KerrisdaleCapital

January 2019

Qualcomm Incorporated (QCOM)

Ignoring the Legal Risk Is Patently Ridiculous

We are short shares of Qualcomm Incorporated, a semiconductor company teetering on the brink of disaster. For years, Qualcomm has presented itself as a technological innovator that monetizes its R&D in two ways: 1) selling chips that go into smartphones and other wireless devices and 2) licensing its patent portfolio. The licensing business, despite contributing far less *revenue* than the chip business, has historically supplied roughly two thirds of Qualcomm's profits, thanks to its extremely high profit margins.

This unusual business model is living on borrowed time. In the past few years, regulators across the globe have concluded that Qualcomm's ability to extract massive licensing fees from device-makers like Apple and Samsung stems not from the quality of its patents but from unlawful monopolistic tactics. In particular, authorities in China, Taiwan, Japan, South Korea, Europe, and the United States have found fault with what they see as Qualcomm's exploitation of its dominance in the market for premium modem chips (the components of smartphones that enable them to connect to cellular networks) to force device-makers to pay outrageously high patent royalties, even on devices that *don't* contain Qualcomm chips, all while refusing to license its IP to potential competitors. These core Qualcomm business practices, regulators contend, violate binding pledges the company has made to license critical patents on "fair, reasonable, and non-discriminatory" (FRAND) terms, including to rivals like Intel. Indeed, in the words of the United States Federal Trade Commission (FTC), quoting an internal Qualcomm assessment from 2015, "**granting a FRAND license to Intel 'would destroy the whole current QTL [licensing] business.**'"

If Qualcomm is right about that, then destruction is imminent. The FTC has brought a powerful legal case against the company, and the trial (conducted entirely before a judge, not a jury) is currently underway, with a scheduled end date of January 29th. **We believe Qualcomm will lose,** a view that we regard as the emerging consensus among informed observers, who have noted not just the strong evidence marshaled by the FTC but also the many instances before and during the trial when the judge signaled disagreement with Qualcomm's legal views and even irritation with its lawyers.

Perhaps because prior legal troubles have "merely" cost Qualcomm billions of dollars without fundamentally transforming its business model, the market has failed to appreciate the potentially dire consequences of the current trial. If the judge grants the FTC the remedies it seeks, forcing Qualcomm, among other things, to license core patents to competitors and to renegotiate all of its existing licenses on fair terms, it could realistically **cut Qualcomm's licensing revenue, earnings power, and stock price in half.** As Qualcomm's long-running game of monopoly draws to a close, there will be no "Get Out of Jail Free" card.

Table of Contents

I. Executive Summary

Qualcomm is very likely to lose its ongoing legal battle with the FTC. Judge Lucy Koh, who is presiding over the *FTC v. Qualcomm* trial, has already ruled against Qualcomm on several critical matters, including rejecting its motion to dismiss the case and pre-determining (on the FTC's motion for partial summary judgment) that Qualcomm is indeed obligated, as a matter of contract law, to license its key (so-called standard-essential) cellular patents to potential competitors like Intel on FRAND terms. Meanwhile, in a closely related consumer class-action lawsuit, Judge Koh allowed the case to move forward despite Qualcomm's vehement objections, characterizing the evidence presented thus far to show that Qualcomm's anticompetitive practices harmed consumers as "copious," "substantial," and "significant."[1]

None of this guarantees that Qualcomm will lose to the FTC, but we and other trial watchers have been impressed by the FTC's performance and, by contrast, surprised at the sometimes combative interactions between Judge Koh and Qualcomm's legal team. In general, government plaintiffs like the FTC enjoy a high win rate, and in this specific case the probability of government victory appears even higher than usual.

Ending Qualcomm's unlawful business model will reset its long-term earnings power far lower. The FTC isn't looking to fine Qualcomm; it's looking to fundamentally change how the company does business. In particular, it's seeking to force Qualcomm to license its most important patents on FRAND terms to competitors like Intel, with royalties set at a small percentage of the price of a modem chip rather than Qualcomm's longstanding practice of charging device-makers a high percentage of the price of an entire phone. This shift alone will radically level the playing field, making the likes of Intel much more competitive, in part because of the legal doctrine of patent exhaustion. Under this doctrine, if Intel pays to license Qualcomm patents and then sells a chip that makes use of those patents to Apple or Samsung, Qualcomm has no legal right to demand any additional license fees from Apple or Samsung; once the initial license is granted, Qualcomm's patent rights are "exhausted" (used up). This creates a troubling dynamic for Qualcomm: if Intel or MediaTek can market modem chips for, say, $20 plus a $1 license fee payable to Qualcomm ($21 all-in), how can Qualcomm continue to sell chips for the same ~$20 plus a smartphone-level license fee that could be as high as $20 on its own ($40 all-in)? The math doesn't work. Thus Qualcomm will be compelled to drastically reduce what Apple has called its "extortion-level royalties"[2] – plausibly by an order of magnitude.

Indeed, this dramatic shift may also unfold more directly if Judge Koh agrees to the FTC's request to "[r]equire Qualcomm to negotiate or renegotiate, as applicable, license terms with customers in good faith under conditions free from" anticompetitive threats and "[r]equire Qualcomm to submit, as necessary, to arbitral or judicial dispute resolution to determine reasonable royalties and other license terms."[3] In other words, the judge's decision in *FTC v. Qualcomm* – a decision that could come as soon as February – could trigger an immediate mass renegotiation in which Qualcomm is explicitly barred from leveraging its market position in

---

[1] Order Granting Plaintiffs' Motion for Class Certification in *In Re: Qualcomm Antitrust Litigation* (case no. 17-MD-02773-LHK), filed September 27, 2018, ECF No. 760, pp. 23 and 25.

