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

Autoridade da Concorrencia Webinar
27 January 2022

Introduction

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).

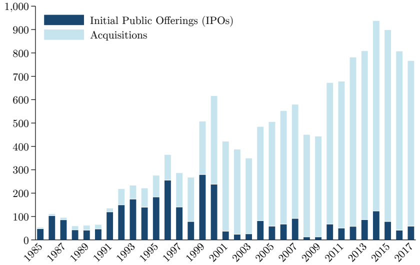


FIGURE NOTES: the figure above plots the number of successful venture capital exits in the United States by year and type (Initial Public Offering v/s Acquisition). The data is sourced from the National Venture Capital Association (NVCA).

Introduction

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).
- Apparent in the digital industry:
  - 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.

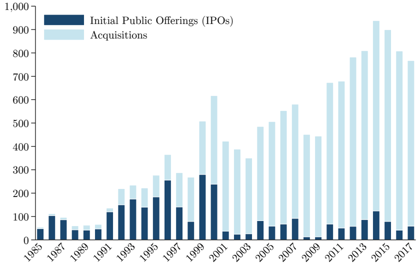


Figure Notes: the figure above plots the number of successful venture capital exits in the United States by year and type (Initial Public Offering v/s Acquisition). The data is sourced from the National Venture Capital Association (NVCA).

Introduction

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).
- Apparent in the digital industry:
  - 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.
- But extends beyond the digital industry:
  - Cunningham et al. (2021), Eliason et al. (2020): similar patterns in pharma, healthcare.

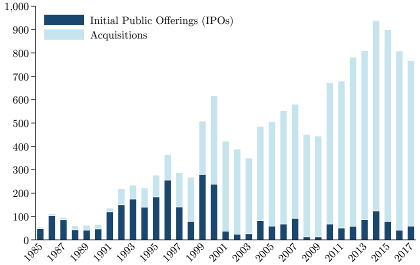


Figure Notes: the figure above plots the number of successful venture capital exits in the United States by year and type (Initial Public Offering v/s Acquisition). The data is sourced from the National Venture Capital Association (NVCA).

Motivation

- Antitrust Agencies have scrutinised very few of such acquisitions.

Motivation

- Antitrust Agencies have scrutinised very few of such acquisitions.
- 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).

Motivation

- Antitrust Agencies have scrutinised very few of such acquisitions.
- 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).
- 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.

Motivation

- Antitrust Agencies have scrutinised very few of such acquisitions.
- 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).
- 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.
- The procompetitive effect may happen because the acquirer has resources (capital, managerial skills, market opportunities) that the target firm lacks.

Motivation

- Antitrust Agencies have scrutinised very few of such acquisitions.
- 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).
- 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.
- The procompetitive effect may happen because the acquirer has resources (capital, managerial skills, market opportunities) that the target firm lacks.

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 $\rightarrow$ should be blocked.

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 → should be blocked.
- The merger policy can exert a selection effect:
  - Pushes towards takeovers that target only financially constrained start-ups and are superior in terms of welfare.

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 $\rightarrow$ should be blocked.
- The merger policy can exert a selection effect:
  - Pushes towards takeovers that target only financially constrained start-ups and are superior in terms of welfare.
- Despite the possible pro-competitive effect when the incumbent develops, the optimal merger policy should not be lenient towards takeovers of potential competitors.
  - It might commit to prohibit takeovers that, when evaluated, are expected to increase welfare.

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 $\rightarrow$ should be blocked.
- The merger policy can exert a selection effect:
  - Pushes towards takeovers that target only financially constrained start-ups and are superior in terms of welfare.
- Despite the possible pro-competitive effect when the incumbent develops, the optimal merger policy should not be lenient towards takeovers of potential competitors.
  - It might commit to prohibit takeovers that, when evaluated, are expected to increase welfare.
- Need to change current approach towards acquisitions of potential competitors.

Model: ingredients

- PLAYERS:
  - **I**ncumbent (monopolist);
  - **S**tart-up;
  - **A**ntitrust **A**uthority;
  - External financiers.

Model: ingredients

- PLAYERS:
    - **I**ncumbent (monopolist);
    - **S**tart-up;
    - **A**ntitrust **A**uthority;
    - External financiers.

- S has a “project" (new substitute product, more efficient technology).

Model: ingredients

- PLAYERS:
  - Incumbent (monopolist);
  - Start-up;
  - Antitrust Authority;
  - External financiers.

- S has a “project" (new substitute product, more efficient technology).

- Project development requires fixed investment K.

