

Competition Policy and Intellectual Property Rights

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Outline

Pt 1

- ❖ Special treatment of innovation-related conduct: Does it exist? Is it Justified?
- ❖ Welfare features of intellectual property rights (IPRs) – welfare trade-offs and limited rights
- ❖ How are patents used and do they achieve their welfare goals?
- ❖ Economic mechanisms and patents – Lessons from the Literature and applications

Single innovation models – many designs promote innovation and “default” optimal design

Sequential innovation models – strong rights promote strong technology markets and innovation

Complementary innovation models – coordination failures and market failures

Probabilistic models – decentralised enforcement and market failures

- ❖ Patent Law and Competition Law Interaction – A General Framework

Pt 2

- ❖ Interaction - A Deeper Dive

Mergers and Innovation - Affects innovation direction, not just amount, and litigation “game”.

Patent Abuse – IPR-based strategies to delay entry

Standard Setting – Standard Setting Organisation Design and the ambiguities of FRAND

Part I

Context and General Themes

Why Study IPR Interaction with Competition Policy?

Is there Special Treatment?

Legal – Treaty of Rome concern for fostering innovation

Regulatory – Technology Transfer Block Exemption Regulation (TTBER)/Technology transfer guidelines

Practice – technology licensing versus distribution agreements?
technology cross-licensing versus interlocking share ownership?

Specific circumstances in case history

Lundbeck, Servier (pay for delay)

Rambus, Qualcomm (treatment of Standard Essential Patents - SEPs)

Dow-DuPont, Google-MMI (merger control and innovation)



Why is Innovation-Competition Policy Important?

Innovation Important for Growth (Fagerberg et al, 2010)

Industry structure - “Sweet spot”

Schumpeter (1942) – benefits of size

Arrow (1962) – “escape competition” and “replacement” effects

Gilbert and Newbery (1982) – persistence of monopoly

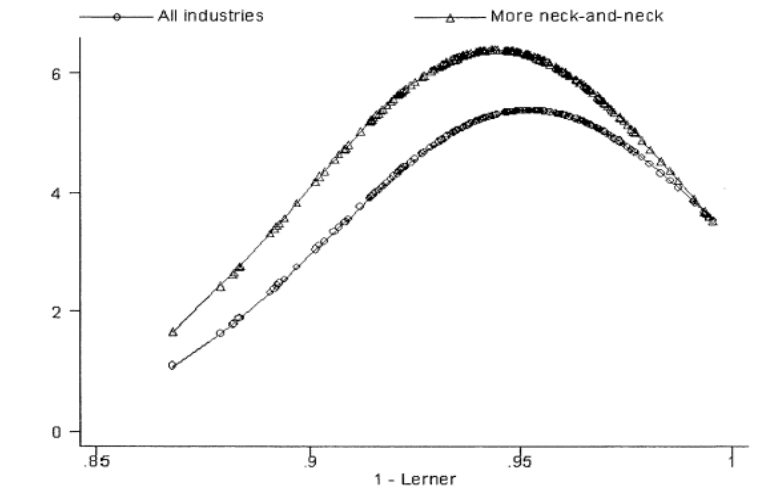
Aghion et al (2005) – combination of effects

scientific opportunity, appropriability, demand, and skills also play a role

Intermediate structure generates innovation variety: small firms innovate differently (products)
from larger firms (processes)

Link to IPR (Shapiro, 2012)

“ [Some] Contestability, Appropriability and Ability necessary to a healthy innovation ecosystem”



General Themes of Economics of Intellectual Property Literature

1. IPRs trade off “static” and “dynamic” efficiency

Static efficiency:

Perfect competition – in theory – results in productive and allocative efficiency.

Vs.

Dynamic efficiency:

Does the perfect competition achieve optimal investment (=innovation)? Reward motive!

Under-incentive: Appropriability problem – innovations generally create consumer as well as producer surplus.

Over-incentive: Business stealing – innovations help the innovator but not rivals

“Too much” or “Too little” innovation in theory with private rewards; empirically too little (Bloom et al, 2013).

General Themes of Economics of Intellectual Property Literature

2. *Intellectual Property generates information*

Non-rivalrous (innovator's use of information does not preclude others' use) and useful for further innovation

But

Ex post free access: Optimal policy is free access *once information is created*.

→ Conditional, limited right



Patents

Basic Features:

- * temporary and tradeable right to exclude others from a technology.
- * no obligation to practice; practice must be within other laws
- * conditional right – disclose “best practice” at the time of patent filing
- * must be an “innovative step” and cannot fall in certain proscribed subject matter

Do They Stimulate Innovation? “Sweet Spot”

Substitution effect: many tools used to protect innovation along with patents (technological protection measures, trade secrecy, copyright, trademark...). Hence, stronger patents are weakly linked to innovation (Hall, 2007; Qian, 2007)

Synergistic Information: Information contributed to an open pool act as an input to generate more innovation. If this process is powerful enough then weak property rights may create the most innovation. (Bessen and Maskin, 2009)

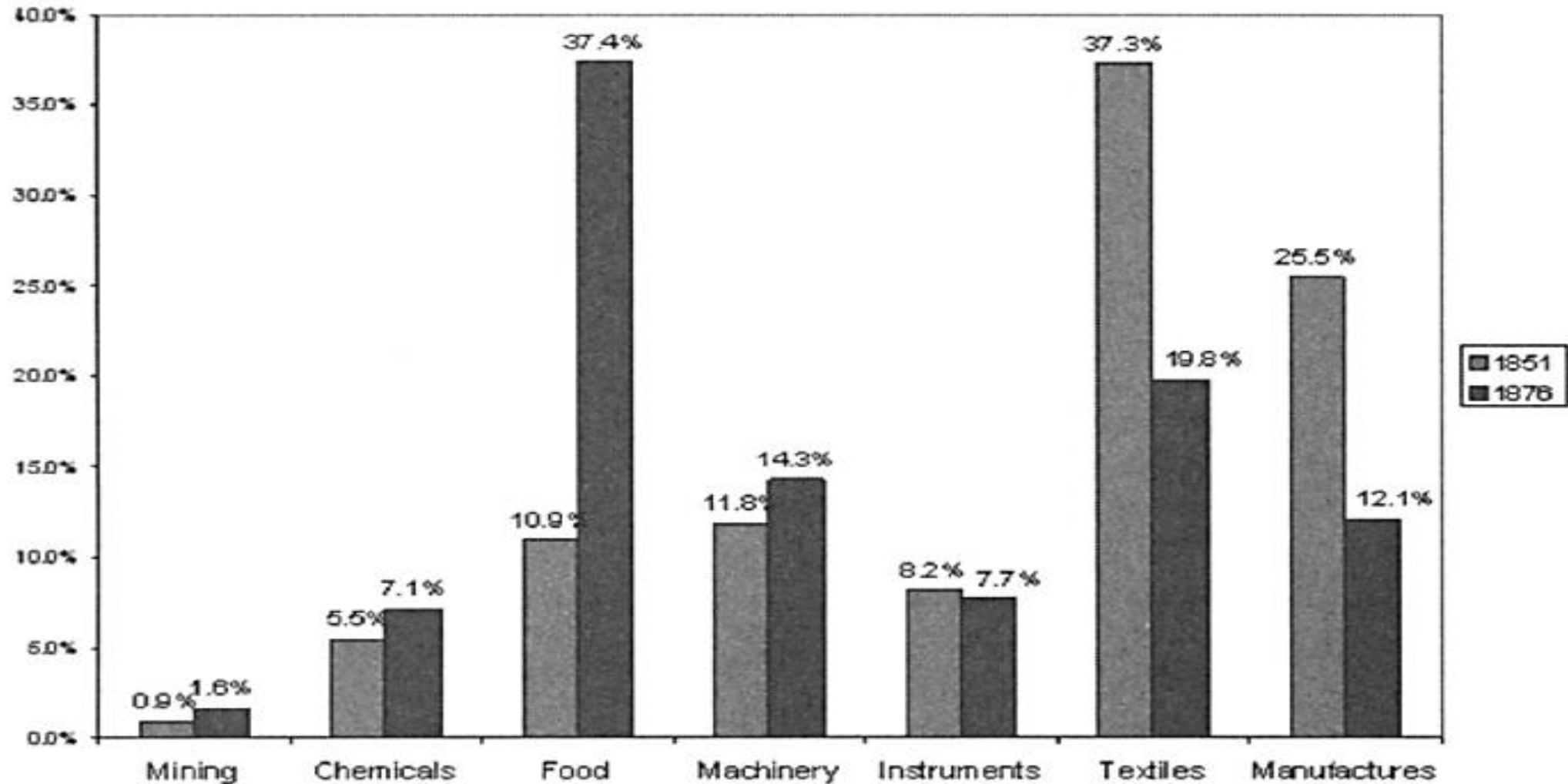
Measurement problem: empirical findings depend on whether measure innovation by inputs (R&D spending), outputs (patents), commercial value, welfare, or other measures.

Sweet spot: Moderate strength of protection may work best to create innovation (Lerner, 2005)

Patents

Do patents affect direction of research?

Moser, 2005 finds that where patents do not exist or are weak, firms invest in areas where secrecy gives good protection, influencing direction of research in economy. (see also Katznelson and Howells, 2021)



Patents

Why Do Firms Patent?

