

**BEFORE THE UNITED STATES INTERNATIONAL TRADE COMMISSION**

In re:  
Certain Mobile Electronic Devices and  
Radio Frequency and Processing  
Components Thereof

Investigation No. 337-TA-1065  
83 Fed. Reg. 64875

**PUBLIC INTEREST SUBMISSION OF THE R STREET INSTITUTE, ENGINE  
ADVOCACY, AND THE INNOVATION DEFENSE FOUNDATION**

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**PUBLIC INTEREST SUBMISSION OF THE R STREET INSTITUTE, ENGINE  
ADVOCACY, AND THE INNOVATION DEFENSE FOUNDATION**

The following comments are respectfully submitted in response to the notice and request for public interest submissions dated December 18, 2018.

In response to the previous Notice of Request in this same investigation, the commenters filed a short statement on the public interest, explaining that the Recommended Determination correctly identified substantial harms to the public interest that would result from an exclusion order, including harms to competition, harms to national security, and harms to the national interest in broadband deployment.<sup>1</sup> The prior comment further observed that any concern for the patent interests of complainant Qualcomm would be adequately satisfied by district court litigation, obviating the need for duplicative and likely excessive remedies from this Commission, particularly where those remedies could cause national-level harms.

The present submission supplements these arguments with economic research that supports the findings of the Recommended Determination. It also answers several of the specific public interest questions that the Commission laid out in its December 18 notice. In particular, this submission makes the following main points.

Economic research confirms the Recommended Determination's conclusion that Intel will likely exit the premium baseband processor market in view of an exclusion order,<sup>2</sup> thereby leaving Qualcomm as the sole and dominant participant in 5G technology development. Even with carve-outs that the Commission and Staff have proposed, any remedy would force Intel to lag further behind the technological curve, diminishing its incentives to push forward with new innovation.

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<sup>1</sup>See Public Interest Statement of the R Street Institute et al., *In re Certain Mobile Elec. Devices*, Inv. No. 337-TA-1065 (Int'l Trade Comm'n Nov. 8, 2018).

<sup>2</sup>Throughout this submission, the term "exclusion order" will refer to any limited exclusion order and cease and desist order being considered in this investigation.

The consequent Qualcomm monopoly over premium baseband processors and 5G innovation would negatively affect multiple important national interests. A monopoly will slow down the overall rate of innovation, meaning that 5G technology will advance more slowly than it would in the presence of a competitive market. A monopoly will also increase the likelihood of cybersecurity vulnerabilities in the national communications infrastructure, both because monopolists have demonstrably diminished incentives to maintain good cybersecurity and because a single dominant provider of baseband processor chips creates a monoculture that could catastrophically fail in the event of a cyberattack. Furthermore, the exclusion of complex devices such as iPhones hampers not just Apple but potentially also iPhone component suppliers, accessory manufacturers, and app developers, many of whom are domestic industries.

National security and other national-level consequences are well within the purview of the Commission's authority under the statutory public interest factors, and the Commission should consider these consequences carefully. As a practical matter, if the Commission does not consider these and Qualcomm ends up with a monopoly, no subsequent government action can undo that harm. The language of the statutory public interest factors offers the Commission a great deal of flexibility to consider matters such as national security, and it is proper for the Commission as an administrative agency to administer its powerful exclusionary remedies sparingly and with caution in view of the public interest.

## **I. Description of commenters.**

The commenters are nonprofit organizations with an interest in promoting technology and innovation through policies that promote free markets and growth.

The R Street Institute is a non-profit, non-partisan public-policy research organization. R Street's mission is to engage in policy research and educational outreach that promotes free

markets as well as limited yet effective government, including properly calibrated legal and regulatory frameworks that support economic growth and individual liberty.