Model: ingredients

- PLAYERS:
  - **I**ncumbent (monopolist);
  - **S**tart-up;
  - **A**ntitrust **A**uthority;
  - External financiers.
- S has a “project" (new substitute product, more efficient technology).
- Project development requires fixed investment K.
  - I can pay K; S has assets $A < K$.

Model: ingredients

- PLAYERS:
  - Incumbent (monopolist);
  - Start-up;
  - Antitrust Authority;
  - External financiers.
- S has a “project" (new substitute product, more efficient technology).
- Project development requires fixed investment K.
  - I can pay K; S has assets $A < K$.
  - S can raise $K - A$ from competitive financial markets.

Model: ingredients

- PLAYERS:
  - Incumbent (monopolist);
  - Start-up;
  - Antitrust Authority;
  - External financiers.

- S has a “project" (new substitute product, more efficient technology).

- Project development requires fixed investment K.
  - I can pay K; S has assets $A < K$.
  - S can raise $K - A$ from competitive financial markets.

- Moral hazard:
  - If effort, development succeeds with probability $p = 1$ (same p for S and I).
  - If no effort, failure for sure, but private benefit $B \rightarrow$ financial constraints.

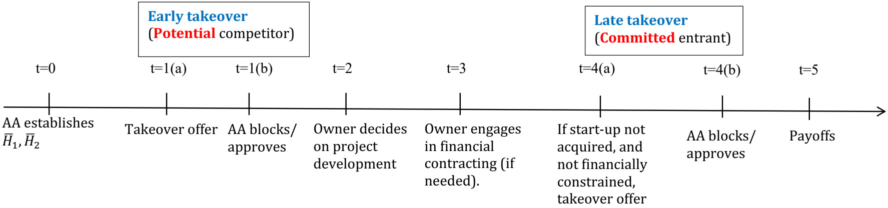
Model: ingredients

- In this model financial resources are the key asset start-ups may be short of and that the acquirer can complement:
  - Ample evidence that financial constraints are important impedement to start-up's growth:
    - 2014 OECD & EC report: lack of access to finance most important problem for small and medium firms.
    - 2016 Small Business Credit Survey: two-thirds of start-ups face financial constraints.
  - Erel et al. (2015): acquisitions can relieve financial frictions of small targets.

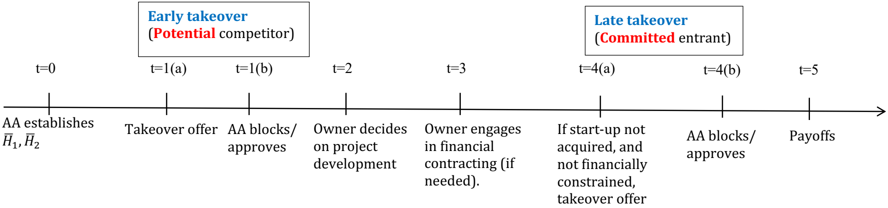
Model: ingredients

- In this model financial resources are the key asset start-ups may be short of and that the acquirer can complement:
  - Ample evidence that financial constraints are important impedement to start-up's growth:
    - 2014 OECD & EC report: lack of access to finance most important problem for small and medium firms.
    - 2016 Small Business Credit Survey: two-thirds of start-ups face financial constraints.
  - Erel et al. (2015): acquisitions can relieve financial frictions of small targets.
- Asymmetric information:
  - S and external financiers observe B.
  - I and AA observe $F(B)$, with $B \sim F(B)$. Hence unsure whether, absent takeover, start-up is able to suceed on its own.
    - Core business of financiers to establish the financial merits of a company. They can inspect banking records, history of debt repayment.
    - "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).

Model: time-line



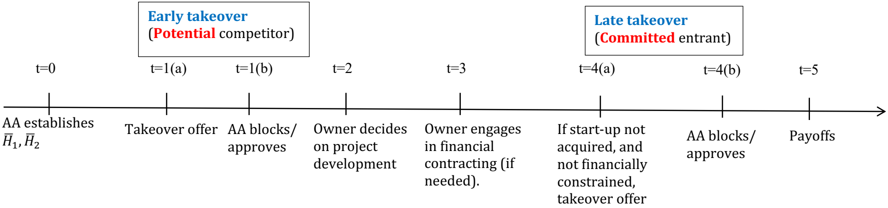
Model: time-line



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

- $\bar{H}_1$, $\bar{H}_2$: if > 0 correspond to “tolerated levels of harm” for early and late takeovers, resp.