Figure 8
Reasons to Patent Process Innovations

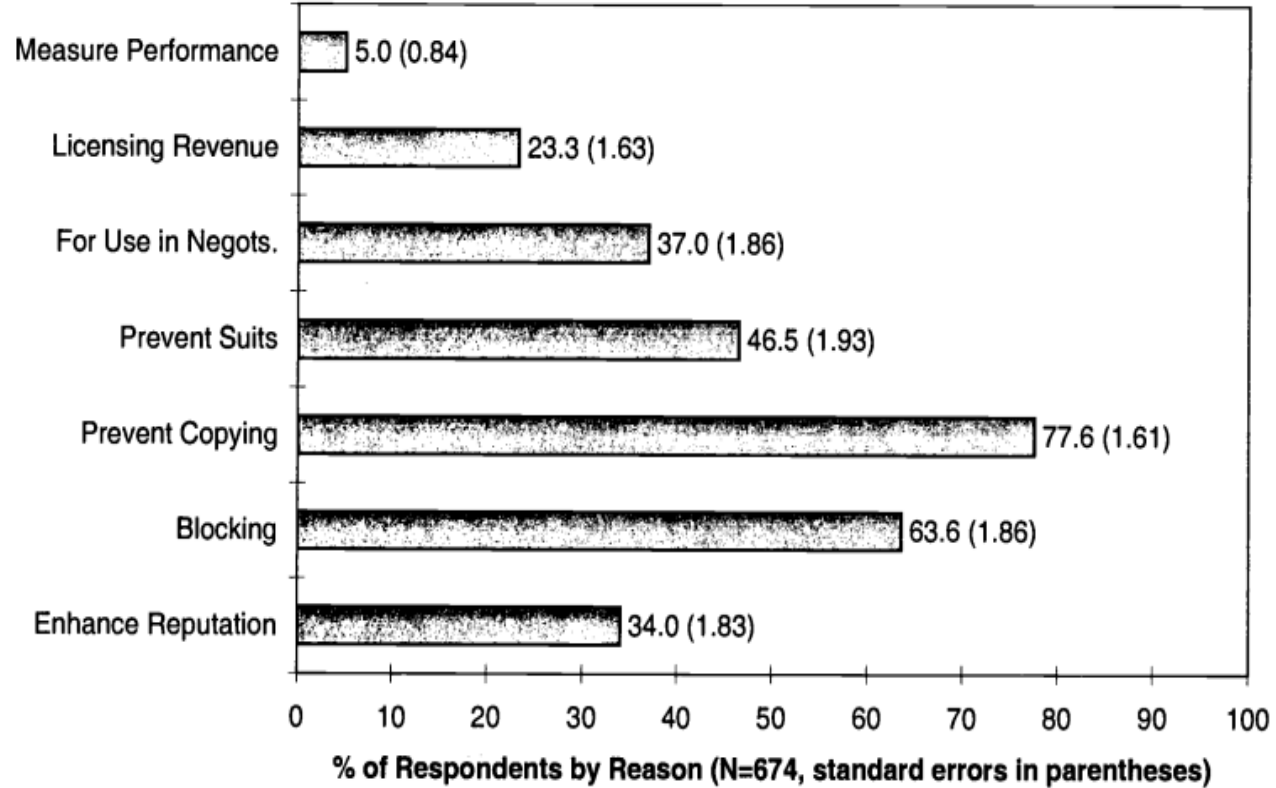
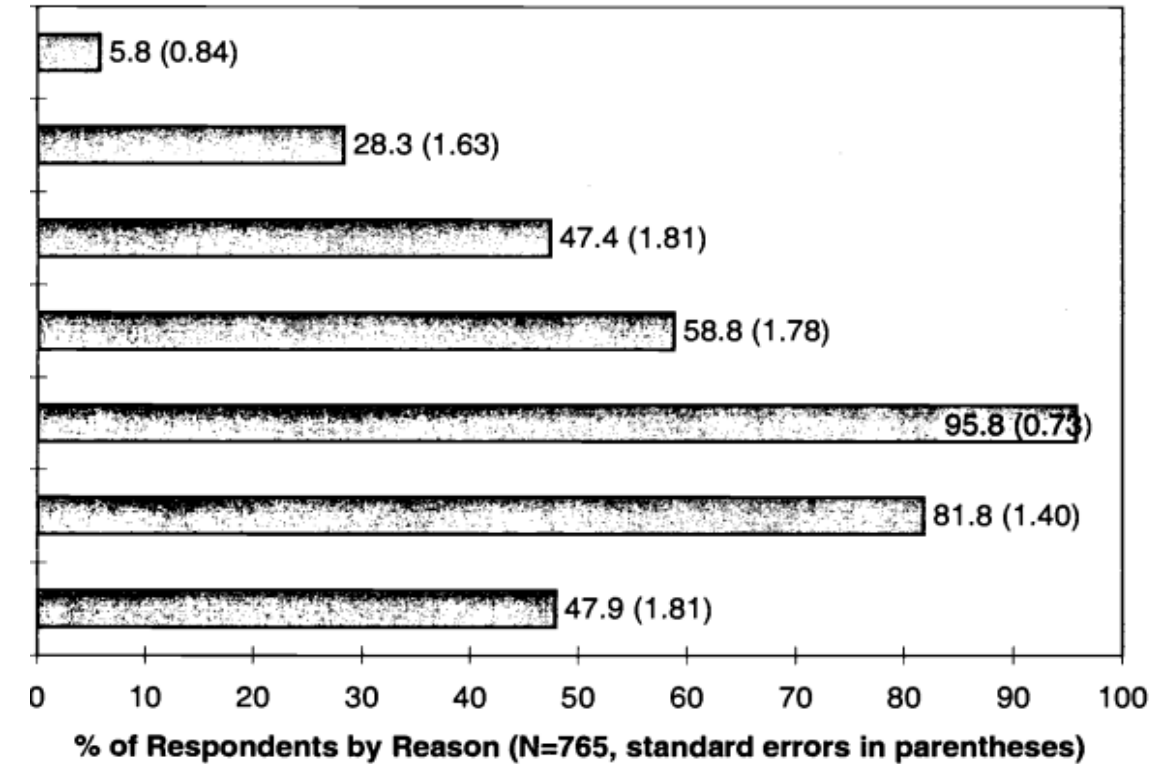


Figure 7
Reasons to Patent Product Innovations



Cohen et al (2000)
Lanjouw and Schankerman (2004)



Patents and other IPRs

Figure 1
Effectiveness of Appropriability Mechanisms for Product Innovations

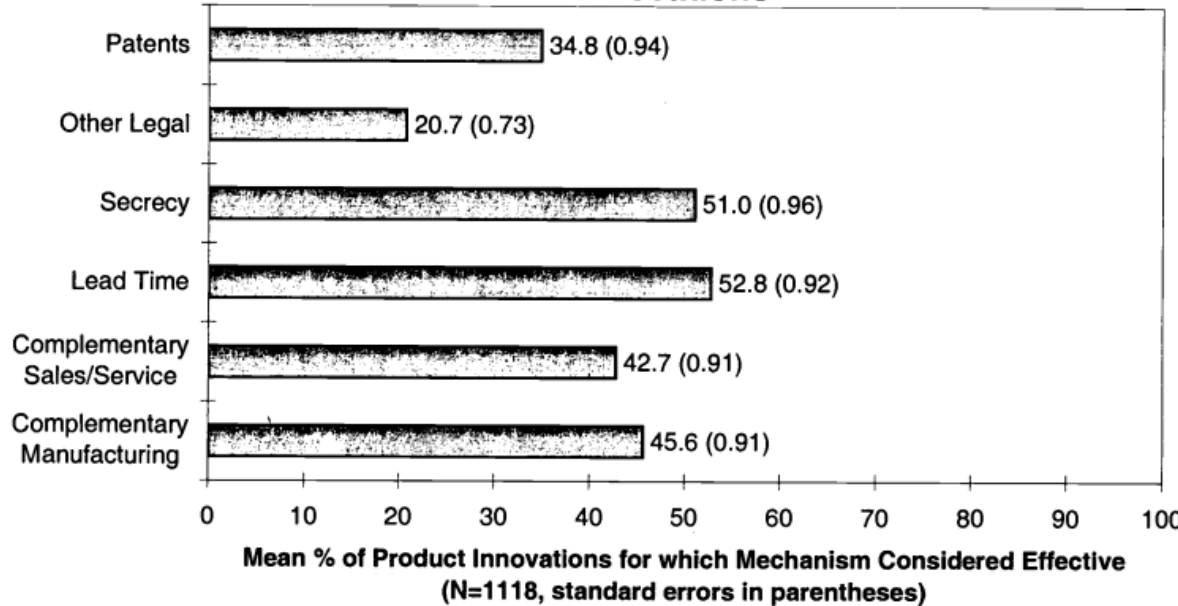
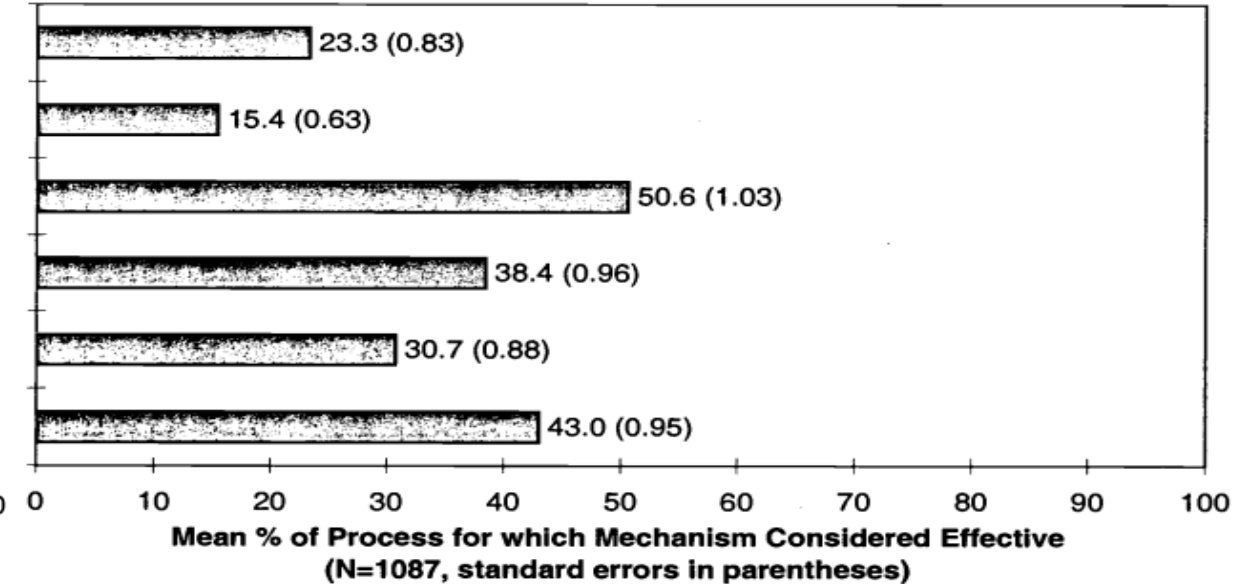


Figure 2
Effectiveness of Appropriability Mechanisms for Process Innovations



(Cohen et al, 2000)

Portfolio of protection measures: methods substitutes and complements to each other

Greater lead time, certain industries favour using patents; trade secrecy can apply to sub-patentable material
IPRs are *one* tool to allow for various profitable strategies

IPR affects firm organisation and financing (Chen, Gao, Ma, 2020).

