

# **ANTITRUST ECONOMICS AT A TIME OF UPHEAVAL: Recent Competition Policy Cases on Two Continents**

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# CHAPTER 15

## USING AND MISUSING MICROECONOMICS: *FEDERAL TRADE COMMISSION v. QUALCOMM*

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### I. INTRODUCTION

In January 2017, the Federal Trade Commission (“FTC”) voted 2-1 to challenge a number of Qualcomm’s business practices. Qualcomm had long been the leading supplier of modem chips, the components of cell phones that allow them to communicate over cellular networks. Qualcomm also was a major innovator in developing cellular technologies and the owner of many patents that were essential to complying with 3G and 4G telecommunications standards.

At the heart of the FTC’s case was Qualcomm’s “no-license/no-chips” policy. Under this policy, Qualcomm refused to sell its modem chips to cell-phone manufacturers such as Apple, Samsung, and Motorola unless they had agreed to pay Qualcomm’s preferred royalty for its standard-essential patents on devices containing the modem chips sold by Qualcomm’s competitors. While the same royalty applied to devices containing Qualcomm modem chips, as we explain below, given Qualcomm’s ability to adjust to the price of its own modem chips, the royalty applied to devices containing those modem chips is irrelevant to the analysis.

The FTC alleged that Qualcomm’s no-license/no-chips policy enabled Qualcomm to use its monopoly power over modem chips to get cell-phone manufacturers to pay unreasonably high royalties for its standard-essential patents for devices containing modem chips of its competitors. Critically, Qualcomm had previously committed to license those patents on reasonable terms. The FTC alleged that Qualcomm’s elevated royalties acted like a tax on modem chips sold by Qualcomm’s *rivals*, raising their costs. The alleged effect of those higher costs was a weakening of Qualcomm’s modem-chip rivals, higher costs for cell-phone makers, and ultimately higher cell-phone prices for consumers. Qualcomm, in its defense, claimed that its royalties were a legitimate effort to charge appropriate fees for its superior technology and in any event were not assessed against Qualcomm’s rivals.

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<sup>1</sup> Shapiro testified as an economic expert witness on behalf of the FTC; Waehrer led the team of economists supporting that testimony.

The FTC's case against Qualcomm was one of the most important enforcement actions in recent years at the intersection of antitrust law and intellectual property law. The case was controversial from the outset, as reflected in the sharp, public dissent by one of the three FTC commissioners. In an extraordinary rupture between the FTC and the U.S. Department of Justice ("DOJ"), the Antitrust Division of the DOJ later intervened vigorously in the case on behalf of Qualcomm.

The case went to trial in January 2019. In May 2019, the District Court gave the FTC a complete victory. However, the Appeals Court reversed the District Court's judgment, leaving Qualcomm as the ultimate victor.

The case provides an exceptional opportunity to see how basic microeconomics can be used – and misused – in antitrust litigation. In this paper, we identify the microeconomic issues underlying the FTC's case against Qualcomm. We then explain how the Appeals Court, with assistance from the Antitrust Division of the Department of Justice, essentially ignored the relevant microeconomics. Section II provides brief background information about Qualcomm. Section III describes the relevant aspects of the FTC Complaint. Section IV explains the economic effects of Qualcomm's no-license/no-chips policy, as argued by both the FTC and Qualcomm experts. Section V reports the pertinent parts of District Court's decision, which closely tracks our analysis. Section VI explains the errors made by the Appeals Court, and Section VII offers concluding remarks.

## II. QUALCOMM'S STANDARD-ESSENTIAL PATENTS AND MODEM CHIPS

The FTC's case against Qualcomm related to the cellular devices that have become ubiquitous over the past two decades. The case involved two critical components of cellular devices:

**Qualcomm's Portfolio of Standard-Essential Patents:** Standard-essential patents ("SEPs") are patents that must be practiced to produce cellular devices compatible with modern cellular networks.

**Qualcomm's Modem Chips:** Modem chips are the components of cellular devices that enable them to communicate with each other across cellular networks.

Cellular networks rely on compatibility standards. A mobile device must comply with the compatibility standard used by a given carrier to operate on that carrier's network. The relevant standards in this case are those governing 3G and 4G cellular networks.

Qualcomm owned a large number of SEPs for 3G and 4G cellular standards. Like other SEP owners, Qualcomm made a "FRAND commitment," when those standards were being developed, to license its SEPs on "fair, reasonable and non-discriminatory" ("FRAND") terms.

Qualcomm licensed its SEPs to original equipment manufacturers ("OEMs") of mobile devices, such as Apple and Samsung. Qualcomm did *not* offer licenses to its SEPs to rival suppliers of modem chips, such as Intel, Broadcom, and MediaTek. Nor did Qualcomm enforce its patents against these rivals, even though their products

infringed Qualcomm's SEPs. Instead, Qualcomm chose to collect its SEP royalties further downstream, from OEMs.<sup>2</sup>

Qualcomm also was a major supplier of modem chips. The FTC's case against Qualcomm involved two types of modem chips: those compatible with CDMA standards ("CDMA modem chips"), and those used in premium "long-term evolution" (LTE) 4G devices ("premium LTE modem chips").

While it faced some competition from other chip manufacturers such as Intel, the FTC alleged that Qualcomm had monopoly power over these two types of modem chips. Qualcomm disputed that allegation, but the District Court agreed with the FTC, and the Appeals Court accepted these factual findings by the District Court. "From 2006 to 2016, Qualcomm possessed monopoly power in the CDMA modem chip market, including over 90 percent of market share. From 2011 to 2016, Qualcomm possessed monopoly power in the premium LTE modem chip market, including at least 70 percent of market share."<sup>3</sup> In this paper, we take as given these factual findings relating to monopoly power; we do not discuss the related evidence or arguments.

### III. THE FTC'S COMPLAINT

The centerpiece of the FTC's case against Qualcomm involved Qualcomm's no-license/no-chips policy. Under that policy, Qualcomm refused to sell modem chips to an OEM unless and until the OEM signed a patent license agreement covering Qualcomm's SEPs. To enforce this policy, Qualcomm threatened to withhold an OEM's chip supply until that OEM signed a patent license on Qualcomm's preferred terms.<sup>4</sup> Critically, these patent licenses set not only the royalty paid on devices that contained Qualcomm modem chips, but also the royalty paid on devices that contained the modem chips of rival manufacturers such as Intel and MediaTek.

The FTC alleged that Qualcomm's no-license/no-chips policy had enabled Qualcomm to illegally maintain its monopolies over CDMA modem chips and premium LTE modem chips.<sup>5</sup>

The FTC alleged that Qualcomm's no-license/no-chips policy enabled Qualcomm to charge unreasonably high royalties for its SEPs. In particular, the FTC Complaint (p. 3) alleged that the result of Qualcomm's no-license/no-chips policy was that "Qualcomm's customers have accepted elevated royalties and other license terms that

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2 Under the legal doctrine of patent exhaustion (also described in Section 4.E) if Qualcomm had licensed its SEPs to rival modem chip suppliers, OEMs would not have needed a license from or to pay royalties to Qualcomm for those SEPs for phones containing the modem chips of rivals.

