



Putting Economists in Their Place
in Patents in Telecoms and
the Internet of Things

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I participated as a panelist in a session entitled, “Economists: Do They Have a Place?” at the Patents in Telecoms and the Internet of Things conference at George Washington University in Washington, D.C. on November 10, 2017. This article is substantially my remarks in that conference panel session. Before my remarks, Stephen Haber of Stanford University said that I had posed the defining question for the entire conference in an audience question-and-answer exchange the previous day. It had perturbed me to hear a panel speaker mischaracterize the communications standards as platforms of preexisting technologies upon which Internet of Things (IoT) innovation will occur. In response, I said that communications standards are rich in technology innovation and patented intellectual property. I asked: if the developers of standards are to be deprived of sharing any of the value in the standards, then who *is* entitled to derive that value, and who in fact *is* capturing that value? Although flattered by Haber’s comment, I also believe a most fundamental and important question is the one that my co-panelist, Alan Marco, the former chief economist of the U.S. Patent and Trademark Office, framed: how well is the market functioning? By analogy, how best to grow the pie is as important as deciding how to divide it when there are competing hungry mouths to feed.¹ The markets for cellular technologies, products and services have performed exceptionally well with innovation, growth and vigorous competition in supply on the basis of existing patent licensing arrangements.²

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¹ The other panelists were Damien Neven of the Graduate Institute Geneva and Nikolaus Thumm of the European Commission. Laurie Fitzgerald of McKool Smith moderated the session.

² Keith Mallinson, *Don't Fix What Isn't Broken: The Extraordinary Record of Innovation and Success in the Cellular Industry Under Existing Licensing Practices*, 23 *GEO. MASON L. REV.* 967 (2016).

I. THE PERILS OF OVERREACH

On the central question, “Do economists have a place?” my answer is yes—to make astrologers look good!³ Such is the popular skepticism about the accuracy and reliability of economists with their theories, analysis, opinions, and forecasts.

We do need economists, but they need to be applied carefully because using one does not guarantee that the right answer will prevail or that old economic theories will continue to hold under new conditions. Celebrated playwright George Bernard Shaw once famously quipped: “If all economists were laid end to end, they would not reach a conclusion.” Look at competing theories in macroeconomics—for example, John Maynard Keynes versus from Milton Friedman. Their differences are significantly a matter of economic philosophy or even ideology. The economics of patents in telecoms and the IoT is also susceptible to such biases.

Economics is sometimes negatively called the “dismal science.” But at least that is a reminder that economics is indeed supposed to be a science, and therefore it should be practiced with adherence to scientific principles, including hypothesis testing in a controlled manner with empirical evidence. Unfortunately, a lot of what we see from economists in the standard-essential patent (SEP) licensing debate and in litigation is hocus pocus—that is, sleight of hand or trickery, in which these principles are inadequately applied or brazenly disregarded. Some dodgy economic concepts are inherently untestable: for example, Daniel Swanson’s and William Baumol’s *ex ante* auctions to set patent licensing rates in which technology owners would offer their essential intellectual property (IP) for inclusion in a standard in a sealed-bid process.⁴ This auction would supposedly ensure (the bizarre and unreasonable objective, in my opinion) that the price paid for the IP is no more than the incremental value over the price of the next-best alternative, even if that increment is close to zero because two rival technologies are of approximately the same (significant) value.

In some cases, economists make things up, and it then becomes dictum from judges without significant public and academic debate. For example, I see no reason why all the value of a standard should accrue to implementers

³ Although this was largely a panel for economists, I have always preferred not to define myself as an economist, even though I have studied a lot economics, including in my MBA at the London Business School. In fact, I tend not to define myself based on a specific academic discipline at all. Instead, as a business analyst who is necessarily empirical in his work, I regard economics rather like math, statistics, physics, or the English language—as a vital tool of my trade—for the purposes of diagnosis and communication as an industry analyst, consultant, and testifying expert witness in the IT and telecoms sector for 30 years. As founder of WiseHarbor, for the last 10 years, I have also taken a particular interest in standard-essential patent licensing for cellular and other technologies.