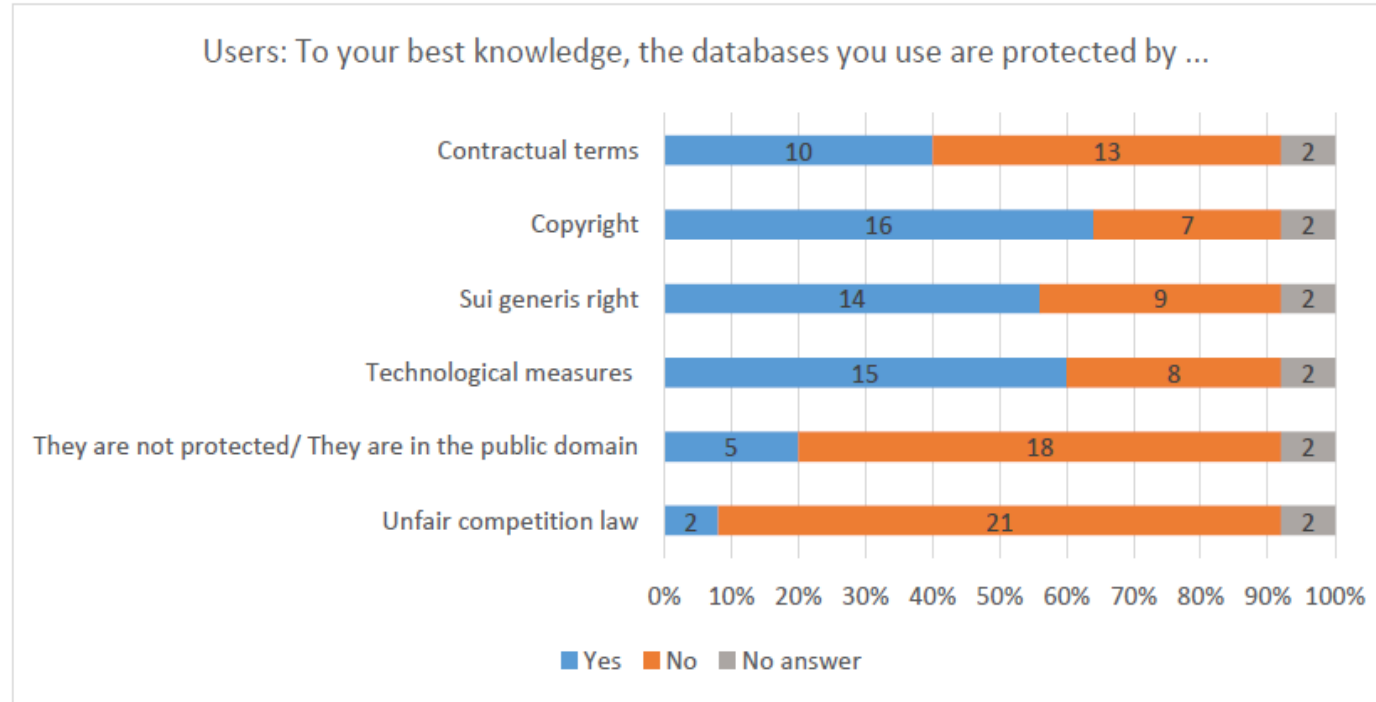
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Data Protection

Similarly for other, newer, IPRs

Figure 15 Means of protection of the databases used by database users



Source: Survey conducted for this study

(European Commission, 2017)

Portfolio of protection measures: methods substitutes and complements to each other

Protection method affects firm organisation and financing

Single Innovation Insights:

- ❖ What matters to innovators is their payoff to investment. As long as this constraint is met, innovation will occur.
- ❖ Payoff can be composed of few periods with high reward or many periods of low reward.
- ❖ Minimizing the distortion in each period maximises consumer gain for many (not all) demand systems: length of protection set long enough to satisfy innovation constraint. “Long, low patents”
- ❖ Has been used to advocate for compulsory licensing, damages to compensate for infringement, and an independent invention defence.
- ❖ Opposite result (“short, fat patents”) if innovation rate varies strongly with royalty rate relative to demand distortion.

details: Rockett, 2010

Application – royalty base

If the payoff is all that matters, then a broad royalty base with a small charge or a small base with a large charge (X% on final price; (X+)% on total value added, (X++)% on value added on hardware only) should make no difference to innovation incentives.

Long low \Leftrightarrow largest possible base (enabled plus non-enabled functionalities), low charge to minimise distortion unless innovation rate varies strongly with royalty (nb: may not be proportional) or demand has a structure such that “short and fat” is better.

Sequential Innovation Insights:

- ❖ Sequential innovation “steals” the rewards due to earlier innovation, upon which it builds. This argues for very large “leading breadth” by Coasian reasoning.
- ❖ Strong protection does not limit follow on innovation if licensing can occur *ex ante*, before cost of innovation sunk for followers. If licensing is *ex post*, a follower who has already sunk investment can be held up (the price of the license may not cover the investment cost, since it will not enter into the price calculations).
- ❖ Where ideas are not “scarce” – where the initial innovator need not partner with another firm to pursue further innovation – then exclusion may occur, but this is not necessarily sub-optimal: where firms can select whether to invest in big or small ideas, strong protection generates an incentive to go for “big steps”.

details: Rockett, 2010

Application - royalty base redux:

Future improvements that are enabled by the innovation are legitimate to include in the royalty base, as they have benefitted from the positive externality of the initial innovation.

Does this reduce future innovation? No reason to agree to a bargain that leaves either party worse off, but if negotiated *ex post*, it can possibly not compensate the follower for sunk costs for *current* improvement. The royalty will be *ex ante* any further innovations, so threat is not to these.

Multiple Complementary Innovations Insights:

“Cournot Complements Problem” – uncoordinated pricing

-N components with per unit royalties affixed to each component, $MC = c + \sum_{i=1}^N r_i$

-For essential components, *each* can command monopoly mark-up → total mark-up is N times monopoly mark-up!

details: Rockett, 2010

Potential threats:

Can an essential components maker “hold up” a product for its entire value *ex post*?

Does this provide an incentive to depart from coordinated standard-setting organisation pricing?

Does this undesirably direct research toward substitutes for essential components?

(Von Graevenitz, 2008, Noel and Schankerman, 2006, Galasso and Schankerman, 2008, Siebert and Von Graevenitz, 2005)

Application – Patent Pools for Complementary Innovations?

Patent Design broadens scope to avoid such coordination problems, but not available for complementarity problems

A good can be assembled out of $M \leq N$ patents at value $V(M)$ and price p_g . A patent will be added if $V(M)-V(M-1) \geq p_m$.

If all N patents used → $p_i \nearrow p_g \nearrow$ → demand for component j *falls*. Components are demand *complements*

If $M < N$ patents used → $p_i \nearrow$ substitute to j → demand for component j *rises*. Components are demand *substitutes*

(Lerner and Tirole, 2004)

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Probabilistic patents

Patents may be infringed or challenged → probabilistic right → bias toward weak patent filings
(Farrell and Shapiro, 2007)

While a patent may be weak, it may not be challenged even if it is a “sham” innovation because of privately-borne litigation expense compared to positive externality of validity suit to competitors

$$\pi(c - \varepsilon + r, c - \varepsilon + r) \geq S\pi(c, c - \varepsilon + r) + (1 - S)\pi(c - \varepsilon, c - \varepsilon) - L$$

Application – “pay for delay”

Preventing pay for delay forces litigation to continue to resolution, eliminating the weak patent problem. (Shapiro)

BUT

“Long low patents” often are optimal. Pay for delay lengthens the patent, so lower royalty can be supported. Without pay for delay, patents effectively “shorter and fatter”. This is only optimal in some demand conditions.

How should IPRs and Competition Policy work together?

- ❖ *Main function of IP Law* is to properly *assign* and defend property rights on assets that might have economic value.

Main goal is to balance the various effects identified earlier (reward vs *ex post* surplus).

- ❖ *Main function of Competition Law* is to regulate the *use* of (intellectual) property rights when these rights are a source of *market power*.

Main goal is to minimise adverse consequences of *market power*.

- ❖ *Timing differs*: IPRs assigned soon after asset created; competition law enters when asset being used.

This difference implies difference in *information* (especially about value of economic asset and structure of market where asset used).

How should IPRs and Competition Policy work together?

- ❖ IPR is not a license to break other laws, including competition law.
- ❖ While IP rights do not necessarily confer significant monopoly power, they can only be effective if they sometimes do (reward theory).
- ❖ Given better information available at time of application of Competition Law, and optimality of *ex post* free access, could be tempted to revisit the trade-offs among effects identified earlier. This must be resisted to maintain innovation incentive.
- ❖ The logic of IP protection is based on “expected” rewards. Hence putting limits on the exercise of IP in some ‘extreme’ cases needs not have a drastic effect on the incentives IP provides.
- ❖ Even if competition law *limits* the extent to which monopoly power can be exercised, it is still possible to *balance* effects identified earlier by judicious choice of length and breadth of protection: if per period gain is lower, then longer protection can compensate.



How should IPRs and Competition Policy work together?

