CPI's North America Column Presents:

The Royalty Base Controversy Revisited

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Introduction

Royalties based on the sales price of the entire final product incorporating the patented technology (also known as *ad-valorem* royalties) are not only industry standard, but, as explained below, tend to result in greater welfare than royalties based on the value of a component part. In a recent paper with Professor Gerard Llobet, we show that ad-valorem royalties tend to lead to lower prices for consumers and also tend to spur innovation as they reduce the standard double marginalization problem that is common in vertically-related industries.

Ad-valorem royalties: the norm in technology markets

Many, if not most, mutual agreements between licensors and licensees set royalties based on the sales price of the entire final product incorporating the patented technology. That is, their *royalty base* is the value of the sales of the entire final product. Royalties calculated with this royalty base are known as *ad-valorem* royalties. Licensing agreements for standard-essential patent (SEP) portfolios are no exception to this rule; their royalty base is typically defined by reference to the value of the sales of the final product.

Ad-valorem royalties are widely used for two reasons. First, the distinction between royalties calculated using the entire value of the product and royalties calculated using any other royalty base, such as e.g. the value of the components that integrate the licensed technology, is somewhat arbitrary. A royalty consists of a royalty base and a royalty rate, which is a simple percentage that identifies what proportion of the royalty base the licensor receives. Since the royalty rate can be adjusted downwards as the base expands, the final royalty payment can be mathematically identical independently of the royalty base. As stated by the U.S. Court of Appeals to the Federal Circuit, "there is nothing inherently wrong with using the market value for the entire product for the infringing component or feature, so long as the multiplier accounts for the proportion of the base represented by the infringing component or feature."[2] Thus, "the individual elements of a royalty payment are irrelevant in isolation, as one variable [i.e. the royalty rate] can adjust with the other [i.e. the royalty base]."[3]

Second, there are a number of practical circumstances that make *ad-valorem* royalties easy

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[2] *Lucent Techs., Inc. v. Gateway, Inc*., 580 F. 3d 1301, 1338-39 (Fed. Cir. 2009).

[3] See Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27.4 SANTA CLARA COMPUTER & HIGH TECHN. L. J. 763-792 (2011), and references therein.

to apply and, in particular, easier and less prone to errors and subjective calls than royalties based on the price or value of the components of the final product covered by particular patents. Most importantly, calculating *component-value* royalties requires apportioning value, which is a highly difficult and subjective task. On the one hand, it may not be possible to separate the value of the product as the sum of the value of its distinct components, since the implementation of key product features may cut across components. On the other, the interactions between the various components that integrate the product make the value of the final product larger than the sum of the values of the different components. When that is the case any attempt to apportion value across component would under-value each and every component. Apportioning value among components is not the only practical problem when using *component-value* royalties, however. In fact, oftentimes, the value of the component that embeds a patented technology is not a valid proxy for the value of that patent, since the patent in question may impart value beyond that particular component. When that is the case, the value of that patent will materially exceed the value of the component.

Discordant voices

Some commentators have argued that royalties based on the sales price of the entire final product may over-compensate patent holders when the patent at issue covers only some components *and* the components covered by the patent are not the sole drivers of consumer demand for the product.[4] According to this view, under these cumulative conditions a royalty calculated by reference to the value of the final product would be excessive.

This view may have influenced the recent policy change at the Institute of Electrical and Electronics Engineers (IEEE), a standard-setting organization (SSO). In March 2015, IEEE modified its policy in connection with the conditions under which a patentee voluntarily commits to license SEPs reading on an IEEE standard on fair, reasonable and non-discriminatory (FRAND) terms.[5] The new policy qualifies a royalty as "reasonable" if, among other conditions, it reflects the value that the patented technology contributes to the value of the "smallest saleable compliant implementation" that practices that patent.[6] It seems, therefore, that for IEEE only *component-value* royalties are reasonable.

To the best of my knowledge, those who argue that *ad-valorem* royalties may over-compensate licensors have not taken into account the practical difficulties that the use of *component-value* royalties would entail. Further, they seem to assume that the royalty rate will not adjust

[4] Brian Love, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STANFORD LAW REVIEW 263-294 (2007).

[5] IEEE-SA Standard Board Bylaws, http://www.standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf.

[6] *Id.* at 16.

in response to changes in the royalty base. To the extent commentators argue that the royalty base should be given by the value of the smallest saleable compliant implementation with no adjustment to the royalty rate, they are simply advocating lower total royalties rather than presenting a position about the appropriate method of calculation.

Efficiency considerations

In a recent paper with Professor Gerard Llobet,[7] we show that *ad-valorem* royalties are superior to royalties based on component value even when the practical considerations discussed above are set aside. *Ad-valorem* royalties lead to higher consumer welfare than component value royalties because they reduce the final product price, encourage investment and, therefore, lead to more output and innovation. These positive effects are compounded in the case of complex products containing multiple patented components.

The intuition behind these results is as follows. *Component-value* royalties increase the effective cost of the component and, therefore, the licensee's marginal cost of producing and commercializing the final product. A manufacturer of a final product entering into a licensing agreement that specifies a *component-value* royalty will pass through a fraction of the royalty increase to final consumers in order to maintain its price-cost margin. *Ad-valorem* royalties reduce the licensee's price cost-margin and so a manufacturer of a final product entering into a licensing agreement that specifies an *ad-valorem* royalty will also pass through a fraction of the royalty increase to final consumers.

However, while the royalty payment made by a licensee when the royalty base equals the value of the sales of the final product (i.e. with *ad-valorem* royalties) is increasing in the price at which the final product is sold, that is not the case when the royalty base is given by the value of the component integrating the technology (i.e. with *component-value* royalties). This is of crucial importance: the pass-through rate will be smaller with *ad-valorem* royalties than with *component-value* royalties, since increasing the final price increases the value of sales and, hence, the royalty payment when the licensee uses *ad-valorem* royalties. As a result, *ad-valorem* royalties result in a relatively lower final product price and greater output.

Furthermore, the expected return to investment for both licensors and licensees is greater when the volume of sales of the final product is greater, since some of the incremental surplus associated with greater output will be appropriated by licensors and licensees. But this means that the rate of return from investment for both licensors and licensees and, hence, their incentives to invest is greater when royalty payments are based on the price of the final

[7] Gerard Llobet and Jorge Padilla, *The Optimal Scope of the Royalty Base in Patent Licensing*, 59 J. LAW & ECON., no. 1, 45-73 (2016).

product, as output is relatively larger with *ad-valorem* royalties.

Because consumers prefer lower prices and greater volumes and, all else being equal, consumers prefer higher investment, which brings products they value to the market, consumer welfare will increase when the volume of sales of the end product is higher and when the investment made by licensors and licensees are greater. That is, consumer welfare will be higher with *ad-valorem* royalties.

The implication is clear: there is no basis in economics for *component-value* royalties. Using the entire value of the final product as the royalty base reduces transaction costs, leads to lower final product prices and higher output and investment, and therefore increases economic efficiency and consumer welfare. Policymakers should thus dismiss arguments in support of the so-called smallest saleable compliant implementation because they are fundamentally incorrect and most likely driven by mere rent-seeking considerations.