Launch of CREATe Copyright & Innovation Network

The Economics of Digital Goods

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Outline

- Information goods: the basic problem
- A simple economic model
- Effects of digitization
- Recent developments
- Directions for future research
Information goods: the basic problem
Information goods

- ‘Information’ = anything that can be digitized
  - Encoded as a stream of 0’s and 1’s.
- ‘Information goods’
  - “Commodity whose main market value is derived from the information it contains” (Wikipedia)
    - Information that is formatted so that it can be exchanged.
    - In digital or in analog format
Nature of information goods

- Information goods are **non-rival**
  - Consumption by one individual doesn’t prevent consumption by another individual.
  - At any level of production of the good, the marginal cost of delivering the good to an extra consumer is zero.
    - ‘First-copy cost’ nature of information goods

- → **Risk of underutilization**
  - Any price above zero creates an inefficient scarcity
Nature of information goods (2)

- Information goods might be non-excludable
  - Is it possible to exclude another individual from consuming the good?
  - Depends on the technology for exclusion and/or legal regime

- → Risk of underproduction
  - No exclusion → no sales
  - No sales → no production
The fragile balance of IP rights

**Incentives**

→ Grant exclusive right to creators to encourage *production*

**Usage**

→ Limit creators’ market power to encourage *diffusion*
IP rights for information goods

Incentives $\rightarrow$ Economic right
\(\text{economic exploitation of the work}\)

Usage $\rightarrow$ Limited scope (\text{protects the expression, not the underlying idea}) & limited time
To organize our thoughts:
A simple economic model
A basic economic model

Each consumer is identified by the value s/he attaches to the album.

Buy the album if value ≥ price → Demand

Costs of creation (mostly fixed)

Sets $p$ (price per copy) to maximize profits
A basic economic model (2)

Should I produce or not?!?

I’ll get some profit as long as I’m protected by copyright and zero afterwards…

So, if this profit flow is larger than my cost, I produce!

Given the copyright length, I can compute the flow of future profits.

Longer copyright is good for me!
A basic economic model (3)

Many potential creators with different costs of creation

Longer copyright → more profits → more creation
A basic economic model (4)

- Consumers’ point of view
  - Copyright protection → “monopoly” → inefficient allocation of resources
    - Creator raises the price above the competitive level.
    - The diffusion of the information good is limited.
    - Potential gains of trade are not realized.
  - It is only when copyright protection is over that efficiency is restored.

**Longer copyright**

→ Diffusion and use of existing creations ↓
→ **Lower welfare**
Effects of digitization
Negative. Piracy

- Piracy (= erosion of copyright protection)
  - Increased competition from consumers making digital copies
    - Very low cost of production and distribution
    - Very high (and non degrading) quality
  - Consumers are only willing to pay up to the additional value that the original brings on top of the copy.

- Empirical estimations
  - Average displacement rate is around 0.11
  - It takes 9 downloads to have one less legitimate sale.
Positive. **Lower costs and demand effects**

- **Lower costs of production and diffusion**
  - Once produced, digital information goods can be reproduced at almost zero marginal cost
  - Fixed costs decrease as well
    - Self-publishing becomes easier
  - Lower cost to publish information goods on the Internet
    - Caveat: more intense competition to get consumers’ attention

- **Piracy may also have positive effects on demand**
  - Sampling effect
  - Network effect
  - Indirect appropriability
Net effects of digitization

Larger consumer surplus
Smaller deadweight loss
\[\downarrow\]
**Good** for *diffusion* (usage)

Lower profit
\[\downarrow\]
**Bad** for *production* (incentives)

“This theft has hurt the music community, with thousands of layoffs, songwriters out of work and new artists having a harder time getting signed and breaking into the business.”

No clear evidence...
Recent developments
What’s new?