3 Appeals Court at 983.

4 District Court at 698.

5 The FTC also challenged Qualcomm's refusal to license its SEPs to its competitors, which the FTC viewed as a violation of Qualcomm's FRAND commitments, and Qualcomm's arrangements with Apple, which the FTC considered to be a form of exclusive dealing. We do not address those allegations here.

do not reflect an assessment of terms that a court or other neutral arbiter would determine to be fair and reasonable.”

The FTC alleged that by charging unreasonably high royalties for its SEPs Qualcomm excluded its modem-chip rivals and thus maintained its modem-chip monopolies.

“By using its monopoly power to obtain elevated royalties that apply to baseband processors supplied by its competitors, Qualcomm in effect collects a “tax” on cell phone manufacturers when they use non-Qualcomm processors. This tax weakens Qualcomm’s competitors, including by reducing demand for their processors, and serves to maintain Qualcomm’s monopoly in baseband processor markets.” (FTC Complaint, p. 3)

Our analysis focuses on this allegation about the economic effects of Qualcomm’s no-license/no-chips policy, which was hotly disputed by Qualcomm and its experts.

The FTC’s case relied on two undisputed facts relating to Qualcomm’s SEPs: (1) Qualcomm had made a commitment to charge “reasonable royalties” for its SEPs; and (2) if Qualcomm and an OEM could not agree on the “reasonable royalties,” either party could go to court to get a “FRAND determination” setting the royalty rate, which would then be binding on both parties. As a factual matter, no OEM obtained such a FRAND determination. All of the SEP royalties that OEMs paid to Qualcomm resulted from agreements Qualcomm negotiated with OEMs.

The economics of FTC’s case against Qualcomm does not rely on (a) any conclusion regarding the specific level of royalties that would have been reasonable for Qualcomm’s SEPs; or (b) whether Qualcomm had breached its FRAND commitment by refusing to license its SEPs to rival suppliers of modem chips (as alleged by the FTC).

## IV. ECONOMIC ANALYSIS OF QUALCOMM’S NO-LICENSE/NO-CHIP POLICY

This section focuses on two economic issues that were critical at trial and upon appeal. First, did Qualcomm’s no-license/no-chip policy result in higher royalties? Second, if so, did those higher royalties have anticompetitive effects? We also briefly discuss an issue that is of interest to many economists but was not a prominent issue in the litigation: why would OEMs agree to elevated royalties that fortified Qualcomm’s monopoly? As part of this description, we include the relevant arguments put forward by Qualcomm and its economic experts on these issues.

### *A. Qualcomm Charged OEMs a Royalty Surcharge*

There was abundant evidence that Qualcomm had used the threat to withhold modem chips in its negotiations with OEMs over royalties. The evidence presented at trial by the FTC and accepted by the Court showed that this threat enabled Qualcomm to extract a far higher royalty from OEMs than it could have obtained without that threat. That conclusion fits well with basic bargaining theory, under which Qualcomm and an OEM share the gains from trade from reaching an agreement.

Qualcomm's no-license/no-chips policy made it far more costly for an OEM to disagree with Qualcomm and seek a judicial determination of the FRAND royalty rate, because this OEM's business would be crippled for an extended period. Qualcomm's no-license/no-chips policy also increased the cost of disagreement for Qualcomm, but not by nearly as much, because a significant portion of Qualcomm's lost chip sales to any one OEM, if Qualcomm stopped selling chips to that OEM, would likely divert to other OEMs, due in part to Qualcomm's monopoly power, leaving Qualcomm's total chip sales largely unchanged. Assuming that the interruption in chip supply would be quite costly to the OEM given Qualcomm's market power and not very costly to Qualcomm, bargaining theory predicts that Qualcomm's no-license/no-chips policy increases the royalty the OEM and Qualcomm would negotiate.

A large portion of testimony of one of Qualcomm's economic experts argued that the no-license/no-chips policy had no apparent impact on the royalty rate. That expert looked at the contract royalty rates negotiated over time and across different OEMs. He attempted to exploit two types of variation in the effectiveness of the no-license/no-chips policy: variation in Qualcomm's alleged market power in modem chips over time, and variation in different OEM's vulnerability to the threat of Qualcomm withhold modem chips.

The FTC alleged that Qualcomm had market power in CDMA chips from 2006 to 2016 and WCDMA chips from 2011 to 2016. Qualcomm's expert therefore argued that royalty rates should have been lower when Qualcomm was not alleged to have market power than during the period where it could use its market power in CDMA chips to extract higher royalties. Finding that negotiated royalties as a percentage of the handset price remained mostly the same in the period with and without market power, he concluded that the "data do not support" the predictions that the no-license/no-chips policy led to higher royalty rates.<sup>6</sup>

As a proxy for an OEM's vulnerability to the no-license/no-chips threat, Qualcomm's expert used that OEM's purchases of Qualcomm chips in the two years following the signing of a licensing agreement as a share of its total chip purchases. According to the expert, if the no-license/no-chips policy allowed Qualcomm to charge higher royalties, one would expect OEMs that relied more heavily on Qualcomm chips to have paid higher royalties than other OEMs. However, he found no correlation between his reliance measure and the negotiated royalty.

This empirical work was disputed by the FTC and found not "reliable" by the court.<sup>7</sup> The vast majority of negotiations resulted in the same royalty rate as a percentage of net handset revenue. Despite varying conditions over time and across OEMs, the lack of variation in Qualcomm's royalty rate was not seen by the court as an argument for its reasonableness. Looking over time, evidence was presented that one could reasonably have expected the royalty rate to fall over time rather than remaining constant.<sup>8</sup> Critically, many of the OEMs classified as not reliant on Qualcomm modem chips were in fact purchasing CDMA chips from a rival chip supplier that had agreed

<sup>6</sup> Trial Transcript, page 1866, lines 3–5.

<sup>7</sup> District Court at 786.

<sup>8</sup> District Court at 783-786.

not to sell chips to unlicensed OEMs, so those OEMs would have suffered a similar interruption in supply without a license.<sup>9</sup> In addition, Qualcomm's agreements with OEMs also included marketing funds, cross-licenses, and the exchange of other valuable consideration that one would need to control for to make proper comparisons across OEMs. Given the uniqueness of each negotiation and difficulty accounting for these other exchanges of value, and Qualcomm's incentive to maintain a uniform headline royalty rate, it was therefore not possible to reliably measure the effect on the policy along the lines pursued by Qualcomm's expert.