Engine Advocacy is a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups, working with government and a community of high-technology, growth-oriented startups across the nation to support the development of technology entrepreneurship. Engine conducts research, organizes events, and spearheads campaigns to educate elected officials, the entrepreneur community, and the general public on issues vital to fostering technological innovation. Part of amplifying startup concerns includes highlighting the unique challenges small startups face when confronted with abusive, and typically opaque, patent litigation.

The Innovation Defense Foundation is a nonprofit, nonpartisan research and issue-advocacy institution that advocates for “permissionless innovation,” seeking to repeal, relax, or replace unnecessary regulations that stand in the way of innovation. Through a combination of research, advocacy, and regulatory filings, the IDF pushes back against risk-averse, regressive, and precautionary policies that both threaten America’s innovators and limit our society’s ability to cope with new and existing challenges.

## **II. Economic research demonstrates that Intel likely would exit the relevant market if faced with even a limited exclusion order with carve-outs or delays.**

The Recommended Determination found that Intel would likely exit the premium base-band processor market and consequently also exit the 5G market, giving Qualcomm a monopoly in both. The Commission asks (in public interest questions C and D) whether a carve-out or delayed implementation of a limited exclusion order would avoid these adverse consequences. Neither would avoid those consequences. Economic research shows that pulling a firm out of an existing technological market often destroys the firm’s incentives to innovate further; that research fits Intel’s situation precisely.

When a firm is close to the technological frontier (that is, when the firm possesses advanced technological knowledge in the field), that firm will likely innovate more. Partly this is because of the incremental nature of innovation: Employee know-how, relationships with suppliers and contractors, and internal research all contribute to the firm's stock of knowledge, which enables further technological developments. But competition dynamics also provide an important reason why firms need to be on the cutting edge in order to contribute to further innovation. Where a firm is technologically neck-and-neck with its competitors, it has an incentive to innovate to leapfrog ahead and escape competition. Where the firm lags too far behind, though, it becomes unable to catch up and thus is unlikely to innovate further.<sup>3</sup>

Substantial economic research confirms that nearness to the technological frontier encourages innovation. A 2009 empirical study considered how firms reacted to entry of competitors.<sup>4</sup> The study found strong evidence that competitor entry “induces incumbents in sectors that are initially close to the technology frontier to innovate more,” but that those further behind innovate less, as indicated in the below figure taken from that paper.<sup>5</sup> Similarly, economists theorize that innovative growth in duopoly markets occurs in a “step-by-step” fashion requiring a degree of copying between competitors, such that “a little imitation is almost always growth-enhancing” by “promoting more frequent neck-and-neck rivalry.”<sup>6</sup> This again suggests that a firm's technological capacity must reach the cutting edge before it can innovate beyond there.

Any remedy that hampers Intel's 4G baseband processor development will thus likely preclude Intel from competing in the 5G market, in view of this economic research. If Intel

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<sup>3</sup>See generally Philippe Aghion, Nick Bloom, Richard Blundell, Rachel Griffith & Peter Howitt, *Competition and Innovation: An Inverted-U Relationship*, 120 Q.J. ECON. 701, 702 (2005).

<sup>4</sup>See Philippe Aghion, Richard Blundell, Rachel Griffith, Peter Howitt & Susanne Prantl, *The Effects of Entry on Incumbent Innovation and Productivity*, 91 REV. ECON. & STAT. 20 (2009).

<sup>5</sup>*Id.* at 20.

<sup>6</sup>Philippe Aghion, Christopher Harris, Peter Howitt & John Vickers, *Competition, Imitation and Growth with Step-by-Step Innovation*, 68 REV. ECON. STUD. 467, 470 (2001).

