



Re-Evaluating Patent Damages in the Knowledge Economy

The Determination of Royalty Base for Standard Essential Patents from an Intellectual Value Chain Perspective



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1. Introduction

Patent valuation is a complex and imprecise process exemplified by the long, contentious history regarding the determination of patent damages in US jurisprudence. This process is made even more difficult as products increasingly undergo technology convergence and market actors deploy divergent business strategies to extract value from their intellectual property. This has led to an increase in patent litigation and a greater need for courts to more accurately calculate patent value. Courts have deployed several procedural rules including the use of the smallest saleable patent practicing unit (SSPPU) and the entire market value rule (EMVR) as a means to reduce the complexity. However, as these rules impact the determination of the royalty base, which can differ by orders of magnitude, the applicability of their use in different market contexts and norms requires investigation as their use by the courts could have a systemic effect on industrial dynamics and economic efficiency in specific markets, especially those reliant on open standards. The goal of this study is to investigate the applicability and implications of the current legal norms for the choice of royalty base in relation to the prevailing market norms regarding SEP transactions in the telecommunication industry. The full paper will be available in an academic journal in the near future. Below is a short summary of the preliminary findings.

2. Value Creation in the Knowledge Economy

For this study the focus is on the key operational differences between competition on a product market (i.e. a MVC) versus a technology market (i.e. an IVC), where the former is primarily concerned with the production and sale of physical products and the latter with the packaging of knowledge as intellectual property and commercialization through license-based transactions. While the material value chain (MVC) can be seen as a component of a more holistic intellectual value creation process, this paper will define the two value chains as separate but complementary as a means to better illustrate the different commercial logics and strategies deployed by market actors – see figure 1 below. This is particularly relevant considering the changing role of IP licensing from being simply an alternative to in-house production to a primary means of generating revenue and facilitating access in standards-enabled markets with multi-technology products, where IP ownership is often distributed among many actors. As technology/patent licensing is often directed at producers of physical products, special interest will be given to the intersection of the two value chains (i.e. the position in the material value chain where licensing takes place) as this directly relates to the determination of royalty base.

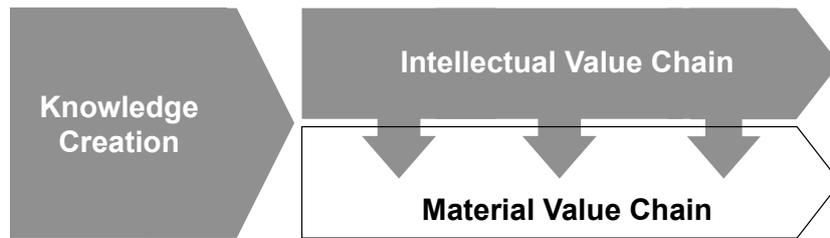


Figure 1. Commercialization of knowledge on both a material and intellectual value chain

3. Positioning of License Agreements in the Telecommunication Value Chain

In the telecommunication industry the market norms for the location of SEP licensing is typically at the position of the end product in the value chain as shown in figure 2 below. On the lower layer, the figure depicts a generic telecommunication material value chain consisting of component manufacturers (e.g. chipset producers), end product suppliers (e.g. brand owners and OEM/ODM), and customers (e.g. operators and/or end users). On the upper layer the figure shows how the results of R&D activities (e.g. SEPs) are managed as intellectual property transactions (e.g. SEP licenses) through the intellectual value chain towards end product suppliers in the material value chain.

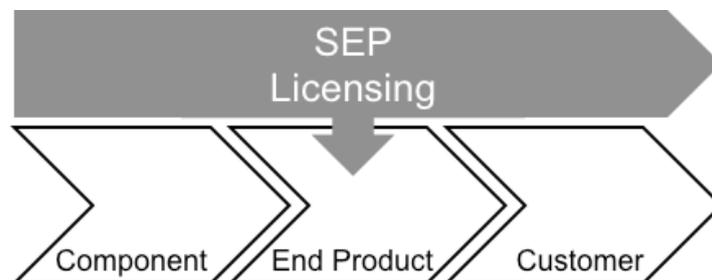


Figure 2. Position of SEP licensing in the telecommunication value chain

The choice of F/RAND licensing towards end product suppliers has evolved as the predominant market norm based on the following reasons:

1. Historical norms

The history of cross-licensing among integrated firms in the telecommunication industry has created a strong norm among actors to license SEPs at the end product supplier position in the value chain. This norm has persisted even as the value chain has transformed and fragmented to include new divisions of labor. This norm can be seen in how firms make royalty declarations, in the specification of “fully compliant” product licensing in F/RAND commitments, in the licensing unit of patent pools, in recent ITC rulings, and in the recent SEP court cases in the US, where the end product supplier has typically been the defendant.