However, other evidence supported the intuitive idea that Qualcomm's no-license/no-chips policy enabled Qualcomm to negotiate higher royalties. Numerous OEM witnesses testified that Qualcomm's threat to withhold its modem chips forced them to agree to higher royalties than they would otherwise have accepted. The District Court describes this evidence in great detail.<sup>10</sup>

Qualcomm's own documents strongly supported this same conclusion. The District Court cited two high-level Qualcomm analyses of whether to divest Qualcomm's licensing business unit, Qualcomm Technology Licensing ("QTL"), from its chip and software business unit, Qualcomm CDMA Technologies ("QCT"). These were "Project Berlin" in 2007 and "Project Phoenix" in 2015. Both times, Qualcomm decided *not* to split QTL from QCT. Both times, top Qualcomm executives recognized that Qualcomm's no-license/no-chips policy gave Qualcomm powerful bargaining leverage in licensing negotiations, so splitting QCT from QTL would undermine QTL's ability to maintain the royalty rates it had been getting from OEMs.<sup>11</sup>

We define Qualcomm's *royalty surcharge* as the per-device difference between the royalty that Qualcomm was able to achieve under its no-license/no-chips policy and the per-device FRAND royalty for Qualcomm's SEP portfolio. The FRAND royalty for Qualcomm's SEP portfolio is the royalty that Qualcomm would have been able to achieve in negotiations with OEMs where disagreements lead to a court-determined FRAND rate *without* any withholding of Qualcomm's modem-chip supply during the pendency of the FRAND dispute.

Therefore: **Qualcomm Actual Royalty = Reasonable Royalty + Royalty Surcharge**

### ***B. The Royalty Surcharge Acts Like a Tax on OEM Purchases of Modem Chips from Qualcomm's Rivals***

We now discuss the economic effects of Qualcomm's royalty surcharge. This analysis builds on the Court's finding that Qualcomm was in fact able to charge OEMs a substantial royalty surcharge (see below).

One important economic question in the litigation related to the apparent disconnect between (a) the FTC's allegation that the royalty surcharge harmed Qual-

9 Transcript at 1884-1885 and District Court at 743-744.

10 District Court at 697-744.

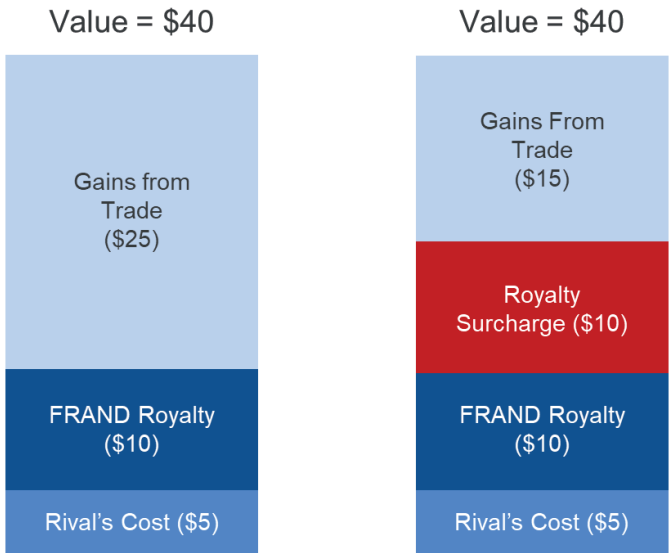
11 District Court at 773-775.

comm’s modem-chip rivals and diminished their ability to compete by imposing an extra “tax” on them, and (b) the fact that Qualcomm actually collected the royalty surcharge from OEMs, not from Qualcomm’s modem-chip rivals.

The FTC’s expert explained that Qualcomm’s royalty surcharge acts like a tax on transactions between OEMs and rival chip manufacturers.<sup>12</sup> The only economic difference is that the tax is collected by Qualcomm rather than by a conventional taxation authority.<sup>13</sup>

Figure 1 below is drawn from the trial demonstratives used by the FTC to explain the effects of a royalty surcharge. In Figure 1, the value of the rival’s modem chip to the OEM is \$40, and the rival chip maker’s cost of supplying that chip is \$5. The SEP royalties charged by Qualcomm for the use of its technologies represent an additional cost of using these chips. In the left-hand panel, Qualcomm is assumed to charge the FRAND royalty of \$10. In that case, the gains from trade for the OEM and the rival are \$25. If these gains from trade are split equally, the rival’s variable profit is \$12.50 and the all-in price of the chip (the price of chip plus the royalty paid to Qualcomm) is \$27.50. One can think of this in two ways that are economically identical: (1) the OEM pays the rival \$17.50 for the chip and \$10 to Qualcomm, or (2) the OEM pays the rival \$27.50 and the rival pays \$10 to Qualcomm. Under (1), Qualcomm collects its FRAND royalty from the OEM. Under (2), Qualcomm collects its FRAND royalty from the rival.

**Figure 1: Effect of a Royalty Surcharge on the Gains from Trade Between an OEM and a Rival Chip Maker**



12 Qualcomm’s reasonable royalties for the use of its technologies also impose a “tax” on Qualcomm’s modem-chip rivals, but the FTC was not disputing a tax of that magnitude. The reasonable royalties by definition reflect the reasonable value of Qualcomm’s SEP portfolio, which itself reflects Qualcomm’s R&D investments that led to those patents.

13 Trial Transcript at 1124 and following.



Now consider the effects of adding a royalty surcharge of \$10, as depicted on the right-hand side of Figure 1. Assuming the same chip value of \$40, this royalty surcharge reduces the gains from trade to \$15. If these reduced gains are again split equally, the rival's variable profit falls to \$7.50 and the all-in price of the modem chip to the OEM increases to \$32.50. In this example, the incidence of the \$10 royalty surcharge is borne equally by the OEM and the rival chip supplier; each is harmed by \$5. Note that the effect of the \$10 royalty surcharge is exactly the same as the effect of a \$10 tax.

The FTC argued that this pricing practice had the same effects as a government tax. Basic microeconomics teaches that the economic effects of a tax on a transaction are independent of whether the tax is collected from buyers or sellers.<sup>14</sup>

Applied here, this basic principle teaches us that the economic effects of Qualcomm's royalty surcharge are exactly the same, regardless of whether the OEM or the rival chip supplier pays that surcharge to Qualcomm. *The economic effect of the royalty surcharge is therefore to raise the marginal costs of Qualcomm's modem-chip rivals by the amount of the surcharge.*

Formally, suppose that the modem-chip supplier has marginal cost  $c$  and faces demand  $D(\bullet)$ , which is a function of the per-unit cost of its modem chips to OEMs. If OEMs pay a royalty  $r$  per modem chip and a price of  $p$  to the modem-chip supplier, the quantity demanded given the price and royalty would be  $D(p + r)$  and the modem-chip supplier's profits are  $[p - c] D(p + r)$ .

Now suppose instead that the royalty is collected directly from the modem-chip supplier. Let  $x$  denote the price charged by the modem-chip supplier. We call  $x$  the "all-in" price of modem-chips because it also covers any royalties associated with Qualcomm's SEPs. Thus, quantity demanded would be  $D(x)$  and the modem-chip supplier's profit would be  $[x - r - c] D(x)$ .

Notice that the economic outcome in terms of the modem-chip supplier's profit and output are the same in the two cases if  $x = p + r$ . This application of the textbook result shows that the economic impact of the royalty on the modem-chip supplier does not depend on whether Qualcomm collects that royalty from OEMs or from rival modem-chip suppliers.<sup>15</sup> Therefore, the effect of any royalty surcharge is the same as an increase in the margin costs of rival modem-chip suppliers. The surcharge will tend to increase  $p + r$ , the all-in price OEMs pay for rival modem-chips, while weakening them as competitors to Qualcomm.