Model: time-line



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

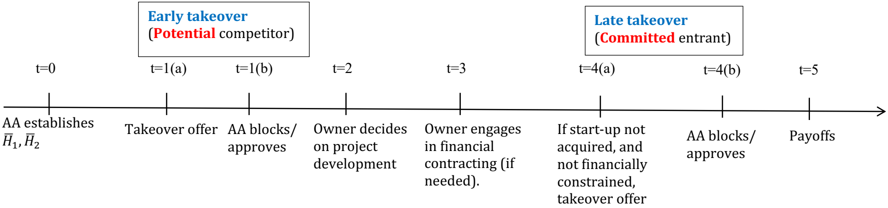
- $\bar{H}_1, \bar{H}_2$: if > 0 correspond to “tolerated levels of harm” for early and late takeovers, resp.

$t = 1$: Early takeover.

- With probability α, 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 S is financially constrained, S and investors do.)

Model: time-line



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

- $\bar{H}_1$, $\bar{H}_2$: if > 0 correspond to "tolerated levels of harm" for early and late takeovers, resp.

$t = 1$: Early takeover.

- With probability α, 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 S is financially constrained, S and investors do.)

$t = 4$: Late takeover.

- With probability α, I makes a take-it-or-leave-it offer. With probability $1 - \alpha$, S does.
- The AA decides on the proposed deal.

  (No asymmetric information.)

Model: payoffs (gross of K)

- If S develops and independent company, competition: π_S^d, π_I^d; W^d.

Model: payoffs (gross of K)

- If S develops and independent company, competition: π_S^d, π_I^d; W^d.
- If no development, I single-product (or less efficient) monopolist: π_I^m; W^m.

Model: payoffs (gross of K)

- If S develops and independent company, competition: π_S^d, π_I^d; W^d.
- If no development, I single-product (or less efficient) monopolist: π_I^m; W^m.
- If I develops (or acquires S at late stage), two-product (or more efficient) monopolist: π_I^M; W^M.

Model: payoffs (gross of K)

- If S develops and independent company, competition: π_S^d, π_I^d; W^d.
- If no development, I single-product (or less efficient) monopolist: π_I^m; W^m.
- If I develops (or acquires S at late stage), two-product (or more efficient) monopolist: π_I^M; W^M.
- We assume: $\pi_I^M > \pi_I^m > \pi_I^d$; $W^m < W^M < W^d$.

Model: payoffs (gross of K)

- If S develops and independent company, competition: π_S^d, π_I^d; W^d.
- If no development, I single-product (or less efficient) monopolist: π_I^m; W^m.
- If I develops (or acquires S at late stage), two-product (or more efficient) monopolist: π_I^M; W^M.
- We assume: $\pi_I^M > \pi_I^m > \pi_I^d$; $W^m < W^M < W^d$.
- Project development is privately and socially efficient:
  - NPV of the project is positive for S: $\pi_S^d > K$.
  - Net social value is positive when project developed by I: $W^M - W^m > K$.
  - A fortiori when developed by S: $W^d - W^m > K$.

Late takeover

- Late takeover at $t = 4$.

Late takeover

- Late takeover at $t = 4$.
  - Late takeover can happen iff S not acquired earlier and managed to secure funding.

Late takeover

- Late takeover at $t = 4$.
  - Late takeover can happen iff S not acquired earlier and managed to secure funding.
  - Late takeover's welfare loss is $W^d - W^M$ (softening of product market competition).

Late takeover

- Late takeover at $t = 4$.
  - Late takeover can happen iff S not acquired earlier and managed to secure funding.
  - Late takeover's welfare loss is $W^d - W^M$ (softening of product market competition).
  - If late takeover approved, start-up appropriates some of the increase in in joint profits produced by the merger (Gilbert and Newbery's efficiency effect) (unless $\alpha = 1$).

Financial contracting

- Financial contracting (Holmstrom-Tirole, 1997) at $t = 3$.

  If no earlier takeover, there exists a threshold level of start-up's private benefit B:

  - If $B > \bar{B}$, the start-up is not funded ($S = S_{nf}$) $\rightarrow$ inefficient financial constraints.
  - If $B \leq \bar{B}$, the start-up obtains funding ($S = S_f$).

Financial contracting

- Financial contracting (Holmstrom-Tirole, 1997) at $t = 3$.

  If no earlier takeover, there exists a threshold level of start-up's private benefit B:

  - If $B > \bar{B}$, the start-up is not funded ($S = S_{nf}$) $\rightarrow$ inefficient financial constraints.
  - If $B \leq \bar{B}$, the start-up obtains funding ($S = S_f$).