2. Risk Management

For integrated firms that maintain both strong SEP portfolios and produce physical products, the position of SEP licensing is important for managing their exposure to the SEP portfolios of other integrated firms.

3. Value capture

SEP holding firms are profit maximizers, the same as all commercial firms. Given the opportunity to choose the position of the value chain in which to license SEP portfolios, a rational firm would choose a position that best reflected the value of the contribution of their technology.

4. Case studies

In order to better understand knowledge-based business models in the context of the telecommunication value chain, both the MVC and IVC, two short cases are examined individually first and then collectively to illustrate their interaction. The first case is Qualcomm, exemplifying a leading company originating from the telecommunication sector that operates in both the MVC and IVC selling both components and licensing SEPs as separate but interrelated business models towards OEM/ODMs. The second case is ARM, exemplifying a leading company originating from the semiconductor/computer industry that operates exclusively in the IVC through a pure IP-based business model towards semiconductor/chip providers¹.

While this study describes how different business models in the MVC and IVC operate and interact, it is also helpful to illustrate how different knowledge-based business models interact in the telecommunication value chain. Figure 3 below shows how the ARM and Qualcomm IP-based business models interface in the IVC, where ARM processor IP cores are licensed to Qualcomm, who integrates them together with other technology blocks to provide full system-on-a-chip (SoC) solutions for mobile devices. Qualcomm subsequently licenses its SEP portfolio to OEM/ODMs manufacturing end products.

¹ Though ARM does not license SEPs, it does license IP and has become a major actor in the telecommunication value chain through convergence of the mobile computing segment. It is used here to illustrate differences in IP licensing norms in relation to Qualcomm and other SEP licensing telecommunication firms. It is a particularly relevant example given that ARM's licensing practice was used as a comparable industry license in determining the F/RAND royalty range and rate in the landmark *Microsoft* ruling recently upheld on appeal by the US 9th Circuit Court of Appeals.

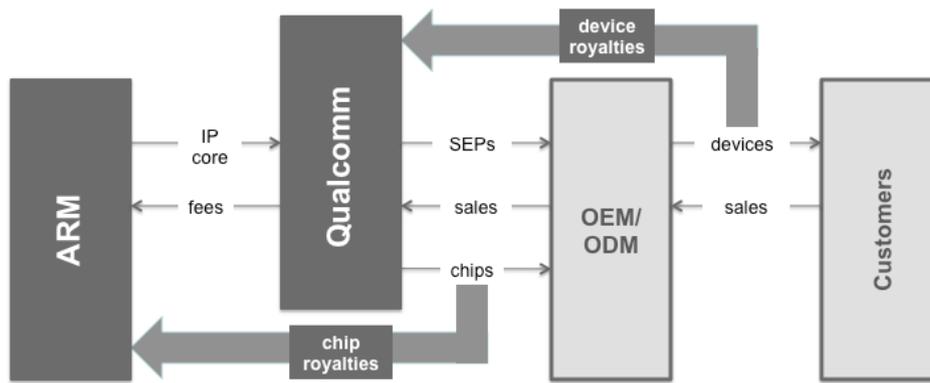


Figure 3. Interrelationship of ARM and Qualcomm IP-Based Business Models

The location of licensing in the telecommunication value chain (i.e. royalty base) of both the ARM and Qualcomm licensing models represents the influence of historical norms where ARM has its roots as a semiconductor company in the computer industry and Qualcomm has its roots as fully integrated telecommunication company. These different histories also manifest themselves in relation to the nature of the scope of their different IP portfolios. While ARM's IP relates primarily to the function and implementation of processor-based chips, Qualcomm's standard essential IP relates to the entire telecommunication system (e.g. the 3G or WiFi communication system) with some functionality implemented on the chip level and others on the device and system level. Thus historical industry norms and the scope of the relevant technical system together with strategic business considerations based on bargaining power in the value chain have all impacted the current configuration and roles played by ARM and Qualcomm in the telecommunication value chain.