### C. Decomposing Qualcomm's Prices

Qualcomm charged OEMs two prices: a price  $p_Q$  for its modem chips, and a per-device royalty rate  $r$  for its SEPs. Let  $\bar{r}$  denote the FRAND royalty for Qual-

14 See, for example, Lipsey, Courant & Ragan (1999, p. 102) "A straightforward application of demand-and-supply analysis will show that tax incidence has nothing to do with whether the government collects the tax directly from consumers or from firms."

15 Likewise, it is not hard to show that for a given  $r$ , the profit-maximizing all-in price  $x^*$  is equal to  $p^* + r$  where  $p^*$  is the profit-maximizing price in the case where the royalty is collected from OEMs. In addition, a higher royalty increases the rival manufacturer's profit maximizing all-in price and lowers its profit margin.

comm's SEPs. By definition, Qualcomm's royalty surcharge is  $s = r - \bar{r}$ . We assume that  $s > 0$  and examine the case where  $s$  is substantial in size.

Rather than focus on  $p_Q$  and  $r$ , it is illuminating to consider a different pricing pair: how much an OEM pays Qualcomm when the OEM makes and sells a device containing a Qualcomm chip, and how much an OEM pays Qualcomm when the OEM makes and sells a device containing a non-Qualcomm chip.

When an OEM sells a device containing a Qualcomm chip, the OEM pays Qualcomm  $p_Q + r$ . We call this the "all-in price" of Qualcomm's modem chips, which we denote by  $x_Q$ . When an OEM sells a device containing a non-Qualcomm chip, the OEM pays Qualcomm  $r$ . We describe Qualcomm's prices with the pair  $[x_Q, r]$ .

Normally, we do not think that a supplier can charge its customers when they purchase from that supplier's *rivals*. For example, when an airline passenger purchases a ticket from United Airlines, Delta Airlines does not also charge that passenger (or United). Indeed, if Delta had a dominant position on a given route where United was trying to compete, it would be highly suspicious for Delta to charge a fee to customers who are flying United on that route.

In fact, this very issue arose in the 1990s when Microsoft entered into "per processor" licenses with computer OEMs. The DOJ explained how those licenses operated: "Per processor' licenses require OEMs to pay a royalty for each computer the OEM sells containing a particular processor (e.g., an Intel 386 microprocessor) whether or not the OEM has included a Microsoft operating system with that computer."<sup>16</sup> The DOJ told the court that "Microsoft's licenses impose a penalty or 'tax' paid to Microsoft upon OEMs' use of competing PC operating systems."<sup>17</sup>

One can think of Microsoft charging computer OEMs a price  $p_M$  for computers including Microsoft's operating system and a price  $z$  for computers not including Microsoft's operating system. In terms of the price pair  $[p_M, z]$ , the DOJ did not object to Microsoft setting  $p_M$ , but the DOJ argued that Microsoft should not be allowed to charge OEMs anything for computers not containing Microsoft's operating system, i.e., that  $z$  should be zero.

In Qualcomm's case, the FTC was not arguing that  $r$  should be zero, but rather that  $r$  should be no larger than  $\bar{r}$ , so the *royalty surcharge*  $s = r - \bar{r}$  should be zero. As a matter of economics any *royalty surcharge*  $s = r - \bar{r}$  operates just like the licensing fee  $z$  that Microsoft charged OEMs for computers not containing its operating system.<sup>18</sup> Both are examples of a supplier with monopoly power imposing a fee on its customers when they purchase products from *rival* suppliers. We next explain why such fees raise rivals' costs and harm competition.

16 *United States of America v. Microsoft*, Complaint, July 15, 1994. For further elaboration, see the DOJ's Competitive Impact Statement.

17 Microsoft's per processor licenses were also challenged in a private antitrust case against Microsoft. *Caldera v. Microsoft*, 87 F. Supp. 2d 1244 (District Court of Utah, 1999). The District Court in that case recognized the potential for Microsoft's per processor licenses to harm competition by excluding its operating-system rivals.

18 The FTC's expert explained this to the Court. Trial Transcript, at 1124-1125.

### ***D. How a Seemingly Neutral Royalty Surcharge Weakens Chip Competitors and Raises Prices to Consumers***

Based on this analysis, the FTC concluded that Qualcomm's royalty surcharged effectively raised the costs of its modem-chip rivals, putting them at a competitive disadvantage, while also harming Qualcomm's customers, OEMs. However, Qualcomm denied that such a royalty surcharge would weaken its modem-chip rivals. Qualcomm persistently claimed that its SEP royalties were "chip agnostic" because they applied equally to handsets that used Qualcomm and non-Qualcomm chips. Therefore, according to Qualcomm, any royalty surcharge would not disadvantage Qualcomm's rival modem-chip suppliers, and not harm competition in the markets for modem chips.

As discussed below, the Appeals Court was convinced by this argument. We believe that confusion on this issue derived from a failure to recognize that when a tax is imposed on a transaction, its economic effects do not depend on whether that tax is collected from the buyer or from the seller.

Once one recognizes that one can treat any royalty surcharge as if it were paid by Qualcomm's modem-chip rivals, the seeming neutrality of Qualcomm's royalty surcharge completely evaporates. Furthermore, the equality of the royalty is irrelevant to the analysis. Qualcomm's royalty surcharge raises its rivals' costs, but not its own. In terms of the price pair  $[x_Q, r]$ , the FTC agreed that Qualcomm could freely set the all-in prices for its chips,  $x_Q$ , but objected to Qualcomm using its power over modem-chips to set  $r > \bar{r}$ .

The situation here is similar in effect to a vertically integrated supplier facing competition downstream. The economic effects of an increase in the input price charged by a vertically integrated supplier are not neutral, even if the integrated supplier's upstream division facially charges that same input price to its own downstream division. It would be nonsensical to claim that increasing the price charged to a downstream rival for an input would not have a foreclosure effect as long as the integrated firm charges the same amount to its downstream division.

The royalty surcharge on rival chips allows Qualcomm to profitably raise the all-in price for its own modem chips. Contrary to Qualcomm's arguments, this effect holds whether the royalty applied to its own chips is equal, above, or below the royalty applied to rival chips. To see why, define Qualcomm's chip price and all-in price as  $p_Q$  and  $x_Q$  where  $x_Q = p_Q + r_Q$  and let  $p_R$  and  $x_R$  denote the chip and all-in prices for the rival chip maker. Here we have introduced notation allowing for different SEP royalties for devices containing Qualcomm chips ( $r_Q$ ) and rival chips ( $r_R$ ) to demonstrate that the equality of these rates is economically irrelevant.

First consider the case in which Qualcomm does not face any chip rivals and thus has a secure monopoly. Under this assumption Qualcomm's profit can be written as:

$$\left[ p_Q + r_Q - c_Q \right] D_Q(p_Q + r_Q) = \left[ x_Q - c_Q \right] D(x_Q).$$

Here, for any given all-in price  $x_Q$ , Qualcomm's profit does not depend on how the all-in price is split between the chip price and the royalty. In the absence of any actual or potential rivals, a royalty surcharge has no effect, as Qualcomm would sim-

ply lower its chip price by an amount equal to the surcharge to maintain the same profit-maximizing all-in price.

