Digital ecosystems and damages to innovation

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Digital ecosystems and damages to innovation

- The platform economy paradox:
  - Improving innovation capacities within the ecosystem v. locking innovation alternatives
  - Complementors benefit from their partnership with the platform but a coopetition model
    - Possible adverse effects on capacities and incentives to innovate
    - Economic and technical dependency depending on the duration of the partnership and its exclusivity (e.g. switching costs to a competing ecosystem.
- From the bright side to the dark side: U.S. Judiciary Committee report (October 2020)
  - Kill zones (Kamepalli et al., 2020)
  - Killer acquisitions (Hemphill et Wu, 2020)

Defining a damage to innovation

- Can innovation be damaging to consumers and to competition process?
- Ezrachi and Stucke (2020):
  - Innovation as a barrier to entry
  - Predatory innovation (raising rival costs, strategically reducing interoperability)
  - Cannibalizing (cloning) an innovation developed by a third party
  - Exploitative innovation (price, data,…)
- Influencing the innovation developed by the ecosystem's complementors
  - Channeling innovation at the benefit of the ecosystem
  - Encouraging single-homing strategies
  - Under the threat of retaliations or through restrictive and unbalanced contractual provisions

Outline

1. Complementors and ecosystems: the impact of coopetition on innovation
2. Coopetition within an ecosystem and competition between ecosystems: the impact on the pace and the composition of innovation
3. Lessons for competition laws
4. Discussion

1. Ecosystems and innovation (1/3)

- The benefits resulting from an integration into an ecosystem v the notions of third-party damages and innovation damages
  - Decreasing barriers to entry, enhancing scale and scope economies and network effects, minimizing transaction costs, and coordinating investments
  - Reducing the capacity to innovate through unbalanced contractual provisions
  - Impairing incentives to innovate through the risk of contractual opportunism
- An economic and technical dependency and its consequences on innovation
  - Distorted access to information and specific investments may trapped complementors (switching costs)
  - As ecosystems tend to consolidate the exit option is less and less plausible to exert

1. Ecosystems and innovation (2/3)

- An adverse effect of a decreasing competitive pressure both within ecosystem and between ecosystems
  - In terms of innovation pace and in terms of innovation composition
    - Not an inverted U-shaped curve but an innovation plateau
      - The decline of innovation incentives is counteracted by the potential competition of other ecosystems (molygopoly hypothesis) and the need to maintain data flows
    - An effect in terms of innovation composition
      - Favoring incremental innovations from the complementors
        - Reinforcing lock-in effects at the expense of complementors and consumers
        - Minimizing the risk of being disrupted

1. Ecosystems and innovation (2/3)

- Ezrachi and Stucke (2020)

  “Innovation can continue to occur in heavily concentrated markets, but the nature of innovation might change. For example, rather than breakthrough innovations, the innovations might be largely incremental and complementary to the dominant platform’s technology and services (such as developing apps for a mobile operating system). Open systems, relying on user-driven innovations, might slowly close after a few firms dominate the industry”.

2. Modeling innovation paths

- A model based on Horowitz and Lai (1996)
  - Innovation dynamics in an industry with an innovator and a complementor
  - Effect on patenting on the size and the frequency of innovation
  - Optimal length of patent protection on innovation rate
- In or case: the duration of the partnership replaces the patent length
- The keystone player innovates and offers a GPT to potential complementors
- During the partnership, this last one doesn’t try to develop a competing service
- It would have to if it would decide to break the partnership

2. The model

- 2 cases to distinguish
  - Only one ecosystem (e.g. after the tipping)
  - Two competing ecosystems (e.g. before the tipping or in a Nicolas Petit’s molygopoly hypothesis)

2. The model

- Hypothesis 1:keystone players provide a boost in innovation in an industry by offering a general-purposetechnology to its complementors.
- Let us build on this hypothesis and design some of the optimization constraints.
  - First, the platform has all the power in terms of the affiliation contract terms with its complementor. The platform accepts or rejects a complementor whenever it wants.
  - Second, the complementor will sign the terms and during this period, it will use the platform's technology. As a consequence, it will not seek to innovate itself and potentially develop a competitive service.
  - Third, when a complementor leaves a platform, then it can and must innovate to meet its market.