[2] Redacted First Amended Complaint in *Apple v. Qualcomm* (case no. 17-cv-0108-GPC-MDD), filed June 20, 2017, ECF No. 83, p. 17.

[3] Joint Pretrial Statement in *FTC v.Qualcomm* (case no. 5:17-cv-00220-LHK-NMC), filed November 29, 2018, ECF No. 946, p. 3.

modem chips to extract excessive, unfair royalties and in which any disagreement over what counts as "excessive" will likely end up back in court. But precedents for determining "reasonable royalties" in similar circumstances strongly disfavor Qualcomm (relative to its current monopolistic business model), pointing to a royalty rate that, according to one FTC expert witness, could be as low as ~0.6%,[4] a rate likely applied to the modem price of tens of dollars as opposed to the device price of hundreds.

Even if we assume a far higher "fair" royalty of $1.50 per device – an amount that Apple's chief operating officer said in sworn testimony that he proposed as relatively fair back in 2007[5] – we estimate that resetting Qualcomm's licensing revenue to fair levels will slash revenue by $2.7 billion (relative to fiscal year 2018) and reduce run-rate diluted EPS to $1.64, implying a fair-value stock price of ~$21 based on historical Qualcomm and peer multiples – 60% lower than the current price. Even in this scenario, Qualcomm would continue to siphon $2.5 billion per year out of the cellular industry – an amount that few outside of Qualcomm would likely view as unjustly paltry.

The prospect of such dramatic downside for Qualcomm's "extortion-level royalties" isn't surprising in light of some of the evidence that has already emerged from the *FTC v. Qualcomm* trial. Not only did Qualcomm say internally that licensing patents on FRAND terms to its competitor Intel – as Judge Koh may soon require – "would destroy the whole current QTL [licensing] business" (as quoted above); the FTC has also argued based on internal Qualcomm documents that a key reason Qualcomm repeatedly decided not to spin out its licensing unit as a separate company was that it wanted to retain the ability to leverage its modem-chip monopoly to extract supra-FRAND excessive royalties. But when Qualcomm is legally compelled *not* to leverage that monopoly, royalties will head much lower. Indeed, just last week the FTC confronted one of Qualcomm's witnesses, the company's senior vice president of licensing strategy, with his own past statement, recorded on audio tape, that when "having to choose between licensing chips and licensing at the handset, the handset was humongously more lucrative."[6] But this "humongously more lucrative" way of doing business – part and parcel of Qualcomm's overall pattern of monopolistic tactics – will likely collapse when Judge Koh issues her final ruling.

Qualcomm's broader business outlook is poor. Even completely disregarding the pivotal FTC case, Qualcomm is not a cheap stock; its current valuation seems to bake in an assumed near-term settlement of its complex legal and business disputes with two major customers, yet such a painless resolution appears less likely than ever. Meanwhile, against the backdrop of an increasingly saturated smartphone market, Qualcomm is facing growing competition from both rival chipmakers and its own customers (who are producing more key components in-house), suggesting lower market share and slower growth in the long run.

---

[4] Transcript of *FTC v. Qualcomm* proceedings, January 14, 2019, volume 5, p. 1012.
[5] Transcript of *FTC v. Qualcomm* proceedings, January 14, 2019, volume 5, p. 870.
[6] Transcript of *FTC v. Qualcomm* proceedings, January 18, 2019, volume 7, p. 1492.

II. Company Overview

Qualcomm Incorporated: Capitalization and Financial Results

Capitalization			Financial results			
				FY2016	FY2017	FY2018
Share price ($)	$54.29					
Shares O/S (mm)	1,212		Revenue ($mm)	$ 23,554	$ 22,291	$ 22,732
($mm)			Stated non-GAAP EPS	$ 4.44	$ 4.28	$ 3.69
Market cap	$ 65,808		Non-GAAP EPS incl. SBC	$ 3.94	$ 3.77	$ 3.19
Net debt*	4,789					
Enterprise value	$ 70,597		QTL % of segment EBT	78%	65%	54%

Source: company filings, Kerrisdale analysis

Note: "SBC" = share-based compensation (an economically meaningful ongoing expense that Qualcomm excludes from its adjusted EPS figures). "QTL" = Qualcomm Technology Licensing. "EBT" = earnings before tax (based on Qualcomm's segment disclosures).

** Net debt and share count reflect the impact of post-September 2018 stock repurchases as disclosed in Qualcomm's FY2018 10-K.*

Founded in 1985, Qualcomm was an early innovator in wireless technology, pioneering the approach known as code-division multiple access (CDMA) and maintaining a strong position as a premier supplier of wireless modems and related components as 3G and 4G evolved. But while other suppliers of such components simply sell components, Qualcomm has divided its business into two key pieces: Qualcomm CDMA Technologies (QCT), a relatively straightforward operation that designs and sells wireless modem chips, and Qualcomm Technology Licensing (QTL), a hard-charging group devoted to getting the makers of smartphones and other wireless devices (known as original equipment manufacturers or OEMs) to pay licensing fees for access to Qualcomm's large portfolio of patents. These patents include both standard-essential patents (SEPs), which Qualcomm has asserted are "essential" to the implementation of cellular technical standards like LTE, and non-SEPs that Qualcomm has developed or acquired and claims would be infringed by popular devices like the iPhone in the absence of a license. The *FTC v. Qualcomm* case has shown that the basic headline rate Qualcomm has historically charged for a license to its entire patent portfolio is 5% of the price of the entire device to which the license applies, with a recently imposed cap of $400 (implying a maximum royalty of 5% x $400 = $20 per device).