  If late takeover approved $\rightarrow$ profits of S increase (unless I holds bargaining power).

Financial contracting

- Financial contracting (Holmstrom-Tirole, 1997) at $t = 3$.

  If no earlier takeover, there exists a threshold level of start-up's private benefit B:

  - If $B > \bar{B}$, the start-up is not funded ($S = S_{nf}$) $\rightarrow$ inefficient financial constraints.
  - If $B \leq \bar{B}$, the start-up obtains funding ($S = S_f$).

  If late takeover approved $\rightarrow$ profits of S increase (unless I holds bargaining power).

  $\rightarrow$ Easier to satisfy ICC.

Financial contracting

- Financial contracting (Holmstrom-Tirole, 1997) at $t = 3$.

If no earlier takeover, there exists a threshold level of start-up's private benefit B:

- If $B > \bar{B}$, the start-up is not funded ($S = S_{nf}$) $\rightarrow$ inefficient financial constraints.
- If $B \leq \bar{B}$, the start-up obtains funding ($S = S_f$).

If late takeover approved $\rightarrow$ profits of S increase (unless I holds bargaining power).

$\rightarrow$ Easier to satisfy ICC.

$\rightarrow$ Relaxation of financial constraints.

Financial contracting

- Financial contracting (Holmstrom-Tirole, 1997) at $t = 3$.

  If no earlier takeover, there exists a threshold level of start-up's private benefit B:

  - If $B > \bar{B}$, the start-up is not funded ($S = S_{nf}$) $\rightarrow$ inefficient financial constraints.
  - If $B \leq \bar{B}$, the start-up obtains funding ($S = S_f$).

  If late takeover approved $\rightarrow$ profits of S increase (unless I holds bargaining power).

  $\rightarrow$ Easier to satisfy ICC.

  $\rightarrow$ Relaxation of financial constraints.

  $\rightarrow \bar{B} = \bar{B}(\bar{H}_2)$.

Investment decision

Investment decision at $t = 2$.

- A financially unconstrained start-up (S_f) always invests in project development.

Investment decision

Investment decision at $t = 2$.

- A financially unconstrained start-up (S_f) always invests in project development.
- The incumbent invests iff $\pi_I^M - \pi_I^m \geq K$.
  - I's profit increase may be insufficient to cover cost K (Arrow's replacement effect).

Investment decision

Investment decision at $t = 2$.

- A financially unconstrained start-up (S_f) always invests in project development.
- The incumbent invests iff $\pi_I^M - \pi_I^m \geq K$.
  - I's profit increase may be insufficient to cover cost K (Arrow's replacement effect).

$\rightarrow$ The incumbent may shelve projects that an unconstrained start-up would develop.

Investment decision

Investment decision at $t = 2$.

- A financially unconstrained start-up (S_f) always invests in project development.
- The incumbent invests iff $\pi_I^M - \pi_I^m \geq K$.
  - I's profit increase may be insufficient to cover cost K (Arrow's replacement effect).

$\rightarrow$ The incumbent may shelve projects that an unconstrained start-up would develop.

$\rightarrow$ Killer acquisitions.

Early takeover: PBE in pure strategies
Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

Early takeover: PBE in pure strategies
Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

- If S is unconstrained ($S = S_f$), takeover welfare detrimental:
  - If I develops, it suppresses product market competition.
  - If I shelves, it also suppresses innovation.

Early takeover: PBE in pure strategies
Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

- If S is unconstrained ($S = S_f$), takeover welfare detrimental:
  - If I develops, it suppresses product market competition.
  - If I shelves, it also suppresses innovation.
- If S financially constrained ($S = S_{nf}$):
  - Takeover welfare neutral if I shelves: the start-up would die anyway.
  - Takeover welfare beneficial if I develops: the early takeover makes up for financial constraints and allows the new product/innovation to reach the market.

Early takeover: PBE in pure strategies
Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

- If S is unconstrained ($S = S_f$), takeover welfare detrimental:
  - If I develops, it suppresses product market competition.
  - If I shelves, it also suppresses innovation.
- If S financially constrained ($S = S_{nf}$):
  - Takeover welfare neutral if I shelves: the start-up would die anyway.
  - Takeover welfare beneficial if I develops: the early takeover makes up for financial constraints and allows the new product/innovation to reach the market.

Remark 1: Lower $\bar{H}_1 \rightarrow$ lower F_W: more difficult for the takeover to be approved.