- ❖ There is no reason for IP law to react to small changes in competition law: as only expected rewards matter for innovation incentive, only need to react is if change is significant enough to affect these expectations.
- ❖ Larger changes in the ex post regulatory environment should be – and have been – accommodated. E.g. US Drug Price Competition and Patent Term Restoration Act of 1984.

Thank you!

Part II

In-Depth Discussion of Selected Topics



Competition Policy and IPRs

Pierre Régibeau

CRESSE, 2022

Mergers

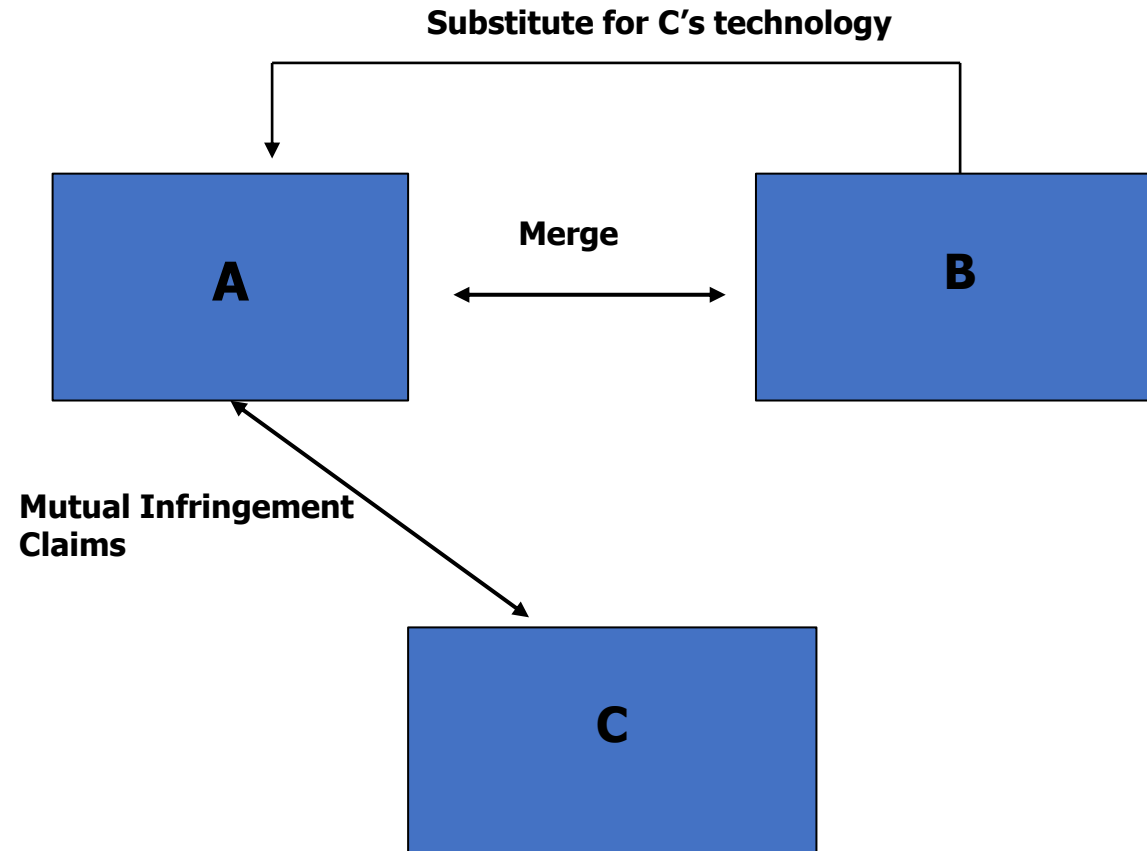
Mergers and Innovation

- Overlap in downstream markets → High likelihood that the merger decreases innovation.
- Mergers MIGHT give rise to a wide set of innovation-related efficiencies
- Effects in Technology markets(see below)
- Effects in Innovation Markets

Mergers and Licensing

- A merger can also change the parties' incentives to license others.
- License if licensing revenues exceed loss of sales due to increased competition.
- Merger increases the loss of sales as it affects two product lines rather than one → reduces incentives to license.

Medical Instruments



Medical Instruments

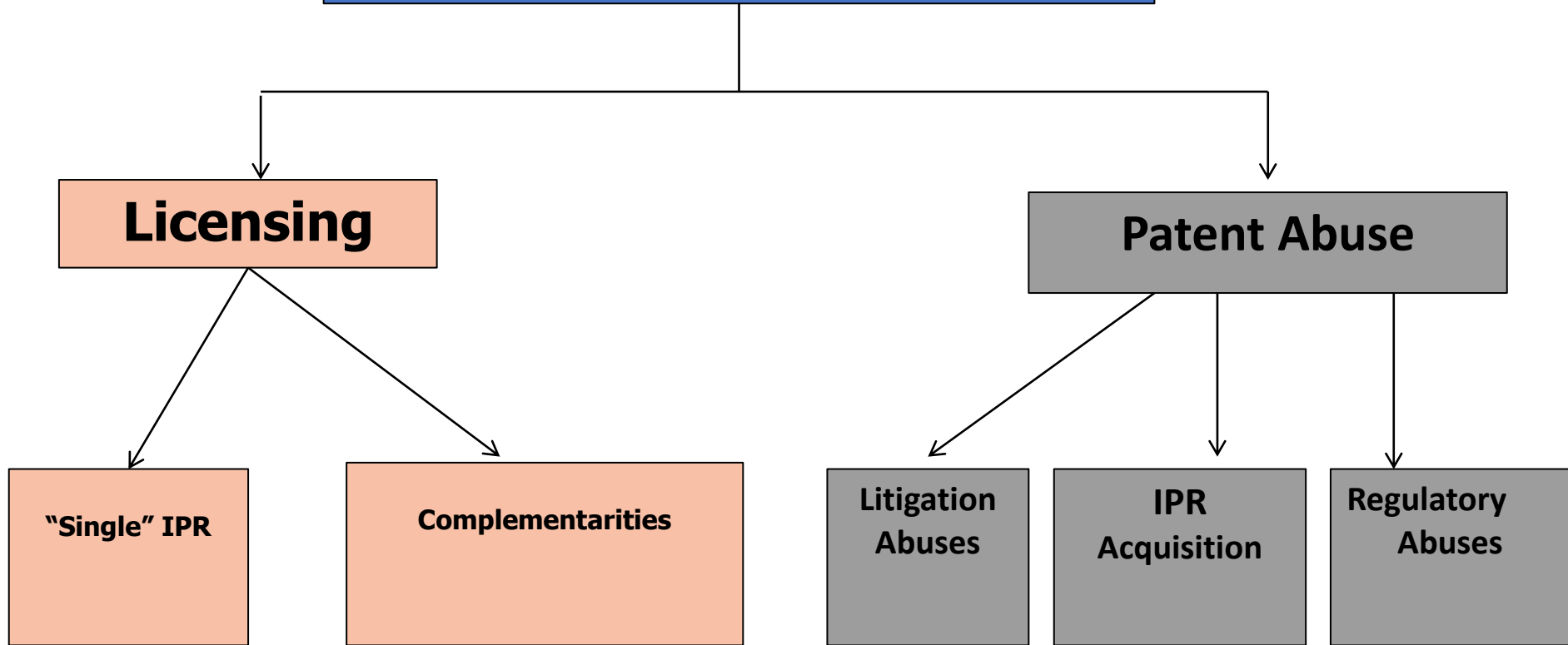
- The merger changes the IP Litigation game.
- Before the merger one would have expected a settlement with cross-licensing between A and C.

Mergers and IP

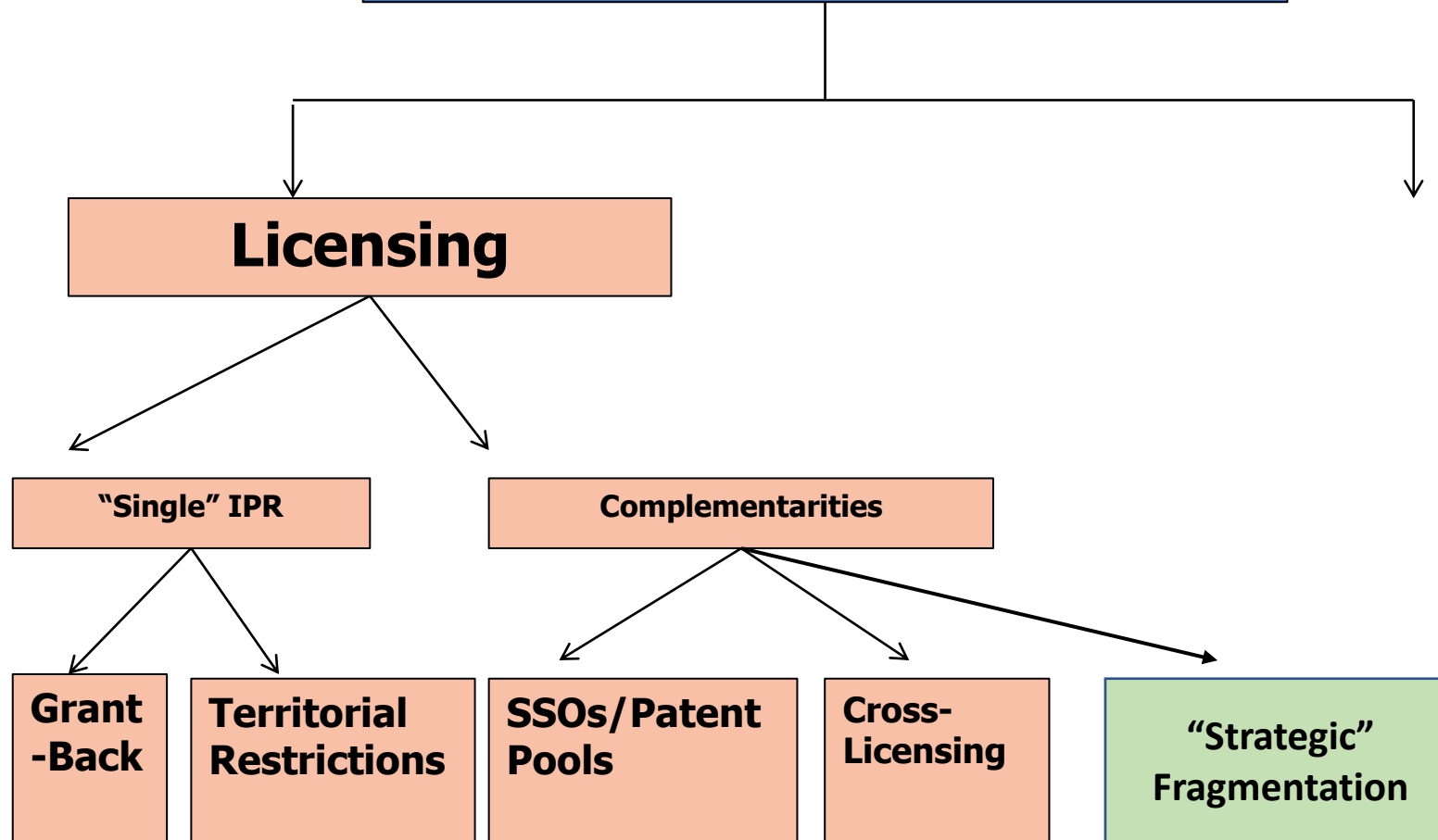
- Look at IP concentration. Possible licensing or patent pool remedies.
- (Vertical) mergers can also change the *direction* of innovation (NVIDIA-Arm?)
- (Vertical) mergers can also affect intensity of IPR litigation and willingness to settle (Illumina-Grail?)

