

Lecture 4

Appropriation Mechanisms – Intro to IP

E5104 – Economics of Innovation

Bernhard Ganglmair



What are Appropriation Mechanisms?

- **Appropriability** is the ability of inventors to capture the profits of an invention via appropriation mechanisms
- Formal or informal?
 - *Informal*: based on actions undertaken by the innovator without the recourse of legal protection
 - *Formal*: defined by the legal system, often requiring some kind of registration
 - *Hybrid*
- Formal appropriation mechanisms are closely linked to different forms of intellectual property rights.

Intellectual Property

- **Intellectual property:** intangible products of human creativity
 - knowledge of how to make or do something
 - creative works such as books, movies, musical recordings, photographs,...
 - new designs for commercial use
 - original product markings and trade names
 - new plant varieties
- “Property” may be misleading as without legal protection they are not property in the traditional sense – absent protection, the owner/creator cannot exclude others from using the idea.

Property?

- Copying a book
 - Without legal provisions, not possible to exclude others from copying the contents of a book
 - Physical book (the object) is conventional property
- Imitating an invention
 - Without legal restrictions, not possible to exclude others from imitating a new invention
 - Individual product containing the invention is conventional property

Forms of Intellectual Property

- Patents (including design patents and plant patents)
- Copyrights
- Trademarks
- Design Rights
- Geographical designations
- Semiconductor mask protection
- Trade secrets (formal or informal?)

These Rights Differ in ...

- the length of term
- the need for registration or examination
- their effectiveness

Today a brief overview of the different types; more details later this term.

Public Goods and Externality

- Public goods characteristics of knowledge:
 - nonrival
 - nonexcludable
- Inefficiently low *private* incentive to invest in innovation
- Solution: temporary rights to exclude in form of intellectual property (patents, copyright!)
- But *social* inefficiency because IP makes non-rival good excludable
- Innovator acts like a monopolist
- *Bottom line:* trade off between static loss vs. dynamic gain

General Role of Intellectual Property Rights

- Economic perspective: IPRs response to the problems created by the public goods nature of knowledge
- Others:
 - moral rights to a creator in the case of artistic creation – granting the right to control the work
 - trademark protection is consumer protection
 - patents come with their own theories of existence (later)

National Rights – International Treaties

- Coverage of legal forms of IP typically restricted to the country that grants it
- However, international cooperation is fairly advanced
- International treaties often specify minimum standards of protection
- They are generally administered by WIPO – World Intellectual Property Organization in Geneva, Switzerland
 - Paris Convention of 1883 (patents and related instruments); in many ways superseded by the 1995 TRIPS agreement (Trade-Related Aspects of Intellectual Property Rights)
 - Berne Convention of 1886 (copyright)
 - Hague Agreement of 1925 (industrial designs)

Patents

What is a Patent? What is it not?

- A patent is:
 - Codified form of knowledge
 - Publicly accessible and searchable information
 - Right to deny third parties use of invention \Rightarrow **negative right** – has value only when can be potentially used to effectively exclude third parties (value ex ante largely unknown)
 - Territorial right for a predetermined limited period of time
 - Consists of **claims**
- A patent is **not**:
 - 1:1 measure of innovation
- Note: **Patent system extremely complex**

What is Patentable?

- **Utility**

- capability of being used in any kind of industry
- the patented invention must contain the potential of commercial value through an industrial application

- **Novelty**

- invention must not yet be in public domain anywhere in the world before the priority date of the corresponding patent.

- **Non-obviousness / Inventive step**

- invention must not be an obvious modification of what is already known (to someone with “ordinary skills” in the industry)
- meaning that the invention must be neither re-producible based solely on existing patented claims nor ex-ante an obvious solution to the problem to someone skilled in the art

Patentability

- **Europe/EPO:** An invention in any field of technology. The invention must be new, susceptible of industrial application, and involve an inventive step. Excluded are discoveries, scientific theories and mathematical methods, aesthetic creations, schemes, rules and methods for performing mental acts, playing games or **doing business**, and **programs for computers**, and presentations of information.
- **United States/USPTO:** Any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. This excludes laws of nature, physical phenomena, and abstract ideas.
- **Japan/JPO:** An invention that is industrially applicable, not previously publicly known or described, and not obvious to one skilled in the art
- **China/CNIPA:** As in Europe, in China an invention patent is granted for new technical solutions or improvements to a product or process, provided that the technical solutions have a practical applicability.