Early takeover: PBE in pure strategies
Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

- If S is unconstrained ($S = S_f$), takeover welfare detrimental:
  - If I develops, it suppresses product market competition.
  - If I shelves, it also suppresses innovation.
- If S financially constrained ($S = S_{nf}$):
  - Takeover welfare neutral if I shelves: the start-up would die anyway.
  - Takeover welfare beneficial if I develops: the early takeover makes up for financial constraints and allows the new product/innovation to reach the market.

Remark 1: Lower $\bar{H}_1 \rightarrow$ lower F_W: more difficult for the takeover to be approved.

Remark 2: If, given Ω, AA is certain that $S = S_{nf}$ ($\phi(\Omega) = 0$), takeover approved.

Early takeover: PBE in pure strategies

Decision of the AA

Given $\bar{H}_1$ and $\bar{H}_2$ and the decision to develop or shelve, 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 being unconstrained:

$$\phi(\Omega) \leq F_W(\pi_I^A, \bar{H}_1, \bar{H}_2).$$

- If S is unconstrained ($S = S_f$), takeover welfare detrimental:
  - If I develops, it suppresses product market competition.
  - If I shelves, it also suppresses innovation.
- If S financially constrained ($S = S_{nf}$):
  - Takeover welfare neutral if I shelves: the start-up would die anyway.
  - Takeover welfare beneficial if I develops: the early takeover makes up for financial constraints and allows the new product/innovation to reach the market.

Remark 1: Lower $\bar{H}_1 \to$ lower F_W: more difficult for the takeover to be approved.

Remark 2: If, given Ω, AA is certain that $S = S_{nf}$ ($\phi(\Omega) = 0$), takeover approved.

Remark 3: If I develops: easier for the takeover to be approved.

Early takeover: PBE in pure strategies
Equilibrium offers

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

- Low price ($P < S_f$'s outside option):
  - Only constrained S willing to accept P / offer $P \to \phi(\Omega) = 0$.
  - The deal is authorised by the AA.

Early takeover: PBE in pure strategies
Equilibrium offers

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

- Low price ($P < S_f$'s outside option):
  - Only constrained S willing to accept P / offer $P \rightarrow \phi(\Omega) = 0$.
  - The deal is authorised by the AA.
- High price ($P \geq S_f$'s outside option):
  - Any S willing to accept P / offer $P \rightarrow$ no updating of prior beliefs $\rightarrow \phi(\Omega) = F(\bar{B})$.
  - I appropriates project, but overpays for S_{nf}.
  - Risk worth taking iff the probability that S is unconstrained is high enough $(F(\bar{B}) > F_I)$.
  - Deal authorised by the AA iff the probability that S is unconstrained is low enough $(F(\bar{B}) \leq F_W)$.

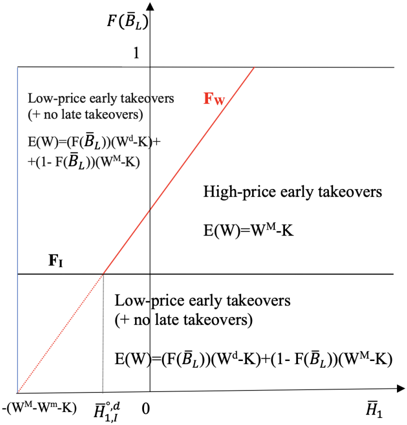
Early takeover: PBE in pure strategies
Equilibrium offers

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

- Low price ($P < S_f$'s outside option):
  - Only constrained S willing to accept P / offer $P \to \phi(\Omega) = 0$.
  - The deal is authorised by the AA.
- High price ($P \geq S_f$'s outside option):
  - Any S willing to accept P / offer $P \to$ no updating of prior beliefs $\to \phi(\Omega) = F(\bar{B})$.
  - I appropriates project, but overpays for S_{nf}.
  - Risk worth taking iff the probability that S is unconstrained is high enough $(F(\bar{B}) > F_I)$.
  - Deal authorised by the AA iff the probability that S is unconstrained is low enough $(F(\bar{B}) \leq F_W)$.

We now illustrate the equilibrium offers when I makes the offer.