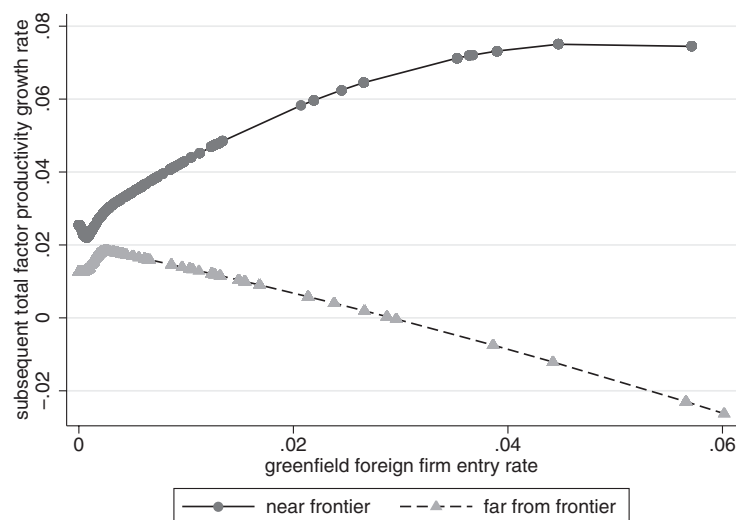


Figure 1: Incumbent firms’ reactions to competitor entry, based on the incumbents’ technological capacity. The horizontal axis is the rate at which competitors entered the market; the vertical shows incumbent firms’ innovation growth in response to those competitors. The top curve shows that technologically advanced incumbents (those “near the frontier”) innovated more in response to greater competition; the bottom curve shows that technologically lagging incumbents (those “far from the frontier”) fell even further behind.

cannot participate in 4G development, it will not enjoy the internal know-how that contributes to its own 5G innovation. Furthermore, blocking Intel from reaching the current 4G technological frontier would potentially put it so far behind Qualcomm that it would no longer be cost-effective to invest in catching up.

None of the proposed relaxations of an exclusion order would avoid the above economic disincentive problem for Intel. The Office of Unfair Import Investigations proposes carving out 5G technology from an exclusion order. But that still forces Intel to lag in 4G technology, widening the innovation gap that Intel would have to leap in order to be competitive in 5G. A time-delayed exclusion order would also likely not provide much solace to Intel, because it would not make sense to invest in 4G technology that Intel could not legally commercialize in the near future; again the result would be that Intel would lag behind the technological frontier.

Accordingly, economic research supports the Recommended Determination's finding that Intel is likely to exit the premium baseband market and thus 5G development. The Commission should leave that finding undisturbed.

### **III. Monopoly in the premium baseband processor market would injure multiple important national interests.**

If Intel indeed exits the premium baseband processor market, leaving Qualcomm as the sole and dominant market provider of those chips, the resulting market dynamics will cause harm to multiple interests of national magnitude.

#### **A. Lack of competition would result in slower innovation and thus slower national development of 5G technologies.**

An exclusion order on Intel-based iPhones would adversely affect competitive conditions in the United States economy as carriers both domestic and international are all working to upgrade their networks to 5G, the next generation of mobile networking technology. Our prior public interest submission laid out three primary reasons why an Intel exit and consequent Qualcomm monopoly in the premium baseband processor market would be harmful: (1) Qualcomm would be able to charge supra-competitive prices that would ultimately be passed on to consumers; (2) the absence of competition would reduce Qualcomm's incentives to innovate and improve its baseband processors, and (3) high entry barriers to developing premium baseband processors would leave Qualcomm's monopoly unassailable for years or even decades.

The present submission bolsters the above assertions with economic research supporting the second point. The 2009 empirical study of firms facing competitor entry, discussed previously, found that incumbent firms close to the technological frontier have strong incentives to innovate in the face of competition in order to "escape" that competition with better products.<sup>7</sup> Qualcomm

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<sup>7</sup> See Aghion, Blundell, Griffith, Howitt & Prantl, *supra* note 4, at 21–22, 27.

undoubtedly is the incumbent firm in the premium baseband processor market and presumably is close to the technological frontier, so competition will likely spur Qualcomm to innovate faster.

