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Dear Readers

In May 2013, a Toulouse School of Economics conference brought together top researchers and key players from the corporate and policy worlds to discuss a question at the heart of modern technology markets: what is a 'fair' royalty for the use of patented technologies incorporated in a technical standard like Wi-Fi?

This issue of the TNIT newsletter presents a summary of the high-level discussion between academic experts, corporate representatives, consultants and policy-makers from patent offices and competition agencies in Europe and the United States. We would like to thank economics writer Romesh VAITILINGAM for writing this overview.*

Please feel free to send us any comments on our Newsletter or the work of the research network more broadly.

We wish you all the best for 2014.

Jacques CRÉMER and Yassine LEFOUILI

**http://www.voxeu.org/person/romesh-vaitilingam*

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Standard-essential patents: The question of FRAND licensing and its impact on standard-setting, competition and innovation

conference report by Romesh VAITILINGAM

What is a 'fair' royalty for the use of patented technologies incorporated in a technical standard like Wi-Fi? A Toulouse School of Economics conference held on 16 May 2013 addressed this issue at the heart of modern technology markets.

The complexity of modern information and communications technology (ICT) has put almost every firm in the sector in the awkward position of not only competing with its rivals but also providing them with intellectual property (IP). Licensing the use of patents covering technologies that have been incorporated in a technical standard on 'fair, reasonable and non-discriminatory' (FRAND) terms has become a core issue for the industry. In recent years, there have been a growing number of high-stakes legal disputes over the meaning of FRAND - and in recent months, there have also been some potentially landmark court decisions.

The nature of 'standard-essential patents' (SEPs) and FRAND licensing - and their implications for standard-setting, competition and innovation - were the focus of a major TSE conference earlier this year. The high-level discussion brought together academic experts, corporate representatives, consultants and policy-makers from patent offices and competition agencies in Europe and the United States.

Among researchers and regulators, there have been some concerns that ambiguities and omissions in the FRAND system used by most standard-setting organizations (SSOs) might undermine innovation - so it was valuable to hear the perspectives of a diverse range of technology companies. At the same time, many academics act as expert witnesses, informing courts on potential resolutions of conflicts: their formalized ways of thinking offered insights into the problems that firms face 'in the trenches'.

The value of interoperability

When competing firms within an industry get together to agree on something, economists typically expect that it will be harmful to consumers. But in the case of standard-setting in technology industries, the opposite is very often the case: consumers can benefit a great deal. For example, widely disseminated standards like Wi-Fi can be of great value to consumers, assuring them that when they take their laptop computer to the coffee shop, they will be able to connect to the internet.

Voluntary standard-setting organizations (SSOs) enable industry participants to meet and establish technical standards. For example, the Institute of Electrical and Electronics Engineers established the standard for Wi-Fi. Such standards allow 'interoperability' across different platforms.

In general, standards can facilitate competition and innovation, but it is important to ensure that SSOs do not provide opportunities for anti-competitive behavior by firms. Competition economists tend to keep Adam SMITH's famous warning in the back of their minds: *'People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices.'*

Once a standard like Wi-Fi has been established, it will naturally rely on IP that is owned by some of the firms - what are known as 'standard-essential patents' (SEPs). So most SSOs will say to their members, if you want your technology

included in a standard, you have to promise to license it to users on 'fair, reasonable and non-discriminatory' (FRAND) terms - which is usually interpreted to mean at a very low price. This is intended to ensure that the market power that is generated by ownership of SEPs cannot be exercised.

ICT products like routers and smart phones typically embody a great many patents, some of which are necessary for the implementation of a standard that allows interoperability across platforms. In such cases, the technologies cannot be implemented without using SEPs and hence it becomes important to think about how to make them as widely available as possible, how SSOs should ask their members to make FRAND commitments and how to resolve conflicts over the meaning of FRAND.