Antitrust

IP and Antitrust Policy



IP and Antitrust Policy



IP and Antitrust Policy

Patent Abuse

Patent "Wars"

Litigation Abuses

IPR Acquisition
(Google-Motorola,
Servier)

Regulatory Abuses
(Astra Zeneca,
Reckitt Beckinser)

SEPs and FRAND:
excessive royalties
(Huawei)

"Pay for Delay"
(Lundbeck, Servier)

Abuse of Regulatory Process

Astra-Zeneca

- One strongly protected new drug, two delivery formats.
- Need to get marketing authorisation not only for the drug but also for each delivery format.
- One format was introduced later and had a more recent patent on it.
- The original patent on the compound was also extended to make up for time spent getting regulatory approval.

Astra Zeneca

- First charge: Lying to the authorities about the date of final approval, thereby extending the length of patent protection.
- *Withdrawing* marketing approval for the delivery format about to become unprotected, thereby delaying generic entry.

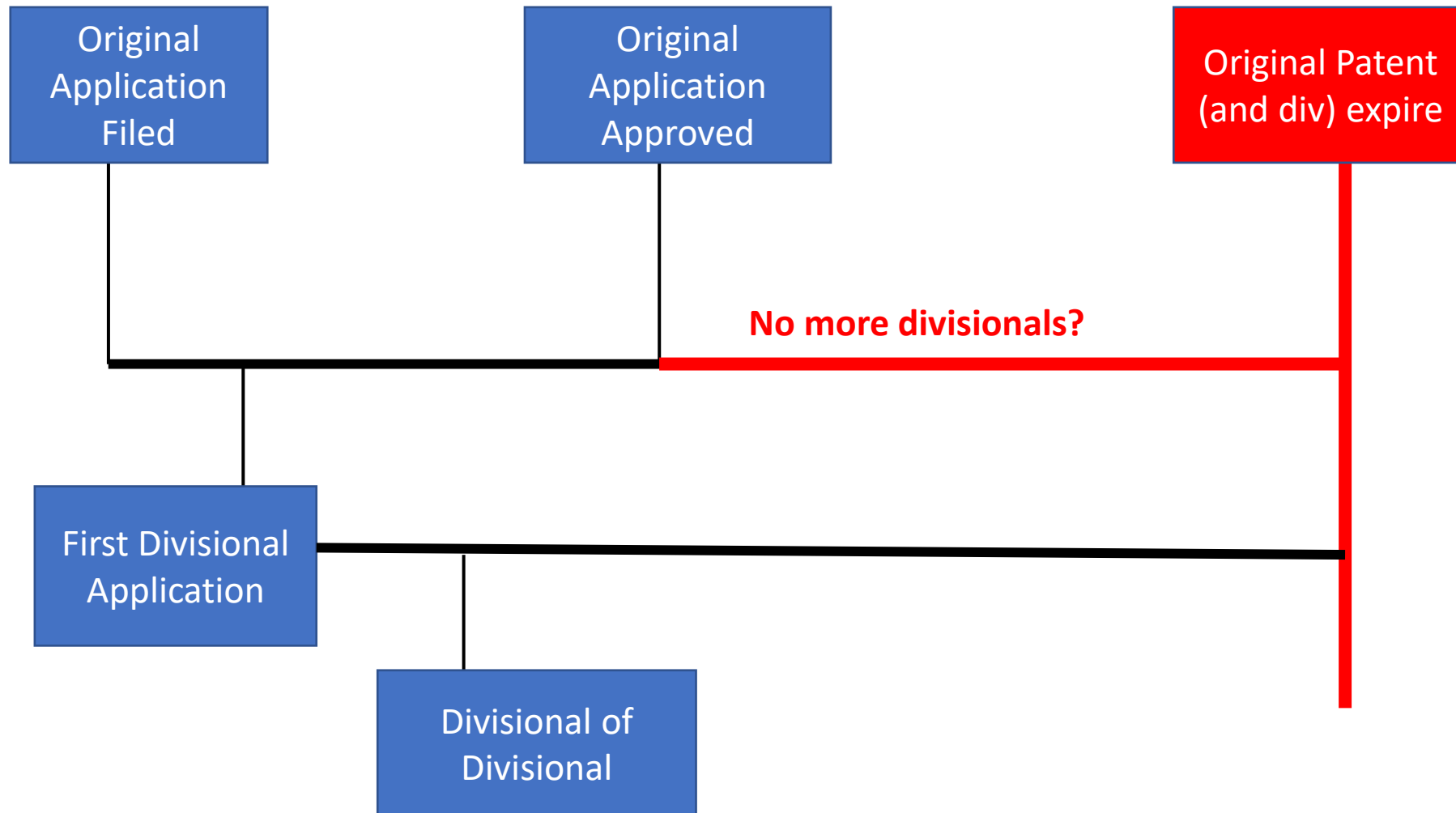
Divisional Patents

- Divisional patent applications are applications that contain matter already included in a previous application.
- The divisional application can retain the same priority date as the initial application. But the review processes are in principle independent.
- Justification: to split initial application into applications with more “subject unity” (Single invention). Avoids the jeopardy of “double patenting”.
- **Europe:** Must be introduced while initial application is still pending. Divisionals can lead to further divisionals even if initial patent application is no longer pending. However a divisional cannot be broader than the spawning application. Also, higher fee for “divisional of divisional”.

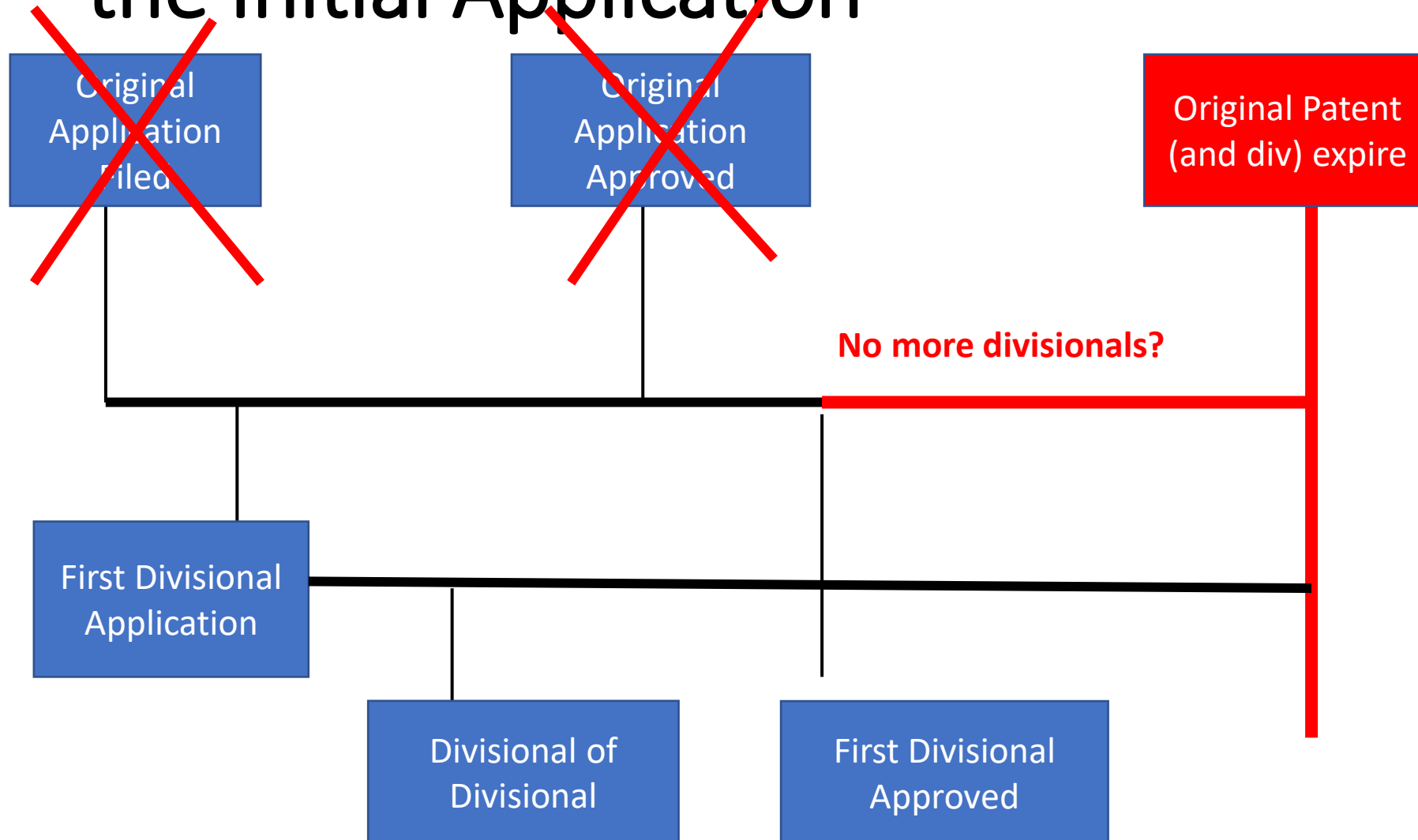
Negative effects of Divisionals

- Prolongs “pendency” and hence legal uncertainty for third parties.
- Can be used as a basis for a “Litigation Carrousel”:
 - Original patent filed, then divisionals filed.
 - Original patent granted
 - Original patent litigated
 - Original patent withdrawn before end of litigation (avoids potential precedent-setting or “signalling” adverse decision)
 - In meantime divisional granted.
 - Sue for infringement of divisional
 - Repeat