Now suppose that Qualcomm faces some competition in the modem-chip market. The demand for Qualcomm chips and rival chip maker chips will be functions of both all-in prices. Qualcomm's profit in the presence of a chip rival is equal to:

$$\left[ x_Q - c_Q \right] D_Q(x_Q, x_R) + r_R D_R(x_Q, x_R).$$

Because Qualcomm can freely adjust its chip price  $p_Q$  to set its all-in price  $x_Q$  at its profit-maximizing level in response to changes in  $r_Q$ , the level of  $r_Q$  has no effect on Qualcomm's profits or its profit maximizing all-in price,  $x_Q$ . However, the level of the royalty charged the rival does impact Qualcomm profits. The anticompetitive effect of the surcharge derives entirely from the impact on the royalty applied to devices containing rival modem chips and not on a comparison with the royalty applied to devices containing Qualcomm chips.

This analysis shows that Qualcomm's argument that their royalties are benign because they are "chip agnostic," which was picked up by the DOJ and accepted by the Appeals Court, is incorrect as a matter of basic microeconomics.

### ***E. Patent Exhaustion***

Under the legal doctrine of patent exhaustion, if a component part is licensed to use a certain patent, then the owner of that patent cannot collect damages for infringement from a downstream firm selling products that practice that patent by virtue of containing that licensed component.

Qualcomm argued that its no-license/no-chips policy was justified because without that policy it would have been required to sell chips to an OEM that was infringing its patents. Qualcomm correctly pointed out that it would then not be able to sue that OEM for infringing Qualcomm's SEPs by selling devices containing Qualcomm chips, due to the doctrine of patent exhaustion. Qualcomm argued that its no-license/no-chips policy was thus necessary for it to earn reasonable royalties on its SEPs.

However, Qualcomm's argument fails logically because Qualcomm could and would simply include the reasonable royalties for its SEPs in the (all-in) price its charges the OEM for its modem chip. Qualcomm would therefore not be prevented from earning reasonable royalties for its SEPs on devices containing Qualcomm chips.

### ***F. Why did OEMs Agree to Pay a Royalty Surcharge?***

We now address the question of how Qualcomm was able to induce OEMs to pay a royalty surcharge that weakened Qualcomm's modem-chip rivals. After all, OEMs are seemingly harmed in the near term by a royalty surcharge, plus they become more vulnerable to Qualcomm's monopoly power over time if Qualcomm's modem-chip rivals reduce or cease their investments in developing modem chips.

This analysis can usefully be separated into two parts. First, is agreement between Qualcomm and OEMs regarding a royalty surcharge impossible or unlikely

because Qualcomm's gain from the royalty surcharge is less than the loss suffered by the OEMs? Second, if Qualcomm and OEMs collectively benefit from a royalty surcharge, are there available mechanisms by which Qualcomm can induce OEMs to agree to pay that surcharge?

### **1. Qualcomm's Royalty Surcharge Raises Joint Profits**

Qualcomm's increase in profit from a royalty surcharge very likely exceeds the loss to OEMs. To see why, note that if handset prices are below the fully integrated or cartelized monopoly price, the joint industry profit – the sum of the profits of Qualcomm, its modem-chip rivals, and OEMs – would increase if handset prices were to increase. (Qualcomm was certainly not arguing that handset prices were at fully cartelized levels.) As described above, an increase in Qualcomm's royalty has the effect of raising all-in chip prices, increasing the costs of handset OEMs. This leads to higher handset prices for consumers. Thus, an increase in Qualcomm's royalty increases Qualcomm's profit by more than the joint losses to the OEMs. The reason is that the royalty surcharge will be passed through to consumers, raising industrywide profits.

The FTC contended that this situation is very different from the canonical setting in which a monopolist cannot profitably induce its customers to enter into exclusionary contracts. Economists use the following example to illustrate the argument put forward by Bork (1978, pp. 306-307), where an incumbent monopolist is not able to exclude entrants.<sup>19</sup> The example involves three players: an incumbent, an entrant, and a consumer. In that simple example, the loss to the consumer from agreeing to purchase exclusively from the incumbent exceeds the increase in the profit to the incumbent from excluding the entrant. As a result, in that example it is not possible for the incumbent to "buy" the consumer's agreement to exclude the entrant.

The Qualcomm situation is fundamentally different because Qualcomm and OEMs collectively *benefit* from the imposition of a royalty surcharge. As pointed out by many economists, when the victims are not at the bargaining table, the so-called Chicago critique need not hold. As a result, thus there is a large collection of models or mechanisms in which customers accept anticompetitive agreements that harm them or others (including downstream consumers) relative to a world in which such agreements are prohibited.<sup>20</sup>

### **2. A Mechanism to Induce OEMs to Pay a Royalty Surcharge**

One such mechanism was presented at trial. There was abundant evidence that OEMs were sufficiently afraid of being cut off from their supply of modem chips from Qualcomm that they agreed to substantially higher royalties than they otherwise would have accepted.

<sup>19</sup> For example, see Whinston (2008, pp. 136-139).

<sup>20</sup> Whinston (2008, pp. 140-178) discusses a whole collection of models where exclusionary contacts are profitable.

What does that imply about the counterfactual world in which Qualcomm was prohibited from bringing its modem-chip monopoly power to bear in its royalty negotiations with OEMs?

One possibility is that Qualcomm would instead have used its modem-chip power to extract a large fixed fee from OEMs. Compared with that but-for world, Qualcomm waived its fixed fees in exchange for OEMs agreeing to pay the royalty surcharge. Viewed this way, Qualcomm paid OEMs a large fixed fee (waiving the fee it otherwise would have charged) in exchange for their agreement to pay Qualcomm an additional amount (the royalty surcharge) every time they purchase a modem chip from another manufacturer. Such contracts clearly harm competition in the supply of modem chips. However, extracting large fixed fees from OEMs might not be a practical, for a number of reasons.<sup>21</sup> Therefore, in that counterfactual world Qualcomm might not have been able to extract as much from OEMs as it was able to obtain using a royalty surcharge.

### ***G. Summary of the Effects of Qualcomm's Royalty Surcharge***

We are now able to summarize the economic effects of Qualcomm's royalty surcharge:

- Qualcomm's rivals are harmed by the royalty surcharge, which raises their costs, reduces their unit sales, and reduces their profit margins on their remaining sales. This in turn reduces their incentives to invest in R&D to develop next-generation modem chips.
- The all-in price of rival modem chips rises, harming OEMs making devices containing those chips and and/or consumers purchasing them.
- Qualcomm benefits directly from the royalty surcharge because it collects a higher royalty on devices containing non-Qualcomm modem chips.
- Qualcomm benefits indirectly from the royalty surcharge due to the increased demand for Qualcomm's chips resulting from the higher all-in price of rival chips. In response, Qualcomm will raise the all-in price of its own chips, but likely by less than the price increases of its rivals. This allows Qualcomm to sell more modem chips and to earn more on each chip it sells.
- The royalty surcharge additionally decreases Qualcomm's incentive to compete, similar to if Qualcomm held a minority ownership share in its rivals. Qualcomm effectively bears an opportunity cost in the form of forgone royalty income when Qualcomm wins modem-chips sales from its rivals.<sup>22</sup>

<sup>21</sup> Determining the size of the fixed fee for each OEM might be difficult. Costly bargaining impasses could result. Charging a sizeable fixed fee also shifts significant risk to OEMs. An OEM would have to commit to a large fixed payment to Qualcomm before it likely knows what its sales will be. These problems do not arise under Qualcomm's no-license/no-chips policy.