Patent enforcement is also intended to encourage innovation, but research finds that patents alone will not do so; competition is another requirement. A 2015 study considered the impact of competition policy and patent strength on innovation among European firms, measured in terms of research and development spending.<sup>8</sup> Initially, the study compared firms in countries with strong patent laws against those in countries with weaker patent laws, and “found no effect of patent protection on R&D intensity,” a conclusion consistent with multiple other studies.<sup>9</sup> However, the study found that when a major competition reform went into effect, strong-patent countries enjoyed a boost in innovation greater than that experienced in weak-patent countries.<sup>10</sup> In other words, strong patent protection is complementary to strong competition; the former does not promote innovation without the latter.

The Recommended Determination relied in part on a finding of fact that a Qualcomm monopoly in the premium baseband processor market would slow down domestic innovation in 5G technologies, potentially allowing foreign nations to overtake the United States. The above economic evidence confirms this finding, suggesting that innovation will indeed be delayed if Qualcomm is left without a substantial competitor in 5G development.

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<sup>8</sup>See Philippe Aghion, Peter Howitt & Susanne Prantl, *Patent Rights, Product Market Reforms, and Innovation*, 20 J. ECON. GROWTH 223, 230 (2015).

<sup>9</sup>*Id.* at 238; see Mariko Sakakibara & Lee Branstetter, *Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms*, 32 RAND J. ECON. 77, 78 (2001) (“We find no evidence of a statistically or economically significant increase in either R&D spending or innovative output that could plausibly be attributed to these reforms [to expand patent rights].”); Yi Qian, *Do National Patent Laws Stimulate Domestic Innovation in a Global Patenting Environment? A Cross-Country Analysis of Pharmaceutical Patent Protection, 1978–2002*, 89 REV. ECON. & STAT. 436, 450 (2007) (“I find no statistically significant relationship between national pharmaceutical patent protection and . . . domestic R&D.”).

<sup>10</sup>Aghion, Howitt & Prantl, *supra* note 8, at 243. Interestingly, the study finds this complementarity effect across patent-intensive industries—except for the computer and telecommunications industries. *Id.*



**B. Monopolized production of premium baseband processors threatens the cybersecurity of the domestic communications infrastructure.**

A Qualcomm monopoly in the premium baseband processor market would present a serious danger to cybersecurity of the national mobile communications system, a matter that is undoubtedly a national security concern. The threat arises in part because economic research shows that monopolists are unlikely to undertake good cybersecurity practices.

Product competition leads to more secure products, and monopoly leads to diminished incentives to ensure security from cyberattacks. Intuitively, this makes sense: Computer security is a value-added benefit to consumers, so firms in competitive markets are likely to use security to gain an edge over their competitors, and are furthermore likely to poke holes in their competitors' products to draw consumers away from those products. In monopolized markets, though, there may be less external impetus to test products for flaws, and the monopolist may choose to focus less on security and more on new product features or increased product quality.

Economic research confirms that competition leads to better cybersecurity. A 2009 empirical study of web browsers considered the impact of market concentration on the amount of time that vendors took to fix security vulnerabilities as they were discovered.<sup>11</sup> The study found that the presence of more competitors correlated with faster cybersecurity response—a reduction of 8–10 days in response time per additional market rival.<sup>12</sup> Similarly, business researchers in 2005 modeled incentives for firms to engage in sharing of cybersecurity information, and concluded that the “inclination to share information and invest in security technologies increases as the degree of competitiveness in an industry increases.”<sup>13</sup> Another study concludes that, where two software firms are in competition, at least one will be willing to take on some degree of risk and

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<sup>11</sup>See Ashish Arora, Chirs Forman, Anand Nandkumar & Rahul Telang, *Competition and Patching of Security Vulnerabilities: An Empirical Analysis*, 22 INFO. ECON. & POL'Y 164, 165 (2010).

<sup>12</sup>See *id.* at 175.