Like most semiconductor producers, QCT earns relatively low margins and is subject to major fluctuations in earnings based on the vagaries of product cycles and end-market demand. QTL, by contrast, used to boast pre-tax profit margins approaching 90%, as nearly every 3G and 4G device maker paid their "tax" on every unit shipped, with little manpower required to generate billions of dollars of revenue. But why? One might expect that hefty royalties charged to powerful OEMs would be met with stiffer resistance, with disagreements over patent validity and quality frequently descending into costly litigation. The puzzle grows when one considers that the cellular SEPs in Qualcomm's portfolio – arguably the most important patents the company has – are encumbered by a FRAND pledge – that is, a contractual promise to a standard-setting organization like 3GPP (which writes the rules for standards like LTE and 5G) that Qualcomm will license those patents on “fair, reasonable, and non-discriminatory” terms to all applicants. Such a pledge, though intentionally vague (with the definition of “FRAND” often determined, in the end, by a judge), is intended precisely to ensure that a patent holder like Qualcomm *can’t* extract excessive royalties from standards-implementers like OEMs and competing chipmakers. Nonetheless, QTL revenues and profits have achieved massive scale, with Qualcomm at one point bragging (in a slide presented at the trial) that its licensing revenue was larger than that of all other major licensing businesses in the world (including telecom titans Ericsson and Nokia) *combined.* Similarly, Huawei’s senior legal counsel testified that 80-90% of the company’s total patent licensing costs for mobile devices go to Qualcomm, despite the fact that Qualcomm is far from the only company that has made major contributions to 3G and 4G cellular standards. (Indeed, one FTC witness, an Ericsson employee, stated that, in terms of cellular SEPs, Qualcomm actually ranks *below* Ericsson (and likely Nokia as well).[7]) In other words, Qualcomm doesn’t hold anywhere near 80-90% of the most important cellular patents, yet it extracts the vast majority of the corresponding patent royalties.

In the opinion of regulators across the world, the reason Qualcomm has gotten away with this anomalously (indeed, “humongously”) lucrative licensing for so long is simple: it has such a dominant position in the markets for CDMA and premium LTE modem chips that OEMs, though regarding Qualcomm’s licensing fees as unfair and thus in violation of its FRAND commitments, felt they had no choice but to pay up. In theory, OEMs could have taken Qualcomm to court over its non-FRAND royalties from day one, but as a practical matter such a step posed too great a risk of Qualcomm retaliation via the QCT side of the business. The FTC’s opening statement in the current trial summarized this overall perspective and briefly explained why it violates US antitrust law:

> This case concerns Qualcomm’s long-standing corporate policies to harm competition and consumers. Under those policies, Qualcomm will not sell modem chips to a customer unless the customer takes a separate license to Qualcomm’s standard-essential patents. The evidence will show that device manufacturers agreed to the license terms not because the royalty rates represent the fair value of Qualcomm’s patents but because they need access to Qualcomm’s modem chips. To buy Qualcomm’s modem chips, device manufacturers have to agree to pay Qualcomm’s elevated royalties, which are effectively a surcharge for access to Qualcomm’s chips, even when they use chips made by Qualcomm’s competitors.
>
> As a matter of textbook economics, if a monopolist demands a substantial payment every time a customer buys from someone else, that payment harms competition and contributes to the maintenance of the monopolist’s market power. Under the FTC Act, that conduct is unlawful and warrants injunctive relief.[8]

---

[7] Deposition Testimony of Christina Petersson, April 20, 2018, *FTC v. Qualcomm,* ECF No. 1324-1.
[8] Transcript of *FTC v. Qualcomm* proceedings, January 4, 2019, volume 1, p. 7.

In parallel with the FTC's lawsuit, Qualcomm's business relationships with key customers have also deteriorated: Apple has stopped using its chips and paying its allegedly non-FRAND royalties, and an additional OEM (universally believed to be Huawei) has also refused to pay. As a result, QTL revenues and profit margins have already dropped significantly.

However, investors have tended to take a sanguine view of these alarming developments, blithely assuming that rebellious OEMs will ultimately settle with Qualcomm on decent terms and that any adverse legal outcome will either result in minimal business-model disruptions or be overturned on appeal. This confidence is misplaced. In reality, the FTC case is going badly for Qualcomm, and the impact of a loss could be massive.

III. Qualcomm Is Very Likely to Lose Its Ongoing Legal Battle with the FTC

The *FTC v. Qualcomm* trial began on January 4th and is scheduled to end on the 29th; the judge will then issue her opinion afterwards, perhaps as soon as February, though she warned yesterday that it's "going to take some time" (at least by her usual speedy standards). It's easy for market participants to ignore complex court cases on the theory that there's no way to estimate the probability of an adverse outcome, but for Qualcomm this facile view fails to recognize the evidence that we already have.

For one thing, Judge Koh has already made several decisions that required her to reject Qualcomm's legal reasoning:

- Qualcomm initially moved to dismiss the FTC's suit; Judge Koh said no.
- Qualcomm sought to present evidence regarding events subsequent to March 2018, the original discovery deadline in the case. Qualcomm believed that new developments like Apple's abandonment of the company's chips in favor of Intel's would make Qualcomm's historical business practices look less anticompetitive, but Judge Koh held fast to the original deadline.
- Most importantly, prior to the trial, the FTC moved for summary judgment on the legal question of whether the agreements Qualcomm made with standards-setting organizations regarding its FRAND commitments required it to license its SEPs to *anyone,* including competing chipmakers like Intel and MediaTek, or just to OEMs. Qualcomm maintained that it only needed to license its patents on FRAND terms to OEMs; at a minimum, Qualcomm said, the question of how far the FRAND commitment extended was difficult and controversial enough that it would need to be decided based on evidence presented at trial, not ahead of time. But Judge Koh disagreed, ruling that, as a matter of pure contract interpretation, Qualcomm was wrong, and, contrary to its longstanding practice, it actually *is* contractually obligated to license its SEPs on FRAND terms to anyone, including rivals. (Technically, Judge Koh's ruling didn't address the question of whether Qualcomm had actually *breached* this commitment, but, based on

the evidence presented in the trial, it clearly has.) This landmark decision went a long way toward advancing the FTC's case even before the trial began.