<sup>22</sup> Qualcomm's per-unit opportunity cost is less than the royalty surcharge, because some sales that Qualcomm gains by lowering its all-in price do not come at the expense of sales by rivals. Instead, they result from end users deciding to purchase more mobile devices, e.g., by increasing the frequency with which they replace their cell phones.



- The all-in price of Qualcomm's chips rises, harming OEMs making devices containing those chips and/or consumers purchasing them.

The FTC's expert explained that all of these effects were present, including the two key elements that establish harm to competition from exclusionary conduct: A weakening of competitors and harm to customers.

## V. THE DISTRICT COURT'S DECISION

The District Court ruled in favor of the FTC on virtually every disputed issue, closely tracking the economic analysis presented to the court by the FTC expert. The District Court rejected the arguments put forward by Qualcomm, finding the testimony of many Qualcomm executives to be lacking credibility.<sup>23</sup>

A critical point of dispute was whether as a result of its conduct Qualcomm's SEP royalties were unreasonably high. The District Court answered this factual question with a clear "yes."

The District Court provided extensive detail about how Qualcomm used its threat to stop supplying modem chips to OEMs to obtain higher royalty rates than Qualcomm would otherwise have been able to negotiate. Based on a substantial body of evidence, from OEM and Qualcomm documents and OEM testimony, the District Court described how this dynamic played out over more than twenty years for each of many OEMs, including LG Electronics, Sony, Samsung, Huawei, Motorola, Lenovo, Blackberry, Apple, ZTE, and Nokia.<sup>24</sup> The District Court also cited numerous other categories of evidence in support of its conclusion that Qualcomm's royalty rates were elevated by Qualcomm's threat to withhold its modem chips from OEMs.

Importantly, Qualcomm's own internal analysis strongly supported this conclusion. The District Court's description of this evidence is described above in Section IV.A.

The District Court also concluded that Qualcomm's royalty surcharge raised rivals' costs and fortified Qualcomm's monopoly power, for the reasons given in Section IV above.<sup>25</sup>

The District Court further explained how Qualcomm's royalty surcharge harmed competition.<sup>26</sup>

23 See Section II.E, "Credibility Determinations." "The Court finds Qualcomm's internal, contemporaneous documents more persuasive than Qualcomm's trial testimony prepared specifically for this litigation. ... Specifically, many Qualcomm executives' trial testimony was contradicted by these witnesses' own contemporaneous emails, handwritten notes, and recorded statements to the Internal Revenue Service ('IRS')." District Court at 676.

24 District Court at 698-742.

25 District Court at 790. When the District Court states that the royalty surcharge "results in exclusivity," we interpret this to mean that the royalty surcharge excludes Qualcomm's modem-chip rivals from the relevant modem-chip markets by lowering their margins, reducing their unit sales, and reducing their profits, thus making it more difficult for them to sustain the investments necessary to offer modem chips that can match Qualcomm's in terms of quality and performance. During the relevant period of time, a number of Qualcomm's modem-chip rivals ceased selling modem chips.

26 District Court at 792.

“Because the surcharge also raises the market price of rivals’ chips, Qualcomm prevents rivals from underbidding Qualcomm, so that Qualcomm can maintain its modem chip market power. The surcharge affects demand for rivals’ chips because as a matter of basic economics, regardless of whether a surcharge is imposed on OEMs or directly on Qualcomm’s rivals, ‘the price paid by buyers rises, and the price received by sellers falls.’ N. Gregory Mankiw, *Principles of Microeconomics*, Vol. 1 156 (7th ed. 2014). Thus, the surcharge ‘places a wedge between the price that buyers pay and the price that sellers receive,’ and demand for such transactions decreases. *Id.* Rivals see lower sales volumes and lower margins, and consumers see less advanced features as competition decreases.”

As noted above in Section IV, Qualcomm had denied that Qualcomm’s royalty surcharge acted like a tax on rival modem chips purchased by OEMs, because the surcharge was paid by OEMs and because the surcharge also applied to devices containing Qualcomm modem chips. The District Court recognized that this was a specious economic argument. The District Court also recognized that Qualcomm’s royalty surcharge operates very much like Microsoft’s per-processor license to raise rivals’ costs.<sup>27</sup>

In summary, the District Court found that Qualcomm’s no-license/no-chips policy allowed Qualcomm to impose a royalty surcharge for its SEPs on OEMs, and that “Qualcomm’s surcharge increased the effective price of rivals’ modem chips.” By imposing a tax on OEMs when they purchased rival modem chips, Qualcomm raised rivals’ costs, reduced the effective price that Qualcomm’s rivals could obtain for their modem chips (for any given all-in price and quality of Qualcomm own modem chips), and increased the all-in price of modem chips to OEMs. The FTC had thus proven the central elements of a violation of Section 2 of the Sherman Act: monopoly power and the use of that power to exclude rivals and harm customers.

The District Court ordered Qualcomm to modify its business practices to comply with antitrust law. Here is the key provision of the District Court’s injunction relating to Qualcomm’s no-license/no-chips policy:

“(1) Qualcomm must not condition the supply of modem chips on a customer’s patent license status and Qualcomm must negotiate or renegotiate license terms with customers in good faith under conditions free from the threat of lack of access to or discriminatory provision of modem chip supply or associated technical support or access to software.”<sup>28</sup>

This injunction was well designed to end Qualcomm’s no-license/no-chips policy. Note that this requirement does not prevent Qualcomm from obtaining reasonable royalties for its SEPs. Nor does it impose any limit on what Qualcomm can charge for its modem chips, so long as those charges do not depend on whether the OEM has signed a license to Qualcomm’s SEPs.

<sup>27</sup> District Court at 792.

<sup>28</sup> District Court at 820.



## VI. THE APPEALS COURT'S DECISION

The Appeals Court took a very different view of Qualcomm's no-license/no-chips policy:

“Qualcomm’s patent-licensing royalties and ‘no license, no chips’ policy do not impose an anticompetitive surcharge on rivals’ modem chip sales. Instead, these aspects of Qualcomm’s business model are ‘chip-supplier neutral’ and do not undermine competition in the relevant antitrust markets.”<sup>29</sup>

In this section, we explain how the Appeals Court reached the erroneous conclusion that a royalty surcharge would be “chip-supplier neutral.”

### A. *Qualcomm’s Appeal Briefs*

Qualcomm’s briefs to the Appeals Court repeated a number of arguments relating to its no-license/no-chips policy that the District Court had rejected after hearing the economic expert testimony presented in court on behalf of the FTC and Qualcomm.

