



Valuing Standard Essential Patents in the Knowledge Economy:

A Comparison of F/RAND Royalty Methodologies
in U.S. Courts



Bowman Heiden
Center for Intellectual Property (CIP)
Department of Technology Management and Economics
Chalmers University of Technology

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1. Introduction

The convergence of computing, Internet, and telecommunications has created intense competition over intellectual property in recent years. This is due to the fact that multi-technology products, such as smartphones and tablets, include thousands of patents across a broad range of technical functions that are owned by many different actors from disparate sectors, all of which competing to receive a share of the expanding telecommunications market. One major area of contention regards intellectual property and technology standards in the ICT sector, in particular, the pricing of licenses for patents essential to the implementation of a technology standard (i.e. standard essential patents).

In 2013-14, the US federal court system issued several rulings determining the royalty rate of standard essential patents (SEPs) under F/RAND commitment to standard setting organizations (SSOs). While not generating as much popular press as the smartphone wars between Apple and Samsung, these cases represent the culmination of a growing battle over the distribution of profits in the telecommunication value chain between technology owners and technology implementers fought through the context of standard essential patents and the F/RAND agreements under which they are licensed. From a downstream manufacturing perspective, SEPs are a cost to be minimized, while for an upstream technology provider, SEPs represent the output of its R&D investments from which it looks to maximize its return. This new mode of vertical competition in the value chain has opened up for new business models and new roles for intellectual property that challenge the traditional industrial norms.

This study focuses on a comparative assessment of the SEP valuation models of four recent SEP court cases in the US in 2013-14 and discusses their systemic implications for industry and policy makers (both SSO and governmental) regarding the potential impact on economic performance and economic efficiency in the context of the shift from industrial to knowledge-based business models. Specifically, this study investigates (1) the impact of evolving knowledge-based market structures and firm positioning on SEP value and (2) the operationalization of valuation principles and norms based on competing business models/value logics and competing theories of patent holdup, royalty stacking, and economic efficiency in the F/RAND context. These investigations are then formulated into a set of propositions towards an improved theoretical understanding of patent value in the knowledge economy. The full paper is forthcoming in the International Journal of IT Standards and Standardization Research. Below is a short summary of the findings.

2. Comparative Analysis of SEP Court Cases in the US

The study includes the analysis of four recent US SEP court cases, including the landmark SEP ruling by the Western District of Washington (*Microsoft v. Motorola*)

and three subsequent F/RAND cases in the Eastern District of Texas (*Ericson v. D-Link et al. and CSIRO v. Cisco Systems*) and the Northern District of Illinois (*Innovatio IP Ventures*). Below table 1 provides comparative information across the four district court cases.

Table 1. Comparative overview of recent F/RAND cases

Plaintive	Defendants	Trial	Standard	No. of SEPs	Value Base*	F/RAND Rate
Microsoft ¹	Motorola Mobility (Google)	Bench	H.264	16	MPEG-LA patent pool	\$0.00555
			802.11	11	Mixed base ^a	\$0.03471
Ericsson	D-Link, Netgear, Belkin, Dell, HP, Acer, Toshiba, Intel	Jury	802.11	3	Previous industry licenses with 3 rd parties	\$0.15 ²
Innovatio	Cisco, Motorola Solutions, SonicWALL, Netgear, HP	Bench	802.11	19	Chipset profits	\$0.0956
CSIRO	Cisco Systems	Bench	802.11	1	End products	\$0.83 ³

* The term value base is used to denote the source from which the F/RAND royalty was calculated

^a Based on an average of Via patent pool rates, prior non-F/RAND 3rd-party component-level license agreement, and a prior consultancy valuation report

Source: Official trial documents

In addition, the court cases have been analyzed across the following parameters:

1. Business models deployed by the litigants
2. Translation of F/RAND valuation principles into legal norms
3. Application of ex ante evaluation methods
4. Determination of royalty base and F/RAND valuation logics and methods

3. Key Findings and Implication on Economic Performance and Efficiency

Below is a discussion of four key conceptual areas supported by the evidence of the four recent cases that together form a framework for further research regarding the value of SEPs in particular and an enhanced theory of patent value in the knowledge economy in general.