<sup>13</sup>Esther Gal-Or & Anindya Ghose, *The Economic Incentives for Sharing Security Information*, 16 INFO. SYSTEMS RES. 186, 188 (2005).

responsibility for cybersecurity, whereas a monopoly software firm will consistently fail to accept such responsibility.<sup>14</sup> To be sure, an unpublished study from 2017 finds that greater market concentration can make firms more responsive to cybersecurity issues, but only to a point: “being in a dominant position reduces the positive effect of having less competitors on the responsiveness of the vendor,” and indeed “more dominant the firm is, the less rapid it is in releasing security patches.”<sup>15</sup> This research confirms that competition is more conducive to cybersecurity.

These concerns apply remarkably well to the facts of the present investigation. Without Intel as a competitor, Qualcomm will lack incentives to respond to vulnerabilities in its chips, to share information about cybersecurity practices and issues, and to take responsibility for security matters. Indeed, Qualcomm’s chips have had their share of cybersecurity failures already.<sup>16</sup> The best way to flush out ongoing and future cybersecurity issues is to ensure the presence of adversarial competition in the market.

### **C. Monopoly in premium baseband processors creates a monoculture that is especially vulnerable to catastrophic cyberattack.**

A second reason why monopoly undermines cybersecurity is that monopoly leads to a “monoculture” of single-vendor products, opening the door to massive systemic failure in the

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<sup>14</sup>See Byung Cho Kim, Pei-yu Chen & Tridas Mukhopadhyay, *An Economic Analysis of the Software Market with a Risk-Sharing Mechanism*, 14 INT’L J. ELECTRONIC COM. No. 2, at 7, 9 (2009).

<sup>15</sup>Arrah-Marie Jo, *The Effect of Competition Intensity on Software Security—An Empirical Analysis of Security Patch Release on the Web Browser Market* 3 (Dec. 2017) (unpublished manuscript), <https://www.tse-fr.eu/sites/default/files/TSE/documents/conf/ConfDigitalEconomy2018/Papiers/jo.pdf>.

<sup>16</sup>See, e.g., Lucian Armasu, *Qualcomm Firmware Vulnerabilities Expose 900 Million Devices, Including Security-Focused Smartphones*, TOM’S HARDWARE (Aug. 9, 2016), <https://www.tomshardware.com/news/quadroter-qualcomm-android-firmware-vulnerabilities,32414.html>. To be sure, Intel chips have not escaped scrutiny either. See Ralf-Philipp Weinmann, *Baseband Attacks: Remote Exploitation of Memory Corruptions in Cellular Protocol Stacks* 2, 6 PROC. USENIX WORKSHOP ON OFFENSIVE TECHS. (2012), <https://www.usenix.org/system/files/conference/woot12/woot12-final24.pdf>. The point is not that one company is categorically better than the other, but that the presence of both as competitors is better.

case of a cyberattack. Computer researchers developed the concept of software monocultures in the early 2000s, in response to the regular phenomenon of computer viruses and other attacks spreading rapidly by exploiting flaws in the dominant operating system at the time, Microsoft Windows.<sup>17</sup> Where a computer system such as Windows has a dominant share of users, a virus that exploits a flaw in that system can quickly spread to infect numerous systems. An operating system monopoly thus enabled that fast and easy spread of cyberattacks, and better cybersecurity would be achieved through greater diversity in online systems.<sup>18</sup> As one research group posited, “a network architecture that supports a collection of heterogeneous network elements for the same functional capability offers a greater possibility of surviving security attacks as compared to homogeneous networks.”<sup>19</sup>

There has been considerable study of this theory that computer monocultures are naturally more vulnerable to attacks. Supporting this theory, researchers have found that software substitutes generally do not share the same flaws: Of 2,627 software vulnerabilities reported in 2007, only 29 (1.1%) applied to two products providing the same functionality.<sup>20</sup> By contrast, different versions of a single software product were found to share vulnerabilities 84.7% of the time.<sup>21</sup> Thus, software monocultures share exploitable flaws even when there is some variation in versions across the monoculture; by contrast, diversity in software is almost guaranteed to prevent a single flaw from affecting all users.

