# 1AC – Harvard

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#### Advantage One is Innovation

#### The Ninth Circuit’s Decision in Qualcomm has barred antitrust from cases involving Standard Essential Patents (SEPs). That gives patent holders undue bargaining leverage against implementers.

Sullivan 20 [Sullivan & Cromwell LLP, Leading Firm in Business Law “Ninth Circuit Holds That Qualcomm’s Patent Licensing Program Does Not Violate U.S. Antitrust Law”. 8/12/20. https://www.sullcrom.com/files/upload/sc-publication-ninth-circuit-holds-qualcomm-patent-licensing-program-does-not-violate-us-antitrust-law.pdf]

The Ninth Circuit’s decision, unless modified by the Supreme Court, affirms Qualcomm’s SEP licensing model for OEMs (and its refusal to license rival chipmakers), at least with respect to any challenge under U.S. antitrust laws. Because Qualcomm’s model has driven the cellular modem licensing and sale landscape for chip suppliers and handset makers alike, the court’s decision will likely quiet concerns on the part of some that the district court’s decision would upend that market, although it perhaps makes it less likely that the market will see increased competition or that chip prices will drop as may have been the case if Judge Koh’s injunction had been upheld.

Although the court confirmed that an SEP holder has no antitrust duty to deal with rivals outside the limited Aspen Skiing exception, the Ninth Circuit left open the possibility that an SEP holder’s FRAND commitments may obligate it to deal with its rivals.39 Importantly, however, the Ninth Circuit clarified that a company’s breach of its FRAND commitments does not amount to anticompetitive conduct in violation of the Sherman Act. Instead, the remedy for such conduct lies in contract law. Moreover, the court’s decision to vacate as moot the district court’s summary judgment decision—which found that Qualcomm was required by its FRAND commitments to license rival chipmakers—removes what some had considered to be persuasive judicial authority in the U.S. supporting a claim that FRAND requires licensing at all levels of a product distribution chain which implement a standard. This is noteworthy for SEP holders because it returns U.S. jurisprudence to the status quo, and at least one court in the Eastern District of Texas interpreted a comparable FRAND commitment as not requiring a SEP holder to license all comers at any level of the supply chain. This issue continues to be litigated in the U.S., notwithstanding the Department of Justice Antitrust Division general view that the market, not FRAND, should determine license structures.

The court’s refusal to force licensing at the chip level (rather than the OEM level) also may ease concerns that patent-exhaustion considerations could be used to limit SEP licensors’ ability to maximize profits if licenses were required at the chip level. The Ninth Circuit confirmed that royalty rates are not required to be set strictly using the SSPPU and recognized that “OEM-level licensing is now the industry norm.”40 The Ninth Circuit also recognized that “[t]here are good reasons for SEP owners to structure their licensing programs to license end-user products.”41 The court’s findings appear consistent with current flexibility in structuring FRAND licensing programs.

The Ninth Circuit’s decision also recognizes that royalty rate determinations, and particularly the determination of a FRAND rate, are an issue that sounds in patent law, not antitrust law. The court “decline[d] to adopt a theory of antitrust liability that would presume anticompetitive conduct any time a company could not prove that the ‘fair value’ of its SEP portfolios corresponds to” what the market is willing to pay for those SEPs in royalty rates.42 Arguably, the Ninth Circuit’s decision will impact negotiation power between patent owners and technology implementers by clarifying the circumstances under which patent licensing conduct will give rise to antitrust liability.

Finally, the Ninth Circuit’s decision is noteworthy beyond its application to SEP licensing because it recognizes and demonstrates that courts should be reluctant to ascribe antitrust liability based on conduct occurring in a dynamic, rapidly evolving market—a characterization that will apply to many existing and emerging technology markets.

#### Three internal links

#### 1 – SEP holders refuse to license their patents on fair, reasonable, and non-discriminatory (FRAND) terms– that kills innovation and locks SMEs out of emerging tech markets

* Note – Refusal to license and rate hikes are encompassed in the concept of patent hold-up

FTC 18 [Federal Trade Commission, Signed by ACT, Auto Alliance, CCIA, HTIA, NRF, SIIA Organizations. “Standards, Licensing, and Innovation: A Response to DOJ AAG’s Comments on Antitrust Law and Standard-Setting”. 08/2018. https://www.ftc.gov/system/files/documents/public\_comments/2018/08/ftc-2018-0055-d-0031-155033.pdf]

2. Standardization Gives Rise to Patent Hold-Up

As the Antitrust Division, other federal agencies, and U.S. courts have long recognized, patent hold-up creates risks to competition.17 Characterizing hold-up as a “unilateral” problem that antitrust law should not be concerned about ignores that the power to hold up arises from concerted multilateral action by participants, often competitors, in a standard-setting organization agreeing on specific technologies to use in the industry. Standardization forecloses alternatives that would otherwise compete in the marketplace, and the FRAND commitment is intended to be a constraint on market power that standardization can create. Efforts by patentees to evade promises they made to license on FRAND terms comprise the abuse of monopoly power that the FRAND commitment is intended to limit. 18 Such unearned monopoly power derives not necessarily from the patentee’s “superior skill, foresight, and industry,” 19 but may derive instead from the fact that it is impossible to design around SEPs while maintaining compliance with the standard, creating a “lock-in” effect.20

Before the adoption of a standard, alternative technological solutions generally exist to provide a particular functionality for which the standard-setting process seeks a uniform, market-wide solution.21 Companies with patents that may cover these alternative solutions compete vigorously for inclusion of their preferred technologies into each standard. Once a standard is set, ex ante competition ceases. Patents that cover the chosen technology become essential because they must be used to comply with the standard. And once a standard achieves commercial acceptance, compliance with the standard becomes a matter of commercial necessity, as failing to comply with the standard would render a product incompatible with other companies’ products. This creates a “lock-in” effect, whereby companies that make or use standard compliant products must use the SEPs that are incorporated into the standards that they implement.22 The degree of lock-in reflects what may be the prohibitive costs of switching away from the standardized technology.

Incorporation of a patent into a standard therefore changes the balance of power between patent holders and prospective licensees dramatically, as the Ninth Circuit explained in Microsoft Corp. v. Motorola, Inc.:

[O]nce a standard becomes widely adopted, SEP holders obtain substantial leverage over new product developers, who have little choice but to incorporate SEP technologies into their products. Using that standard-development leverage, the SEP holders are in a position to demand more for a license than the patented technology, had it not been adopted by the SSO, would be worth. The tactic of withholding a license unless and until a manufacturer agrees to pay an unduly high royalty rate for an SEP is referred to as “hold-up.”23

The SEP holder’s strengthened bargaining position after adoption of a standard is directly attributable to the elimination of alternatives to the SEP resulting from the adoption of a standard. Because license negotiations typically do not take place until after a standard has been adopted, when the SEP holder is no longer competing to have its technology included in the standard, the prospective licensee is “at the patentee’s mercy.”24 Prospective licensees therefore may be willing to pay a much higher royalty for use of the patented technology than they would have been willing to pay ex ante, when the SEP holder faced competition from other technologies. Further, while large corporations familiar with SEP licensing may be able to absorb the cost of an unreasonable license or seek redress in court at significant cost to their own innovative efforts, the same opportunities may not be available to small and medium enterprises. These innovators may be forced to abandon business plans in standard-dependent markets entirely.

As a result, the Antitrust Division has recognized that, unless constrained, a SEP holder can exploit its unearned market power to obtain unfair licensing terms, including access to a licensee’s patents at unreasonable prices or supra-competitive royalties that are significantly higher than the SEP holder could have obtained before its patent was incorporated into the standard.

#### SMEs are the lynchpin of emerging tech innovation

Corl 19 [Eric, Business News Expert, Entreprenuer, Founder and CEO of IdeaBuyer. “How Startups Drive the Economy”. 3/14/19. https://medium.com/@ericcorl/how-startups-drive-the-economy-69b73cfbae1]

According to a 2016 report from the Kauffman Foundation, transformation startups have been launched at a faster rate in recent years but still has a way to go.

These “high” growth firms make up just 15% of all companies. But they contribute an estimate of 50% of total jobs created. These young companies comparably invest more in research and development (R&D) than older ones.

The focus of this article is on Transformational startups.

The Big Small Impacts

Startups may be small. But they create ripples in the economy that change people’s way of living.

Here are the ways startups disrupt the economy and forces it to evolve, taking technology one -or several steps- higher.

1. Advance Technology

Older companies or incumbents are more likely to invest in R&D on existing technologies and incremental innovation. While startups are more focused on new technologies and cutting-edge innovation.

Free from a multilayered corporate bureaucracy, startups are more agile and able to build an idea into a product and improve it upon consumer demand with faster decision-making communications. Its high stakes deeply motivate its employees to do whatever it takes to succeed.

Giant companies like Google and Microsoft often acquire startups and use their size and distribution channels to improve the innovation and boost its sales.

However, a member of Harvard’s Labor and Worklife Program, Vivek Wadhwa argues that “when technology’s top guns join these companies, they seem to make a smaller impact than those that don’t get hired.” He then advised that startups must be armed with seed financing in order for the economy get more technological innovation.

2. Open New Markets

Startups create new markets or completely transform old markets by introducing products that change the world. Giants today like Apple, Facebook and Google were once small but ambitious startups.

New technologies often create new opportunities that startups take advantage of. Startups then create a massive value over mature businesses, inspiring competition and disrupting the economy to evolve.

However, not all startups succeed. According to James Surowiecki of MIT Technology Review, the reason behind this is the increased power of established incumbents. Though incumbents have been toppled before, the American industry has grown more concentrated over the last 30 years.

3. Boost Production of Goods and Services

According to Bryan Ritchie and Nick Swisher of IDEA Center, startups disproportionately have higher technology. This drives up production of goods and services.

In a 2017 report by the Center for Economic Studies at the US Census Bureau, they have found that firms that have a high growth output are disproportionately young and “makes disproportionate contributions to output and productivity growth.”

In another paper published on 2011 by Small Business Administration, startups were discovered to generate more revenue with the same number of capital inputs than older companies.

4. Increase Employment

Startups create jobs. These “high-growth” firms are companies that add jobs at a rate of 25 plus percent.

Wadhwa states, “Without startups, there would be no net job growth in the US economy. From 1977 to 2005, existing companies were net job destroyers, losing 1 million net jobs per year. New businesses in their first year added an average of 3 million jobs annually.”

In a 2017 report by the Progressive Policy Institute, the private sector job growth is significantly higher where the startup activity is high. In contrast, regions with few startup activity experience less than half the job growth.