FRAND commitments serve to promote the standard by assuring firms that use it that they will not be blocked from bringing their products to market as long as they are willing to pay reasonable royalties for any SEPs. The commitments are also intended to provide reasonable rewards to firms that have invested in research and development (R&D) to develop the technology used by the standard.

The reason that a FRAND promise is needed upfront is that once the standard becomes successful and popular (everybody adopts it, coffee shops invest in routers, firms invest in factories to make the chips and so on), then the owner of the IP could try to charge a very high price for it - a problem known as 'hold-up'. With everybody locked in, the costs of switching to an alternative technology could be very high, so they would just have to pay the high price.

But foreseeing that outcome, firms and consumers would be hesitant to make use of the standard. To forestall that outcome and to ensure that the standard is successful, owners of SEPs are asked to make FRAND commitments. The problem then comes when there are ex post disagreements about what FRAND actually means - and in practice, there has been a great deal of costly litigation as a result.

For example, disagreements can arise over the exact definition of a FRAND commitment and the validity of the patent. Potential licensees may claim that a licensing demand made by a SEP owner is not a FRAND offer or that the patent is not valid or essential in the first place. But even when the potential licensee is likely to be correct in such an assessment, the SEP owner can still make it very costly to resolve such disputes.

A SEP owner's threat to engage in expensive litigation (or to pursue an injunction or exclusion order, which would forbid the defendant from using the technology, if the licensee does not pay the requested royalties) creates a powerful incentive for a licensee to settle, even on poor terms. Thus, SEP owners can obtain payment far in excess of the value of their technology and appropriate the profits due to the later investments of others. Such behavior potentially raises licensing costs in the industry, distorts the market for innovation and discourages adoption of standards.

The recent surge of litigation in the smart phone and other technology sectors, much of which concerns the interpretation and enforcement of FRAND commitments, has brought these issues to the attention of regulators. Many feel that a better approach to FRAND is needed.

The view from the trenches

Ostensibly, there is a great deal of disagreement and polarization between parties involved in the debate over FRAND, in part perhaps because it is a manifestation of a global battle between rival platforms. But discussions at the corporate roundtable of the TSE conference suggested that there is much more on which industry participants agree than might be expected.

By and large, the 'view from the trenches' seems to be that the system of FRAND in SSOs is working and that, despite all the litigation, the problems may be somewhat overstated. While there is a desire by many market participants to avoid the growing legal costs and uncertainty associated with existing rules, some corporate representatives see litigation as a natural part of the patent system and the appropriate way to resolve disputes.

But while there is a general level of consensus as to what are the chief issues, there is less consensus about how to reach solutions - and what should be the respective roles of the SSOs, the courts and the competition agencies. Certainly, there is increasing involvement by the competition agencies, particularly on issues related to the definition of the FRAND commitment; whether FRAND commitments go with a patent when it is transferred; and whether and to what extent FRAND commitments preclude the availability of injunctions or exclusion orders in the international trade arena.

Nevertheless, the general consensus from the corporations is that the process of developing standards through the SSOs and the FRAND system of licensing that supports the deployment of IP into standards are an engine of innovation. In general, economists and the competition agencies agree with the view that this engine is working at least adequately.

But research by Justus BARON and colleagues finds a beneficial effect of the proliferation of SEPs on the progress of standards only when ownership of the SEPs on a given standard is concentrated. And a study by Jorge CONTRERAS notes that FRAND commitments have proved ineffective in

addressing the problem of 'royalty stacking', which occurs when multiple patent holders assert rights in - and demand royalties on - the same standard (both papers are summarized below).

Furthermore, as some economists pointed out at the conference, what is not observed is the counterfactual: how much innovation there would have been in a world where the FRAND system worked more effectively. As one said, 'the problem is that we don't know what we don't know'.

The assessment of the courts

While there has been a great deal of litigation surrounding FRAND commitments, it is important to note that most of the firms have been on both sides of the table – as both defendants and claimants in disputes about intellectual property rights (IPR). This suggests that, ultimately, they should all have an interest in finding the solution that is best for society, given that they are not always on the same side of the issue.