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<sup>17</sup>See, e.g., Daniel E. Geer Jr., *Monoculture: Monopoly Considered Harmful*, IEEE SECURITY & PRIVACY, Nov.–Dec. 2003, <https://ieeexplore.ieee.org/abstract/document/1253563>.

<sup>18</sup>See *id.*

<sup>19</sup>Yongguang Zhang, Harrick Vin, Lorenzo Alvisi, Wenke Lee & Son K. Dao, *Heterogeneous Networking: A New Survivability Paradigm*, 2001 PROC. WORKSHOP ON NEW SECURITY PARADIGMS 33, 34.

<sup>20</sup>See Jin Han, Debin Gao & Robert H. Deng, *On the Effectiveness of Software Diversity: A Systematic Study on Real-World Vulnerabilities*, 6 PROC. INT’L CONF. ON DETECTION INTRUSIONS & MALWARE & VULNERABILITY ASSESSMENT 127, 133–34 (2009).

<sup>21</sup>See *id.* at 140.

In the case of a Qualcomm monopoly in the relevant baseband processor market, monoculture is an especially concerning possibility. Heavy reliance on mobile communications means that a widespread attack could have devastating consequences, potentially blacking out a region and affecting essential services such as 911. A monoculture of chips could also enable mass surveillance or spying on citizens' mobile communications by private hackers or foreign governments. The presence of baseband processors from multiple vendors would mitigate these possibilities.<sup>22</sup>

The monoculture theory is not without critics, but a review of those criticisms show them to be inapplicable to the Intel–Qualcomm situation. Some critics suggest that software diversity imposes unwarranted costs on firms who must forego economies of scale and devise seemingly duplicative yet different setups of computer systems.<sup>23</sup> But those concerns largely focus on the situation where a single firm produces and manages the heterogeneous systems, and are avoided where heterogeneity arises naturally through competition between two unrelated firms. Critics also argue that technological measures can create “artificial diversity” through automated randomization of software code.<sup>24</sup> But even these critics acknowledge that artificial diversity techniques are often insufficient because they must make assumptions about what aspects of the technology are most likely vulnerable to attack, and indeed they concede that artificial diver-

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<sup>22</sup>Cf. Devlin Barrett, *Americans' Cellphones Targeted in Secret U.S. Spy Program*, WALL ST. J., Nov. 13, 2014, <https://www.wsj.com/articles/americans-cellphones-targeted-in-secret-u-s-spy-program-1415917533> (discussing technology for surveillance of cell phone calls enabled by a flaw in baseband processor security); Heath Hardman, *The Brave New World of Cell-Site Simulators*, 8 ALB. GOV'T L. REV. 1 (2015).

<sup>23</sup>See, e.g., Randal C. Picker, *Cybersecurity: Of Heterogeneity and Autarky*, in THE LAW AND ECONOMICS OF CYBERSECURITY 115, 125 (Mark F. Grady & Francesco Parisi eds., 2005). Picker proposes “autarky,” namely self-sufficiency of computers so that they can be disconnected from networks, as an alternative solution to monoculture. That proposal obviously is unworkable for mobile phones.

<sup>24</sup>See Fred B. Schneider & Kenneth P. Birman, *The Monoculture Risk Put into Context*, IEEE SECURITY & PRIVACY, Jan.–Feb. 2009, at 14, 15.

sity cannot stop attacks involving operation of legitimate software functions in undesirable ways (sending spam emails or deleting document files, for example).<sup>25</sup>

It is recognized that a monoculture is unavoidable in at least one respect: All baseband processors, whether Intel's, Qualcomm's, or others', must conform to the technical standard for 5G, so a flaw in the standard itself would render all mobile devices vulnerable to an identical attack. The best defense against this especially catastrophic possibility is rigorous development and testing of the 5G standard. The best way to ensure rigorous development and testing is to ensure that as many firms as possible, especially firms that share basic American values, are involved in the development of 5G. The necessary standardization of mobile communications, then, is perhaps the most important reason why a competitive 5G market between Intel and Qualcomm is essential to cybersecurity and national security.