5. Direct Local Impacts

Startups also have a direct change on the cities where they are located such as how Microsoft has transformed Redmond and Google has changed Mountain View California. They bring in wealth and a large inflow of graduates and experienced professionals from other locations who are looking for job opportunities.

Startups are a Driving Economic Force

Startups are engines of growth. To avoid economic stagnation, methods must be sought to foster competition and assist transformational entrepreneurs.

While it is important to get support in a federal level, the effort must be focused in a local level. Cities need to foster programs that encourage entrepreneurship. It is absolutely critical for growth at a local and national level and legislative and political motives can no longer take entrepreneurs into account as an after-thought.

Removing barriers. Facilitating connections. Empowering startups. These are just the few ways for civic leaders to give a better edge to entrepreneurs.

Over the years, I’ve gotten more and more involved in advocating for other entrepreneurs and I’ve been introduced to some great organizations. For one, the SBE Council (http://www.SBECouncil.org) is doing a wonderful job on the federal level advocating for entrepreneurs and small businesses to make sure our voices are heard. Please follow them and support them online.

The Small Business Administration is also doing great work with their main street leaders program to connect local businesses to Washington, DC. If you have a business, they want to hear your voice.

Remember, startups are the driving force behind our economy — we must advocate for the entrepreneurs behind them and continue to foster innovation.

#### 2 – Excessive sham litigation plagues standard patent disputes – only the federal legal clarity of the plan solves

Hovenkamp 19 [Herbert, James B. Dinan University Professor, University of Pennsylvania Law School and The Wharton School. “FRAND and Antitrust”. 9/2019. https://awards.concurrences.com/IMG/pdf/2.\_frand\_and\_antitrust.pdf?55742/742050234fc2871a2db38c61d1e7936e388e6cc9]

Abuses of the Judicial Process

Should the owner of FRAND encumbered patents be accountable under the antitrust laws for the way it employs judicial processes? For example, suppose that the owner of a FRAND patent seeks an injunction against a manufacturer of a good that employs the patent and participates in the standard. Patentees have a statutory right to obtain an injunction against proven infringers.193 As a result, seeking injunctive relief from a court should not ordinarily be an antitrust violation.

Nevertheless, there are important qualifications. If someone files a suit that no reasonable litigant would have brought with the expectation of success, then antitrust liability can attach. In such cases the litigation plaintiff’s expectation of success comes not from winning the lawsuit, but rather from depleting the defendant’s assets, delaying its market entry, or otherwise injuring it in ways unrelated to the outcome of the litigation.

The grandparent of these cases is Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.194 The patentee had a patent that it knew to be unenforceable under the statutory on sale bar,195 but it attempted to exclude a competitor from the market anyway via a patent infringement suit. The Walker Process case applied the so called “sham” litigation exception that holds that the filing of a law suit loses its First Amendment protected status if the lawsuit is a “sham,” which means that it was filed without a realistic prospect of success from the litigation itself, but rather to intimidate, harass, or deplete the resources of the litigation defendant.196

One important precondition to the sham litigation exception is that existing law be sufficiently “settled” that a lawsuit filed in conflict with it should be regarded as “objectively meritless.”197 That is, a reasonable person in the plaintiff’s position should have known that the lawsuit would not succeed. For example, if there is a conflict in the Federal Circuit Courts of Appeal respecting a particular issue, a plaintiff should be entitled to convince the appellate courts to apply one interpretation rather than the other one.198 Issues of first impression or those that could reasonably come out either way can of course be the subject of litigation.

There is no obvious reason that the sham litigation rule should not apply in the FRAND context, and under these same constraints. Once it has become a matter of settled law that a SEP owner is not entitled to an injunction under a given set of circumstances – that is, that a knowledgeable person would realize that there was no genuine prospect of relief -- then further lawsuits under those circumstances may give rise to antitrust liability.199 If the lawsuit is plainly in violation of an enforceable contract obligation, Walker Process liability should be appropriate. On the other hand, if the issue remains open to legal doubt, then filing a lawsuit is appropriate, even if the suit is ultimately unsuccessful.

Sham litigation establishes the conduct element of an antitrust offense. In order to establish an antitrust violation, the challenger would still have to make out the other elements of an antitrust cause of action – namely, power and unreasonable exclusion for §2 cases, or a restraint of trade for §1 cases. 200

For example, once the FRAND obligation for a patent or set of patents has been established to require licensing to all implementers operating on the standard, a firm that files infringement lawsuits seeking injunctions against firms simply because they are product market competitors should generate the conduct basis for antitrust liability. While this road to antitrust liability might seem narrow, it becomes broader as litigation clarifies issues so that they can be regarded as settled.

#### Just the threat of sham injunctions stifles innovation by hiking licensing rates and legal costs

Wood 13 [Chris Wood and Joseph Kattan, partners in the Antitrust and Trade Regulation practice of Gibson, Dunn & Crutcher LLP. “Standard-Essential Patents and the Problem of Hold-Up”. 12/13/13. http://awa2014.concurrences.com/IMG/pdf/standard\_essential\_patent\_kattan-wood.pdf]

The threat of an injunction is an extraordinarily powerful weapon when asserted by a SEP holder, as the potential licensee faces the prospect of its product being excluded from the market. As one federal court framed the issue, “[i]t would seem clear that a negotiation where one party … must either come to an agreement or cease its sales … fundamentally places that party at a disadvantage.”51 Similarly, the European Commission has noted that “the threat of injunction, the seeking of an injunction or indeed the actual enforcement of an injunction granted against a good faith potential licensee, may significantly impede effective competition by, for example, forcing the potential licensee into agreeing to potentially onerous licensing terms which it would otherwise not have agreed to.”52 As a result, a rational implementer faced with an injunction threat may well conclude that paying an unreasonable royalty is less risky than fending off infringement litigation.53

The use of injunctive relief against willing licensees, or the threat of seeking such relief, is fundamentally incompatible with the FRAND promise. Injunctive relief is an extraordinary remedy that is available only where a patent holder would be “irreparabl[y]” harmed due to a lack of available monetary relief.”54 By contrast, a SEP holder that makes a FRAND commitment agrees to license its SEPs to any standard implementer willing to pay a FRAND compliant royalty, thereby acknowledging that monetary compensation constitutes adequate remuneration for its SEPs.55 As Judge Posner has observed, “[b]y committing to license its patents on FRAND terms, [the SEP holder] committed to license … to anyone willing to pay a FRAND royalty and thus implicitly acknowledged that a royalty is adequate compensation for a license to use that patent.”

Some authors have argued that the language of FRAND commitments “cannot be read to suggest abdication of injunctive relief.”57 But the plain meaning of the FRAND language used by leading SSOs requires that SEP holders grant a license to every willing licensee. For example, the bylaws of the U.S.-based IEEE, which is responsible for the development of the Wi-Fi standard for wireless networking, state that a FRAND commitment must provide “that a license for a compliant implementation of the standard will be made available to an unrestricted number of applicants on a worldwide basis …. under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.”58 In analyzing the virtually identical FRAND commitment of the International Telecommunications Union (“ITU”), the U.S. Court of Appeals for the Ninth Circuit determined that “[t]his language admits of no limitations as to who or how many applicants could receive a license.” 59 Similarly, the Intellectual Property Rights (IPR) Policy of ETSI, which is responsible for the development of the 3G and 4G telecommunications standards, while framed in different language, also requires that FRAND commitments guarantee a license to every willing licensee. It requires “an irrevocable undertaking in writing” to grant irrevocable licenses on FRAND terms to “manufacture, including the right to make or have made customized components and sub-systems to the licensee’s own design,” “sell, lease, or otherwise dispose of equipment so manufactured,” “repair, use, or operate equipment,” and “use methods.”60 By mandating a license for every potential application of a patent— from manufacture to sale to lease to use or repair—this policy contemplates that the FRAND commitment exclude no potential licensee that is ready to take a license on FRAND terms.

Given that injunctions are designed to provide a remedy where monetary compensation cannot, injunctions should be reserved for the limited circumstances in which monetary damages are an insufficient remedy for patent infringement.61 If a standard implementer is either unwilling or unable to pay a judicially-determined FRAND royalty, or is outside the court’s jurisdiction so that monetary relief could not be enforced, monetary compensation may not be an adequate remedy, in which case an injunction should be available. Whenever the SEP holder is able to secure monetary compensation, however, the threat of injunctive relief serves no purpose other than to give the SEP holders leverage to extract royalties above the FRAND levels that they contractually agreed to accept.

#### 3 – Agency flip-flopping triggers mass investment uncertainty and confirms fears that enforcement will switch on the president’s whim

Syrett 19 [Timothy, partner at WilmerHale, is an intellectual property and antitrust litigator. “The FTC’s Qualcomm Case Reveals Concerning Divide with DOJ on Patent Hold-Up”. 6/28/19. https://www.ipwatchdog.com/2019/06/28/ftcs-qualcomm-case-reveals-concerning-divide-doj-patent-hold/id=110764/]

The DOJ’s turn away from its long-held position on the risks of patent hold-up is a cause for serious concern.

First, it is bad policy. In explaining the DOJ’s about-face, Delrahim has referred to a “so-called ‘hold-up’ problem in the context of SSOs” and contended that concerns with hold-up “rely on models devoid of economic or empirical evidence that hold-up is a real phenomenon.” But the DOJ’s prior recognition of the risks of patent hold-up was well supported.

U.S. courts have long recognized that SEPs pose a hold-up threat. In 2007, for example, the Third Circuit observed that “[t]o guard against anticompetitive patent hold-up, most [standards development organizations] require firms supplying essential technologies for inclusion in a prospective standard to commit to licensing their technologies on FRAND terms.” Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297, 313 (3d Cir. 2007). More recently, the Ninth Circuit explained that “[t]he development of standards . . . creates an opportunity for companies to engage in anti-competitive behavior” and that “[u]sing that standard-development leverage, the SEP holders are in a position to demand more for a license than the patented technology, had it not been adopted by the SSO, would be worth.” Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024, 1031 (9th Cir. 2015); see also, e.g., Ericsson, Inc. v. D-Link Sys., Inc., 773 F.3d 1201, 1209 (Fed. Cir. 2014) (“SEPs pose two potential problems that could inhibit widespread adoption of the standard: patent hold-up and royalty stacking”).