Equilibrium offers
The Incumbent develops (and late takeovers are blocked)

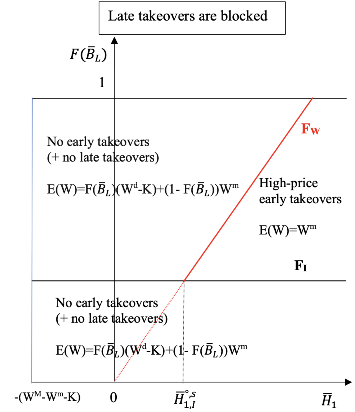


- NW: Selection effect of the merger policy.
- The lower $\bar{H}_1$, the stronger the selection effect, the more likely a low-price takeover occurs instead of a high-price takeover.

Late takeovers authorized

Equilibrium offers

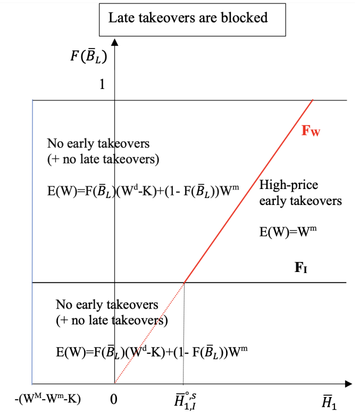
The Incumbent shelves (and late takeovers are blocked)



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

Equilibrium offers

The Incumbent shelves (and late takeovers are blocked)



- 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.

Late takeovers authorized

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.
- The optimal merger policy commits to standards of review that prevent high-price early takeovers from arising at equilibrium:
  - If the incumbent shelves, it suffices to commit to a sufficiently low tolerated level of harm

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.
- The optimal merger policy commits to standards of review that prevent high-price early takeovers from arising at equilibrium:
  - If the incumbent shelves, it suffices to commit to a sufficiently low tolerated level of harm
  - If the incumbent develops, the optimal merger policy may need to commit to prohibit takeovers that are welfare beneficial

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.
- The optimal merger policy commits to standards of review that prevent high-price early takeovers from arising at equilibrium:
  - If the incumbent shelves, it suffices to commit to a sufficiently low tolerated level of harm
  - If the incumbent develops, the optimal merger policy may need to commit to prohibit takeovers that are welfare beneficial
- Why it may be optimal to prohibit a takeover that, when evaluated, is expected to increase welfare?

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.
- The optimal merger policy commits to standards of review that prevent high-price early takeovers from arising at equilibrium:
    - If the incumbent shelves, it suffices to commit to a sufficiently low tolerated level of harm
    - If the incumbent develops, the optimal merger policy may need to commit to prohibit takeovers that are welfare beneficial
- Why it may be optimal to prohibit a takeover that, when evaluated, is expected to increase welfare?
    - Selection effect: by forcing the switch to a low-price takeover, such merger policy makes expected welfare even higher.

The optimal merger policy
Potential competitors

- Expected welfare lowest when high-price takeovers occur.
- The optimal merger policy commits to standards of review that prevent high-price early takeovers from arising at equilibrium:
  - If the incumbent shelves, it suffices to commit to a sufficiently low tolerated level of harm
  - If the incumbent develops, the optimal merger policy may need to commit to prohibit takeovers that are welfare beneficial
- Why it may be optimal to prohibit a takeover that, when evaluated, is expected to increase welfare?
  - 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, on the relative bargaining power and on the merger policy regarding late takeovers.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.
  - If I has bargaining power, allowing late takeovers causes welfare loss:
    - Softened product market competition reduces welfare gain from development.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.
  - If I has bargaining power, allowing late takeovers causes welfare loss:
    - Softened product market competition reduces welfare gain from development.
  - If S has the bargaining power, allowing late takeovers relaxes financial constraints:
    - \+ Higher probability of project development.
    - – Sacrifice of allocative efficiency.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.
  - If I has bargaining power, allowing late takeovers causes welfare loss:
    - Softened product market competition reduces welfare gain from development.
  - If S has the bargaining power, allowing late takeovers relaxes financial constraints:
    - \+ Higher probability of project development.
    - − Sacrifice of allocative efficiency.
  - When former effect dominates, a permissive policy targeting late takeovers generates a welfare gain.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.
  - If I has bargaining power, allowing late takeovers causes welfare loss:
    - Softened product market competition reduces welfare gain from development.
  - If S has the bargaining power, allowing late takeovers relaxes financial constraints:
    - $+$ Higher probability of project development.
    - $-$ Sacrifice of allocative efficiency.
  - When former effect dominates, a permissive policy targeting late takeovers generates a welfare gain.
- Authorising late takeovers is optimal iff:
  - (i) I shelves.
  - (ii) $\frac{F(\bar{B}_H)}{F(\bar{B}_L)} > \frac{W^d - K - W^m}{W^M - K - W^m}$ $\rightarrow$ dynamic efficiency $>$ allocative inefficiency.
  - (iii) $\alpha < \hat{\alpha}$: probability that I makes the offer low enough.