Furthermore, in a closely related antitrust class-action suit against Qualcomm – which, because it includes everyone in the United States who purchased a smartphone over a multi-year period, is likely the largest class action (in terms of number of class members) in US history – Judge Koh certified the class and thus allowed the suit to move forward, again over the strident objections of Qualcomm's legal team. Her order in that case recounted in great detail the evidence that the plaintiffs had already presented to show that they had a plausible case that Qualcomm charged excessive, unfair, and unlawful patent royalties and that these excessive royalties were passed through to smartphone prices, pushing them up and thereby harming consumers; Judge Koh clearly believed the evidence was good enough to give the plaintiffs their day in court. While the legal issues at play in the FTC case are not identical to those in the class-action suit, it can't be good for Qualcomm to see Judge Koh take such a favorable view of a body of evidence very similar to that set forth by the FTC. (For example, one of the FTC's expert witnesses has also provided evidence in the class action, and his work is discussed very respectfully by Judge Koh.) The point is not that the judge is biased against Qualcomm but that Qualcomm's legal arguments have repeatedly failed to persuade her – perhaps simply because the legal underpinnings of the company's business practices are weak.

In addition, in a past case not directly involving Qualcomm, *GPNE v. Apple,* Judge Koh also ruled on a matter relevant to Qualcomm in a way that goes against its interests. The plaintiff, GPNE, purported to hold cellular SEPs (based on pager technology) and sued Apple for patent infringement. Apple submitted expert testimony in which the calculation of potential damages caused by this alleged infringement was based on a small percentage of the value of a standalone modem chip (also known as a baseband processor chip), *not* the entire value of, say, an iPhone. GPNE objected, in line with Qualcomm's view of its own patents, that it was legally entitled to a royalty on the entire device and thus that Apple's expert testimony should be thrown out. But Judge Koh disagreed, "hold[ing] as a matter of law that in this case, the baseband processor is the proper smallest salable patent-practicing unit"[9] – in other words, the correct starting point or "royalty base" for calculating a reasonable royalty that, in turn, would dictate how much Apple would owe to GPNE if it was found to infringe on its patents. While the facts in the GPNE case don't perfectly line up with the facts in the Qualcomm case, the similarities are strong; if Judge Koh concludes in one case that reasonable royalties on cellular SEPs should be a small fraction of the price of an individual modem chip, *not* an entire smartphone, then it's difficult to see why she'd conclude differently in another case. Once again, this precedent does not bode well for Qualcomm.

As the trial has unfolded, we have also been struck by the tone of some of Judge Koh's interactions with Qualcomm's lawyers. While we wouldn't put too much weight on this sort of observation, it certainly does Qualcomm no favors to be at odds with a critical decision-maker.

---

[9] Order Re: GPNE and Apple's Motions to Exclude in *GPNE v. Apple* (case no. 12-CV-02885-LHK), dated April 16 2014, ECF No. 242, pp. 24-5.

For example, Judge Koh complained that Qualcomm's lawyers, while cross-examining the FTC's witnesses, were not actually "impeaching" them (legitimately calling into question their credibility):

> The Court: How is that impeachment? Why do you all keep doing this? These are not really impeachment, but you – anyway, go ahead, please. This has been going on with multiple Qualcomm cross-examinations that these are not impeachment.
>
> Mr. Paige: I asked—
>
> The Court: Can you answer my question? Why is that impeachment?[10]

On another occasion, when the FTC played a segment from an audio tape, Qualcomm objected that the FTC cut off the recording prematurely and should let it play longer to provide more context – but Judge Koh was unimpressed:

> Mr. Bornstein: Your honor, I have a completeness objection. Can we have that keep playing, please. I think we cut off for some important context for Mr. Reifschneider's comments.
>
> The Court: We'll do this in your time. I mean, it would have been easier with the transcript. Qualcomm blocked the transcript from coming in, and he's saying, "Oh, but if I had the transcript, I would be able to testify X and Z." So it's a little bit frustrating from our perspective. You're requiring us to go back in chambers and listen to the whole tape, which is I hope what you wanted because that's what's going to happen because you would not allow the transcript in. So you'll do your completeness objections on your own time.[11]

In another instance, Judge Koh complained that Qualcomm initially insisted that the dollar value of one its incentive payments to Apple be sealed (i.e. kept off the public record), only to later refer to it in open court and claim it was public knowledge: "Mr. Van Nest [one of Qualcomm's lawyers] had represented that the $1 billion number was public, which was not true, and also that it had not been sealed. I had sealed it at the request of Qualcomm. Qualcomm had represented that that was competitive pricing information. I took their representation as correct, and I sealed it. But that should all be unsealed now."[12] Again, friction over such procedural matters between the judge and Qualcomm's legal team certainly doesn't guarantee that Qualcomm will lose, but the overall picture is bleak.

Meanwhile, the FTC has put forward a strong case – and we're not the only ones who think so. Just last week, Bloomberg Intelligence released a short piece entitled "Qualcomm Has Uphill

---

[10] Transcript of *FTC v. Qualcomm* proceedings, January 14, 2019, volume 5, p. 899.
[11] Transcript of *FTC v. Qualcomm* proceedings, January 18, 2019, volume 7, p. 1490.
[12] Transcript of *FTC v. Qualcomm* proceedings, January 14, 2019, volume 5, p. 863.