As to the economics of patent hold-up, the DOJ observed in a 2015 business review letter that the “economic bargaining model underlying claims of hold-up has been studied extensively and applied to the standard-setting context,” citing scholarship dating back decades. That conclusion echoed the views of the DOJ and FTC in their 2007 report that patent hold-up is simply a “variant of the classic ‘hold-up problem’.” The DOJ also noted in its 2015 letter that “litigated cases demonstrate the potential for hold up when owners of RAND-encumbered standards-essential patents make royalty demands significantly above the adjudicated RAND rate” and provided examples where licensors’ demands were on the order of about 170 to 230 times what courts determined were RAND rates.

Recognition of the dangers of hold-up is thus well supported as a matter of law and economics. To be sure, if competitors collude in an SSO to fix the terms on which they will license technology, antitrust enforcement would be appropriate. But simply because one can envision the possibility of an alternative form of anticompetitive conduct relating to standard setting does not mean that the DOJ should simply ignore the well-documented existence of another form of harm.

Second, the DOJ’s abrupt shift away from over a decade of guidance on hold-up creates uncertainty for the many industries that rely on standards. While the shift in policy has been cast as being motivated by a concern for fostering innovation, it threatens to have the opposite effect. Companies planning investments in standardized products now face greater uncertainty about whether they can count on established rules, particularly as articulated in the DOJ’s business review letters, to safeguard their ability to license SEPs on FRAND terms.

Third, that a change in administration has led the DOJ to turn away from a long-held, bipartisan approach plays into the perception that antitrust enforcement is increasingly a political tool. While there may be higher profile examples of the politicization of antitrust enforcement, any step that suggests that a change in administration, not law and economics, will lead to wholesale departure from existing antitrust policy is troubling.

#### Tech investment certainty is the maker or breaker of broader innovation– only the plan stabilizes patent and antitrust certainty

Michel 17 [Hon. Paul R. Michel, Former Chief Judge, U.S. Court of Appeals for the Federal Circuit; Matthew J. Dowd, founder Dowd PLLC, "THE NEED FOR “INNOVATION CERTAINTY” AT THE CROSSROADS OF PATENT AND ANTITRUST LAW", April 2017, [https://www.competitionpolicyinternational.com/wp-content/uploads/2017/04/CPI-Michel-Dowd.pdf](https://www.google.com/url?q=https://www.competitionpolicyinternational.com/wp-content/uploads/2017/04/CPI-Michel-Dowd.pdf&sa=D&source=hangouts&ust=1631479189098000&usg=AOvVaw15b1X_q2CCXmXzm69Ur4_h)]

Innovation has long been the driving force of the U.S. economy.2 From the early days of our nation, inventors played a pivotal role in creating wealth for a growing nation, and this innovation continues today. Quantum computing research being funded by Google, IBM, Intel, and Microsoft; Genetic engineering, such as CRISPR; Autonomous vehicles, such as Otto’s self-driving trucks: The nation’s continued success in innovation is critical for maintaining the United States as an economic leader.

Successful innovation requires the proper environment. Innovators need intellectual capital, an educated workforce, and access to financial capital. These resources enable innovators to conduct the research and development and to optimize products for the commercial marketplace.

Equally important is a sufficient degree of what we call “innovation certainty.” Innovation certainty considers those legal, regulatory, and political factors that affect the degree of risk. The lower the degree of innovation certainty, the less hospitable the system is for innovators and investors. The less stable the legal and political rules, the more inimical the jurisdiction is to the investors who ultimately finance the innovative work.

During the past ten years, innovation certainty in the United States has decreased dramatically, and the decrease is directly attributable to two general trends: The destabilization of patent law, and the increased uncertainty in antitrust law. Both patent law and antitrust law, when properly implemented, contribute to an optimal level of innovation certainty. Patent law incentivizes innovation by awarding exclusive rights, thereby encouraging investment in and public disclosure of inventions.3 Antitrust law incentivizes innovation by maximizing competition in a free marketplace and allowing startup innovators to disrupt markets and avoid monopolies created by market power. Working within these legal regimes, private firms innovate and commercialize. They also create efficient transaction mechanisms, such as standard setting organizations (“SSOs”) and FRAND (“fair, reasonable, and non-discriminatory”) licensing agreements for standard essential patents (“SEPs”), so that innovators and their investors can efficiently obtain a return on their capital.

#### Winning the commercial tech innovation race solidifies military overmatch BUT the lead is razor-thin now

Molling 18 [Christian, research director of DGAP, German Council on Foreign Relations. “Defense Innovation and the Future of Transatlantic Strategic Superiority: A German Perspective”. 3/23/18. https://www.gmfus.org/news/defense-innovation-and-future-transatlantic-strategic-superiority-german-perspective]

Technological superiority is key for the West’s military power. But the reality of how to maintain this superiority is changing. Instead of innovation in defense technology coming predominately from national programs linked to the military, innovation is now increasingly generated by the private sector and takes place around the globe. The competition of commercial companies for their consumers has also led to shorter innovation cycles, especially in the area of information technology, and to a geographical diversification of centers of innovation — with new hubs especially in Asia. The ability of non-Western actors to increasingly incorporate civilian innovation into defense applications has led, among other things, to the perception of a growing erosion of conventional deterrence and defense capabilities in relation to rising powers and new actors of international security.

#### Loss of leadership on emerging tech causes nuclear transition wars in Taiwan and Eastern Europe.

Kroenig & Gopalaswamy 18, \*Associate Professor of Government and Foreign Service at Georgetown University and Deputy Director for Strategy in the Scowcroft Center for Strategy and Security at the Atlantic Council. \*\*Director of the South Asia Center at the Atlantic Council. He holds a PhD in mechanical engineering with a specialization in numerical acoustics from Trinity College, Dublin. (Matthew & Bharath, 11-12-2018, "Will disruptive technology cause nuclear war?", *Bulletin of the Atomic Scientists*, https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war/)

Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the “bargaining model of war.” This theory identifies rapid shifts in the balance of power as a primary cause of conflict.

International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understandings of which states have the advantage.

You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power.

For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia’s military modernization have been on full display in its ongoing intervention in Ukraine.

Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, “Whoever leads in AI will rule the world.”

If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war.

If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member.

Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation.

This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly.

#### Licensing hikes and lack of legal clarity decimate AI innovation and threaten broader adoption

Ghafele 21 [Roya, visiting Professor in IP Law with the School of Law of Brunel University, Director of Oxfirst. “The Role of Standards and Patents in Artificial Intelligence”. 3/24/21. https://www.linkedin.com/pulse/role-standards-patents-artificial-intelligence-roya-ghafele?trk=public\_profile\_article\_view]

AI systems label a specific model of innovation that benefits from a wide range of contributors; be they inside or outside the firm. The role of patent law as an organizational principle of this type of ‘networked innovation’ remains yet to be adequately governed. In AI business thrives because of the interconnected framework in which it is embedded in.

The technological transformations enabled have triggered drastic modifications of the nature of economic exchange; making novel ways of doing business possible; not necessarily by owning devices protected by patents, but by owning access to a multitude of devices and facilitating easy interacting and exchange between them. Hence, the classical value proposition, whereby a single invention is protected through patent law and by consequence its owner has the right to exclude third parties from accessing it may risk to harm the nurturing eco system emerging from the standardization process.[1] In that regard, public policy formulation will need to play a major role, so to provide a governance structure that allows all players, be they large or small, to succeed. In particular it will require to study at greater length the role that patents that read on standards will and can play in this promising ecosystem.

This new economic context asks for a differentiated governance structure that assures in particular the functioning interplay between patents and standards. Against this background, this proposal suggests that the role of the FRAND (fair, reasonable and non-discriminatory) commitment should be further studied. Within a UK context in particular, it should be discussed to what extent it would not be appropriate to run another ‘Heargraves Review’ that addresses in greater detail the role of standard essential patents in the novel business environment provided by AI.

The Novel Economic Framework Provided by Artificial Intelligence

AI is still at its early stage and the opportunities it can offer have not even been seized yet to its full extent. At present, we do not even know the many different creative ways in which entrepreneurs will take AI forward. Entrepreneurs are experimenting with leveraging the AI in areas as vast as fashion or primary healthcare. Which businesses will ultimately prove viable remains still to be seen. AI is also big business. Investors expect growth rates as high as 20%.

In AI it is not the single device that creates value, but the ability to connect a sheer infinite number of devices with each other. The worth relies in the continuous expansion of the connection. It is the interconnectivity that creates value, not just the simple ownership of a single device.

At present most connected devices or telecom networks are controlled by humans. However, a key feature of the AI is that devices will be controlled by other devices (the controllers). These again can be classified in various ways, so to reflect the specific features of the controller. In the networked architecture of the AI various devices are at the same time receivers and suppliers of information; making it increasingly difficult to untangle the net of who provides and who receives proprietary technology and who adds value to the technology.

As such, Artificial Intelligence is a prototypical technology space, where Small and Medium Sized Enterprises (SMEs), universities and their spin-outs as well as big corporations alike could constitute a fruitful innovation ecosystem. All these players could thrive in the spirit of collaborative exchange, so to collectively re-invent the future of society, provided that adequate foundations are set for the role of patents within the context of AI.

The Need for Standards

Standard setting will be instrumental for the success of AI. It is only through a common language, the adoption of an interoperable and connected system that the wide spread use of AI can succeed. The process of standardisation will enhance innovation efficiency because it enhances compatibility and increases the credibility of technological solution. This standardisation process will likely be highly beneficial to the widespread dissemination of AI.

The success of a standard is based on its wide dissemination; its value derives from its vast usage. This stands in sharp contrast to patents, which are negative rights built around exclusivity. Contrary to a standard, the value of a patent derives from its strength to exclude to the best extent possible third parties from using it; unless obviously a third party is willing to pay for its usage.

This is why the inherent dilemma between patents and standards is hard to overcome. It is a tension between ‘free access and tight control.[2]’ This tensions is well pronounced in the standard essential patents debate. A patent declared essential to a standard is a strange hybrid that combines patent laws’ negative right’s aspect with a standard’s capability to disseminate a technology as wide as possible. As this formula bears the potential to accrue exceptional market power in the hands of patent owners, while at the same time rendering access to proprietary technology potentially very expensive, the (F)RAND (fair, reasonable and non- discriminatory) promise was introduced.

The (F)RAND rationale at its the core seeks to counter anti-competitive aspects of the licensing of standard essential patents. The (F)RAND commitment obligates SEPs owners to make their patents available on fair, reasonable and non-discriminatory terms. The reason why it does this, is because in the absence of doing so, there is a strong concern that opportunist behaviour can arise and by consequence competition in technology markets can be distorted.

Due to technical standard setting, there often arise only a handful of patent holders in a particular standard. This may be due to first mover advantages or because some firms have the necessary innovation capabilities to capture the patent landscape. It is alleged that these patent holders – having claimed an important position in the patent landscape – can charge abnormally high licensing rates to standard essential patent implementers; a phenomenon known as hold up.