TRIPS – Harmonization

- TRIPS ensures that process for granting a patent is approximately the same everywhere
- Requires member countries to make patent protection available for any product or process; with exceptions (see EPO)
- Term of patent protection must not be less than a period of 20 years from the date of filing
 - Prior to TRIPS adoption in 1995, U.S. patent term was 17 years from the date of grant.
 - Surge in filings prior to the change suggests that it was an effective shorting of the patent term (How would you show this empirically?)
- Simultaneous discovery – who gets the patent?
 - Most countries in the world use “first-to-file”
 - Until 2011, U.S. introduced “first-to-invent” (*America Invents Act*)

Europe is Special

- A patent application filed with the European Patent Office (in Munich) becomes a set of national patent rights in several European countries at the time of issue.
- Similar situation exists for the African Regional Intellectual Property Organization (ARIPO), the Organization Africaine de la Propriété Intellectuelle (OAPI), and the Eurasian Patent Organization (EAPO).
- In late 2022, EU will introduce the European Unitary Patent
 - examined and issued by the EPO
 - provides coverage for 25 EU member states
 - enforcement through the newly created Unified Patent Court with Court of First Instance seated in Paris, a section in Munich; local and regional divisions) and Court of Appeal in Luxembourg
 - Fees cover all 25 member states
- Currently: national courts and authorities decide on the infringement and validity of European patents (parallelism)

Patent Cooperation Treaty (PCT)

- National protection creates costs for international protection
- The PCT (1978) reduces the patent prosecution costs
- Any resident or national of a contracting state (153) can file an application under the PT that specifies the office that should conduct the prior art search
- PCT application serves as application filed in each designated contracting state; but patent is granted by individual states
- Advantage: Fewer searches, process is less expensive
- Application and search are standardized, grants are not
- 94% of all applications go to one of five patent offices for search: EPO (35%), JPO (20%), China (19%), Korea (11%), and the U.S. (9%).

Economic Justification for Patents

- **Invention motivation**

- right to exclude others from using the invention creates an incentive to invent

- **Invention dissemination**

- patents disclose an invention and therefore facilitate knowledge diffusion (in contrast to trade secrecy)

- **Induce commercialization**

- patents provide incentives to develop and commercialize an invention by excluding others from this activity for a time

- **Exploration control** – also known as *prospect theory*

- ownership of a broad patent on an initial breakthrough allows for orderly exploration or in a number of directions without wasteful effort that would occur if anyone could enter the area

Utility Models

- Some patent systems include utility models (petty patents or utility patents [not in the U.S. sense])
 - weaker form of patent with less stringent requirements for patentability
 - generally less cheaper to obtain and maintain
 - shorter term (6 to 15 years)
- German Patent and Trademark Office (DPMA) writes:

“Utility models are ‘fast IP rights.’ Examination and grant of a patent usually take several years. A utility model, on the other hand, can be entered in the Register within a few weeks after receiving the application provided the documents filed comply with the requirements of the Utility Model Act (Gebrauchsmustergesetz) and the application fee has been received in due time.”
- About 75 countries use it; Australia discontinued its use in 2021.

Plant Patents

- IP protection for plants is a recent development (U.S.: Plant Patent Act of 1930)
- International Union for the Protection of New Varieties of Plants (UPOV) created in Geneva in 1961
- UPOV convention creates plant breeder's rights for plant variety however it has been obtained
 - new plant must be novel
 - plant must be distinct from other available varieties
 - plant must display homogeneity
 - traits unique to the new variety must be stable so that plant remains true to type after repeated cycles of propagation
- Controversy over 1991 revision of UPOV because of the potential of terminator genes (render seeds produced by plants infertile and prevent reuse)

How Do You Obtain Plant Protection in the U.S. Today?

- **Plant variety protection**
 - issued by the Plant Variety Protection Office of the U.S. Department of Agriculture
 - Term is 20 years
 - Subject to research exemption
- **Plant patents**
 - issued by U.S. Patent and Trademark Office
 - Term is 20 years from filing date
- **Utility (invention) patents**
 - issued by the USPTO; term is 20 years from filing date
 - for genes, traits, methods, plant parts, or varieties
- ...or combinations

Design Rights

What Are Industrial Designs?

- Industrial designs constitute the ornamental aspect of an article
- They can cover shape, pattern, color, etc., of an article
- Industrial designs are covered by the Hague Agreement of 1925; register design at WIPO for protection for 5 years, up to individual country's terms
- In the U.S. also design patent system (more rigorous examination) for term of 14 years (from date of issue)
 - novelty
 - non-obviousness
 - originality
 - ornamentality
- Obscure form of IP protection?