#### **IV. An exclusion order potentially harms multiple domestic industries that have nothing to do with the alleged patent infringement.**

A further related consequence of an exclusion order in this investigation is that it will potentially injure multiple domestic industries that are unrelated to the patented technology at issue. This unexpected consequence bolsters the conclusion that competitive conditions in the United States economy will be negatively affected.

The iPhones at issue are complex products that implicate multiple domestic industries at different levels of the supply chain. Aside from Intel obviously, multiple American companies supply components of the iPhone: Corning of New York makes the glass for screens,<sup>26</sup> Analog

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<sup>25</sup>See *id.* (discussing "interface attacks").

<sup>26</sup>See Roger Fingas, *Corning Reveals Gorilla Glass 6 Likely Destined for Apple Devices*, APPLEINSIDER (July 18, 2018), <https://appleinsider.com/articles/18/07/18/corning-reveals-gorilla-glass-6-likely-destined-for-apple-devices>.

Devices of Massachusetts supplies touch screen technologies,<sup>27</sup> and Finisar and Lumentum of California produce face-sensing lasers.<sup>28</sup> Other domestic firms make accessories for iPhones, such as cases, charging cables, docks, battery packs, and so on. And there are millions of iPhone app developers, many of whom likely are within the United States.<sup>29</sup>

Any exclusion order on iPhones implicates all the above firms too, potentially undermining their viability as domestic industries. If these firms' technologies implicated the patents at issue, then the consequences of exclusion might be tolerable, but here the sole patent found to be infringed relates to power management technologies unrelated to the industries of any of the component, accessory, or app development firms described above. The harm to those domestic industries would be entirely unjustified. Moreover, insofar as these component manufacturers, accessory designers, and app developers are innovators and often patent owners,<sup>30</sup> an exclusion order not only impairs domestic industries but also domestic inventors.

These side effects on unrelated industries are a symptom of a problem that scholars have long recognized: An exclusion order creates economic holdup, because the patent owner who benefits from the exclusion order is in a position to negotiate for not just the value of the patented technology but the entire value of the item being excluded.<sup>31</sup> As demonstrated by the above

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<sup>27</sup>See Ashraf Eassa, *This Apple Inc. Supplier Might Have Caught a Break*, MOTLEY FOOL (Apr. 14, 2017), <https://www.fool.com/investing/2017/04/14/this-apple-inc-supplier-might-have-caught-a-break.aspx>.

<sup>28</sup>See Dan Frommer, *Why Apple Is Putting \$400 Million into Lasers*, RECODE (Dec. 13, 2017), <https://www.recode.net/2017/12/13/16772222/apple-finisar-vcsel-sensor-augmented-reality-airpods>.

<sup>29</sup>See Ingrid Lunden, *App Store Hits 20M Registered Developers and \$100B in Revenues, 500M Visitors per Week*, TECHCRUNCH (June 4, 2018), <https://techcrunch.com/2018/06/04/app-store-hits-20m-registered-developers-at-100b-in-revenues-500m-visitors-per-week/>.

<sup>30</sup>See, e.g., Glasses Having Improved Toughness and Scratch Resistance, U.S. Patent No. 8,969,226 (issued Mar. 3, 2015) (a Corning patent on Gorilla Glass).

<sup>31</sup>See Dieter Balkenborg et al., *A Simple Economic Teaching Experiment on the Hold-Up Problem*, 43 J. ECON. EDUC. 377 (2012) (describing holdup and surveying literature); Benjamin Klein et al., *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J.L. & ECON.

example, holdup can affect not just the firm whose product is being excluded and consumers of that product, but also external companies who make components or complementary goods.

In considering the effect of an exclusion order on competitive conditions in the United States, the Commission thus ought to consider not just the implications of exclusion for Apple and Intel, but also for other firms in the supply chain who stand to be indirectly harmed by an exclusion order.