Alongside those undesired consequences, royalty stacking can be another means to prevent downstream innovation. Royalty stacking can be defined as ‘situations in which a single product potentially infringes on many patents, and thus may bear multiple royalty burdens. The term 'royalty stacking' reflects the fact that, from the perspective of the firm making the product in question, all of the different claims for royalties must be added or 'stacked' together to determine the total royalty burden borne by the product if the firm is to sell that product free of patent litigation.’[3]

Research Questions

Nonetheless the (F)RAND commitment translates into an insufficiently complete contract between licensors and licensees. This is because of a built-in ambiguity over what “fair, reasonable and non-discriminatory” means; an ambiguity that is not addressed by means of the policies themselves but is expected to be resolved by “others”. This has led commentators such as Swanson & Baumol to argue that the (F)RAND commitment is of limited value in the absence of objective benchmarks that make clear the concrete terms or range of terms that are deemed to be reasonable and non- discriminatory.[4] This vagueness can lead to abuse and antitrust issues.[5] The situation is furthermore complicated by clandestine licensing markets and the absence of publicly available royalty rates that could be used as benchmarks to determine the value of a royalty rate of a SEPs.

Further issues pertain to a lack of clarity on ownership and distribution of patents that read on standards. Equally, there is lack of consistency as it pertains to the valuation of standard essential patents. Lack of clarity can also lead to a host of other unresolved challenges, such as negotiations taking potentially place in the shadow of the law and potential asymmetrical bargaining power between SEPs owners and downstream innovators.

#### AI innovation solves next gen cyberattacks

Dixon 19 [William, Head of Future Networks and Technology, World Economic Forum, Nicole Eagan, Chief Executive Officer, Darktrace. “3 ways AI will change the nature of cyber attacks”. 6/19/19. https://www.weforum.org/agenda/2019/06/ai-is-powering-a-new-generation-of-cyberattack-its-also-our-best-defence/]

Cyberattacks are becoming ubiquitous and have been recognized as one of the most strategically significant risks facing the world today. In recent years, we have witnessed digital assaults against governments and the owners of critical infrastructure, large private corporations and smaller ones, educational institutions and non-profit organizations. Not only is no sector immune from cyberattacks, the level of sophistication of the threats they face is continually increasing.

The future of cybersecurity will be driven by a new class of subtle and stealthy attackers that has recently emerged. Their aim is not to steal data, but rather to manipulate or change it. There is little doubt that artificial intelligence (AI) will be used by attackers to drive the next major upgrade in cyber weaponry and will ultimately pioneer the malicious use of AI. AI’s fundamental ability to learn and adapt will usher in a new era in which highly-customised and human-mimicking attacks are scalable. ’Offensive AI’ – highly sophisticated and malicious attack code – will be able to mutate itself as it learns about its environment, and to expertly compromise systems with minimal chance of detection.

Prototype-AI attacks: a glimpse into the future

AI-powered cyberattacks are not a hypothetical future concept. All the required building blocks for the use of offensive AI already exist: highly sophisticated malware, financially motivated – and ruthless – criminals willing to use any means possible to increase their return on investment, and open-source AI research projects which make highly valuable information available in the public domain.

One of the most notorious pieces of contemporary malware – the Emotet trojan – is a prime example of a prototype-AI attack. Emotet’s main distribution mechanism is spam-phishing, usually via invoice scams that trick users into clicking on malicious email attachments. The Emotet authors have recently added another module to their trojan, which steals email data from infected victims. The intention behind this email exfiltration capability was previously unclear, but Emotet has recently been observed sending out contextualized phishing emails at scale. This means it can automatically insert itself into pre-existing email threads, advising the victim to click on a malicious attachment, which then appears in the final, malicious email. This insertion of the malware into pre-existing emails gives the phishing email more context, thereby making it appear more legitimate.

Yet the criminals behind the creation of Emotet could easily leverage AI to supercharge this attack. Currently, the message on the final phishing email is usually highly generic - “Please see attached”, for instance - and this may sometimes arouse suspicion. However, by leveraging an AI’s ability to learn and replicate natural language by analysing the context of the email thread, these phishing emails could become highly tailored to individuals. This would mean that an AI-powered Emotet trojan could create and insert entirely customized, more believable phishing emails. Crucially, it would be able to send these out at scale, which would allow criminals to increase the yield of their operations enormously.

The consequences of these developing attack methods could be highly destructive, and even life-threatening. By undermining data integrity, these stealthy attacks cause trust in organizations to falter, and may even cause systemic failures to occur. Imagine an oil rig using faulty geo-prospection data to drill for oil in the wrong place, or a physician making a diagnosis using compromised medical records. As the AI arms race continues, we can only expect this circle of innovation to escalate.

Offensive AI: a paradigm shift in cyberattacks

In 2017, the WannaCry ransomware attack hit organizations in over 150 countries around the world, marking the beginning of a new era in cyberattack sophistication. Its success lay in its ability to move laterally through an organization in a matter of seconds while paralysing hard drives, and the incident went on to inspire multiple copycat attacks. This cycle of “innovation” will continue, and attackers have already moved on to cryptocurrency mining malware, which secretly steals processing power to mine for digital currencies such as bitcoin, and banking trojans, a type of malware that steals financial data while masquerading as a genuine application.

The use of adversarial artificial intelligence will impact the security landscape in three key ways:

1 - Impersonation of trusted users

AI attacks will be highly tailored yet operate at scale. These malwares will be able to learn the nuances of an individual’s behaviour and language by analysing email and social media communications. They will be able to use this knowledge to replicate a user’s writing style, crafting messages that appear highly credible. Messages written by AI malware will therefore be almost impossible to distinguish from genuine communications. As the majority of attacks get into our systems through our inboxes, even the most cyber-aware computer user will be vulnerable.

2 - Blending into the background

Sophisticated threat actors can often maintain a long-term presence in their target environments for months at a time, without being detected. They move slowly and with caution, to evade traditional security controls and are often targeted to specific individuals and organizations. AI will also be able to learn the dominant communication channels and the best ports and protocols to use to move around a system, discretely blending in with routine activity. This ability to disguise itself amid the noise will mean that it is able to expertly spread within a digital environment, and stealthily compromise more devices than ever before. AI malware will also be able to analyse vast volumes of data at machine speed, rapidly identifying which data sets are valuable and which are not. This will save the (human) attacker a great deal of time and effort.

3 - Faster attacks with more effective consequences

Today’s most sophisticated attacks require skilled technicians to conduct research on their target and identify individuals of interest, understand their social network and observe over time how they interact with digital platforms. In tomorrow’s world, an offensive AI will be able to achieve the same level of sophistication in a fraction of the time, and at many times the scale.

Not only will AI-driven attacks be much more tailored and consequently more effective, their ability to understand context means they will be even harder to detect. Traditional security controls will be impotent against this new threat, as they can only spot predictable, pre-modelled activity. AI is constantly evolving and will become ever-more resistant to the categorization of threats that remains fundamental to the modus operandi of legacy security approaches.

Incorporating AI in the digital ecosystem

As we increasingly rely on connected systems and devices, we are quickly developing a highly advanced and heavily connected digital ecosystem. We will require partnerships and capabilities that prioritize winning the strategic battles that count – and safeguard not only economically valuable data held by the public and private sectors, but the confidence in digital systems that underpins social cohesion and democratic institutions.

Investment in new technology will play a critical role in this emerging reality and evolving ecosystem. According to Forrester’s Using AI for Evil report, “mainstream AI-powered hacking is just a matter of time”. Indeed, as we begin to see AI become part of the cyber attacker’s toolkit, the only way that we will be able to combat this malicious use of AI is with AI itself. Therefore, incorporating the technology into this ecosystem is crucial.

Counterattack: Fighting machine with machine

The cybersecurity community is already heavily investing in this new future, and is using AI solutions to rapidly detect and contain any emerging cyberthreats that have the potential to disrupt or compromise key data. Defensive AI is not merely a technological advantage in fighting cyberattacks, but a vital ally on this new battlefield. Rather than rely on security personnel to respond to incidents manually, organizations will instead use AI to fight back against a developing problem in the short term, while human teams will oversee the AI’s decision-making and perform remedial work that improves overall resilience in the long term.

AI-powered attacks will outpace human response teams and outwit current legacy-based defenses; therefore, the mutually-dependent partnership of human and AI will be the bedrock of defense strategies in the future. The battleground of the future is digital, and AI is the undisputed weapon of choice. There is no silver bullet to the generational challenge of cybersecurity, but one thing is clear: only AI can play AI at its own game. The technology is available, and the time to prepare is now.

#### Cyber war goes nuclear

Erik Gartzke &Jon R. Lindsay 17. Gartzke is at the Department of Political Science, University of California, San Diego; Lindsay is at the Munk School of Global Affairs, University of Toronto. 03/01/2017. “Thermonuclear Cyberwar.” Journal of Cybersecurity, vol. 3, no. 1, pp. 37–48.