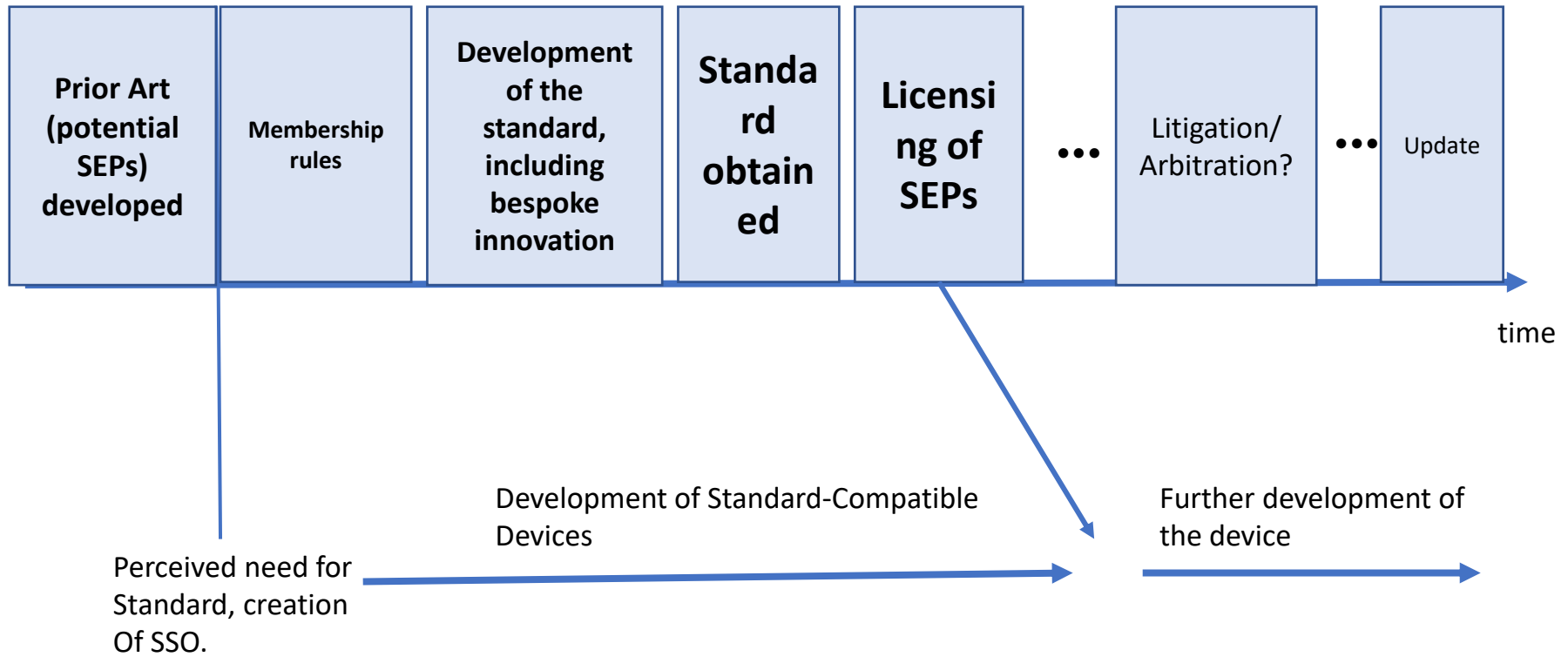
Divisional Patents



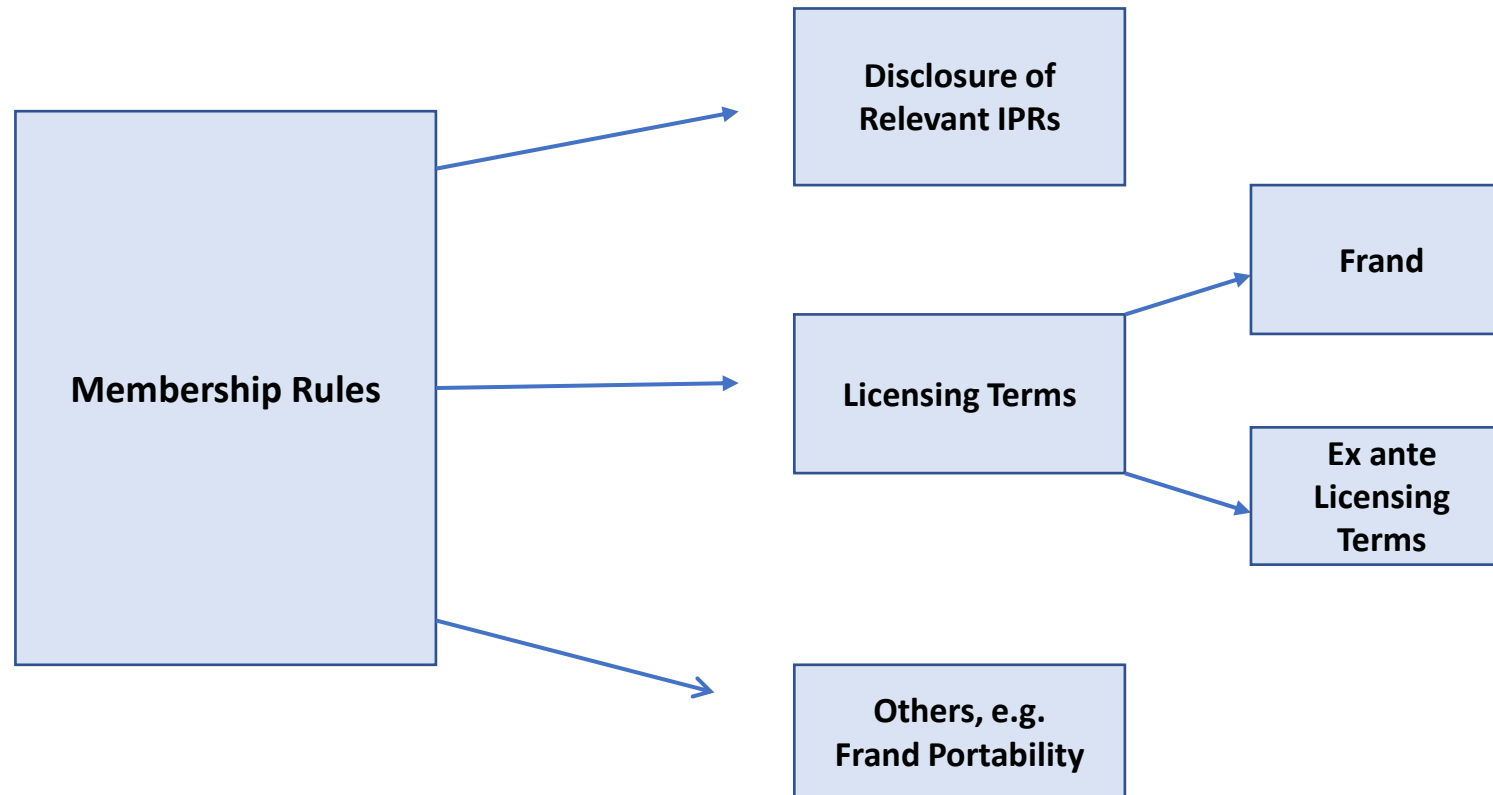
Divisional Patents: Withdrawing the Initial Application