The optimal merger policy
Committed entrants

- When the incumbent develops, the optimal merger policy prohibits late takeovers.
- When the incumbent shelves:
  - No early takeover takes place $\rightarrow$ only unconstrained start-ups develop.
  - If I has bargaining power, allowing late takeovers causes welfare loss:
    - Softened product market competition reduces welfare gain from development.
  - If S has the bargaining power, allowing late takeovers relaxes financial constraints:
    - $+$ Higher probability of project development.
    - $-$ Sacrifice of allocative efficiency.
  - When former effect dominates, a permissive policy targeting late takeovers generates a welfare gain.
- Authorising late takeovers is optimal iff:
  - (i) I shelves.
  - (ii) $\frac{F(\bar{B}_H)}{F(\bar{B}_L)} > \frac{W^d - K - W^m}{W^M - K - W^m}$ $\rightarrow$ dynamic efficiency $>$ allocative inefficiency.
  - (iii) $\alpha < \hat{\alpha}$: probability that I makes the offer low enough.
- Condition (ii) is not satisfied when financial frictions are limited.

Hybrid PBE

- The low-price PBE equilibrium is inefficient from firms' perspective: a takeover targeting only S_f cannot occur even though it would increase firms' profits.
- Allowing for mixed strategies may alleviate such an inefficiency.
- At a hybrid PBE:
  - S_f always offers $P_H \in \mathcal{P} \subset \mathbb{R}_+$; S_{nf} 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 unconstrained ($\phi(P_H)$).

Hybrid PBE

- The low-price PBE equilibrium is inefficient from firms' perspective: a takeover targeting only S_f cannot occur even though it would increase firms' profits.
- Allowing for mixed strategies may alleviate such an inefficiency.
- At a hybrid PBE:
  - S_f always offers $P_H \in \mathcal{P} \subset \mathbb{R}_+$; S_{nf} 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 unconstrained ($\phi(P_H)$).
- Such hybrid PBE exists if (and only if):
  - S makes the offer and I develops.
  - AA authorizes the early takeover ($\phi(P_H) \leq F_W(\cdot)$), but blocks late takeovers.
  - I is not willing to accept a high-price offer with pure strategies ($F(\bar{B}_L) \leq F_S$).

Hybrid PBE

- The low-price PBE equilibrium is inefficient from firms' perspective: a takeover targeting only S_f cannot occur even though it would increase firms' profits.
- Allowing for mixed strategies may alleviate such an inefficiency.
- At a hybrid PBE:
  - S_f always offers $P_H \in \mathcal{P} \subset \mathbb{R}_+$; S_{nf} 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 unconstrained ($\phi(P_H)$).
- Such hybrid PBE exists if (and only if):
  - S makes the offer and I develops.
  - AA authorizes the early takeover ($\phi(P_H) \leq F_W(\cdot)$), but blocks late takeovers.
  - I is not willing to accept a high-price offer with pure strategies ($F(\bar{B}_L) \leq F_S$).
- 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.

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
- How to make enforcement of merger control stricter for these acquisitions?

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
- How to make enforcement of merger control stricter for these acquisitions?
  - AA should use takeover price as *prima facie* evidence to decide on early takeovers and estimate the counterfactual scenario.
    - European Commission already looks at the price during its investigations, but not to establish anticompetitive effects.
    - In our setting a high takeover price signals that the acquisition may not be indispensable for the success of the start-up $\rightarrow$ should be blocked.

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
- How to make enforcement of merger control stricter for these acquisitions?
  - AA should use takeover price as *prima facie* evidence to decide on early takeovers and estimate the counterfactual scenario.
    - European Commission already looks at the price during its investigations, but not to establish anticompetitive effects.
    - In our setting a high takeover price signals that the acquisition may not be indispensable for the success of the start-up $\rightarrow$ should be blocked.
  - Obligation to inform the AA introduced by the DMA does not seem enough.

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
- How to make enforcement of merger control stricter for these acquisitions?
  - AA should use takeover price as *prima facie* evidence to decide on early takeovers and estimate the counterfactual scenario.
    - European Commission already looks at the price during its investigations, but not to establish anticompetitive effects.
    - In our setting a high takeover price signals that the acquisition may not be indispensable for the success of the start-up $\rightarrow$ should be blocked.
  - Obligation to inform the AA introduced by the DMA does not seem enough.
  - Go beyond the requirement to show that anti-competitive effects are "more likely than not" to block a takeover. Block when expected effects detrimental, as proposed in the UK?