Cyber warfare is routinely overhyped as a new weapon of mass destruction, but when used in conjunction with actual weapons of mass destruction, severe, and underappreciated, dangers emerge. One side of a stylized debate about cybersecurity in international relations argues that offensive advantages in cyberspace empower weaker nations, terrorist cells, or even lone rogue operators to paralyze vital infrastructure [4–8]. The other side argues that operational difficulties and effective deterrence restrains the severity of cyber attack, while governments and cybersecurity firms have a pecuniary interest in exaggerating the threat [9–13]. Although we have contributed to the skeptical side of this debate [14–16], \*\*\*BEGIN FOOTNOTE\*\*\* 14. Gartzke E. The myth of cyberwar: bringing war in cyberspace back down to earth. Int Security 2013;38:41–73. Google ScholarCrossRef 15 Lindsay JR. Stuxnet and the limits of cyber warfare. Security Stud 2013;22:365–404. Google ScholarCrossRef 16 Lindsay JR. The impact of China on cybersecurity: fiction and friction. Int Security 2014;39:7–47. Google ScholarCrossRef \*\*\*END FOOTNOTE\*\*\* the same strategic logic that leads us to view cyberwar as a limited political instrument in most situations also leads us to view it as incredibly destabilizing in rare situations. In a recent Israeli wargame of a regional scenario involving the United States and Russia, one participant remarked on “how quickly localized cyber events can turn dangerously kinetic when leaders are ill-prepared to deal in the cyber domain” [17]. Importantly, this sort of catalytic instability arises not from the cyber domain itself but through its interaction with forces and characteristics in other domains (land, sea, air, etc.). Further, it arises only in situations where actors possess, and are willing to use, robust traditional military forces to defend their interests. Classical deterrence theory developed to explain nuclear deterrence with nuclear weapons, but different types of weapons or combinations of operations in different domains can have differential effects on deterrence and defense [18, 19]. Nuclear weapons and cyber operations are particularly complementary (i.e. nearly complete opposites) with respect to their strategic characteristics. Theorists and practitioners have stressed the unprecedented destructiveness of nuclear weapons in explaining how nuclear deterrence works, but it is equally, if not more, important for deterrence that capabilities and intentions are clearly communicated. As quickly became apparent, public displays of their nuclear arsenals improved deterrence.x At the same time, disclosing details of a nation’s nuclear capabilities did not much degrade the ability to strike or retaliate, given that defense against nuclear attack remains extremely difficult. Knowledge of nuclear capabilities is necessary to achieve a deterrent effect [20]. Cyber operations, in contrast, rely on undisclosed vulnerabilities, social engineering, and creative guile to generate indirect effects in the information systems that coordinate military, economic, and social behavior. Revelation enables crippling countermeasures, while the imperative to conceal capabilities constrains both the scope of cyber operations and their utility for coercive signaling [21, 22]. The diversity of cyber operations and confusion about their effects also contrast with the obvious destructiveness of nuclear weapons. The problem is that transparency and deception do not mix well. An attacker who hacks an adversary’s nuclear command and control apparatus, or the weapons themselves, will gain an advantage in warfighting that the attacker cannot reveal, while the adversary will continue to believe it wields a deterrent that may no longer exist. Most analyses of inadvertent escalation from cyber or conventional to nuclear war focus on “use it or lose it” pressures and fog of war created by attacks that become visible to the target [23, 24]. In a US–China conflict scenario, for example, conventional military strikes in conjunction with cyber attacks that blind sensors and confuse decision making could generate incentives for both sides to rush to preempt or escalate [25–27]. These are plausible concerns, but the revelation of information about a newly unfavorable balance of power might also cause hesitation and lead to compromise. Cyber blinding could potentially make traditional offensive operations more difficult, shifting the advantage to defenders and making conflict less likely. Clandestine attacks that remain invisible to the target potentially present a more insidious threat to crisis stability. There are empirical and theoretical reasons for taking seriously the effects of offensive cyber operations on nuclear deterrence, and we should expect the dangers to vary with the relative cyber capabilities of the actors in a crisis interaction. Nuclear command and control vulnerability General Robert Kehler, commander of US Strategic Command (STRATCOM) in 2013, stated in testimony before the Senate Armed Services Committee, “we are very concerned with the potential of a cyber-related attack on our nuclear command and control and on the weapons systems themselves” [28]. Nuclear command, control, and communications (NC3) form the nervous system of the nuclear enterprise spanning intelligence and early warning sensors located in orbit and on Earth, fixed and mobile command and control centers through which national leadership can order a launch, operational nuclear forces including strategic bombers, land-based intercontinental missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and the communication and transportation networks that tie the whole apparatus together [29, 30]. NC3 should ideally ensure that nuclear forces will always be available if authorized by the National Command Authority (to enhance deterrence) and never used without authorization (to enhance safety and reassurance). Friendly errors or enemy interference in NC3 can undermine the “always-never” criterion**,** weakening deterrence [31, 32]. NC3 has long been recognized as the weakest link in the US nuclear enterprise. According to a declassified official history, a Strategic Air Command (SAC) task group in 1979 “reported that tactical warning and communications systems … were ‘fragile’ and susceptible to electronic countermeasures, electromagnetic pulse, and sabotage, which could deny necessary warning and assessment to the National Command Authorities” [33]. Two years later, the Principal Deputy Under Secretary of Defense for Research and Engineering released a broad-based, multiservice report that doubled down on SAC’s findings: “the United States could not assure survivability, endurability, or connectivity of the national command authority function” due to: major command, control, and communications deficiencies: in tactical warning and attack assessment where existing systems were vulnerable to disruption and destruction from electromagnetic pulse, other high altitude nuclear effects, electronic warfare, sabotage, or physical attack; in decision making where there was inability to assure national command authority survival and connection with the nuclear forces, especially under surprise conditions; and in communications systems, which were susceptible to the same threats above and which could not guarantee availability of even minimum-essential capability during a protracted war. [33] The nuclear weapons safety literature likewise provides a number of troubling examples of NC3 glitches that illustrate some of the vulnerabilities attackers could, in principle, exploit [34–36]. The SAC history noted that NORAD has received numerous false launch indications from faulty computer components, loose circuits, and even a nuclear war training tape loaded by mistake into a live system that produced erroneous Soviet launch indications [33]. In a 1991 briefing to the STRATCOM commander, a Defense Intelligence Agency targeteer confessed, “Sir, I apologize, but we have found a problem with this target. There is a mistake in the computer code … . Sir, the error has been there for at least the life of this eighteen-month planning cycle. The nature of the error is such that the target would not have been struck” [37]. It would be a difficult operation to intentionally plant undetected errors like this, but the presence of bugs does reveal that such a hack is possible. Following many near-misses and self-audits during and after the Cold War, American NC3 improved with the addition of new safeguards and redundancies. As General Kehler pointed out in 2013, “the nuclear deterrent force was designed to operate through the most extreme circumstances we could possibly imagine” [28]. Yet vulnerabilities remain. In 2010, the US Air Force lost contact with 50 Minuteman III ICBMs for an hour because of a faulty hardware circuit at a launch control center [38]. If the accident had occurred during a crisis, or the component had been sabotaged, the USAF would have been unable to launch and unable to detect and cancel unauthorized launch attempts. As Bruce Blair, a former Minuteman missileer, points out, during a control center blackout the antennas at unmanned silos and the cables between them provide potential surreptitious access vectors [39]. The unclassified summary of a 2015 audit of US NC3 stated that “known capability gaps or deficiencies remain” [40]. Perhaps more worrisome are the unknown deficiencies. A 2013 Defense Science Board report on military cyber vulnerabilities found that while the: nuclear deterrent is regularly evaluated for reliability and readiness … , most of the systems have not been assessed (end-to-end) against a [sophisticated state] cyber attack to understand possible weak spots. A 2007 Air Force study addressed portions of this issue for the ICBM leg of the U.S. triad but was still not a complete assessment against a high-tier threat. [41] If NC3 vulnerabilities are unknown, it is also unknown whether an advanced cyber actor would be able to exploit them. As Kehler notes, “We don’t know what we don’t know” [28]. Even if NC3 of nuclear forces narrowly conceived is a hard target, cyber attacks on other critical infrastructure in preparation to or during a nuclear crisis could complicate or confuse government decision making. General Keith Alexander, Director of the NSA in the same Senate hearing with General Kehler, testified that: our infrastructure that we ride on, the power and the communications grid, are one of the things that is a source of concern … we can go to backup generators and we can have independent routes, but … our ability to communicate would be significantly reduced and it would complicate our governance … . I think what General Kehler has would be intact … [but] the cascading effect … in that kind of environment … concerns us. [28] Kehler further emphasized that “there’s a continuing need to make sure that we are protected against electromagnetic pulse and any kind of electromagnetic interference” [28]. Many NC3 components are antiquated and hard to upgrade, which is a mixed blessing. Kehler points out, “Much of the nuclear command and control system today is the legacy system that we’ve had. In some ways that helps us in terms of the cyber threat. In some cases it’s point to point, hard-wired, which makes it very difficult for an external cyber threat to emerge” [28]. The Government Accountability Office notes that the “Department of Defense uses 8-inch floppy disks in a legacy system that coordinates the operational functions of the nation’s nuclear forces” [42]. While this may limit some forms of remote access, it is also indicative of reliance on an earlier generation of software when security engineering standards were less mature. Upgrades to the digital Strategic Automated Command and Control System planned for 2017 have the potential to correct some problems, but these changes may also introduce new access vectors and vulnerabilities [43]. Admiral Cecil Haney, Kehler’s successor at STRATCOM, highlighted the challenges of NC3 modernization in 2015: Assured and reliable NC3 is fundamental to the credibility of our nuclear deterrent. The aging NC3 systems continue to meet their intended purpose, but risk to mission success is increasing as key elements of the system age. The unpredictable challenges posed by today’s complex security environment make it increasingly important to optimize our NC3 architecture while leveraging new technologies so that NC3 systems operate together as a core set of survivable and endurable capabilities that underpin a broader, national command and control system. [44] In no small irony, the internet itself owes its intellectual origin, in part, to the threat to NC3 from large-scale physical attack. A 1962 RAND report by Paul Baran considered “the problem of building digital communication networks using links with less than perfect reliability” to enable “stations surviving a physical attack and remaining in electrical connection … to operate together as a coherent entity after attack” [45]. Baran advocated as a solution decentralized packet switching protocols, not unlike those realized in the ARPANET program. The emergence of the internet was the result of many other factors that had nothing to do with managing nuclear operations, notably the meritocratic ideals of 1960s counterculture that contributed to the neglect of security in the internet’s founding architecture [46, 47]. Fears of NC3 vulnerability helped to create the internet, which then helped to create the present-day cybersecurity epidemic, which has come full circle to create new fears about NC3 vulnerability. NC3 vulnerability is not unique to the United States. The NC3 of other nuclear powers may even be easier to compromise, especially in the case of new entrants to the nuclear club like North Korea. Moreover, the United States has already demonstrated both the ability and willingness to infiltrate sensitive foreign nuclear infrastructure through operations such as Olympic Games (Stuxnet), albeit targeting Iran’s nuclear fuel cycle rather than NC3. It would be surprising