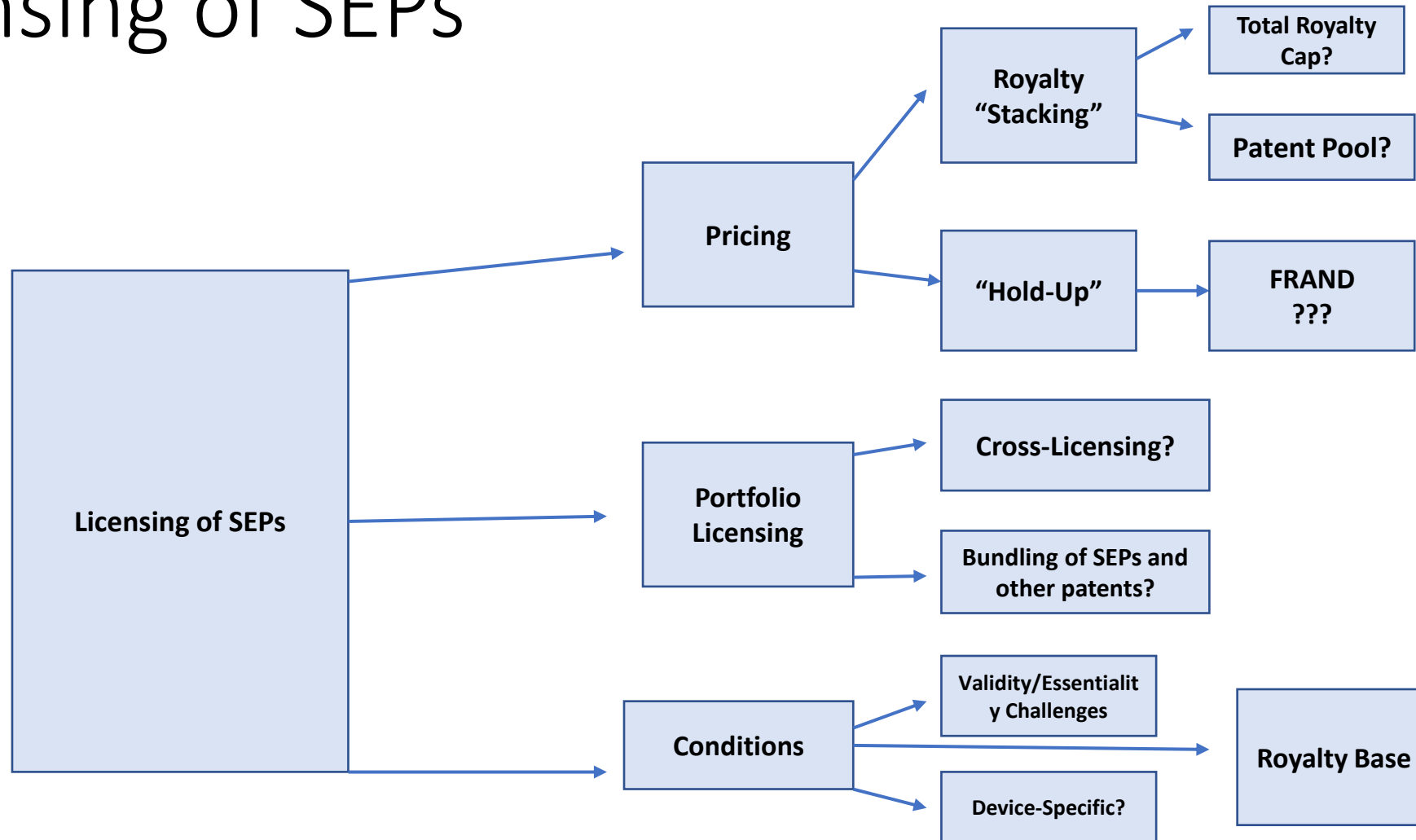
Standard Setting and IPRs



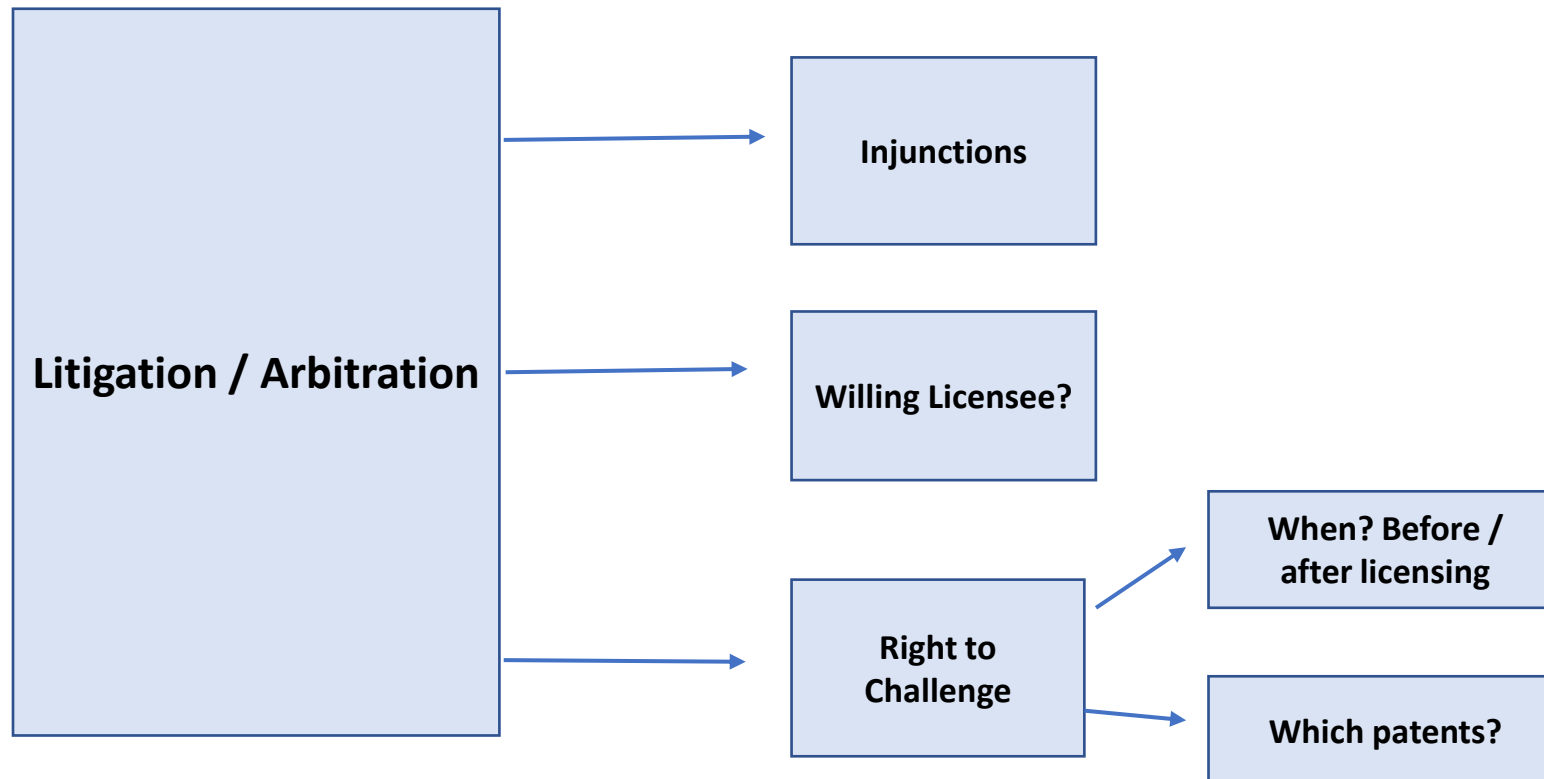
Membership Rules



Licensing of SEPs



Litigation/Arbitration



The Current State of Affair in the EU (Huawei)

- The SEP holder must alert the standard user of the potential infringement and must make a clear Frand offer.
- The user can accept the offer, or make a counter-offer.
- The bargaining process should be given sufficient time.
- The SEP holder can use injunctions against an “unwilling” licensee
- Insisting on keeping the right to challenge the SEPs in Court does not make the licensee “unwilling”
- A licensee who accepts to have the Frand terms set by a Court or through arbitration is not “unwilling”

A FRAND Benchmark and its implications

- An often suggested benchmark for FRAND is one where the bargaining power of the licensors has not been increased by the inclusion of their technologies into the standard.
- The benchmark must therefore be the result of notional bilateral negotiations between individual licensors and licensees at a time where the need for a standard has been recognised but before there is any narrowing down of the technologies that are likely to be reflected in the standard.
- This benchmark is often used in the US.

Implications of the Ex Ante Benchmark

- For each pair of licensor and licensee there is a unique set of royalty rates and contractual provisions, i.e. the single agreement that would have been reached. Conceptually, *there is no FRAND royalty range*.
- While the benchmark yields rates and conditions for each bilateral contract, what really matters for users is the *total royalty stack* that these individual royalties imply. It is based on this total that implementers can decide whether or not to support the standard when they are still free to “walk away” and look for an alternative.

Implications of the Ex Ante Benchmark

- The royalties that would emerge ex ante depend on the pattern of patent ownership ex ante.
- Greater concentration of ownership of substitute patents leads to higher royalties.
- Greater concentration of ownership of complementary patents leads to lower royalties.
- → if a large portfolio is split ex post, the total FRAND royalty that can be jointly collected is the same as the FRAND royalty that could have been collected without the split

A possible policy approach

- Maximum royalty for access to the *standard* set ex ante by the SSO, i.e. maximum royalty stack.
- Individual royalties cannot exceed this total cap.
- Development of sensible “stack sharing” techniques.

Sharing the Stack

- Default is sharing according to share of declared or verified SEPs
- Parties can argue to deviate from that benchmark. Burden of proof on SEP holder if claim a higher share and on user if claim a lower share.
- Clearly the stack resulting from the application of such sharing rules by different Courts will not correspond exactly to the initially declared stack. This is why declaring a range or a maximum makes sense

Unwired Planet – Huawei

- UWP acquired part of Ericsson's SEP portfolio.
- Dispute about UWP's royalty demands.
- UWP's demand for a worldwide license
- Negotiation process and injunctions