⁴ Daniel G. Swanson & William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1, 51–56 (2005).

rather than to technology developers, as is commonly asserted. I have never seen any analysis quantifying pass-through of benefits (including cost savings) to end-users. That is why I posed my abovementioned question to the panel speaker the preceding day of the 2017 conference.

The problem is insufficient diligence or accountability for the theory, data, and analysis the economists develop or adopt (for example, from other experts). Shortcomings among economists include various forms of over-reach, including the following.

A. *Application of Theory Beyond Its Proven Applicability*

At the Patents in Telecoms conference in 2015, Nancy Rose, the Deputy Assistant Attorney General for Economic Analysis at the Antitrust Division of the U.S. Department of Justice, riffed on the existence of patent holdup by saying it was like invisible dark matter in the universe.⁵ She presented a hypothetical case concerning the construction of an oil or gas terminal and a pipeline to connect it, but she failed to show that holdup has actually occurred in licensing SEPs, let alone any empirical evidence that there is a significant or systemic problem.

Another example is the old Cournot-complements theory, which explains pricing in brass making.⁶ That theory is the basis of royalty-stacking allegations in patent licensing. My empirical research shows aggregate royalties to be around five percent for mobile phones, which is far lower than stacking theory predicts.⁷ In our session, Stephen Haber mentioned that he independently validated my methodology and results, as Gregory Sidak has also done.⁸

B. *Economists Reaching Beyond Their Analytical Competence*

Economics is a broad field, and it neighbors or overlaps many others. Experts need to recognize the limits of their expertise in the same way that lawyers and physicians typically stick to their specializations. Analysis of pass-through, measuring the extent to which value and costs are transferred

⁵ Nancy Rose, Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S. Department of Justice, Presentation at the Patents in Telecoms Conference: An Economist's Perspective on Holdup 10 (Nov. 5–6, 2015), <https://www.scribd.com/presentation/319854262/Rose-Nov5-Patents-in-Telecoms>.

⁶ AUGUSTIN COURNOT, RESEARCHES INTO THE MATHEMATICAL PRINCIPLES OF THE THEORY OF WEALTH 100 (Macmillan & Co. 1897).

⁷ Keith Mallinson, *Cumulative Mobile-SEP Royalty Payments No More Than Around 5% of Mobile Handset Revenues*, IP FINANCE (Aug. 19, 2015), <http://www.ip.finance/2015/08/cumulative-mobile-sep-royalty-payments.html>.

⁸ Alexander Galetovic, Stephen H. Haber & Lew Zaretski, *A New Dataset on Mobile Phone Patent License Royalties* (Hoover Institution Working Group on Intellectual Property, Innovation, and Prosperity, Working Paper No. 16011, 2016); J. Gregory Sidak, *What Aggregate Royalty Do Manufacturers of Mobile Phones Pay to License Standard-Essential Patents?*, 1 CRITERION J. INNOVATION 701 (2016).

along the value chain downstream from producers through intermediaries such as product manufacturers to consumers, is for specialized economists using empirical analysis. Nevertheless, some economists commonly make unfounded and contradictory claims, depending what suits their purpose at one time or another. For example, without evidence or analysis, they assert that, *if patent fees are not reduced, many manufacturers will go bust due to all the additional expense because most of them are already making no money*. Or, they say, *patent fees need to be moderated because the resulting product costs result in higher prices that harm consumer welfare*. Are value and cost passed on to end-users, or do they stay with the intermediaries?

C. Economists Relying on the Data and Analyses of Others That Are Inadequately Formulated and Unreliable

An economist should not unquestioningly adopt the analysis of another expert simply because it supports what the economist is seeking to prove.

For example, economists commonly seek metrics that enable them to apportion royalties “top down” among licensors for patent licensing based on the proportion of total SEPs that each licensor owns. SEP declarations are liberally made to standard development organizations (SDOs)—that is, over-disclosure is encouraged to be on the safe side—to conservatively ensure that patents without fair, reasonable, and nondiscriminatory (FRAND) commitments do not block the standards. SDOs’ SEP declaration requirements were not formulated for other purposes, such as measuring shares of SEP value. Determining essentiality and then counting SEPs is not primarily a matter of economics, but various economists in litigation are willing to cherry pick among studies with widely differing results to obtain the proxy for measurement they require. I have not seen any attempts by those who employ patent counting to test the reliability of such assessments. In my analysis, I have found patent-counting studies to be highly inaccurate and unreliable.⁹

D. So, How Do We Improve the Quality of Our Economic and Other Expert Analysis?

Academic peer review is highly beneficial, but this is not always possible—as is the case, for example, in litigation, when some metrics might also be used in an entirely new way when an economic expert is looking for a proxy for something, like cost or price, in a time-series analysis.

