



# Introdução à Economia/Introductory Economics

## 7. Digital economy, information, and social challenges

(adapted from CORE, The Economy.  
Based on Unit 21)

2021/2022  
2nd Quarter (P2)

# Economies of scale: Demand-side

**Network external** effects: Benefits to users increase with the number of users (ex: languages, game consoles)

**Winner-takes-all competition:** May not select the best technology due to first-adopter advantage (**lock-in**)

Example: Betamax is of higher quality than VHS, but VHS may still take over the market if there are enough VHS users.

# Matching (two-sided) markets

A **matching (two-sided) market** matches members of 2 distinct groups, who each benefit from being matched with the right member of the other group.

Activities of each group can be

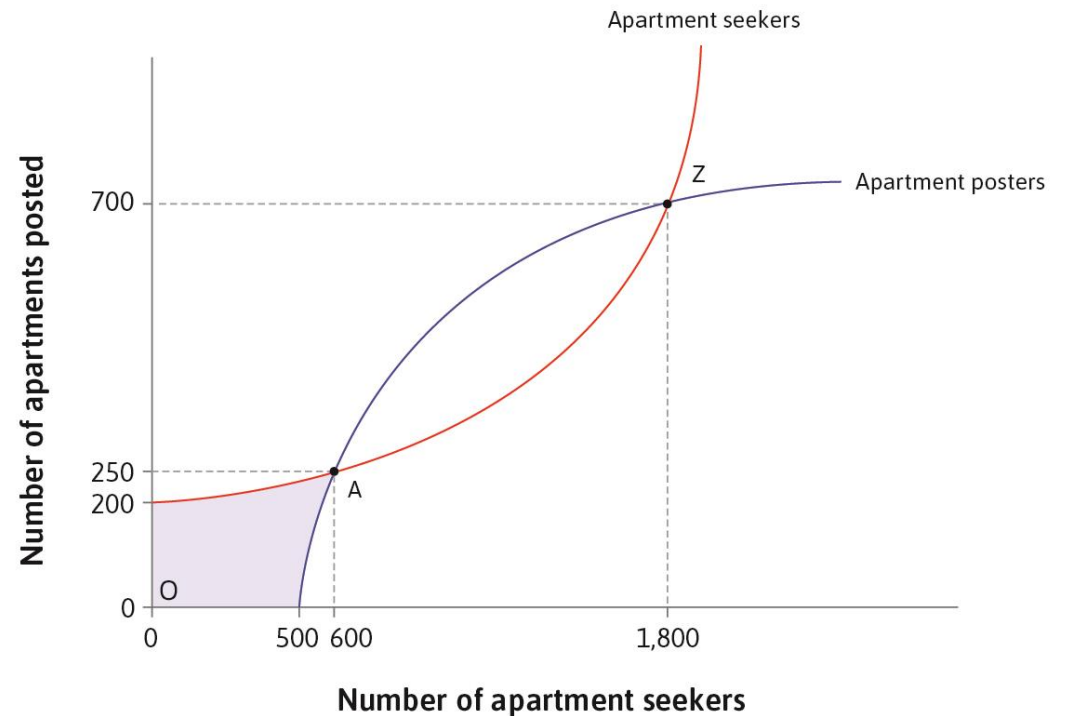
- **Strategic complements:** engaging in one activity increases the benefits of the other activity
  - In this case, participating in one market has external benefits on users of the other market (chicken-and-egg problem).
- **Strategic substitutes:** (the opposite).

# Modelling 2-sided markets

Differs from previous supply/demand models:  
Supply is a function of demand, and vice versa

Example: AirBnb

- ‘Posters’ curve – how many apartments posted in response to number of seekers on the site.
- ‘Seekers’ curve – number of seekers in response to number of apartments posted.
- Need at least 600 seekers or 250 posters for market to exist.