Conclusions

- Incorporating possible pro-competitive effects of early acquisitions in the analysis does not lead to the conclusion that the merger policy should be lenient.
- Current laissez-faire approach towards acquisitions of potential competitors should be scrapped.
- How to make enforcement of merger control stricter for these acquisitions?
  - AA should use takeover price as *prima facie* evidence to decide on early takeovers and estimate the counterfactual scenario.
    - European Commission already looks at the price during its investigations, but not to establish anticompetitive effects.
    - In our setting a high takeover price signals that the acquisition may not be indispensable for the success of the start-up $\rightarrow$ should be blocked.
  - Obligation to inform the AA introduced by the DMA does not seem enough.
  - Go beyond the requirement to show that anti-competitive effects are "more likely than not" to block a takeover. Block when expected effects detrimental, as proposed in the UK?
  - Other solutions?

Implementation

Implementation

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.

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.
- 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).

Related Literature

- Recent but growing literature on acquisitions of potential competitors:

Related Literature

- 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.

Related Literature

- 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 merger on competition, AA is not a strategic player (no selection effect).

Related Literature

- 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 merger on competition, AA is not a strategic player (no selection effect).

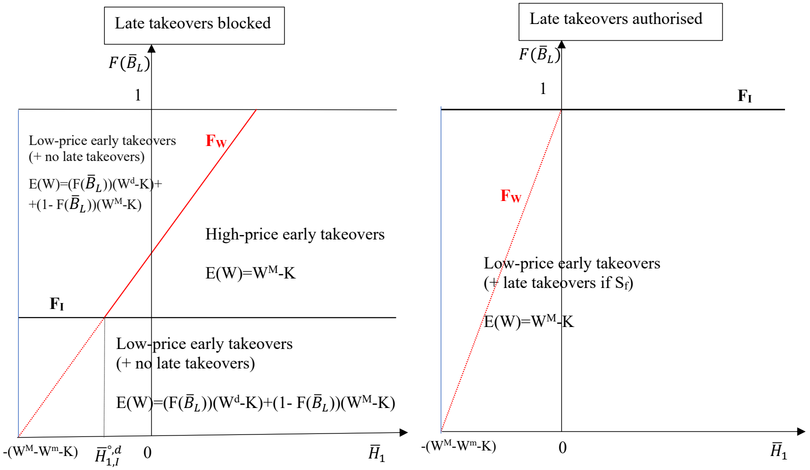
  Early v. late acquisitions:

  - Arora et al. (2021): trade-off between capturing more value being acquired late v. running a grater risk of failing due to lacking assets.
  - Norback and Persson (2009): early acquisitions to pre-empt entry 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.

Related Literature

- Literature on the merger approval rules:
  - Besanko and Spulber (1993), Armstrong and Vickers (2010), Nocke and Whinston (2010, 2013), among others: merging parties hold superior information vis-á-vis AA.
  - We study equilibrium merger policy under the assumption that incumbent and AA cannot observe whether the start-up is able to develop the project absent the takeover.
  - Similar to Nocke and Whinston (2013), optimal merger policy requires rejecting some welfare-improving deals.

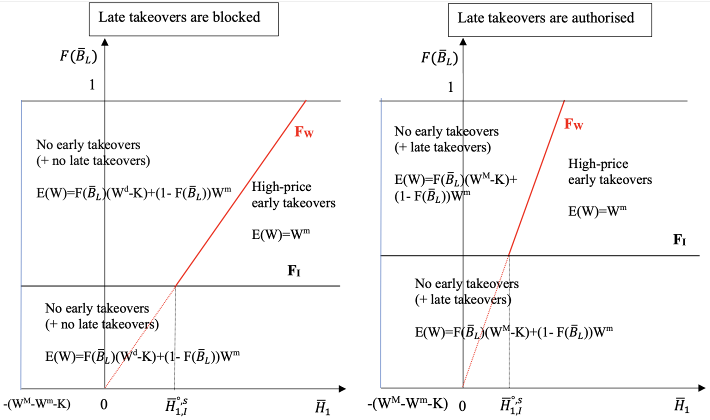
Equilibrium offers
The Incumbent develops



- If late takeovers authorized, I will acquire S_{nf} in $t = 0$ and S_f in $t = 4$.

Back

Equilibrium offers
The Incumbent shelves



Back