Climb in Second Half of FTC Antitrust Trial," noting that "Halfway through its trial against Qualcomm, the FTC continues to have the upper hand, in our view. The agency has done a good job depicting Qualcomm's tactics as abuses of market power that have harmed competition." Similarly, Joshua Sisco, a senior antitrust correspondent for the legal news source MLex, remarked that, though it was too early to say for sure how the judge would ultimately rule, "I think the FTC's case has been going really well," noting in particular the persuasiveness of a key witness from Intel. Florian Mueller, an anti-software-patent advocate who has followed the various legal cases against Qualcomm very closely for years and is attending the current trial in person, wrote more emphatically about the FTC's "likely-winning case":

> The FTC's litigation staff can be proud of the tremendous work they've done (and imagine the distractions resulting from the government shutdown). The case the government has rested is extremely strong, and I already have this feeling that this "Your Honor, the FTC rests its case" moment may have been one of the most important moments in worldwide antitrust history.

To be sure, Mueller can be regarded as a biased observer in light of his personal opposition to Qualcomm's business model, but his analytical track record is nothing to scoff at; for instance, he correctly predicted that the FTC would win its important motion for summary judgment.

In fact, in our conversations with other market participants, we have found that *everyone* who is paying close attention to the FTC case – including some with "buy" ratings on Qualcomm stock – agree that the FTC seems to be winning. Stepping back from the details of the case, it shouldn't be surprising to see the FTC prevail. Government plaintiffs don't like to lose, and they are careful to pursue only the cases where they believe the odds are stacked in their favor. With Qualcomm specifically, though the market has been trained over the years to overlook the inherent suspiciousness of the company's anomalous and monopolistic business model, governments across the world have consistently found it to be unlawful; why should the US be any different? Moreover, as much as Qualcomm will argue that all of its contractual arrangements are perfectly fair, a "who's who" of the wireless industry has already testified under oath that, just as the FTC alleges, Qualcomm's licensing fees are excessive, unfair, and anticompetitive. Litigation is inherently uncertain, but we believe the most likely outcome is quite clear: the FTC will win, and Qualcomm will lose.

IV. Ending Qualcomm's Unlawful Business Model Will Reset Its Long-Term Earnings Power Far Lower

What happens if Qualcomm loses? We believe that market participants have been complacent about the FTC case in part because of confusion about the remedies the FTC is seeking. In past run-ins with global regulators, Qualcomm has often emerged relatively unscathed, paying a fine and moving on. But if the FTC convinces Judge Koh to grant what it's asking for, this case will turn out much differently. It's not about getting Qualcomm to cough up more money; it's about changing the way it does business. Below, we present the far-reaching "relief sought" by the FTC, in the agency's own words (emphasis added):

> The FTC seeks a declaration and adjudication that Qualcomm's conduct violates Section 5(a) of the FTC Act, 15 U.S.C. § 45(a). In addition, the FTC seeks permanent injunctive and other equitable relief that would redress and prevent recurrence of Qualcomm's conduct, including an order that would at least:

- Prohibit Qualcomm from conditioning the supply of modem chips on a customer's patent-license status;
- **Require Qualcomm to negotiate or renegotiate, as applicable, 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, software, or other support;**
- **Require Qualcomm to submit, as necessary, to arbitral or judicial dispute resolution to determine reasonable royalties and other license terms should a customer choose to pursue such resolution;**
- **Require Qualcomm to make exhaustive SEP licenses available to modem-chip suppliers on fair, reasonable, and non-discriminatory terms and to submit, as necessary, to arbitral or judicial dispute resolution to determine such terms;**
- Prohibit Qualcomm from discriminating or retaliating in any way against any modem-chip customer or modem-chip supplier because of a dispute with Qualcomm over license terms or because of a customer's license status;
- Prohibit Qualcomm from making payments or providing other value contingent on a customer's agreement to license terms;
- Prohibit Qualcomm from entering express or de facto exclusive-dealing agreements for the supply of modem chips;
- Prohibit Qualcomm from interfering with the ability of any customer to communicate with a government agency about a potential law enforcement or regulatory matter;
- Require Qualcomm to adhere to compliance and monitoring procedures and appropriate "fencing in" provisions, including but not limited to a potential firewall between patent licensing and chip personnel; and
- Impose any other relief that the Court finds necessary and appropriate to redress and prevent recurrence of Qualcomm's conduct.[13]

If the FTC wins, it will be because it has convinced Judge Koh that Qualcomm's approach to tying its chip business to its licensing business is unlawful and has inflated its licensing revenue; Judge Koh must then do what she can to stop this behavior. This will necessarily mean a major overhaul of the business model, as contemplated in the remedies described above, and a major downward reset in Qualcomm's earnings power. This is not an extreme tail event but a base case (conditional on an FTC victory, which, again, we regard as by far the most likely outcome).

[13] Joint Pretrial Statement in *FTC v. Qualcomm,* filed November 29, 2018, ECF No. 946, pp. 3-4.

How will these remedies actually play out? Consider the requirement that Qualcomm "renegotiate…license terms with customers in good faith" and "submit, as necessary, to arbitral or judicial dispute resolution to determine reasonable royalties and other license terms should a customer choose to pursue such resolution." Given Qualcomm's position that its current license terms are *already* fair, it's hard to see how these mass renegotiations will proceed smoothly; Qualcomm's counterparties, for their part, will also be strongly tempted to see how far they can get in court, where "fairness" and "reasonableness" can be judged based on precedents and case law without fear of Qualcomm's market power. Indeed, the FTC's opening statement described how, in the agency's view, all of Qualcomm's existing license agreements were tainted by anticompetitive tactics and presumptively unfair:

> The process of tying the sale of chips to licensing poisons the negotiation of a FRAND rate. Now, without a threat to chip supply, a party faced with a demand for unreasonable royalties for standard-essential patents can challenge that demand in court, either as a defendant in patent litigation, or a plaintiff in a FRAND determination action. Qualcomm's policies prevent OEMs from negotiating in the shadow of the law. Instead, they negotiate in the shadow of a potentially devastating disruption in chip supply.

