



# Are patent pools a way to help patent owners enforce their rights?



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## ABSTRACT

This paper explores empirically the interplay between patent pooling and litigations using data on 1564 United States patents belonging to eight modern I.C.T. pools and to a control database with patents having the same characteristics. First, our analysis makes it possible to highlight that pool patents are more litigated than non-pool patents presenting the same characteristics. Second, we underline that the difference in the likelihood to be involved in an infringement case, with the patent holder as plaintiff, is due to a pool effect *per se*, on top of the impact of the pool on the market size of the patent. Third, we explore several tracks that could explain this positive pool effect on litigations. We underscore that the patent inclusion in a pool, by reducing the uncertainty on the patent essentiality, facilitates dispute resolution by settlement. We also show that the pools' size, as measured by the number of members, has a positive effect on the number of cases which could be due to a transmission of information between members. We emphasize and discuss such other factors that affect the incentives to litigate as the size of the firm and whether the patent holder is vertically integrated. From a public policy standpoint, our results underscore the need for a higher scrutiny of the real functioning of modern I.C.T. pools by the antitrust authorities.

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## 1. Introduction

A patent pool is an agreement between patent owners in order to grant a single license for several patents. The economic literature underlines two main economic benefits of patent pools: (a) they help to reduce the overall transaction costs by reducing the number of licenses for a potential licensee and (b) they eliminate or reduce the double marginalization problem by allowing patent owners to coordinate their behaviors on royalties.<sup>1</sup> In contrast to these benefits, these organizations can also have negative economic effects. The main problem highlighted in the literature is the introduction of substitutable patents into the pool thereby reducing competition on the royalty level of these patents.<sup>2</sup> In order to reduce these

potential negative effects, [Lerner and Tirole \(2004\)](#) indicate that a pool should be both formed only of complementary patents and allow patent owners to license their patents independently.<sup>3</sup>

In practice, the main difficulty faced by pool administrators is to create sufficient incentives for patent owners of essential patents to participate. Indeed, patent holders have strong incentives to free ride by taking advantage of the opportunity to charge higher royalties for their patents by not participating to the pool ([Aoki and Nagaoka, 2004](#)). If the pool does not necessarily allow for the maximization of licensing revenues, and given the importance of modern pools, the patent holders may have additional incentives to participate that are not fully analyzed in the literature. This paper addresses this question analyzing empirically the link between

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<sup>1</sup> The double marginalization problem was first defined by [Cournot \(1838\)](#) as: "the exercise of market power at successive vertical layers in a supply chain". In adapting the double marginalization concept to intellectual property, [Shapiro \(2001\)](#) indicates that the total amount of royalties that owners of complementary patents claim will be too high due to a lack of coordination. In the case of a standardized technology, this lack of coordination between owners of complementary patents could reduce the standards' diffusion.

<sup>2</sup> [Kato \(2004\)](#) stresses that, under certain conditions, patent pools constituted of substitutable patents can also enhance consumer welfare. [Jeitschko and Zhang \(2014\)](#) open an interesting field of research taking into account, in a welfare analysis of patent pooling, not only the impact of pools on the level of the licenses

but also their impact on the incentives to innovate. They conclude that, when pool formation facilitates information sharing and either increases spillovers in development or decreases the degree of product differentiation, patent pools can adversely affect welfare by reducing the incentives toward product development and product market competition – even with perfectly complementary patents.

<sup>3</sup> This compulsory individual licensing rule should eliminate pools constituted of substitutable patents, making them unstable. [Brenner \(2008\)](#) deepens the analysis of the compulsory individual licensing rule by underlining that this rule is efficient only if the patent does not have strong competition (substitutes) outside the pool.

modern patent pools and patent litigations, which has not yet been studied in the economic literature.<sup>4</sup>

In order to conduct our analysis, we use a database of 1564 U.S. patents in 8 modern Information and Communication Technology (I.C.T.) pools and a litigation database created by the Stanford Law School. We link these data on patents and litigations to data on the nature and structure of firms and patent pools. Our analysis makes it possible to underscore a couple of findings. First, we highlight that pool patents are more litigated than non-pool patents presenting the same characteristics. Second, we emphasize that this difference in the likelihood to be litigated is due to a pool effect *per se* that is independent of the impact of the pool on the market size of the patent. Third, we explore several tracks that could explain this positive pool *ex post* effect on patent litigations especially the impact of the third-party expert essentiality evaluation, at the time of introduction, on the likelihood that the case will be ended by settlement or the possibility that pool members exchange information on potential infringers. We emphasize and discuss such other factors that affect the incentives to litigate as the size of the firm and whether the patent holder is vertically integrated.

From a practical viewpoint, by underlining the importance of the essentiality evaluation on the value of the patent and the possibility that pools could be a way for members to exchange information, our paper calls for a higher scrutiny of the real functioning of modern I.C.T. pools by the antitrust authorities. It is thus perfectly in line with the recent increased interest of the United States Department Of Justice (D.O.J.) Antitrust Division in one of the main I.C.T. pool administrator: MPEG LA.<sup>5</sup>

The remainder of this paper is organized as follows. Section 2 presents some stylized facts on the subject of patent pools and patent litigations. Section 3 explains the collection process of the data. Section 4 provides some descriptive findings. Section 5 introduces our theoretical framework on the link between patent pools and litigations. Section 6 presents the empirical results.