Notably, Qualcomm’s brief made the following argument:

“The District Court next held that Qualcomm’s royalties, paid by OEMs, are ‘unreasonable’ and act as a ‘surcharge’ on the chip sales of its rivals, reducing the money they have available to innovate and thus compete. As a threshold matter, that defies common sense because Qualcomm imposes no ‘surcharge’ on its competitors; it is undisputed that competing chipmakers do not pay any royalties to Qualcomm.”<sup>30</sup>

“Put simply, Qualcomm’s license fees imposed no obstacle to its rivals’ ability to compete on the merits—by offering better chips at lower prices.”<sup>31</sup>

These arguments failed to recognize the basic economics of tax incidence: the economic effects of the higher royalties do not depend on which party actually remits those royalties to Qualcomm.

### B. *Intervention by the U.S. Department of Justice*

The DOJ intervened three times in the case in favor of Qualcomm.<sup>32</sup> The DOJ’s challenging its sister antitrust enforcement agency in a major enforcement action was truly extraordinary.<sup>33</sup>

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<sup>29</sup> Appeals Court at 1005.

<sup>30</sup> Qualcomm Opening Brief, p. 26.

<sup>31</sup> Qualcomm Opening Brief, p. 29.

<sup>32</sup> In addition, a sitting FTC Commissioner, Christine Wilson, publicly attacked the District Court’s decision in favor of her own agency while it was on appeal. See Wilson (2019a) and (2019b).

<sup>33</sup> Qualcomm had been a major client of the leader of the Antitrust Division before he joined the DOJ: “Makan Delrahim, a tech lobbyist turned enforcer,” *Financial Times*, July 26, 2019.

First, the DOJ intervened at the District Court level, urging the District Court to hold an evidentiary hearing before imposing any remedy. The DOJ expressed concern that “an overly broad remedy in this case could reduce competition and innovation in markets for 5G technology and downstream applications that rely on that technology.”<sup>34</sup>

Next, the DOJ filed a brief urging the Appeals Court to order a stay to prevent the District Court’s injunction from going into effect.<sup>35</sup> The opening passage from that brief states:

“The district court’s ruling threatens competition, innovation, and national security. Its liability determination misapplied Supreme Court precedent, and its remedy is unprecedented. Immediate implementation of the remedy could put our nation’s security at risk, potentially undermining U.S. leadership in 5G technology and standard-setting, which is vital to military readiness and other critical national interests.”

Despite these dire warnings, the DOJ did not explain why requiring Qualcomm to negotiate its SEP licenses without the threat of cutting OEMs off from their supply of Qualcomm’s modem chips would have any of these feared effects.

Third, and most dramatically, the DOJ strongly supported Qualcomm’s appeal, urging the Ninth Circuit to reverse the District Court.<sup>36</sup> The heart of the DOJ’s argument was that Qualcomm was simply charging high royalties, which is not an anti-trust violation.

“The court erroneously reasoned that Qualcomm’s practice was anticompetitive because it allowed Qualcomm to charge OEMs purportedly high prices. ... Premising liability on ‘unreasonably high’ prices, as the court did here—instead of harm to competition—can radically undermine important incentives to innovate. ‘The opportunity to charge monopoly prices—at least for a short period—is what attracts ‘business acumen’ in the first place; it induces risk taking that produces innovation and economic growth.’ *Trinko*, 540 U.S. at 407.”<sup>37</sup>

As explained above, this argument overlooks Qualcomm’s practice of charging unreasonably high royalties for its SEPs on devices containing *rival* modem chips. This case is thus distinguished from situations in which a dominant firm merely charges a high price. Furthermore, the case relies on Qualcomm’s promise to license its SEPs on FRAND terms, which is a fundamental distinction from situations in which a dominant firm merely charges a high price.

<sup>34</sup> Statement of Interest of the United States of America, May 2, 2019.

<sup>35</sup> Statement of Interest Concerning Qualcomm’s Motion for Partial Stay of Injunction Pending Appeal, July 16, 2019.

<sup>36</sup> Brief of the United States of America as Amicus Curiae in Support of Appellant and Vacatur, August 30, 2019.

<sup>37</sup> *Ibid.* at 8.

The DOJ also argued that Qualcomm's no-license/no-chips policy could not harm competition because it was directed at Qualcomm's customers, OEMs, not Qualcomm's modem-chip rivals.

Lastly, the DOJ attempted to distinguish Qualcomm's royalty surcharge from Microsoft's per-processor licenses:

"In *Caldera*, however, '[t]he effect of [a per-processor licensing] arrangement was that an OEM who chose to install [a competing system] would pay two royalties on the same machine.' 87 F. Supp. 2d at 1250. Thus, the per-processor arrangement could serve as a disincentive for OEMs to purchase or invest in competing systems. Here, by contrast, OEMs pay for use of Qualcomm's SEPs that are essential to every cellular device produced, regardless of which supplier's chip is used."<sup>38</sup>

This argument makes sense for the reasonable royalties that Qualcomm charges OEMs but not when applied to the royalty surcharge. The DOJ seems to be assuming away the issue by simply assuming there was no royalty surcharge. As explained above, Qualcomm's surcharge acted to raise rivals' costs, just like Microsoft's per-processor licenses.

### ***C. Pinpointing the Errors***

The Appeals Court was convinced by the arguments put forward by Qualcomm and endorsed by the DOJ. Critically, the Appeals Court argued that a royalty surcharge by Qualcomm would not cause harm to competition because it was paid by Qualcomm's customers, the OEMs.

"Finally, even assuming that a deviation between licensing royalty rates and a patent portfolio's 'fair value' could amount to 'anticompetitive harm' in the antitrust sense, the primary harms the district court identified here were to the OEMs who agreed to pay Qualcomm's royalty rates—that is, Qualcomm's *customers*, not its *competitors*. These harms were thus located outside the 'areas of effective competition'—the markets for CDMA and premium LTE modem chips—and had no direct impact on competition in those markets."<sup>39</sup>

Here, the Appeals Court failed to understand that the textbook proposition that the economic effects of a tax do not depend upon whether the tax is collected from the buyer or the seller. The Appeals Court also failed to appreciate that a tax on a transaction typically harms both parties to that transaction. The District Court had heard expert testimony on precisely that point.

The Appeals Court also attempted to distinguish Qualcomm's royalty surcharge from Microsoft's per processor licenses.

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<sup>38</sup> *Ibid.* at 18, footnote omitted, emphasis supplied.

<sup>39</sup> Appeals Court at 999 (citations omitted).

“Qualcomm’s licensing royalties are qualitatively different from the per-unit operating-system royalties at issue in *Caldera*. When Qualcomm licenses its SEPs to an OEM, those patent licenses have value—indeed, they are necessary to the OEM’s ability to market and sell its cellular products to consumers—regardless of whether the OEM uses Qualcomm’s modem chips or chips manufactured and sold by one of Qualcomm’s rivals.”<sup>40</sup>

At this critical point, the Appeal Court again overlooked the distinction between Qualcomm’s FRAND royalty and an additional royalty surcharge.