If Judge Koh puts Qualcomm's negotiations back "in the shadow of the law" where they belong, what "reasonable" royalty rates will emerge? And will it be anywhere near Qualcomm's historical headline rate of 5% of the price of an entire smartphone?

In patent-infringement cases, under US law, the damages awarded to successful plaintiffs must be at least equal to "a reasonable royalty for the use made of the invention by the infringer."[14] But a key 19th-century Supreme Court ruling (*Garretson v. Clark*) held that patent holders seeking damages must "[g]ive evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented feature, and such evidence must be reliable and tangible, and not conjectural or speculative." In other words, the reasonable royalty can't be based on "the entire value of the whole machine" if the patent in question pertains only to one component of the machine; instead, the royalty should be based solely on the contribution of the patented feature to the overall value of the item.

In applying this precedent, courts have recently gravitated toward the concept of the "smallest salable patent-practicing unit," or SSPPU. Indeed, as discussed above, Judge Koh herself ruled in 2014 in a non-Qualcomm case that, for a cellular standard-essential patent, the relevant SSPPU was *not* an entire device (like a smartphone) but rather the wireless modem, whose market value is an order of magnitude lower.

Thus the most likely outcome of the FTC's renegotiation remedy is that Qualcomm's current licensees will seek "judicial dispute resolution" to "determine reasonable royalties" on Qualcomm's patent portfolio, and, applying existing precedents, the courts will conclude that Qualcomm deserves at most a small percentage of the value *of a modem chip,* not the value of

[14] 35 U.S.C. § 284.

a whole phone. What percentage? That will be for judges to decide based on expert testimony, but the figures discussed by one of the FTC's expert witnesses, Matthew Lasinski, are instructive. Using the so-called top-down methodology employed in other intellectual-property cases, Lasinski estimated that *all* cellular SEPs deserved only a 6% combined royalty rate, with Qualcomm deserving only 10% of that royalty stream based on the alleged strength of its patent portfolio relative to those of other SEP contributors like Nokia and Ericsson. Overall, then, Qualcomm "should" get only 0.6% of the value of the smallest salable patent-practicing unit corresponding to its cellular standard-essential patents – in other words, 0.6% of the price of a modem chip, or roughly 0.6% x $20 = **$0.12 per smartphone**. Needless to say, this would represent a massive drop from Qualcomm's current rates of $10-20 per smartphone. Qualcomm would of course argue that it has contributed more than 10% of the value of all 3G and 4G SEPs, but the key point is that once royalties are set as a small percentage of a modem price as opposed to a phone price, licensing revenues must fall drastically.

Qualcomm would also argue that such calculations neglect the value of its non-SEPs: patents that don't directly pertain to technical standards like LTE but are still infringed by typical cellular devices. However, the value of such patents remains an open question. Interestingly, when Qualcomm was forced by Chinese authorities to offer Chinese OEMs patent licenses covering just its SEPs as opposed to its entire portfolio, the OEMs chose to license just the SEPs and skip the others, suggesting they attributed little value to them. In the past, Qualcomm executives have identified features like airplane mode as subject to its non-standard-essential patents, but such a feature is intuitively difficult to regard as patent-worthy. More substantively, the US Patent and Trademark Office has instituted 19 different *inter partes* review (IPR) challenges to Qualcomm-held non-standard-essential patents just in the past week; while this doesn't guarantee that Qualcomm's patents are ruled to be invalid, it does indicate that the Patent Office believes the case for invalidity is plausible.

Meanwhile, as Qualcomm has recently sued Apple for infringement of its non-SEPs in multiple jurisdictions across the world, it's striking how weak some of the patents appear given that Qualcomm presumably filtered through its entire portfolio to find its strongest and most defensible assets. In one case in Germany, for instance, Apple managed to work around Qualcomm's allegedly infringed user-interface patent simply by updating iOS for German users so that searches bring up just text but no icons. In another case, Qualcomm claimed that Apple infringed its Chinese patent on "moving 'cards' around on a touchscreen display"; again, Apple maintained than an updated version of iOS rendered the patent irrelevant. In short, Qualcomm's much ballyhooed non-SEPs appear, not surprisingly, unessential. But if a reasonable royalty for its cellular SEPs is just $0.12 per device, then its non-SEPs can be worth multiples of that value without getting anywhere close to the company's current royalty levels.

Even if Judge Koh doesn't mandate full license renegotiation, a similar outcome can be reached via other dynamics. Consider the FTC's proposed requirement that Qualcomm "make exhaustive SEP licenses available to modem-chip suppliers on fair, reasonable, and non-discriminatory terms and to submit, as necessary, to arbitral or judicial dispute resolution to determine such terms." Such a remedy aligns quite well with Judge Koh's prior summary-judgment ruling that Qualcomm is contractually obligated to license its SEPs on FRAND terms to competing modem-chip suppliers, and thus appears to be an easy win for the FTC. But the consequences for Qualcomm could be severe. Once competing suppliers like Intel and MediaTek can obtain chip-level SEP licenses for a "fair" price (subject to judicial determination in the event of a disagreement and thus likely to gravitate toward a low percentage of the chip price, not the whole-device price), OEMs who buy chips from them will no longer have to worry about paying Qualcomm for anything SEP-related because these patents will be deemed "exhausted." By contrast, if Qualcomm tries to maintain its existing business model for customers that do buy its chips, those OEMs face much higher all-in prices when going with competitors because they have to pay for both chips and device-level patent licenses. Under a regime where Qualcomm is forced to license its SEPs to competitors, existing Qualcomm customers will have a massive incentive to switch away from Qualcomm to its competitors given the dramatic difference in pricing. This will put pressure on Qualcomm to slash its royalties.