to learn that the United States has failed to upgrade its Cold War NC3 attack plans to include offensive cyber operations against a wide variety of national targets. Hacking the deterrent The United States included NC3 attacks in its Cold War counterforce and damage limitation war plans, even as contemporary critics perceived these options to be destabilizing for deterrence [48]. The best known example of these activities and capabilities is a Special Access Program named Canopy Wing. East German intelligence obtained the highly classified plans from a US Army spy in Berlin, and the details began to emerge publicly after the Cold War. An East German intelligence officer, Markus Wolf, writes in his memoir that Canopy Wing “listed the types of electronic warfare that would be used to neutralize the Soviet Union and Warsaw Pact’s command centers in case of all-out war. It detailed the precise method of depriving the Soviet High Command of its high-frequency communications used to give orders to its armed forces” [49]. It is easy to see why NC3 is such an attractive target in the unlikely event of a nuclear war. If for whatever reason deterrence fails and the enemy decides to push the nuclear button, it would obviously be better to disable or destroy missiles before they launch than to rely on possibly futile efforts to shoot them down, or to accept the loss of millions of lives. American plans to disable Soviet NC3 with electronic warfare, furthermore, would have been intended to complement plans for decapitating strikes against Soviet nuclear forces. Temporary disabling of information networks in isolation would have failed to achieve any important strategic objective. A blinded adversary would eventually see again and would scramble to reconstitute its ability to launch its weapons, expecting that preemption was inevitable in any case. Reconstitution, moreover, would invalidate much of the intelligence and some of the tradecraft on which the blinding attack relied. Capabilities fielded through Canopy Wing were presumably intended to facilitate a preemptive military strike on Soviet NC3 to disable the ability to retaliate and limit the damage of any retaliatory force that survived, given credible indications that war was imminent. Canopy Wing included [50]: “Measures for short-circuiting … communications and weapons systems using, among other things, microscopic carbon-fiber particles and chemical weapons.” “Electronic blocking of communications immediately prior to an attack, thereby rendering a counterattack impossible.” “Deployment of various weapons systems for instantaneous destruction of command centers, including pin-point targeting with precision-guided weapons to destroy ‘hardened bunkers’.” “Use of deception measures, including the use of computer-simulated voices to override and substitute false commands from ground-control stations to aircraft and from regional command centers to the Soviet submarine fleet.” “Us[e of] the technical installations of ‘Radio Free Europe/Radio Liberty’ and ‘Voice of America,’ as well as the radio communications installations of the U.S. Armed Forces for creating interference and other electronic effects.” Wolf also ran a spy in the US Air Force who disclosed that the Americans had managed to penetrate the [Soviet air base at Eberswalde]’s ground-air communications and were working on a method of blocking orders before they reached the Russian pilots and substituting their own from West Berlin. Had this succeeded, the MiG pilots would have received commands from their American enemy. It sounded like science fiction, but, our experts concluded, it was in no way impossible that they could have pulled off such a trick, given the enormous spending and technical power of U.S. military air research. [49] One East German source claimed that Canopy Wing had a $14.5 billion budget for research and operational costs and a staff of 1570 people, while another claimed that it would take over 4 years and $65 million to develop “a prototype of a sophisticated electronic system for paralyzing Soviet radio traffic in the high-frequency range” [50]. Canopy Wing was not cheap, and even so, it was only a research and prototyping program. Operationalization of its capabilities and integration into NATO war plans would have been even more expensive. This is suggestive of the level of effort required to craft effective offensive cyber operations against NC3. Preparation comes to naught when a sensitive program is compromised. Canopy Wing was caught in what we describe below as the cyber commitment problem, the inability to disclose a warfighting capability for the sake of deterrence without losing it in the process. According to New York Times reporting on the counterintelligence investigation of the East German spy in the Army, Warrant Officer James Hall, “officials said that one program rendered useless cost hundreds of millions of dollars and was designed to exploit a Soviet communications vulnerability uncovered in the late 1970's” [51]. This program was probably Canopy Wing. Wolf writes, “Once we passed [Hall’s documents about Canopy Wing] on to the Soviets, they were able to install scrambling devices and other countermeasures” [49]. It is tempting to speculate that the Soviet deployment of a new NC3 system known as Signal-A to replace Signal-M (which was most likely the one targeted by Canopy Wing) was motivated in part by Hall’s betrayal [50]. Canopy Wing underscores the potential and limitations of NC3 subversion. Modern cyber methods can potentially perform many of the missions Canopy Wing addressed with electronic warfare and other means, but with even greater stealth and precision. Cyber operations might, in principle, compromise any part of the NC3 system (early warning, command centers, data transport, operational forces, etc.) by blinding sensors, injecting bogus commands or suppressing legitimate ones, monitoring or corrupting data transmissions, or interfering with the reliable launch and guidance of missiles. In practice, the operational feasibility of cyber attack against NC3 or any other target depends on the software and hardware configuration and organizational processes of the target, the intelligence and planning capacity of the attacker, and the ability and willingness to take advantage of the effects created by cyber attack [52, 53]. Cyber compromise of NC3 is technically plausible though operationally difficult, a point to which we return in a later section. To understand which threats are not only technically possible but also probable under some circumstance, we further need a political logic of cost and benefit [14]. In particular, how is it possible for a crisis to escalate to levels of destruction more costly than any conceivable political reward? Canopy Wing highlights some of the strategic dangers of NC3 exploitation. Warsaw Pact observers appear to have been deeply concerned that the program reflected an American willingness to undertake a surprise decapitation attack: they said that it “sent ice-cold shivers down our spines” [50]. The Soviets designed a system called Perimeter that, not unlike the Doomsday Device in Dr. Strangelove, was designed to detect a nuclear attack and retaliate automatically, even if cut off from Soviet high command, through an elaborate system of sensors, underground computers, and command missiles to transmit launch codes [54]. Both Canopy Wing and Perimeter show that the United States and the Soviet Union took nuclear warfighting seriously and were willing to develop secret advantages for such an event. By the same token, they were not able to reveal such capabilities to improve deterrence to avoid having to fight a nuclear war in the first place. Nuclear deterrence and credible communication Nuclear weapons have some salient political properties. They are singularly and obviously destructive. They kill in more, and more ghastly, ways than conventional munitions through electromagnetic radiation, blast, firestorms, radioactive fallout, and health effects that linger for years. Bombers, ICBMs, and SLBMs can project warheads globally without significantly mitigating their lethality, steeply attenuating the conventional loss-of-strength gradient [55]. Defense against nuclear attack is very difficult, even with modern ballistic missile defenses, given the speed of incoming warheads and use of decoys; multiple warheads and missile volleys further reduce the probability of perfect interception. If one cannot preemptively destroy all of an enemy’s missiles, then there is a nontrivial chance of getting hit by some of them. When one missed missile can incinerate millions of people, the notion of winning a nuclear war starts to seem meaningless for many politicians. As defense seemed increasingly impractical, early Cold War strategists championed the threat of assured retaliation as the chief mechanism for avoiding war [56–59]. Political actors have issued threats for millennia, but the advent of nuclear weapons brought deterrence as a strategy to center stage. The Cold War was an intense learning experience for both practitioners and students of international security, rewriting well-worn realities more than once [60–62]. A key conundrum was the practice of brinkmanship. Adversaries who could not compete by “winning” a nuclear war could still compete by manipulating the “risk” of nuclear annihilation, gambling that an opponent would have the good judgment to back down at some point short of the nuclear brink. Brinkmanship crises—conceptualized as games of Chicken where one cannot heighten tensions without increasing the hazard of the mutually undesired outcome—require that decision makers behave irrationally, or possibly that they act randomly, which is difficult to conceptualize in practical terms [63]. The chief concern in historical episodes of chicken, such as the Berlin Crisis and Cuban Missile Crisis, was not whether a certain level of harm was possible, but whether an adversary was resolved enough, possibly, to risk nuclear suicide. The logical inconsistency of the need for illogic to win led almost from the beginning of the nuclear era to elaborate deductive contortions [64–66]. Both mutually assured destruction (MAD) and successful brinksmanship depend on a less appreciated, but no less fundamental, feature of nuclear weapons: political transparency. Most elements of military power are weakened by disclosure [67]. Military plans are considerably less effective if shared with an enemy. Conventional weapons become less lethal as adversaries learn what different systems can and cannot do, where they are located, how they are operated, and how to devise countermeasures and array defenses to blunt or disarm an attack. In contrast, relatively little reduction in destruction follows from enemy knowledge of nuclear capabilities. For most of the nuclear era, no effective defense existed against a nuclear attack. Even today, with evolving ABM systems, one ICBM still might get through and annihilate the capital city. Nuclear forces are more robust to revelation than other weapons, enabling nuclear nations better to advertise the harm they can inflict. The need for transparency to achieve an effective deterrent is driven home by the satirical Cold War film, Dr. Strangelove: “the whole point of a Doomsday Machine is lost, if you keep it a secret! Why didn’t you tell the world, eh?” During the real Cold War, fortunately, Soviet leaders paraded their nuclear weapons through Red Square for the benefit of foreign military attaches and the international press corps. Satellites photographed missile, bomber, and submarine bases. While other aspects of military affairs on both sides of the Iron Curtain remained closely guarded secrets, the United States and the Soviet Union permitted observers to evaluate their nuclear capabilities. This is especially remarkable given the secrecy that pervaded Soviet society. The relative transparency of nuclear arsenals ensured that the superpowers could calculate risks and consequences within a first-order approximation, which led to a reduction in severe conflict and instability even as political competition in other arenas was fierce [61, 68]. Recent insights about the causes of war suggest that divergent expectations about the costs and consequences of war are necessary for contests to occur [69–73]. These insights are associated with rationalist theories, such as deterrence theory itself. Empirical studies and psychological critiques of the rationality assumption have helped to refine models and bring some circumspection into their application, but the formulation of sound strategy (if not the execution) still requires the articulation of some rational linkage between cause and effect [19, 62, 74]. Many supposedly nonrational factors, moreover, simply manifest as uncertainty in strategic interaction. Our focus here is on the effect of uncertainty and ignorance on the ability of states and other actors to bargain in lieu of fighting. Many wars are a product of what adversaries do not know or what they misperceive, whether as a result of bluffing, secrecy, or intrinsic uncertainty [75, 76]. If knowledge of capabilities or resolve is a prerequisite for deterrence, then one reason for deterrence failure is the inability or unwillingness to credibly communicate details of the genuine balance of power, threat, or interests. Fighting, conversely, can be understood as a costly process of discovery that informs adversaries of their actual relative strength and resolve. From this perspective, successful deterrence involves instilling in an adversary perceptions like those that result from fighting, but before fighting actually begins. Agreement about the balance of power can enable states to bargain (tacit or overt) effectively without needing to fight, forging compromises that each prefers to military confrontation or even to the bulk of possible risky brinkmanship crises. Despite other deficits, nuclear weapons have long been considered to be stabilizing with respect to rational incentives for war(the risk of nuclear accidents is another matter) [77]. If