I have been retained in litigation as a testifying expert to work alongside and to provide factual and quantitative support to some eminent economists.

⁹ Keith Mallinson, *Do Not Count on Accuracy in Third-Party Patent-Essentiality Determinations*, IP FINANCE (May 12, 2017), <http://www.ip.finance/2017/05/do-not-count-on-accuracy-in-third-party.html>.

I also provide expert testimony in rebuttal to the underpinnings of opposing experts' economic analysis. For example, in a major cartel price-fixing case, the opposing economists were using a U.S. Bureau of Labor Statistics (BLS) price index for microprocessors as a proxy for costs and revenues with LCD display panels in their regression model of the "but for" world without the alleged price fixing. I doubt the index had ever been used like that before, but in the limited time to prepare my rebuttal I was able to ascertain that using this index for a purpose quite different from that for which it had been developed was not accurate and reliable. Distortions arose because the composition of the index has been significantly reformulated several times over many years. I even found that the Federal Reserve (which, I read somewhere, has more Ph.D. economists than any other organization) had checked the trajectory of that BLS index and had found it to be significantly out of line with the Federal Reserve's assessments since the economic meltdown of 2008.

II. EVIDENCE ON ALLEGED LOCK-IN

In response to a question from the floor at the November 10, 2017 conference, I took the opportunity to express my concern that economists are prone to theorize, and to assert phenomena or problems while neglecting to produce any specific and directly applicable examples, let alone identifying and measuring any alleged systemic problems empirically. I recited my rebuttal to the notion of Apple, for example, in smartphones, being subject to lock-in with cellular standards, as included in my comments in response to a "roadmap" communiqué on standard-essential patents from the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs.¹⁰

A key condition for holdup is that the party being held up is "locked in" with relationship-specific sunk investments and resulting switching costs. However, Apple has always been a late entrant with respect to new cellular standards, and so it has not sunk any such costs until long after standardization. Apple could, therefore, find out royalty costs and negotiate licensing agreements in advance of committing to the standards. Licensing rates are generally per cellular standard and include improvements following a standard's initial release. Some licenses include multiple standards. The first iPhone was a 2G-only device introduced in 2007—twenty years after the standard was established in 1987 and fifteen years after the first GSM phones were sold. The first 3G WCDMA iPhone was introduced in 2008—nine years after the standard was established in 1999 and seven years after the first 3G phones were sold. Apple did not introduce its first LTE device until the iPhone 5 in

¹⁰ Keith Mallinson, *Adjusting the Balance in SEP Evaluations and Licensing*, IP FINANCE (May 19, 2017), <http://www.ip.finance/2017/05/adjusting-balance-in-sep-evaluations.html>.

September 2012—four years after the standard was established and three years after the first LTE devices were sold following the initial service launches at the end of 2009. Results of the Next Generation Mobile Networks Alliance’s royalty-rate evaluations on LTE rates were released in 2008, and widespread public notification of maximum royalty rates from prospective licensors was published in 2010. It typically takes up to approximately eighteen months to design and produce a new phone. Most of the specific investments for design and production are in the later stages. Furthermore, there was no surprise (opportunistic or otherwise) in the maximum that Apple could theoretically need to pay by the time it was making its iPhone investments. As mentioned above, the actual amounts handset manufacturers pay to license all standards from all licensors are a small fraction of those theoretical maximum rates of which Apple was well aware at least two years before launching, for example, the first LTE iPhone.

CONCLUSION

Horses for courses: Those who use economists should beware of opinions that extend beyond the expert’s specialization. Garbage in, garbage out: Economists need to take responsibility for what their own economic analysis relies upon. We need economists to publish, and as expert witnesses, but we need to flush out inapplicable theories, biases, and nonsense with more empirical testing, public debate including academic peer review, and rebuttal in litigation according to the applicable rules of evidence.