To illustrate the arithmetic, suppose that Microsoft charged OEMs \$50 per device for Windows, but also \$50 for each device they ship without Windows. In our notation,  $[p_M, z] = [50, 50]$ . Microsoft has the right to set the price for Windows at  $p_M = 50$ , but Microsoft does not have the right to charge OEMs for computers that do not run Windows, so  $z$  should equal zero. Put differently, Microsoft’s “reasonable royalty” for Windows for a non-Windows machine is zero, as recognized by the Appeals Court. So, Microsoft’s \$50 charge for non-Windows machines is a royalty surcharge. The Appeals Court accepts that such a charge excludes rivals.

What about Qualcomm? Suppose that the reasonable royalty rate for Qualcomm’s SEP portfolio is  $\bar{r} = 1\%$  of the device price but Qualcomm is charging  $r = 5\%$  of the device price. The royalty surcharge is  $s = 4\%$  of the device price. The Appeals Court correctly observed that Qualcomm’s SEPs “have value in such devices,” but then incorrectly asserts based on this observation that the full 5 percent royalty rate cannot be exclusionary. Remember, at this point in its opinion, the Appeals Court is assuming that Qualcomm *did* obtain unreasonably high royalty rates and is arguing that such rates would not harm competition.

The Appeals Court also accepted Qualcomm’s justification for its no-license/no-chips policy based on patent exhaustion.

“Otherwise, because of patent exhaustion, OEMs could decline to take licenses, arguing instead that their purchase of chips from Qualcomm extinguished Qualcomm’s patent rights with respect to any CDMA or premium LTE technologies embodied in the chips. This would not only prevent Qualcomm from obtaining the maximum value for its patents, it would result in OEMs having to pay more money (in licensing royalties) to purchase and use a competitor’s chips, which are unlicensed. Instead, Qualcomm’s practices, taken together, are ‘chip supplier neutral’—that is, OEMs are required to pay a per-unit licensing royalty to Qualcomm for its patent portfolios regardless of which company they choose to source their chips from.”<sup>41</sup>

In this passage, the Appeals Court overlooks the fact that even without its no-license/no-chips policy, Qualcomm could still freely set the all-in price for its modem chips, so that policy is not needed to allow Qualcomm to benefit from the technolo-

<sup>40</sup> Appeals Court at 1000.

<sup>41</sup> Appeals Court at 985.

gies embodied in those chips. Note that the Appeals Court embraces the idea that Qualcomm should not be prevented “from obtaining the maximum value for its patents,” but that perspective is directly contrary to Qualcomm’s FRAND commitment. Lastly, the Appeals court repeats the erroneous proposition that Qualcomm’s royalties are “chip supplier neutral.”

## VII. CONCLUSION

Several factors contributed to Qualcomm’s victory on appeal.

First, the DOJ intervened strongly in favor of Qualcomm. They expressed a fear that requiring Qualcomm to drop its no-license/no-chips policy would pose a threat to national security. The DOJ emphasized that Qualcomm was a national champion and raised the specter that imposing restraints on Qualcomm would be a gift to China in its economic rivalry with the United States. Surely these warnings from the DOJ and the Department of Defense gave the three appellate judges pause about affirming the District Court’s decision and ordering Qualcomm to drop its no-license/no-chips policy.

Second, even the FTC had to concede that the District Court had made a legal error in its finding that Qualcomm’s refusal to license its SEPs to Qualcomm’s modem-chip rivals was a stand-alone violation of the Sherman Act.<sup>42</sup> That error may well have undermined the Appeals Court’s confidence in the District Court’s legal analysis.

Third, the Appeals Court was convinced by specious economic arguments put forward by Qualcomm, as we have explained in some detail. Additional economics training for appellate judges would help reduce the incidence of such errors.

Fourth, the three appellate judges, facing a novel business practice that they found difficult to understand, defaulted in favor of the defendant. Here is a telling passage from their decision:

“Furthermore, novel business practices—especially in technology markets—should not be ‘conclusively presumed to be unreasonable and therefore illegal without elaborate inquiry as to the precise harm they have caused or the business excuse for their use.’ *Microsoft*, 253 F.3d at 91 (citing *N. Pac. Ry. Co.*, 356 U.S. at 5).”<sup>43</sup>

In reality, however, Qualcomm’s no-license/no-chips policy *had* been subject to an “elaborate inquiry” in the form of a detailed investigation by the FTC, a full trial on the merits, and extensive factual findings by the District Court after hearing economic expert testimony from both sides. The Appeals Court’s reversal of the District Court was an unfortunate outcome in terms of the use of microeconomics in antitrust cases.

42 The key Supreme Court precedents regarding a monopolist’s duty to deal with a rival are *Aspen Skiing v. Aspen Highlands*, 472 U.S. 585 (1985) and *Verizon v. Trinko*, 540 U.S. 398 (2004).

43 Appeals Court, 990-991.

## REFERENCES

- Bork, Robert (1978). *The Antitrust Paradox*, New York, Free Press.
- Contreras, Jorge & Richard J. Gilbert (2015). “A Unified Framework for RAND and Other Reasonable Royalties,” *Berkeley Technology Law Journal*, 30(2), 1447-1499.
- Easterbrook, Frank (1984). “The Limits of Antitrust,” *Texas Law Review*, 63, 1.
- Federal Trade Commission v. Qualcomm* (2017), Complaint.
- Federal Trade Commission v. Qualcomm* (2017), Dissenting Statement by Commissioner Ohlhausen.
- Federal Trade Commission v. Qualcomm* (2019), 411 F. Supp. 3d 658, (“District Court”).
- Federal Trade Commission v. Qualcomm* (2020), 969 F.3d 974, (“Appeals Court”).
- Lemley, Mark & Carl Shapiro (2007). “Patent Holdup and Royalty Stacking,” *Texas Law Review*, 85, 1991-2049
- Lemley, Mark & Carl Shapiro (2013). “A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents,” *Berkeley Technology Law Review*, 28, 1135-1166.
- Lipsey, Richard, Paul Courant & Christopher Ragan (1999). *Economics*, 12th ed., New York, Addison-Wesley.
- Manne, Geoffrey & Joshua Wright (2010). “Innovation and the Limits of Antitrust,” *Journal of Competition Law & Economics*, 6, 153.
- National Research Council (2013). *Patent Challenges for Standard Setting*, National Academies Press.
- Shapiro, Carl (2010). “Injunctions, Hold-Up, and Patent Remedies,” *American Law and Economics Review*, 12, 280-318.
- Shapiro, Carl (2021). “Antitrust: What Went Wrong and How to Fix It,” *Antitrust Magazine*.
- Shapiro, Carl & Mark Lemley (2020). “The Role of Antitrust in Preventing Patent Holdup,” *University of Pennsylvania Law Review*, 168, 2019-2063.
- Wilson, Christine (2019a). “A Court’s Dangerous Overreach,” *Wall Street Journal*, May 28.
- Wilson, Christine (2019b). “Antitrust and Innovation: Still Not a Dynamic Duo,” Remarks at the Stanford Essential Patents Symposium, September 10.
- Whinston, Michael D. (2008). *Lectures on Antitrust Economics*, Cambridge, The MIT Press.