2. The model

Keystone maximization function

$$\max_{\langle n(t)\rangle_{\tau=0}^{\infty}} \sum_{t=0}^{\infty} \delta^t [\pi_t(n_t, m_t) - C[n_t - n_{t-1}]],$$

Keystone innovation incentives

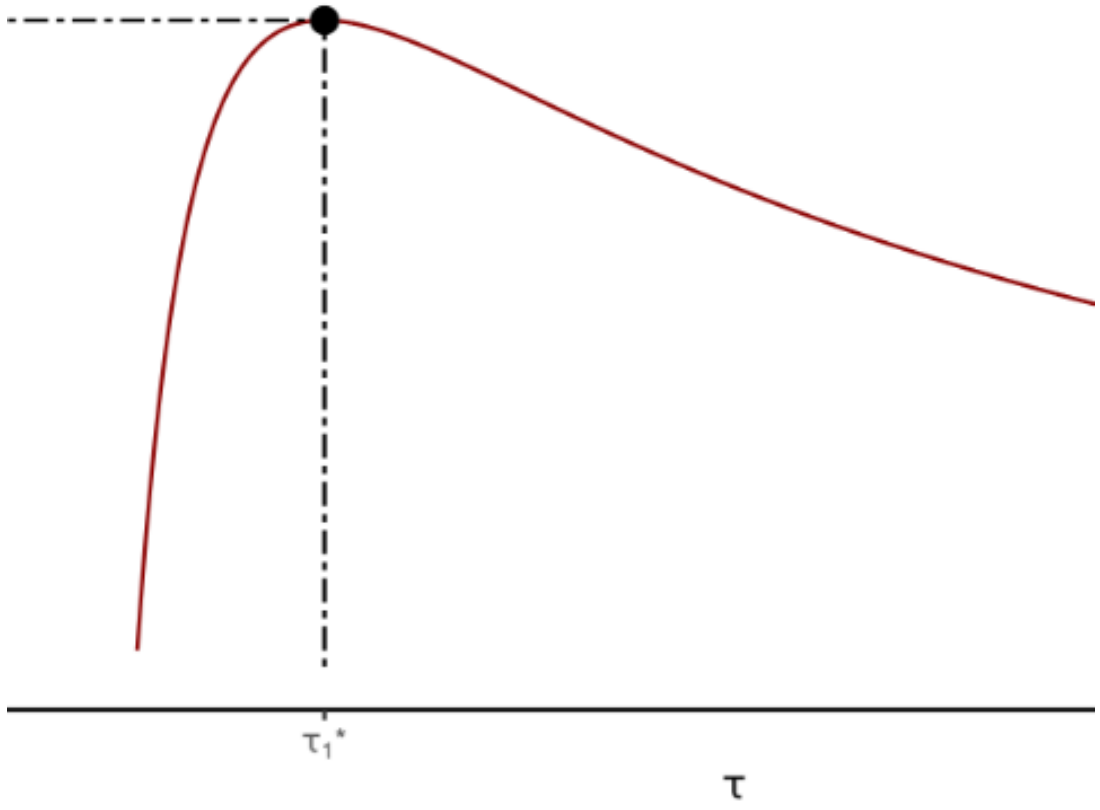
$$\phi^{n_{t-\tau}-n_t} = \frac{C \times (1-\delta)}{(1-\delta^\tau) \times p_n \times x_n \times \ln \phi}.$$

Optimal innovation rate depending on the duration of the contract

$$\omega_1^* = \frac{\delta^{\tau*} \times \ln \delta}{(1-\delta^{\tau*}) \times \ln \phi}$$

We can infer a positive influence of the contract in a first period and a decreasing one as soon as the contract duration exceeds the optimal one

