implementation

Incentive to misreport?

- AA can ask firms to report takeover price and other financial data.
- Deflating reported price can be harmful for future firm valuation, once decision is public.
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What is a high price?

▶ Valuation: standard capital budgeting exercise already performed by AA.
▶ Benchmarking: past takeovers’ prices available in common financial datasets (e.g., Thomson Reuters Refinitiv).