each side has a secure second strike—or even a minimal deterrent with some nonzero chance of launching a few missiles—then each side can expect to gain little and lose much by fighting a nuclear war. Whereas the costs of conventional war can be more mysterious because each side might decide to hold something back and meter out its punishment due to some internal constraint or a theory of graduated escalation, even a modest initial nuclear exchange is recognized to be extremely costly. As long as both sides understand this and understand (or believe) that the adversary understands this as well, then the relationship is stable. Countries engage nuclear powers with considerable deference, especially over issues of fundamental national or international importance. At the same time, nuclear weapons appear to be of limited value in prosecuting aggressive action, especially over issues of secondary or tertiary importance, or in response to aggression from others at lower levels of dispute intensity. Nuclear weapons are best used for signaling a willingness to run serious risks to protect or extort some issue that is considered of vital national interest. As mentioned previously, both superpowers in the Cold War considered the warfighting advantages of nuclear weapons quite apart from any deterrent effect, and the United States and Russia still do. High-altitude bursts for air defense, electromagnetic pulse for frying electronics, underwater detonations for anti-submarine warfare, hardened target penetration, area denial, and so on, have some battlefield utility. Transparency per se is less important than weapon effects for warfighting uses, and can even be deleterious for tactics that depend on stealth and mobility. Even a single tactical nuke, however, would inevitably be a political event. Survivability of the second strike deterrent can also militate against transparency, as in the case of the Soviet Perimeter system, as mobility, concealment, and deception can make it harder for an observer to track and count respective forces from space. Counterforce strategies, platform diversity and mobility, ballistic missile defense systems, and force employment doctrine can all make it more difficult for one or both sides in a crisis to know whether an attack is likely to succeed or fail. The resulting uncertainty affects not only estimates of relative capabilities but also the degree of confidence in retaliation. At the same time, there is reason to believe that platform diversity lowers the risk of nuclear or conventional contests, because increasing the number of types of delivery platforms heightens second strike survivability without increasing the lethality of an initial strike [78]. While transparency is not itself a requirement for nuclear use, stable deterrence benefits to the degree to which retaliation can be anticipated, as well as the likelihood that the consequences of a first strike are more costly than any benefit. Cyber operations, in contrast, are neither robust to revelation nor as obviously destructive. The cyber commitment problem Deterrence (and compellence) uses force or threats of force to “warn” an adversary about consequences if it takes or fails to take an action. In contrast, defense (and conquest) uses force to “win” a contest of strength and change the material distribution of power. Sometimes militaries can change the distribution of information and power at the same time. Military mobilization in a crisis signifies resolve and displays a credible warning, but it also makes it easier to attack or defend if the warning fails. Persistence in a battle of attrition not only bleeds an adversary but also reveals a willingness to pay a higher price for victory. More often, however, the informational requirements of winning and warning are in tension. Combat performance often hinges on well-kept secrets, feints, and diversions. Many military plans and capabilities degrade when revealed. National security involves trade-offs between the goals of preventing war, by advertising capabilities or interests, and improving fighting power should war break out, by concealing capabilities and surprising the enemy. The need to conceal details of the true balance of power to preserve battlefield effectiveness gives rise to the military commitment problem [79, 80]. Japan could not coerce the United States by revealing its plan to attack Pearl Harbor because the United States could not credibly promise to refrain from reorienting defenses and dispersing the Pacific Fleet. War resulted not just because of what opponents did not know but because of what they could not tell each other without paying a severe price in military advantage. The military benefits of surprise (winning) trumped the diplomatic benefits of coercion (warning). Cyber operations, whether for disruption and intelligence, are extremely constrained by the military commitment problem. Revelation of a cyber threat in advance that is specific enough to convince a target of the validity of the threat also provides enough information potentially to neutralize it. Stuxnet took years and hundreds of millions of dollars to develop but was patched within weeks of its discovery. The Snowden leaks negated a whole swath of tradecraft that the NSA took years to develop. States may use other forms of covert action, such as publicly disavowed lethal aid or aerial bombing (e.g. Nixon’s Cambodia campaign), to discretely signal their interests, but such cases can only work to the extent that revelation of operational details fails to disarm rebels or prevent airstrikes [81]. Cyber operations, especially against NC3, must be conducted in extreme secrecy as a condition of the efficacy of the attack. Cyber tradecraft relies on stealth, stratagem, and deception [21]. Operations tailored to compromise complex remote targets require extensive intelligence, planning and preparation, and testing to be effective. Actions that alert a target of an exploit allow the target to patch, reconfigure, or adopt countermeasures that invalidate the plan. As the Defense Science Board points out, competent network defenders: can also be expected to employ highly-trained system and network administrators, and this operational staff will be equipped with continuously improving network defensive tools and techniques (the same tools we advocate to improve our defenses). Should an adversary discover an implant, it is usually relatively simple to remove or disable. For this reason, offensive cyber will always be a fragile capability. [41] The world’s most advanced cyber powers, the United States, Russia, Israel, China, France, and the United Kingdom, are also nuclear states, while India, Pakistan, and North Korea also have cyber warfare programs. NC3 is likely to be an especially well defended part of their cyber infrastructures. NC3 is a hard target for offensive operations, which thus requires careful planning, detailed intelligence, and long lead-times to avoid compromise. Cyberspace is further ill-suited for signaling because cyber operations are complex, esoteric, and hard for commanders and policymakers to understand. Most targeted cyber operations have to be tailored for each unique target (a complex organization not simply a machine), quite unlike a general purpose munition tested on a range. Malware can fail in many ways and produce unintended side effects, as when the Stuxnet code was accidentally released to the public. The category of “cyber” includes tremendous diversity: irritant scams, hacktivist and propaganda operations, intelligence collection, critical infrastructure disruption, etc. Few intrusions create consequences that rise to the level of attacks such as Stuxnet or BlackEnergy, and even they pale beside the harm imposed by a small war. Vague threats are less credible because they are indistinguishable from casual bluffing. Ambiguity can be useful for concealing a lack of capability or resolve, allowing an actor to pool with more capable or resolved states and acquiring some deterrence success by association. But this works by discounting the costliness of the threat. Nuclear threats, for example, are usually somewhat veiled because one cannot credibly threaten nuclear suicide. The consistently ambiguous phrasing of US cyber declaratory policy (e.g. “we will respond to cyber-attacks in a manner and at a time and place of our choosing using appropriate instruments of U.S. power” [82]) seeks to operate across domains to mobilize credibility in one area to compensate for a lack of credibility elsewhere, specifically by leveraging the greater robustness to revelation of military capabilities other than cyber. This does not mean that cyberspace is categorically useless for signaling, just as nuclear weapons are not categorically useless for warfighting. Ransomware attacks work when the money extorted to unlock the compromised host is priced below the cost of an investigation or replacing the system. The United States probably gained some benefits in general deterrence (i.e. discouraging the emergence of challenges as opposed to immediate deterrence in response to a challenge) through the disclosure of Stuxnet and the Snowden leaks. Both revelations compromised tradecraft, but they also advertised that the NSA probably had more exploits and tradecraft where they came from. Some cyber operations may actually be hard to mitigate within tactically meaningful timelines (e.g. hardware implants installed in hard-to-reach locations). Such operations might be revealed to coerce concessions within the tactical window created by a given operation, if the attacker can coordinate the window with the application of coercion in other domains. As a general rule, however, the cyber domain on its own is better suited for winning than warning [83]. Cyber and nuclear weapons fall on extreme opposite sides of this spectrum. Dangerous complements Nuclear weapons have been used in anger twice—against the Japanese cities Hiroshima and Nagasaki—but cyberspace is abused daily. Considered separately, the nuclear domain is stable and the cyber domain is unstable. In combination, the results are ambiguous. The nuclear domain can bound the intensity of destruction that a cyber attacker is willing to inflict on an adversary. US declaratory policy states that unacceptable cyber attacks may prompt a military response; while nuclear weapons are not explicitly threatened, neither are they withheld. Nuclear threats have no credibility at the low end, where the bulk of cyber attacks occur. This produces a cross-domain version of the stability–instability paradox, where deterrence works at the high end but is not credible, and thus encourages provocation, at low intensities. Nuclear weapons, and military power generally, create an upper bound on cyber aggression to the degree that retaliation is anticipated and feared [22, 83, 84]. In the other direction, the unstable cyber domain can undermine the stability of nuclear deterrence. Most analysts who argue that the cyber–nuclear combination is a recipe for danger focus on the fog of crisis decision making [85–87]. Stephen Cimbala points out that today’s relatively smaller nuclear arsenals may perversely magnify the attractiveness of NC3 exploitation in a crisis: “Ironically, the downsizing of U.S. and post-Soviet Russian strategic nuclear arsenals since the end of the Cold War, while a positive development from the perspectives of nuclear arms control and nonproliferation, makes the concurrence of cyber and nuclear attack capabilities more alarming” [88]. Cimbala focuses mainly on the risks of misperception and miscalculation that emerge when a cyber attack muddies the transparent communication required for opponents to understand one another’s interests, redlines, and willingness to use force, and to ensure reliable control over subordinate commanders. Thus a nuclear actor “faced with a sudden burst of holes in its vital warning and response systems might, for example, press the preemption button instead of waiting to ride out the attack and then retaliate” [85]. The outcome of fog of decision scenarios such as these depend on how humans react to risk and uncertainty, which in turn depends on bounded rationality and organizational frameworks that might confuse rational decision making [89, 90]. These factors exacerbate a hard problem. Yet within a rationalist framework, cyber attacks that have already created their effects need not trigger an escalatory spiral. While being handed a fait accompli may trigger an aggressive reaction, it is also plausible that the target’s awareness that its NC3 has been compromised in some way would help to convey new information that the balance of power is not as favorable as previously thought. This in turn could encourage the target to accommodate, rather than escalate. While defects in rational decision making are a serious concern in any cyber–nuclear scenario, the situation becomes even more hazardous when there are rational incentives to escalate. Although “known unknowns” can create confusion, to paraphrase Donald Rumsfeld, the “unknown unknowns” are perhaps more dangerous. A successful clandestine penetration of NC3 can defeat the informational symmetry that stabilizes nuclear relationships. Nuclear weapons are useful for deterrence because they impose a degree of consensus about the distribution of power; each side knows the other can inflict prohibitive levels of damage, even if they may disagree about the precise extent of this damage. Cyber operations are attractive precisely because they can secretly revise the distribution of power. NC3 neutralization may be an expensive and rarified capability in the reach of only a few states with mature signals intelligence agencies, but it is much cheaper than nuclear attack. Yet the very usefulness of cyber operations for nuclear warfighting ensure that deterrence failure during brinksmanship crises is more likely. Nuclear states may initiate crises of risk and resolve to see who will back down first, which is not always clear in advance. Chicken appears viable, ironically, because each player understands