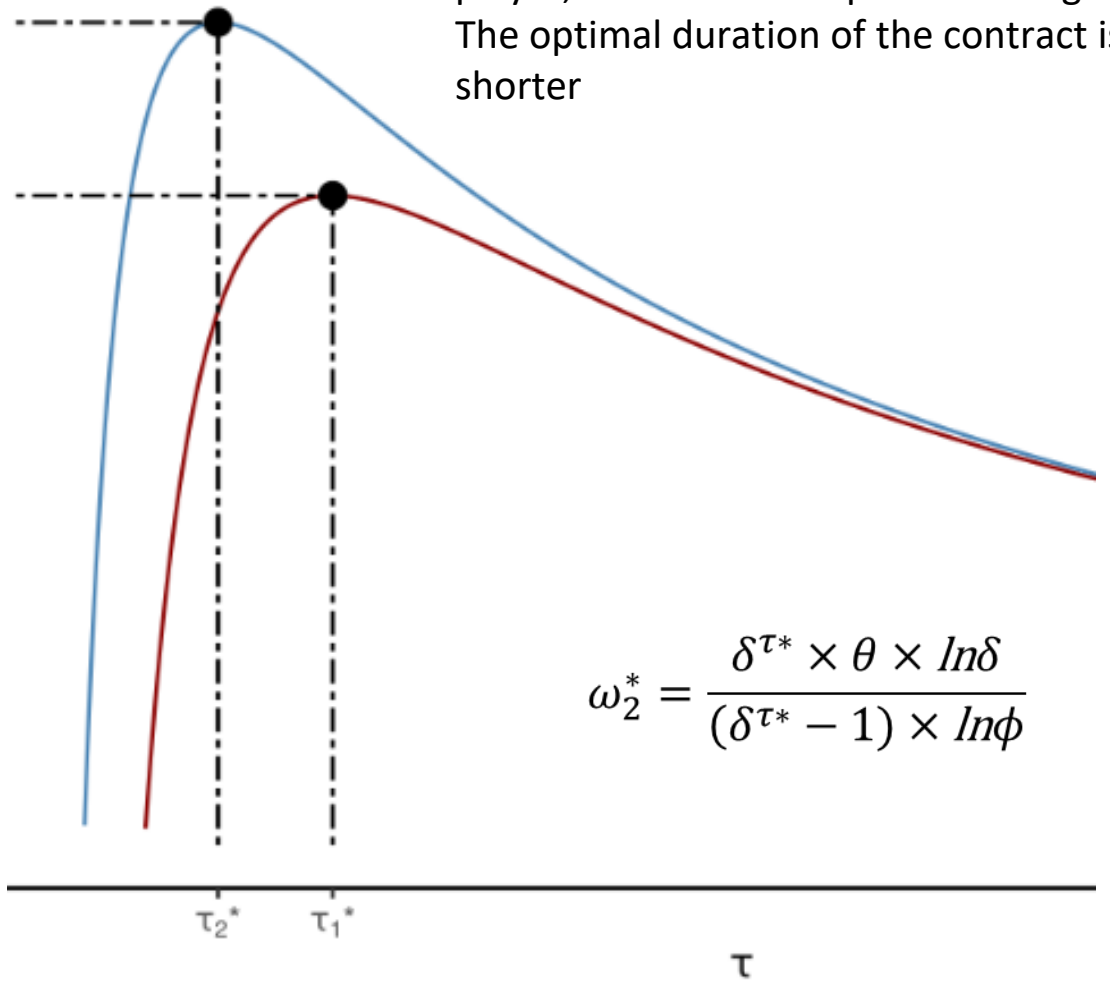
The optimal rate of innovation with only one platform



ptimal innovation rate, computed with the following calibration f
2, $\phi = 10$, $C = 2$ *and* $\theta = 1.1$.

The optimal rate of innovation with two platforms

Hypothesis 2: when an industry is composed of more than one keystone player, the innovation path is stronger
The optimal duration of the contract is shorter



$$\omega_2^* = \frac{\delta^{\tau*} \times \theta \times ln\delta}{(\delta^{\tau*} - 1) \times ln\phi}$$

timal rates of innovation, computed with the following calibration
2, $\phi = 10$, $C = 2$ *and* $\theta = 1.1$.

3. Lessons for competition law enforcement (1/2)

- Ecosystems accelerate innovations and are benefiting to complementors both in terms of innovation capacities and incentives
- The competition between ecosystems is no longer mainly a price-based one but rather a competition led by quality and innovation
- Preserving competition between ecosystems favors innovation

3. Lessons for competition law enforcement (2/2)

- The gatekeeper position and the structuring power of the keystone player may have some adverse consequences on innovation
  - The coordination effect can be detrimental as it prevents the development of radical innovations from complementors that might disrupt the incumbent
  - The complementors face a contractual hold-up risk and can refrain their innovation-oriented capacities
    - This risk is all the more significant than the keystone benefit from a data-advantage and can mobilize now-casting tools to detect emergent or even potential threats or opportunities
    - The position of complementors is increasingly weak as they rely on the keystone critical infrastructure that play like an essential facility

4. Discussion

- The integration in an ecosystem enhances complementors capacities to innovate but progressively impairs their capacities to act unilaterally on the market and to innovate to their own profit
- Competition policies should
  - Limit the distortions within the ecosystems by addressing dependency-related issues
  - Favoring the competition between the ecosystems by reducing switching costs for complementors
- Potential paths: empowering complementors for favoring potential disruption (access to data, critical facilities, but also to algorithms to duplicate them as Gal and Petit (2020) proposes?)

5. References

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