¹ Note that Microsoft sued for breach of contract, so Motorola/Google is the actor seeking F/RAND royalties for their SEP portfolio.

² The F/RAND rate has been vacated and remanded with instructions from CAFC.

³ The royalty rate, for the most part, is not explicitly based on a F/RAND commitment due to the historical circumstances of CSIRO relations with the 802.11 standard and the wireless industry.

1. Transition from a Production Logic to a Technology Logic

The four SEP holders under study exemplified the increasing use of SEPs to generate revenue (i.e. technology logic) beyond the traditional production of physical products (i.e. production logic) by both practicing and non-practicing entities. Specifically, the four cases illustrated a diverse set of contexts and business models as described in section 2.1, including a mixed use of value logics as follows:

- Practicing entities that deploy the standard in their own products but also look to monetize their superior SEP portfolio over other producing firms (e.g. Motorola and Ericsson).
- Non-practicing entities that acquire patents from other market actors (including practicing entities) with the sole purpose of patent assertion to monetize the assets (e.g. Innovatio).
- Non-practicing entities whose main function is only to perform R&D and rely completely on license-based business models to transfer their technology to the market (e.g. CSIRO)

Further empirical and theoretical research on the impact of the new division of innovative labor on the industrial value chain is required to better ascertain how different knowledge-based modes of firm action affect economic performance and efficiency.

2. The Context of Standards as a Determinant of SEP Value

In addition to the emergence of new roles and value logics deployed by firms discussed above, there is evidence that the contextual nature of the standard itself may have the greatest impact on the value of SEPs. Thus the profile of how a standard was developed, in particular, the primary value logic of the stakeholder firms, can be observed by the licensing and litigation history involving the standard. Widespread infringement would suggest a technology logic while extensive cross-licensing or the formation of a successful patent pool would suggest a production logic. There is a need for further research on the techno-economic typology of different standards to confirm this proposition, however, this would imply that one-size fits all business norms, valuation methods, and policy measures will likely not be economically efficient.

3. Conflicting Norms on Appropriate Royalty Base and Valuation Models

The changing landscape of IP strategies and business models was also apparent in the different value logics that underpinned the choice of valuation methods put forward by the different actors across the four cases. While the US courts have a long history of determining reasonable royalties, it could be argued that these determinations have been primarily made within a production logic. For instance, legal norms for setting the royalty base, such as the rule implicating the smallest saleable patent-practicing unit or entire market value rule (EMVR), are designed from the perspective of an

industrial value chain and may require further adaption to the new roles of IP and knowledge-based business models that often license different parts of the value chain. Therefore, it is not surprising, that in a changing paradigm from a production to a technology logic, the current legal norms are mismatched with traditional business norms, which leads to argumentation aligned to the existing legal norms instead of the current business reality. The cases show that SEP holders will likely need to show evidence of the market value of their SEPs through arms-length market transactions to prove the value through a technology logic. More research is needed to explain how the current legal norms address knowledge-based business models and its subsequent impact on economic performance and efficiency.

4. Relevance of Patent Holdup and Royalty Stacking

Given the theoretical importance of the concepts of patent holdup and royalty stacking to the determination of SEP value, the dearth of evidence put forward by the market actors in the four recent cases suggests that they are not a significant market issue in the context of the H.264 and 802.11 standards. This further implies that F/RAND contracts in their incomplete, historical interpretation have been successful in regulating patent holdup and royalty stacking issues in technology transactions among market actors at least in these standards. However, one important insight stemming from the lack of evidence of systemic patent holdup and royalty stacking in the studied cases is that policy measures designed to eliminate these problems are possibly unnecessary and could potentially alter the balance, creating patent holdout that could reduce the quality of standards and reduce overall social welfare. More research is required that models the impact of policy interventions from both a dynamic and static efficiency perspective.