One way or another, then, an FTC victory will likely mean that Qualcomm's license fees will reset from a percentage of the device price to a percentage of the modem-chip price, ending Qualcomm's long period of overearning and forcing it to subsist only on fair and reasonable royalties. It thus makes sense that Qualcomm executives noted that licensing at the device level was "humongously more lucrative" than licensing at the chip level and worried that licensing to Intel "would destroy the whole current QTL business"; they knew what they were talking about.

How would this business-model transformation translate into earnings power? To be sure, estimating the effect is more art than science. While the FTC's expert witness had good reason to argue for a 0.6% royalty rate, we concede that judges might be reluctant to impose so dramatic of a reduction all at once. Nonetheless, since the FTC's entire case is premised on the notion that Qualcomm is extracting supra-FRAND royalties from the cellular industry and since several lines of legal reasoning point to future licensing at the chip level, it's also unrealistic to suppose that Qualcomm's licensing revenue will remain at anywhere near its current magnitude.

To illustrate one plausible scenario, we use a figure cited by Apple's COO under oath as a fair initial offer: $1.50 per device. Such an amount would actually be a relatively high percentage of current chip prices (roughly 8%), comparable to the *total* royalty rate settled upon in other court cases for *all* SEPs combined, not just the share of a single patent-holder like Qualcomm. Running the numbers, a $1.50-per-device royalty rate would still give Qualcomm a $2.5B annual revenue stream – not an outcome likely to inspire much sympathy for what Qualcomm would no doubt depict as its mistreatment. Nonetheless, this scenario would imply massive downside for Qualcomm's stock price:

Kerrisdale Analysis of Qualcomm's Potential Earnings Power Assuming an FTC Victory	
Actual FY2018 QTL revenue	$ 5,163
Assumed future royalty rate per device	$ 1.50
Global 3G/4G/5G device shipments (B)	1.85
Compliance rate	90%
Devices generating royalties	1.67
Pro forma QTL revenue ($mm)	$ 2,498
Reduction in QTL revenue	*$ (2,666)*
Assumed QTL incremental margin	90%
Reduction in QTL EBT	*$ (2,399)*
FY2018 non-GAAP EBT	$ 5,620
Less: share-based compensation	(883)
Adjusted FY2018 non-GAAP EBT	$ 4,737
Reduction in QTL EBT	(2,399)
Pro forma QCOM EBT	$ 2,338
Normalized income tax at 15%	351
Pro forma net income	$ 1,987
Shares O/S	1,212
Pro forma EPS	$ 1.64
Assumed P/E multiple*	13x
Implied QCOM share price	**$ 21.31**
Downside	-61%

Source: Kerrisdale analysis
Note: device shipments represent the midpoint of Qualcomm's estimate range for 2018.

In the calculations above, we assume that Qualcomm ultimately collects its royalties on almost every cellular device shipped across the globe, including units produced by Apple and Huawei that generate no royalties today; however, we do haircut the total shipments figure slightly to reflect Qualcomm's historical experience of receiving royalties on fewer devices than it estimated were actually shipped (i.e. OEMs underreporting to save on fees). Given the QTL segment's very high incremental margins, the vast majority of the reduction in licensing revenue will fall to the bottom line, and we simply apply this reduction in profits to Qualcomm's actual FY2018 results, adjusted to reflect a normalized tax rate and the company's current share count. We then multiply by an assumed P/E multiple of 13x to obtain a per-share valuation estimate of ~$21, 61% lower than where Qualcomm currently trades. (As one sell-side analyst wrote in May 2018, Qualcomm's "five year average forward P/E is ~13x, roughly in-line with its handset component supplier peers." This is higher than Intel's current forward P/E of 10.6x.[15])

[15] Source: Capital IQ.

Interestingly, in this scenario, Qualcomm finally starts to look more like a normal company, with 72% of segment profits coming from QCT – the actual chip business, not the licensing shop.

Of course, any particular estimate of the financial impact of a Qualcomm loss in the FTC case will wind up being wrong; the situation is complex and will play out over an extended time period even after the judge issues her final ruling. Nonetheless, a dramatically negative impact to Qualcomm's earnings power shouldn't be regarded as unlikely or extreme; it's exactly what investors should expect if the FTC gets its way – and, at this point, that looks like a good bet.

V. Qualcomm's Broader Business Outlook Is Poor

If Qualcomm already had a depressed valuation or a clear path to grow its way out of an FTC-induced earnings slump, it might make sense for the market to shrug off all the legal risks, but neither premise is true. After taking account of its share-based compensation expense and adjusting for a normalized 15% tax instead of the temporary ~1% rate enjoyed in recent quarters, Qualcomm's run-rate trailing EPS is $3.32. Qualcomm thus trades at more than 16x earnings, a relatively high multiple for a semiconductor company beset by regulatory scrutiny and heavily exposed to a problematic end market: smartphones. As recent worries over Apple's iPhone sales have shown, the global smartphone market is maturing, as consumers keep old devices for longer and balk at paying higher prices. Meanwhile, though Qualcomm still produces the best wireless modems, competitors like Intel and MediaTek have become more capable, while major Qualcomm OEM customers Samsung and Huawei have increasingly moved to in-source their modem production, starting with lower-end devices but threatening to further displace Qualcomm as time goes on. Weak end-market growth coupled with intensifying competition will suppress Qualcomm earnings power for the foreseeable future even without considering the ramifications of the FTC case.