## 2. What is a standardization process, an essential patent and an infringement?

### 2.1. Stylized facts on essential patents and the standardization process

One may define the creation of a standard as the creation of a common and documented repository to harmonize the activities of a technological sector. Either formal (such as standard developing organizations) or informal (such as consortia) standardization bodies may conduct standardization. The creation of pools helps the dissemination of technology by allowing users to sign only a single license for several patents. A patent holder may choose whether to bring its patent to the pool or not. In practice, patent holders have few incentives to participate due to the possibility of free-riding (taking advantage of the pools' creation by charging higher royalties without participating in it).

A patent has to be essential to the standard to be included in a pool.<sup>6</sup> Nonetheless, it is difficult to identify precisely all the essential patents related to a technology. All pool patents are essential, but all essential patents are not in the pool. A vast majority of

essential patents are not included in a pool probably due to the lack of incentives for patent holders to participate.

Pools usually have third-party experts that assess the essentiality of the patents before inclusion. This third-party expert establishes a patent essentiality report identifying the part of the standard to which the patent proves essential.<sup>7</sup> One of our main hypotheses in this paper tests whether this essentiality evaluation by a patent expert reduces the uncertainty on the outcome of the dispute and, thus, facilitates the resolution by settlement.

Simcoe et al. (2009) study the effect of patent disclosure in Standard Setting Organizations (SSOs) on the number of litigations. In this paper, we analyze pool patents consisting of not only patents declared essential but also essential patents not disclosed in an SSO. There is a strikingly small overlap between patents disclosed as essential in an SSO and real essential patents included in a pool.<sup>8</sup> This small overlap can be explained in two ways. First, the evaluators do not typically assess patent essentiality before disclosure in an SSO and, subsequently, many patents disclosed turn out not to be truly essential in reality.<sup>9</sup> Moreover, some very large firms particularly active in the standardization field do not participate to patent pools (e.g., Qualcomm). In addition, the pool functioning rules (essentiality evaluation, patent holders discussion on royalties, etc.) should have an impact on litigations that the patent disclosure in an SSO does not have. Thus, although we use a similar method, we analyze a totally different underlying effect than that analyzed by Simcoe et al. (2009).

### 2.2. Stylized facts on patent infringement

One can define a patent infringement as the use and/or production of an invention or a technology, for which someone owns a patent, without obtaining permission from the patent holder. In most countries, patent holders generally can enforce patents via civil lawsuits<sup>10</sup> but some countries also have criminal procedures against infringement. In the case of a civil lawsuit, the patent holder will seek monetary compensation and the infringer can be liable for all or part of profits made from the use of the infringing technology as well as damages to compensate any harm suffered by the patent holder. In order to prove the infringement, the patent holder has to show a violation of at least one of the patent claims.<sup>11</sup> A patent owner that would like to enforce its rights faces a major constraint when an accused infringer attempts to challenge the validity of the patent. Indeed, in the United States, the courts can declare a patent invalid if at least one of the patentability requirements has not been fulfilled.

All patent infringements do not reach the level of judicial decision. Indeed, many conflicts are resolved by a bargaining between the possible infringer and the patent holder. The economic literature on the subject identifies many reasons that could justify the refusal of a settlement by one of the parties. The first obvious answer: the patent holder and the possible infringer have different expectations on the outcome of the case. The economic literature (Meurer, 1989; Lanjouw and Schankerman, 1998; Priest and Klein, 1984; Cooter and Rubinfeld, 1989) also highlights two other

<sup>7</sup> The essentiality reports are available online for all the pools managed by MPEG LA.

<sup>8</sup> See for instance, Delcamp (2012).

<sup>9</sup> For instance, the essentiality evaluation of Fairfield Resources on patents declared as essential to LTE and SAE emphasizes that around 50% of the families declared contain no essential or probably essential patent (see <http://www.frlicense.com/LTE%20Final%20Report.pdf>).

<sup>10</sup> Such as in the United States.

<sup>11</sup> However, in many states, the accused infringer can be liable for patent infringement even though the technology does not fit exactly in the field of a patent claim due to the "doctrine of equivalents."

<sup>4</sup> Lampe and Moser (2010) present preliminary empirical results on the link between the sewing machine pool (1856–1877) and patent litigations. Whereas these findings are interesting, the intellectual property landscape has evolved so much since the late nineteenth century that the results of this experience are difficult to extrapolate.

<sup>5</sup> In March 2011, the DOJ Antitrust Division reportedly started an investigation of actions by MPEG LA, more especially regarding web video encoding technology.

<sup>6</sup> The usual definition considers essential any patent that has no close substitutes, or substitutes so inferior that it makes them very distant alternatives.

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