Of course, litigation is very expensive, but by involving both economic expertise and legal expertise, the process does try to evolve legal rules that embody economic good sense and it has procedurally rich ways of doing that. As several participants noted, it is hard to see how resolution of some of these FRAND disputes could happen without litigation. If the opinions are written well by courts, then eventually the issues should be resolved and litigation should abate.

Indeed, there have been several significant SEP-related court cases that are beginning to suggest some guidelines. One is the very first court estimate of a FRAND royalty, which was made in April 2013 when Judge James ROBART put a figure on what Microsoft should reasonably pay for two SEPs relating to video and Wi-Fi that are owned by Motorola Mobility (which is now part of Google).

Motorola had originally demanded a royalty as a percentage of the final price that Microsoft charged for any product using the SEPs - for example, an Xbox games console. Instead, the judge recommended a royalty measured in cents rather than dollars, on the basis of which Microsoft would owe Motorola $1.8 million a year as opposed to the original demand of $4 billion. A jury subsequently found that Motorola had breached its FRAND commitments over the two SEPs, and the judge has rejected Motorola's motion to overturn the verdict.

In a separate case relating to Wi-Fi, another judge has applied a modified version of Judge ROBART's methodology to determine the FRAND rate to be paid by manufacturers of Wi-Fi equipment for 19 SEPs owned by Innovatio. Exhaustive details of the decisions on these cases and many others can be found on the blogs that discuss SEPs and FRAND (see below). A paper by Gregory SIDAK presented at the conference aims to provide courts with a practical approach to determining FRAND royalties (see the summaries of studies below).

The role of the standard-setting organizations

The issues surrounding standards and the licensing of IP are really global problems. Most of firms are operating globally and many of the SSOs are global organizations: consumers naturally want their coffee shop connection to Wi-Fi to be guaranteed to work wherever they are in the world.

But the strategies of firms in their litigation over what constitutes FRAND commitments are often local: they might bring a case in Germany or different places in the United States. This phenomenon of 'forum shopping' arises because there are rules that are more favorable to one party or the other in different jurisdictions.

There are also considerable differences in terms of the tools available to competition agencies in different parts of the world. The European Commission, for example, has a tool called Article 102 that is designed to deal with monopoly and market power and which makes it possible to pursue companies on the grounds of 'abuse of dominance'; in the

United States, the antitrust tools are less flexible and so the competition agencies cannot pursue companies in the same way as in Europe. There is also an issue of whether the policies, competition rules and court decisions in the two continents are actually consistent with one another.

It is also important to look beyond the West, especially at what China is doing in this area. The Chinese have a very aggressive standard-setting policy driven by central government, whereas in the Western economies, standard-setting is much more market-driven, which is one reason why there is so much ambiguity in the system. China seems to be much more focused on how the government thinks these policies ought to work, which has the potential to generate conflict with the Western SSOs.

The processes of the SSOs on the use and licensing of IP in ICT have recently been examined by a committee commissioned by the National Academy of Sciences to look at 'Patent challenges for standard-setting in the global economy'. Among the many recommendations in the report, which was published in late 2013, the committee 'urges SSOs to become more explicit in their IPR policies regarding their understanding of and expectations about FRAND licensing commitments'.

(http://sites.nationalacademies.org/pga/step/ipmanagement/)

The way forward

In both Europe and the United States, competition agencies are increasingly signaling their willingness to intervene in the SEPs licensing problem because they fear that industry bodies are not delivering. For example, there are policy initiatives to regulate the use of SEPs to prevent adverse effects of so-called 'patent thickets' on the development and use of new technology. The high number of SEPs is in particular perceived to be responsible for the legal battles characterizing the telecoms industry.