**V. It is properly within the Commission’s statutory authority to consider national matters such as national security.**

Given these potentially dire consequences of a limited exclusion order on key national interests such as national security, the Commission asks (in public interest question E) whether its statutory authorization to consider the public interest entails considering such matters as national security. There are at least two reasons why the Commission can, should, and must consider them.

First, consideration of important national interests falls neatly within the text of the Commission’s statutory public interest factors. National security and mobile communications infrastructure cybersecurity in particular are certainly matters of “the public . . . welfare” and they are matters that affect “United States consumers.” Furthermore, insofar as those considerations ultimately bear upon the importance of maintaining competition in the premium baseband processor market, they are relevant to “competitive conditions in the United States economy.” The statutory public interest factors provide the Commission with “broad discretion in selecting the form, scope and extent of the remedy,”<sup>32</sup> and thus they leave much flexibility for consideration of national security effects, cybersecurity effects, and other such matters of national importance.

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297, 298 (1978); Joseph Farrell et al., *Standard Setting, Patents, and Hold-Up*, 74 ANTITRUST L.J. 603, 612 (2007); Colleen V. Chien & Mark A. Lemley, *Patent Holdup, the ITC, and the Public Interest*, 98 CORNELL L. REV. 1 (2012).

<sup>32</sup>*Viscofan, S.A. v. U.S. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986).

Second, the Commission must consider national security and other major national interests because, as a practical matter, it is the sole agency that can do so in this dispute. If the ITC issues a limited exclusion order that ultimately boots Intel out of the market and hands Qualcomm a monopoly, no other government agency can repair that harm. The government cannot fabricate a new baseband chip manufacturing firm to compete with Qualcomm. Perhaps the government can engage in heavy regulation and social planning to achieve some of its cybersecurity and national security goals (something that Qualcomm presumably would not prefer), but ultimately no legal tool can force a company to innovate in the same way that competition would induce Qualcomm and Intel to out-innovate each other.

Given that courts will generally not second-guess public interest determinations,<sup>33</sup> the Commission is effectively the tribunal of last resort for matters of national security or other national policy to be considered. By contrast, the ITC is not the tribunal of last resort for vindication of patent rights, since its determinations are not preclusive on courts,<sup>34</sup> so forbearing from exclusion would do minimal harm while avoiding serious risks of national proportions.

The statutory public interest factors ensure that this Commission's role is not merely the wooden application of the patent laws in the importation context, but rather the advancement of important national policies. Congress indeed said in no uncertain terms that "the public interest must be paramount in the administration of" section 337 and that the public interest factors "must be the overriding considerations in the administration of this statute," noting "price gouging and monopolistic practices in the domestic industry" as specific examples where an exclusion order was inappropriate.<sup>35</sup> It makes good sense, in terms of both limited government and public protection, for the Commission to forbear from wielding its powerful federal authority in ways

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<sup>33</sup>See *Sealed Air Corp. v. U.S. Int'l Trade Comm'n*, 645 F.2d 976, 989 (Fed. Cir. 1981) ("[I]t is not the function of a court to substitute a different remedy of its own design for that chosen by the ITC, or to substitute its view of the public interest for that of the ITC.").

<sup>34</sup>See *Bio-Tech. Gen. Corp. v. Genentech, Inc.*, 80 F.3d 1553, 1564 (Fed. Cir. 1996).

<sup>35</sup>TRADE REFORM ACT OF 1974, S. REP. NO. 93-1298, at 193, 197 (1974).



that could leave lasting damage on national security and the economy. The statutory public interest factors provide flexibility for the Commission to avoid unjust results, and application of that flexibility is most appropriate in the present investigation.

## **VI. Conclusion**

For at least the foregoing reasons, the Commission should determine that the public interest precludes issuance of any limited exclusion order or other remedy in the present investigation.

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