What about 5G? While Qualcomm does enjoy a clear lead over rival manufacturers in its 5G product development, we believe this advantage is strongest in one specific area of heightened technical difficulty: millimeter-wave (mmWave) spectrum. But 5G doesn't require mmWave spectrum. In fact, as we have discussed elsewhere, the band that mobile operators outside the US are planning to use for initial 5G deployments is the 3.5 GHz band; meanwhile, within the US, efforts are underway to repurpose the 3.7-4.2GHz band for 5G. (Interestingly, these efforts were initially spearheaded by Intel, which we believe views the band as an easier path to 5G than mmWave.) In addition, T-Mobile plans to roll out 5G on its low-band 600MHz spectrum, while AT&T has also recently discussed using sub-6GHz spectrum for its 5G buildout. This matters because sub-6GHz 5G will be much more similar to existing LTE than exotic mmWave 5G will be, reducing the degree of difficulty for the likes of Intel or MediaTek to produce 5G-capable hardware. Thus, to the extent that mmWave deployment ends up focusing on a small number of areas while widespread 5G leverages more conventional spectrum – a fairly consensus viewpoint – Qualcomm's technical advantage in mmWave has less practical importance. In short, we see nothing positive about Qualcomm's underlying business prospects that can compensate for the immense legal risk the company faces.

VI. Conclusion

Nothing lasts forever – certainly not patents. Qualcomm has profited mightily by cleverly linking its chip business and its patent portfolio, but the jig is up, and the company will need to adjust to its new reality. With an unprecedentedly pivotal court case coming to a head over the next several weeks, the market can't keep its head in the sand for much longer. Soon, investors will have to grapple with the fact that Qualcomm's longstanding business model is likely going the way of its CDMA technology – a historical relic that lingers on beyond its glory days as a shadow of its former self.

Full Legal Disclaimer

As of the publication date of this report, Kerrisdale Capital Management LLC and its affiliates (collectively "Kerrisdale") have short positions in the stock of Qualcomm Incorporated (“QCOM”). In addition, others that contributed research to this report and others that we have shared our research with (collectively with Kerrisdale, the “Authors”) likewise may have short positions in the stock of QCOM. The Authors stand to realize gains in the event that the price of the stock decreases. Following publication of the report, the Authors may transact in the securities of the company covered herein. All content in this report represent the opinions of Kerrisdale. The Authors have obtained all information herein from sources they believe to be accurate and reliable. However, such information is presented “as is,” without warranty of any kind – whether express or implied. The Authors make no representation, express or implied, as to the accuracy, timeliness, or completeness of any such information or with regard to the results obtained from its use. All expressions of opinion are subject to change without notice, and the Authors do not undertake to update or supplement this report or any information contained herein. This report is not a recommendation to short the shares of any company, including QCOM, and is only a discussion of why Kerrisdale is short QCOM.

This document is for informational purposes only and it is not intended as an official confirmation of any transaction. All market prices, data and other information are not warranted as to completeness or accuracy and are subject to change without notice. The information included in this document is based upon selected public market data and reflects prevailing conditions and the Authors’ views as of this date, all of which are accordingly subject to change. The Authors’ opinions and estimates constitute a best efforts judgment and should be regarded as indicative, preliminary and for illustrative purposes only.

Any investment involves substantial risks, including, but not limited to, pricing volatility, inadequate liquidity, and the potential complete loss of principal. This report’s estimated fundamental value only represents a best efforts estimate of the potential fundamental valuation of a specific security, and is not expressed as, or implied as, assessments of the quality of a security, a summary of past performance, or an actionable investment strategy for an investor.

This document does not in any way constitute an offer or solicitation of an offer to buy or sell any investment, security, or commodity discussed herein or of any of the affiliates of the Authors. Also, this document does not in any way constitute an offer or solicitation of an offer to buy or sell any security in any jurisdiction in which such an offer would be unlawful under the securities laws of such jurisdiction. To the best of the Authors’ abilities and beliefs, all information contained herein is accurate and reliable. The Authors reserve the rights for their affiliates, officers, and employees to hold cash or derivative positions in any company discussed in this document at any time. As of the original publication date of this document, investors should assume that the Authors are short shares of QCOM and stand to potentially realize gains in the event that the market valuation of the company’s common equity is lower than prior to the original publication date. These affiliates, officers, and individuals shall have no obligation to inform any investor or viewer of this report about their historical, current, and future trading activities. In addition, the Authors may benefit from any change in the valuation of any other companies, securities, or commodities discussed in this document. Analysts who prepared this report are compensated based upon (among other factors) the overall profitability of the Authors' operations and their affiliates. The compensation structure for the Authors' analysts is generally a derivative of their effectiveness in generating and communicating new investment ideas and the performance of recommended strategies for the Authors. This could represent a potential conflict of interest in the statements and opinions in the Authors' documents.

The information contained in this document may include, or incorporate by reference, forward-looking statements, which would include any statements that are not statements of historical fact. Any or all of the Authors' forward-looking assumptions, expectations, projections, intentions or beliefs about future events may turn out to be wrong. These forward-looking statements can be affected by inaccurate assumptions or by known or unknown risks, uncertainties and other factors, most of which are beyond the Authors' control. Investors should conduct independent due diligence, with assistance from professional financial, legal and tax experts, on all securities, companies, and commodities discussed in this document and develop a stand-alone judgment of the relevant markets prior to making any investment decision.