While the TSE conference understandably did not reach an agreed position among the diverse range of participants on the way forward, a common theme was that since it is the actions of SSOs that create market power for SEP owners, they have the responsibility to ensure that this market power is constrained so that consumers can benefit as much as possible from standard-setting activity.

There was no great debate on economic principles: what needs to be done is to make FRAND work better. Papers by Jorge CONTRERAS, by Kai-Uwe KÜHN and colleagues, by Mark LEMLEY and Carl SHAPIRO, and by Josh LERNER and Jean TIROLE suggest ways in which the SSOs can act (see the summaries of studies below).

One participant concluded: 'a big message is that there is a need for organizations such as the industry bodies to provide that improvement in the processes that is necessary. We cannot rely necessarily on the courts; we cannot rely on other antitrust agencies to do the jobs of the court. If the solution needs to come from within, then it needs to come from within. But it needs to be fast because the antitrust agencies are pursuing this.'

Summaries of recent studies of SEPs/FRAND by leading economists

Essential patents and standard dynamics

by Justus BARON, Tim POHLMANN and Knut BLIND, presented at the TSE's TIGER Forum, June 2013

In both Europe and the United States, there are policy initiatives to regulate the use of SEPs to prevent adverse effects of 'patent thickets' on the development and use of novel technology. Advocates of the patent thicket theory argue that innovation slows down when a commonly used technology such as a standard includes patents held by various owners. But there is very little empirical evidence of such effects.

This paper aims to fill that gap by investigating the effect of including patented technology in a standard on the rate and direction of subsequent technological progress of these standards. The authors analyze a database of 3,500 ICT standards issued by the most important formal SSOs operating on a worldwide scale. They use the issuance of new standard versions as indicative of continuous technological progress, and control for the overall speed of technological progress in the related field.

The authors find that including essential patents that read on a technological standard has a surprisingly strong positive effect on the rate of continuous technological progress of the standard. But this effect weakens if ownership over patents is increasingly fragmented. Thus, the beneficial effect of patents on continuous progress is strongest if the ownership of patents is highly concentrated.

Full paper available here: http://www.intertic.org/Conference/Baron.pdf

Fixing FRAND: a pseudo-pool approach to standards-based patent licensing

by Jorge CONTRERAS, Antitrust Law Journal, Fall 2013

Technical interoperability standards are critical elements of smart phones, laptop computers, digital files and thousands of other products in the modern networked economy. Most such standards are developed in voluntary SSOs that require participants to license patents essential to the standard on FRAND terms.

FRAND commitments are thought to avoid the problem of patent hold-up: the imposition of excessive royalty demands after a standard has been widely adopted in the market. While at first sight, FRAND commitments seem to assure product vendors that patents will not obstruct the manufacture and sale of standards-compliant products, in reality these commitments are vague and unreliable. Moreover, they have proven ineffective for addressing the problem of 'royalty stacking', which occurs when multiple patent holders assert rights in – and demand royalties on – the same standard.

The recent surge of litigation in the smart phone and other technology sectors, much of which concerns the interpretation and enforcement of FRAND commitments, has brought these issues to the attention of regulators, industry and the public. Many agree that a better approach to FRAND is needed.

This paper proposes a novel solution to the FRAND problem that borrows from the related field of 'patent pools'. In patent pools, multiple patent holders agree to charge a single, collective royalty on patents included in the pool. This structure, which has been used in connection with several successful industry standards, allows market participants to manufacture and sell standards-compliant products with a high degree of certainty about their aggregate royalty burden.

While the cost and administrative overhead of patent pools may make them inappropriate for the majority of standards developed in SSOs, salient features of pools can be adapted for use in SSOs under what the author terms a 'pseudo-pool' approach.

The proposal encourages joint negotiation of royalty rates prior to lock-in of a standard, conduct that has been viewed with approval by several regulatory agencies and acknowledged as offering various pro-competitive benefits. The proposed structure would eliminate the current uncertainty about royalty levels on standardized products, while at the same time addressing the related issue of royalty stacking.