5. Analysis of IVC-based principles and market norms in relation to current legal norms for determination of royalty base

This section analyzes the impact of IVC principles and prevailing market norms on the interpretation of legal norms regarding apportionment and royalty base determinations in the adjudication of patent damages for standard-essential patents (SEPs). Five relevant areas of consideration have been highlighted to advise courts, regulators, SSOs, and other policy-makers when interpreting and setting norms related to SEPs, F/RAND, and standard-enabled markets. In particular, these five areas are meant to generate a better understanding of how the nature of the value of knowledge and the evolution of market norms in the telecommunication value chain should normatively influence the interpretation of legal norms to provide greater equity and economic efficiency.

1. The Value of Knowledge is Not Constrained by the Material Value Chain

One key characteristic of a knowledge economy is the increased value of the knowledge component of value propositions. When we move from a MVC to IVC logic, one key challenge will be how to value different knowledge-based

contributions delivered through multiple interrelated value propositions, such as knowledge embedded in physical products and knowledge packaged as license offers. In the context of patent damages, this would fall within the general category of the challenge of apportionment where the court has developed several procedural rules to help manage the complexity, such as SSPPU and EMVR. Therefore, the value of IP cannot always be defined simply by looking into the MVC. For example, the market norms in the telecommunication industry show that firms license SEPs separately from physical value propositions (e.g. chipsets) through the IVC towards end product, making the component level inappropriate as the royalty base without a necessary adjustment to account for customary business practice.

2. Royalty Lacking – Components are Not Licensed in the Telecommunication Value Chain

Building on the previous section above, the use of the SSPPU rule becomes increasingly challenging when the IP in question has not been licensed on the component level. As discussed previously, the norm in the telecommunication industry is to license SEPs at the end product position in the value chain, which effectively means that the component level is left unlicensed. This creates a downward pressure on the price of components creating what could be termed as a reverse royalty-stacking or “royalty lacking” problem if a component level royalty base is chosen in an industry that doesn’t license SEPs at the component level.

3. Market Norms are to License SEPs on Fully-Compliant End Products

Based on historical norms and strategic behavior, SEP holders in the telecommunication value chain primarily license SEPs on fully compliant products sold by end product suppliers. This practice has existed now for quite some time, especially in cellular standards, though increasingly in Wi-Fi standards, however, with less evidence of traditional licensing activity. While numerous antitrust inquires have examined SEP licensing practice, to date no competition authority has found the practice of SEP licensing to the end product position of the value chain to be anti-competitive. However, it is possible that different industries and industry segments may have different norms as the Qualcomm and ARM cases in section 4 demonstrate.

4. Standards Drive Market Demand by Definition

For consortium-based telecommunication standards, it is particularly difficult to separate the standard-setting process from the construction of the market. However, different actors view standards in different ways. For implementation firms the standard is a means to facilitate the sale of products and services, while for innovation specialists and large SEP portfolio holders, the standard is viewed as a product itself. The use of SSPPU and EMVR can be seen as a means by the court to manage the complexity of determining patent damages in multi-technology products, however, the distinction is too digital. The EMVR requirement that the end product cannot be used as the base if the patents in suit are not proven to drive the demand

for the product is not applicable for standards that drive market demand by definition.

5. Market Norms are Embedded in SEP License Agreements

The use of the Georgia-Pacific Factors (GPFs) provide an opportunity for market norms to be integrated into the determination of patent damages, in particular, GPFs 1-2. It is not a coincidence that these are the first two factors as courts have long acknowledged that the best measure of a reasonable royalty is an established royalty rate in the industry (i.e. market norms). Existing comparable licenses have market norms related to the royalty base and apportionment embedded intrinsically within the agreements. Existing licenses eliminate the need to determine these factors hypothetically as they have been determined in practice through an actual market transaction. In new areas where little case law exists, existing market agreements are valuable resources in supplying courts with important information on market norms. However, it is important that comparables are in fact comparable, so caution should be used when comparing transactions across different standardization and market contexts.