Apple vs. Samsung

- Recent litigation between Samsung and Apple over design of mobile phones
- Design rights/patents can be rather valuable
- Four design patents: on rounded corners, uniform bezel, home button, icon layout
- Apple was awarded \$533.3 million for Samsung's design patent infringement

Copyright

What is Copyright?

- Copyright protects the expression of an idea not the idea itself
- Registration not required
- Exclusive control over the creation
- Some limitations on copyright: **fair use**. Extends to
 - comments
 - criticism
 - news reporting
 - scholarship
 - research
 - parody
 - library photocopying
- Term: life of the creator plus 70 years

Trademarks

Trademark System

- **Trademark:** distinctive sign, mark or symbol that identifies goods or services as those produced by a specific person or company
- What can be a trademark:
 - Any word(s), graphics, figures, images, a combination of these or similar that act as a distinguishing feature
 - Distinctive shapes, colors, or sounds
- Purpose of a mark: **negative right** – exclusive use of mark in relation to the products or services for which trademark is registered
 - Advertise a sign as a registered trademark
 - Stop rivals imitating ('passing-off') the products of others
 - License the trademark for use by third parties
 - Sell the trade-mark to others

Registration of Trademarks

- Apply at national (e.g. U.S. Patent and Trademark Office), regional (EU Office for Harmonization in the Internal Market – OHIM), international (Madrid system – WIPO) offices
- Madrid system facilitates international filing of trademark application
- If registered by WIPO, automatically registered in all designated contracting states unless refused by office in contracting state (within time limit)

Important Differences Across Jurisdictions

- Registration: (U.S. common law) 'first possession' & use in commerce (sale to intended customers) vs. first to register
- Formal vs. substantive examination
 - e.g., examination whether sign is sufficiently distinctive and not deceptive
 - e.g., examination that no other registered trademark with which a new trademark could be confused.
- (Intent to) use requirement (use creates right) or first to register (registration creates right)

Registration of Trademarks

- A trademark never indicates novelty or inventive step!
- Trademarks do not expire (payment of renewal fees required)
- Trademarks are national rights, registration of TMs according to rules and regulations of national, regional, and international trademark offices

Types

- **Fanciful mark:** made-up name that resembles no other word ('Exxon', 'Kodak')
- **Arbitrary and suggestive marks:** no meaning related to the product that it is used to name ('Apple')
- **Suggestive marks:** words that imply characteristics of the goods they are used to name but do not describe them ('Business Week', 'Financial Times', 'Wall Street Journal')
- **Descriptive mark:** need for secondary meaning, i.e., consuming public understands the word to name a brand ('Holiday Inn')
- **Symbols, shapes, colors**
 - Note: generic words cannot be trademarked
 - Note: functional features cannot be trademarked

Classification

- Classes: 45 classes of the International Classification of Goods and Services for the Purposes of the Registration of Marks under the Nice Agreements ("Nice Classification")
- Class is legally important as it defines the product groups that are protected by the trademark
- Trademark can specify one or several classes (depends on jurisdiction – single or multiclass system)
- Classes 1-34 goods, 35-45 services
- Most popular classes:
 - **Services:** Class 35 'advertising, business management, business administration, and office functions'
 - **Goods:** Class 9 'scientific, photographic and measuring apparatus and instruments, processing equipment and computers'

Do Trademarks Represent Innovation?

- Element in the process of innovation
- Potentially provide some measure of innovation in sectors with products and processes that are not patentable (e.g. banking or retail)
- But remember: from legal point of view no invention

Table: UK Community Innovation Surveys (CIS) 3, 4, and 5

Protection method	Not used (%)	Low (%)	Medium (%)	High (%)
Registered IP	80.70	9.85	5.99	3.47
Patent	83.76	5.93	4.43	5.87
Trademark	77.70	7.08	7.42	7.79
Registered design	82.53	6.83	5.48	5.16

Do Trademarks Represent Innovation?

- Potentially provide some measure of innovation in sectors with products and processes that are not patentable (e.g. banking or retail)

Table: UK Community Innovation Surveys (CIS) 3, 4, and 5

		Innovation			
		New to the firm		New to the market	
		%	Average share in turnover	%	Average share in turnover
Trademark	No	94.89	16.11	91.57	10.83
	Yes	5.11	15.85	8.42	14.12
Patent	No	97.30	16.22	93.71	10.73
	Yes	2.70	13.33	6.28	18.13