Full paper available here: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2232515

Summaries of recent studies of SEPs/FRAND by leading economists

Standard-setting organizations can help solve the standard-essential patents licensing problem

by Kai-Uwe KÜHN, Fiona SCOTT MORTON and Howard SHELANSKI,
Competition Policy International Antitrust Chronicle, March 2013

IPR were established in both the United States and Europe to protect inventors, to stimulate innovation and to benefit consumers. But specific circumstances affecting some industries like the ICT sector may limit the effectiveness of IPR in achieving these goals. With SEPs, in particular, there are ambiguities in the definition of licensing restrictions as well as weaknesses in the process of IPR enforcement. These seem to contribute to hold-up problems that may threaten innovation incentives and harm consumers.

While these problems are generally difficult to resolve, this paper proposes reforms to the current IPR policies of SSOs (groups of competitors that jointly create standards) that the authors believe would greatly improve efficiency in patent licensing and substantially reduce the problem of hold-up and litigation in this sector.

It is the actions of SSOs that create market power for SEP owners. The SSOs have the responsibility to ensure that this market power is constrained so that consumers can benefit as much as possible from standard-setting activity and so that SEP owners cannot discourage innovation by engaging in hold-up.

Many existing SSO policies are not strong or clear enough to achieve these goals reliably or efficiently. In particular, these authors believe that stronger commitments to a clearer FRAND licensing process can go a long way towards mitigating hold-up problems, reducing litigation costs and speeding innovation. Any FRAND commitment should also be understood to include a commitment to certain processes of dispute resolution and transfer of FRAND obligations

Full paper available here: https://www.competitionpolicyinternational.com/assets/Free/ScottMortonetalMar-13Special.pdf

Standard-essential patents: who is really holding up (and when)?

by Gregor LANGUS, Vilen LIPATOV and Damien NEVEN,
Journal of Competition Law and Economics, May 2013

This paper analyzes the effect of injunctions on royalty negotiations for SEPs. The authors develop a model in which courts grant injunctions only when they have sufficient evidence that the prospective licensee is unwilling, in line with the way courts appear to operate in Europe.

In such a framework, prospective licensees have a powerful strategic tool: the offers that they make to a patent holder will affect the royalty rate that the court may adopt as well as the probability of being subject to injunctions (and the liability for litigation costs). The authors find that despite the availability of injunctions, the holder of a sufficiently weak patent will end up accepting below FRAND rates, in particular when litigation costs are high.

They also find that the prospective licensee will sometimes prefer to litigate and the holder of a sufficiently strong patent will always end up in litigation by rejecting offers below FRAND. This arises in particular when the prospective licensee has little to fear from being found unwilling, namely when the trial takes time (so that the threat of injunctions is less powerful) and when litigation costs are low. The authors thus find that hold-up (royalties above the fair rate) as well as 'reverse hold-up' (royalties below the fair rate) may arise in equilibrium.

Full paper available here:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2222592

Summaries of recent studies of SEPs/FRAND by leading economists

A simple approach to setting reasonable royalties for standard-essential patents

by Mark LEMLEY and Carl SHAPIRO, forthcoming in Berkeley Technology Law Journal

SSOs typically require their members to license any SEP on FRAND terms. Unfortunately, numerous high-stakes disputes have broken out over just what these FRAND commitments mean, and how and where to enforce them. SSOs have been unable to clean up and clarify their IP rules, even though many of the ambiguities and flaws in these rules have been recognized for a decade or more.

This paper proposes a simple and practical set of rules that SSOs can adopt to achieve the goals of FRAND commitments far more efficiently with far less litigation. Under the proposed approach, if a SEP owner and an implementer of the standard cannot agree on licensing terms, the SEP owner is obligated to enter into binding baseball-style (or 'final offer') arbitration with any willing licensee to determine the royalty rate.