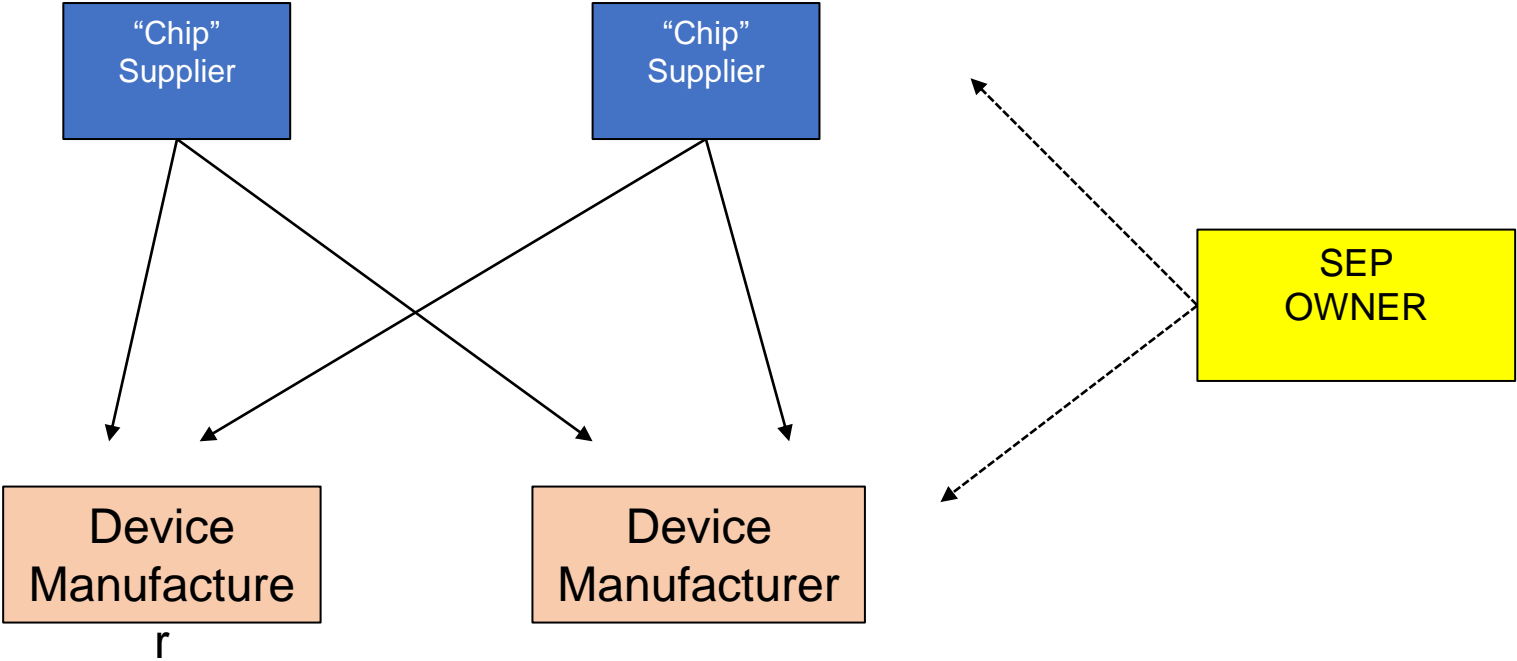
Royalty Demands

- Justice Birrs accepted the “ex ante” benchmark, rejecting the notion of a broad “Frاند range”.
- In practice, the judge relied both on comparisons and on a top down approach tied to the corresponding total stack.

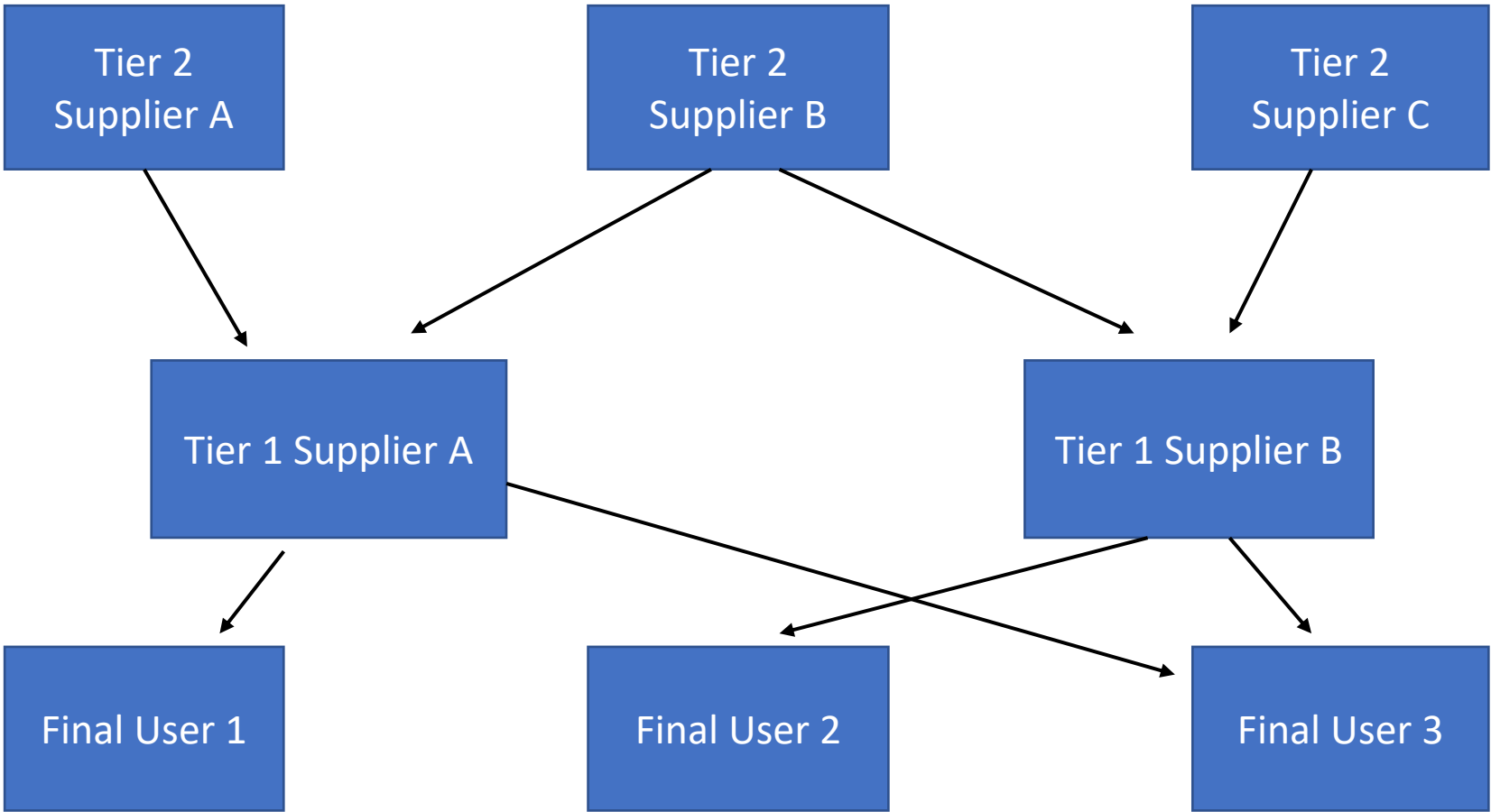
Royalty Demands

- Distinction between contractual law and competition law abuses.
- Contract law: single Frand rate.
- Abuse: only if significantly above that rate

The Appropriate Level of SEP Licensing



The Appropriate “Level” for SEP Licensing



Doctrine of Patent Exhaustion

- Under the doctrine, once an authorized sale of a patented article occurs, the patent holder's exclusive rights to control the use and sale of that article are said to be "exhausted," and the purchaser is free to use or resell that article without further restraint from patent law. In other words, sale of a patented article exhausts the patentee's right in that article.
- This *appears* to prevent the patent holder from charging a royalty for using its technology for making a good AND also charging a royalty on products embedding this good.
- HOWEVER, there are subtleties: components and applications might rely on different sets of patents or different aspects of the same patents, for example.
- Still, makes it unlikely that SEP holders could generally license for a fee at multiple levels of a vertical chain/

The Appropriate “Level” for SEP Licensing

- It is economically efficient to allow SEP-owners to charge different royalty rates for different fields of application or even possibly for different types of devices.
- Licensing upstream might make it hard to enforce such discrimination as tracking the ultimate destination of upstream inputs might not be feasible. So, unless this separation can be achieved upstream, this is a reason for licensing end users.
- On the other hand, if upstream suppliers deal with many downstream firms and downstream firms have many different suppliers of different inputs requiring clearance of different IPRs, having the upstream firm deal with the IP relating to their specific input is efficient as it involves fewer transaction costs and the input suppliers have better knowledge of the technologies and IPRs involved.

Thank you



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References

General Reading:

Hall, B and N. Rosenberg, Handbook of the Economics of Innovation, Elsevier. 2010 (2 volumes; electronic version available; esp chapters 7, Rockett, and 20, Fagerberg) – [Introduction to IPRs. Includes most references in these slides!](#)

Scotchmer, S. Innovation and Incentives. Cambridge: MIT Press. 2004 (PDF available) [introduction to IPRs.](#)

Anderman, S. (ed) The Interface between Intellectual Property Law and Competition Law. Cambridge U. Press. 2007 (updated 2009, also CUP). (relevant chapter by Régibeau/Rockett available through Essex Repository in pre-publication form.) [IPR-competition policy interface – general lessons](#)

Hall, B., C. Helmers, M. Rogers, V. Sena, “The Choice Between Formal and Informal Intellectual Property,” Journal of Economic Literature 52(2). 2014. 375-423. [Compares patents and other means of protection.](#)

Kwoka, J., and L. White, The Antitrust Revolution: Economics, Competition and Policy. 5th Edition. Oxford: Oxford University Press. 2008. [General application of economic analysis to competition cases.](#)

References not Included in General Readings:

Bloom, N., M. Schankerman, J. Van Reenen, “Identifying Technology Spillovers and Product Market Rivalry,” *Econometrica* 81(4). 2013. 1347-1393.

Chen, D., H. Gao, and Y. Ma, “Human Capital Driven Acquisition: Evidence from the Inevitable Disclosure Doctrine,” *Management Science*, *forthcoming*. April, 2020. Available at SSRN <https://ssrn.com/abstract=2713600> or <http://dx.doi.org/10.2139/ssrn.2713600>

European Commission, “Study in Support of the Evaluation of Directive 96/9/EC on the Legal Protection of Databases. Annex 2: Economic Analysis. 2017/0084.

Katznelson, R., and J. Howells, “Exclusive Rights Stimulate Design Around: How Circumventing Edison’s Lamp Patent Promoted Competition and New Technology Development,” *Journal of Competition Law And Economics* 17(4), 2021, 1007-1052.

Shapiro, C. “Competition and Innovation: Did Arrow Hit the Bull’s Eye?” in Lerner, J., and Stern, S., Eds. *The Rate and Direction of Inventive Activity Revisited*, Chapter 7. University of Chicago Press: Chicago, Illinois. 2012. (Available at Chicago Scholarship Online, 2013)

Cases – available online at https://competition-policy.ec.europa.eu/competition-case-search_en