- Diffusion & consumption
- Intermediaries
- Business models

DISRUPTION
New intermediaries

- Digital platforms …

Serve as intermediaries…
- Between producers of content and end-users
- + (possibly) advertisers

Combine content with value-added services
- Playlists, recommendation systems, synchronisation on mobile, …
New modes of diffusion and consumption

Content supplied in real time over the internet

No need to download files

Non durable access instead of permanent ownership

More freedom to choose *what, when, where, with whom* to consume
New business models of streaming platforms

- **Subscription**
  - Users pay a flat rate for a given period of time.
  - They can consume the content available on the platform on an unlimited basis during that period.

- **Embedded advertising**
  - Content can be accessed for free but is bundled with advertising.
  - Advertising nuisance = shadow cost of free content

- **Freemium model**
  - Hybrid of the first two.
  - Choice between free version (with ads) & premium version (no ads, flat fee and premium services)
Directions for future research
Previous models are inadequate

- **Creator as unique decision-maker**
  - Past → Approximation for ‘artist + record company’
  - Now → New intermediaries with increasing bargaining power.

- **Single information good sold at uniform price**
  - Past → CD as a bundle of songs, sales, no price discrimination
  - Now → Unbundling, subscription, access to catalog, ‘renting’ of songs

- **Utilities from different information goods can be added**
  - Past → Implicit assumption behind the monopoly setting
  - Now → Subscription schemes and recommendation systems permit free discovery of new information goods, and revelation of tastes.

- **2 missing pieces**
  - Consumer choices & platforms
Understanding consumer choices

- **Streaming extends users’ consumption possibilities**
  - Unit of consumption has changed.
    - Bottomless library of contents instead of addition of individual contents
  - Conditions of access have changed.
    - Temporary (but extended) access replaces permanent ownership.
  - Streaming reduces consumers’ search costs for content.
    - Users can discover more easily new content and their own tastes.
    - Follows from subscription model
    - Facilitated by value-added services
      - Recommendation systems
      - Customized channels
      - Content sharing (on the platform itself or on social networks)

- **Needs proper modelling**
Understanding streaming platforms

- Streaming becomes...
  - a major mode of content consumption
  - a major source of revenues for content producers

Proportion of Total US Music Revenues From Streaming
Source: RIAA

Increasing market power for providers of streaming services

Understanding streaming platforms (2)

- Streaming services = digital platforms
  - **Platforms**: intermediaries that facilitate and manage the interaction between a large number of users.
    - Among them: multi-sided platforms
  - **Digital platforms**: interaction takes place on the Internet and concerns digital goods.

- Where the theory of Industrial Organization can help
  - Identify external effects
  - Analyze platform strategies
  - Understand platform competition
External effects
Platform strategies

- **How to manage user participation?**
  - Marketplace or Reseller?
    - Let ‘suppliers’ sell their product directly to ‘buyers’ or purchase products from ‘suppliers’ & resell them to ‘buyers’?
  - Most streaming platforms **combine the 2 modes**
    - Reseller for content & marketplace for advertising (e.g., Spotify, Netflix)

- **Pricing:** Subscription, embedded ads or freemium?

- **Non-price strategies**
  - Value-added services
    - Reinforce positive network effects among consumers
    - Create switching costs if platform specific
  - Exclusivity agreements with content producers
  - Production of own content
Platform competition

- Depends on users’ ability to ‘multihome’ & on external effects

Content producers → Platform → Users S

Advertisers → Platform → Users D

Multihome ⇒ milked?

Winner takes most?

Singlehome ⇒ courted?
Key takeaways

- Peculiarities of information goods
  - Non-rival → if price above zero, then underutilization
  - Non-excludable → if price equal zero, then underproduction

- Copyright strikes a balance between incentives and usage

- Digitization disturbs this balance
  - Piracy increases usage but reduces incentives
  - Cost reductions increase production and usage
  - New intermediaries and new business models deeply affect usage.

- Challenges for economic research
  - Understand better consumer choices
  - Include digital platforms into the picture
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