This obligation may be conditioned on the implementer making a reciprocal FRAND commitment for any SEPs it owns that read on the same standard. If the implementer is unwilling to enter into binding arbitration, the SEP owner's FRAND commitment not to go to court to enforce its SEP against that party is discharged.

The authors explain how their proposed FRAND regime would work in practice. Their hope is that several forces will now combine to make progress possible: first, a desire by many market participants to avoid the growing legal costs and uncertainty associated with existing rules; second, the availability of a package of reforms that will greatly reduce these costs while promoting the basic goals of FRAND regimes; and third, the growing risk that failure to act will create antitrust liability, as competition authorities increasingly signal their willingness to intervene.

Full paper available here: http://faculty.haas.berkeley.edu/shapiro/frand.pdf

Standard-essential patents

by Josh LERNER and Jean TIROLE, Harvard Business School Working Paper 14-038, November 2013

Standards play a key role in many industries, including those critical for future growth. IP owners vie to have their technologies incorporated into standards, so as to collect royalty revenues (if their patents dominate some of the functionalities embodied in the standard) or just to develop a competitive edge through their familiarity with the technology. But it is hard to know in advance whether patents are complements or substitutes – that is, how essential they are.

Thus a major policy issue in the standard-setting process is that patents that seem relatively unimportant may, by being included into the standard, become SEPs. In an attempt to curb the monopoly power that the standard creates, most SSOs require the owners of patents covered by the standard to grant licenses on FRAND terms. But such loose price commitments can lead to intense litigation activity.

In a formal analysis of SEPs, the authors build a framework in which 'essentialization' and regulation functions can be analyzed and provide a precise identification of the inefficiencies attached to the lack of price commitment. They suggest a policy reform that restores the ex ante competition called for by researchers and in the policy debate.

The authors note that price discussions within the standard-setting process run the risk of expropriation of IP holders, as even balanced SSOs will 'blackmail' owners to accept low prices in exchange for their functionalities being selected into the standard. At the same time, the ability to engage in 'forum shopping' enables IP owners to shun SSOs that force them to charge competitive prices: this suggests imposing mandatory structured price commitments on SSOs.

Full paper available here: http://www.hbs.edu/faculty/Pages/download.aspx?name=14-038.pdf

Summaries of recent studies of SEPs/FRAND by leading economists

The meaning of FRAND, part 1: royalties

by Gregory SIDAK, Journal of Competition Law and Economics, November 2013

Many legal and economic proposals would define what it means for a patent holder to commit to an SSO to license its SEPs on FRAND terms. Drawing from both legal theory and economic theory, this paper examines the meaning of FRAND.

The author's interpretation reconciles a number of conflicting definitions of FRAND and provides courts with a practical approach to determining FRAND royalties. A proper understanding of a FRAND royalty requires recognizing the combinatorial value of SEPs. That recognition reveals the fallacy in attempting to apply the 'ex ante incremental value' rule to the determination of a FRAND royalty. FRAND royalties divide the aggregate royalties generated by the standard among the holders of patents essential to the standard.

Such a division should maximize the surplus resulting from the creation of the standard. It must also satisfy an individual-rationality constraint for the patent holder and the licensee, thereby encouraging continued participation in the setting and implementing of open standards, as opposed to greater reliance on proprietary standards.

Full paper available here: http://idei.fr/doc/conf/sic/seppapers2013/sidak037.pdf

Blogs discussing the latest news on SEPs/FRAND

- **The Essential Patent Blog - the source for standard-essential patent litigation**
  http://essentialpatentblog.com/
- **FOSS Patents**
  This blog covers software patent news and issues with a particular focus on wireless, mobile devices (smart phones, tablet computers)
  http://www.fosspatents.com/
- **Patently-O blog:**
  http://www.patentlyo.com/
- **TAP (Technology - Academics - Policy) blog**
  http://www.techpolicy.com/Blog.aspx