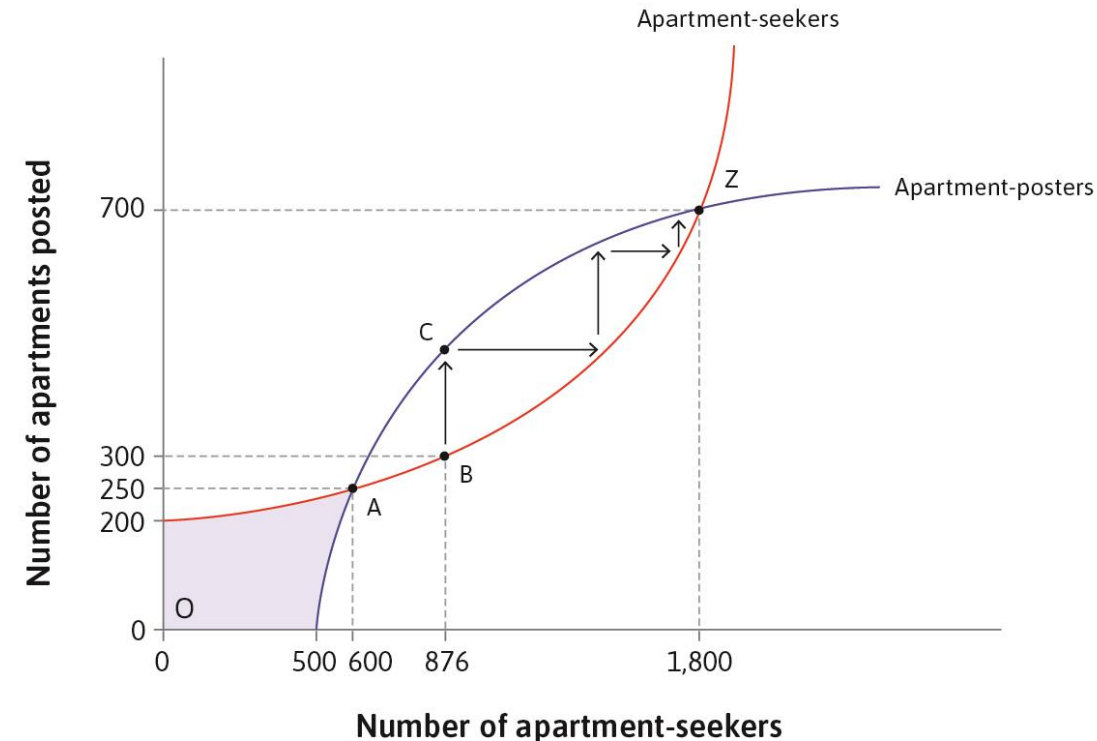
# Modelling 2-sided markets: Equilibria

## 3 Equilibria:

- O - Zero supply (optimal response to zero demand)
- A - Moderate supply/demand ('enough' balance between supply and demand to keep market open)
- Z - High supply/demand (due to strategic complements)

In this figure, for the market to start at least 600 seekers **or** 250 posts are needed, otherwise we will be in the shaded area where the market doesn't exist.

O and Z are **stable** equilibria, while A is **unstable**.



# Forming two-sided markets

Chicken-and-egg problem: how can the new market be formed?

- Public policy can create the platform (e.g., on the internet, or a physical marketplace)
- Private initiative – individual(s) find resources to launch the risky project
- Companies can charge low/zero prices to one group of users, which will attract the other group (e.g., software)

Once formed, companies benefit from innovation rents, and the chicken-and-egg problem deters new competitors. Once formed, these markets tend to be large and (close to) monopolies, which is a concern for competition policy and a challenge to regulators.

# Intellectual Property Rights

Governments can protect ideas that are **codifiable** (can be written down) and non-excludable (cannot prevent imitation), using:

- **Patents:** Publication and legal protection of the idea/invention. Patents usually have a time limit (e.g., 20 years)
- **Trademarks:** Give the owner exclusive rights over a logo, name, or registered design. Trademarks can last indefinitely
- **Copyright:** Give the author of an intellectual work the right to exclude others from reproducing, adapting, or selling it. Copyright has a time limit

# Patents and knowledge production

Intellectual property rights can promote or discourage innovation, depending on the size of the innovation rents vs. the impediments to innovation diffusion (limiting others from using/copying the innovation can slow down innovation).

The innovator incurs costs but receives innovation rents for the duration of the patent.

The patent reduces benefits to others, because it delays copying and diffusion.

When the patent expires, the benefits to society increase while the owner falls off a 'patent cliff'.



# Optimal patent protection

- Tradeoff between innovation rents and diffusion (benefits to society from innovation).

Policies concerning innovation aim to:

- Increase the pace of innovation
- Influence the direction of innovation towards the production of socially valued ideas (e.g., government funding of early-stage research, prize for solving a social problem)

Example: Government-funded research helped bring about digital innovations including the internet, GPS, and touch screens.

# Social and economic challenges from the digital economy

- Information reliability/misinformation
- Data protection
- Privacy
- Job conversion/destruction
- Remote working
- Fraud
- Taxing/regulation of platforms
- Competition and network effects (“tech giants”)

# Additional Reading

- Chapters 14-17, *Economia do Bem Comum*, Jean Tirole, 2018, Guerra e Paz.
- “The impact of big data on market structures”, available in Fenix.
- [https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en)
- <https://www.economist.com/business/facebooks-rumoured-name-change-reflects-its-ambitions-and-its-weakness-1/21805755>