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Economic efficiency and field-of-use pricing of SEP licenses under FRAND terms

Dr Eskil Ullberg, PhD

Adjunct Professor, George Mason University, Virginia, USA and Head of the Trade in Ideas Program,
Institute of Management of Innovation and Technology, Stockholm, Sweden.



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Economic efficiency and *field-of-use* pricing of SEP licenses under FRAND terms

Dr Eskil Ullberg¹, PhD

Executive Summary

This article is concerned with patented technology markets, and whether price differentiation based on field-of-use is economically efficient. The focus is on the licensing of Standard Essential Patents (SEPs) on Fair, Reasonable and Non-Discriminatory (FRAND) terms and conditions, including also the Internet of Things (IoT) applications, and the economic growth in the digital economy, especially for Small and Medium sized Enterprises (SMEs).

The central argument proposed is that the difference in the value between usages of standardised technologies determines whether a single price for all usages or specific field-of-use prices are economically efficient.

When considering the increasing range of applications of standardised technology, now including also the Internet of Things (IoT) and 5G applications the values for usages of patented essential technologies can be considerably different. This is in particular the case if we also include differences in willingness to pay in emerging markets and developed markets where applications typically are different.

Previous discussions on SEP licensing and FRAND have focused on royalty rate pricing metrics within a specific licensed product market. This article discusses economic efficiency of ‘between-market’ differentiation of royalty rates for SEP licensing. This is important, because field-of-use licensing is a principle (inherent) to patents.

A literature review is performed from three evaluation angles: A market analysis under neoclassical assumptions of price-taking agents and marginal (incremental) value, an expanded market analysis where the Willingness To Pay (WTP) replaces marginal cost as criteria for what price should be paid for licences, and market studies based on an experimental economics (behavioural) approach and auction theory, having similar characteristics as the SEP market in terms of risk. Marginal cost refers to the cost of producing an additional unit of product. In patent licensing, that would mean writing an additional contract. But the value is in the use in the product, i.e. the value of the license must be priced according to its use-value, expressed as WTP. Licensing is a *producer* market. The analysis is based on the principle of field-of-use licensing, established already in the first known patent law in 1474.

From the literature review it is concluded that if the sector (“the market”) is expanded through a differential pricing policy, resulting in the creation of a more efficient overall market, in many cases there would not be a conflict with competition law. Price differentiation appears to be the right policy, when values of the technology to the user are *dissimilar*, as otherwise

¹ Eskil Ullberg is Adjunct Professor, at George Mason University and head of the Trade in Ideas Program, at the Institute of Management of Innovation and Technology. His research interest is on markets in patents, and how they can leverage the human capital formation, especially for developing countries, through exchange in human ideas.

low-value users could not be able to enter the market, thus the IoT industry, and the Digital Single Market linked with it, would not succeed.

Without price differentiation the high-value users, who typically pay royalties for access to essential technologies, would instead indirectly “subsidise” the low-value users, who may not pay anything in case of a single price, i.e. unaffordable for them, and possibly too low for sustained technology development. A senior judge commented that what they can do at best is to find the “least unfair” solution in an infringement case. Price differentiation seems the “least unfair” policy in this case as more users are likely to pay which avoids unfair competition from users not paying. When more users pay, based on value, that ultimately encourages a market in the next generation technology, sustaining and encouraging research, potential productivity gains and economic growth. Thus, price differentiation, which results in more markets being served, seems to be socially preferable. This suggests an overwhelming case for price differentiation based on field-of-use, under these conditions, which likely would further technology and economic growth in the digital economy, especially for SMEs.

It appears that a serious policy effort is needed to continue an efficient mechanism for the licensing of SEPs on FRAND terms and conditions, also in the IoT field on basis of the principle (mechanism) of field-of-use licensing. Such a price differentiation pricing policy should be encouraged by informed policy makers, given the likely social gains.

When is field-of-use price differentiation efficient?

Based on the literature review, field-of-use prices are efficient and socially preferable:

- (i) if the value (of using standardised technology) between the fields-of-use is *dissimilar* (Smith, 1969); conversely, if the values are not dissimilar, a single price can be more efficient (Smith, 1967). These findings inform a price differentiation policy based on value dissimilarity.
- (ii) if prices are based on *users’ short-run marginal opportunity cost* (not to be confused with price differentiation). Prices should not follow *long-run marginal cost* (including investments). This makes field-of-use pricing key to sustain technology development. This finding calls for further analysis in the users’ cost structures. (Hirshleifer, 1958)
- (iii) if differential prices enable *markets to expand* through distributing technology into new products and services. In many cases this would not be a use of the patent system in conflict with anti-trust law (Varian, 1996)
- (iv) if price differentiation is necessary based on users’ *willingness to pay*, to provide enough revenues for IP holder, a practice that expands markets (Hausman and MacKie-Mason, 1988)
- (v) if, in the long-term, dynamic effects allows for testing out – a selection mechanism – which *inventions* can be implemented economically in innovations, contributing to growth. Such learning from markets on what technology is economically useful directs future research on technology (Ullberg, 2016).
- (vi) The conclusions regarding pricing under uncertainty is that price differentiation is socially preferable (Smith, 1966).

The field-of-use price differentiation should thereby be well established principle in SEP licensing under FRAND conditions.

Key findings of the Paper

Field-of-use is a principle (mechanism) inherent to the patent system since the earliest codified patent system in the world (Venice statute of 1474) that allows for price differentiation.

- Price differentiation based on field-of-use is efficient, i.e. socially preferable, if values of usage of the standardised technology are *dissimilar*.
- Price differentiation likely leads to the broadest possible use of standardised technology thus to the highest social gains, including distribution through SEP FRAND licensing.
- Price differentiation likely leads to the “least unfair” result to SEP holders, as low-value users of the standardized technology would be able and willing to pay something (less than high-value users of the same standardised technology) if different prices apply. On the other hand, they could not afford entering the market if different prices would not apply. Resorting to *de facto* zero royalty licences for low-value users would create an indirect subsidy and skew incentives for competition on standardised technology. This would weaken the infrastructure in the digital economy, including IoT applications under 5G, and especially for the SMEs.
- To sustain development of the next generation of technology, the broadest possible use of technology may be desirable. Such use will give information on economic viability of SEPs and thus such learning will direct next generation research towards profitable technology. Such use is also socially preferable.