that a nuclear war would be a disaster for all, and thus all can agree that someone can be expected swerve. Nuclear deterrence should ultimately make dealing with an adversary diplomatically more attractive than fighting, provided that fighting is costly—as would seem evident for the prospect of nuclear war—and assuming that bargains are available to states willing to accept compromise rather than annihilation. If, however, one side knows, but the other does not, that the attacker has disabled the target’s ability to perceive an impending military attack, or to react to one when it is underway, then they will not have a shared understanding of the probable outcome of war, even in broad terms. Consider a brinksmanship crisis between two nuclear states where only one has realized a successful penetration of the rival’s NC3. The cyber attacker knows that it has a military advantage, but it cannot reveal the advantage to the target, lest the advantage be lost. The target does not know that it is at a disadvantage, and it cannot be told by the attacker for the same reason. The attacker perceives an imbalance of power while the target perceives a balance. A dangerous competition in risk taking ensues. The first side knows that it does not need to back down. The second side feels confident that it can stand fast and raise the stakes far beyond what it would be willing to if it understood the true balance of power. Each side is willing to escalate to create more risk for the other side, making it more likely that one or the other will conclude that deterrence has failed and move into warfighting mode to attempt to limit the damage the other can inflict. The targeted nature and uncertain effects of offensive cyber operations put additional pressure on decision makers. An intrusion will probably disable only part of the enemy’s NC3 architecture, not all of it (which is not only operationally formidable to achieve but also more likely to be noticed by the target). Thus the target may retain control over some nuclear forces, or conventional forces. The target may be tempted to use some of them piecemeal to signal a willingness to escalate further, even though it cannot actually escalate because of the cyber operation. The cyber attacker knows that it has escalation dominance, but when even a minor demonstration by the target can cause great damage, it is tempting to preempt this move or others like it. This situation would be especially unstable if only second strike but not primary strike NC3 was incapacitated. Uncertainty in the efficacy of the clandestine penetration would discount the attacker’s confidence in its escalation dominance, with a range of possible outcomes. Enough uncertainty would discount the cyber attack to nothing, which would have a stabilizing effect by returning the crisis to the pure nuclear domain. A little bit of uncertainty about cyber effectiveness would heighten risk acceptance while also raising the incentives to preempt as an insurance measure. Adding allies into the mix introduces additional instability. An ally emboldened by its nuclear umbrella might run provocative risks that it would be much more reluctant to embrace if it was aware that the umbrella was actually full of holes. Conversely, if the clandestine advantage is held by the state extending the umbrella, allies could become unnerved by the willingness of their defender to run what appear to be outsize risks, oblivious of the reasons for the defender’s confidence, creating discord in the alliance and incentives for self-protective action, leading to greater uncertainty about alliance solidarity. The direction of influence between the cyber and nuclear realms depends to large degree on which domain is the main arena of action. Planning and conducting cyber operations will be bounded by the ability of aggressors to convince themselves that attacks will remain secret, and by the confidence of nuclear nations in their invulnerability. Fears of cross-domain escalation will tend to keep instability in cyberspace bounded. However, if a crisis has risen to the point where nuclear threats are being seriously considered or made, then NC3 exploitation will be destabilizing. Brinksmanship crises seem to have receded in frequency since the Cuban Missile Crisis but may be more likely than is generally believed. President Vladimir Putin of Russia has insinuated more than once in recent years that his government is willing to use tactical nuclear weapons if necessary to support his policies. Cyber power and nuclear stability Not all crises are the same. Indeed, their very idiosyncrasies create the uncertainties that make bargaining failure more likely [75]. So far our analysis would be at home in the Cold War, with the technological novelty of cyber operations. Yet not every state has the same cyber capabilities or vulnerabilities. Variation in cyber power relations across dyads should be expected to affect the strategic stability of nuclear states. The so-called second nuclear age differs from superpower rivalry in important ways [91]. There are fewer absolute numbers of warheads in the world, down from a peak of over 70 000 in the 1980s to about 15 000 today (less than 5000 deployed), but they are distributed very unevenly [92]. The United States and Russia have comparably sized arsenals, each with a fully diversified triad of delivery platforms, while North Korea only has a dozen or so bombs and no meaningful delivery system (for now). China, India, Pakistan, Britain, France, and Israel have modest arsenals in the range of several dozen to a couple hundred weapons, but they have very different doctrines, conventional force complements, domestic political institutions, and alliance relationships. The recent nuclear powers lack the hard-won experience and shared norms of the Cold War to guide them through crises, and even the United States and Russia have much to relearn. Cyber warfare capacity also varies considerably across contemporary nuclear nations. The United States, Russia, Israel, and Britain are in the top tier, able to run sophisticated, persistent, clandestine penetrations. China is a uniquely active cyber power with ambitious cyber warfare doctrine, but its operational focus is on economic espionage and political censorship, resulting in less refined tradecraft and more porous defenses for military purposes [16]. France, India, and Pakistan also have active cyber warfare programs, while North Korea is the least developed cyber nation, depending on China for its expertise [93]. It is beyond the scope of this article to assess crisis dyads in detail, and data on nuclear and cyber power for these countries are shrouded in secrecy. Here, as a way of summing up the arguments above, we offer a few conjectures about how stylized aspects of cyber power affect crisis stability through incentives and key aspects of decision making. We do not stress relative nuclear weapon capabilities on the admittedly strong (and contestable) assumption that nuclear transparency in the absence of cyber operations would render nuclear asymmetry irrelevant for crisis bargaining because both sides would agree about the terrible consequences of conflict [94]. We also omit domestic or psychological variables that affect relative power assessments, although these are obviously important. Even if neither India nor Pakistan have viable cyber–nuclear capabilities, brinksmanship between them is dangerous for many other reasons, notably compressed decision timelines, Pakistan’s willingness to shoot first, and domestic regime instability. Our focus is on the impact of offensive and defensive cyber power on nuclear deterrence above and beyond the other factors that certainly play a role in real-world outcomes. First, does the cyber attacker have the organizational capacity, technical expertise, and intelligence support to “compromise” the target’s NC3? Can hackers access critical networks, exploit technical vulnerabilities, and confidently execute a payload to disrupt or exploit strategic sensing, command, forces, or transport capacity? The result would be some tangible advantage for warfighting, such as tactical warning or control paralysis, but one that cannot be exercised in bargaining. Second, is the target able to “detect” the compromise of its NC3? The more complicated and sensitive the target, the more likely cyber attackers are to make a mistake that undermines the intrusion. Attribution is not likely to be difficult given the constricted pool of potential attackers, but at the same time the consequences of misattributing “false flag” operations could be severe [95]. At a minimum, detection is assumed to provide information to the target that the balance of power is perhaps not as favorable as imagined previously. We assume that detection without an actual compromise is possible because of false positives or deceptive information operations designed to create pessimism or paranoia. Third, is the target able to “mitigate” the compromise it detects? Revelation can prompt patching or network reconfiguration to block an attack, but this assumption is not always realistic. The attacker may have multiple pathways open or may have implanted malware that is difficult to remove in tactically meaningful timelines. In such cases the cyber commitment problem is not absolute, since the discovery of the power to hurt does not automatically disarm it. Successful mitigation here is assumed to restore mutual assessments of the balance of power to what they would be absent the cyber attack. Table 1 shows how these factors combine to produce different deterrence outcomes in a brinksmanship (chicken) crisis. If there is no cyber compromise and the target detects nothing (no false positives) then we have the optimistic ideal case where nuclear transparency affords stable “deterrence.” Transparency about the nuclear balance, including the viability of secure second strike forces, provides strategic stability. We also expect this box to describe situations where the target has excellent network defense capabilities and thus the prospect of defense, denial or deception successfully deters any attempts to penetrate NC3. This may resemble the Cold War situation (with electronic warfare in lieu of cyber), or even the present day US–Russia dyad, where the odds of either side pulling off a successful compromise against a highly capable defender are not favorable. Alternately the attack may be deemed risky enough to encourage serious circumspection. However, the existence of Canopy Wing does not encourage optimism in this regard. [[TABLE 1 OMITTED]] Conversely, if there is a compromise that goes undetected, then there is a heightened risk of “war” because of the cyber commitment problem. This box may be particularly relevant for asymmetric dyads such as the United States and North Korea, where one side has real cyber power but the other side is willing to go to the brink where it believes, falsely, that it has the capability to compel its counterpart to back down. Cyber disruption of NC3 is attractive for damage limitation should deterrence fail, given that the weaker state’s diminutive arsenal makes damage limitation by the stronger state more likely to succeed. The dilemma for the stronger state is that the clandestine counterforce hedge, which makes warfighting success more likely, is precisely what makes deterrence more likely to fail. The United States would face similar counterforce dilemmas with other dyads like China or even Russia, although even a strong cyber power should be more circumspect when confronted with an adversary with a larger/more capable nuclear and conventional arsenal. More complex and cyber savvy targets, moreover, are more likely to detect a breach in NC3, leading to more ambiguous outcomes depending on how actors cope with risk and uncertainty. Paradoxically, confidence in cyber security may be a major contributor to failure; believing one is safe from attack increases the chance that an attack is successful. If the successful compromise is detected but not mitigated, then the target learns that the balance of power is not as favorable as thought. This possibility suggests fleeting opportunities for “coercion” by revealing the cyber coup to the target in the midst of a crisis while the cyber attacker maintains or develops a favorable military advantage before the target has the opportunity to reverse or compensate the NC3 disruption. Recognizing the newly transparent costs of war, a risk neutral or risk averse target should prefer compromise. The coercive advantages (deterrence or compellence) of a detected but unmitigated NC3 compromise will likely be fleeting. This suggests a logical possibility for creating a window of opportunity for using particular cyber operations that are more robust to revelation as a credible signal of superior capability in the midst of a crisis. It would be important to exploit this fleeting advantage via other credible military threats (e.g. forces mobilized on visible alert or deployed into the crisis area) before the window closes. One side may be able gain an unearned advantage, an opportunity for coercion via a “bluff,” by the same window-of-opportunity logic. A target concerned about NC3 compromise will probably have some network monitoring system and other protections in place. Defensive systems can produce false positives as a result of internal errors or a deception operation by the attacker to encourage paranoia. It is logically possible that some false positives would appear to the target to be difficult to mitigate. In this situation, the target could believe it is at a disadvantage, even though this is not in fact the case. This gambit would be operationally very difficult to pull off with any reliability in a real nuclear crisis. Cyber–nuclear coercion and bluffing strategies are fraught with danger. Detection without mitigation might put a risk-acceptant or loss-averse target into a “use-lose” situation, creating pressures to preempt or escalate. The muddling of decision-making heightens the risk of accidents or irrational choices in a crisis scenario. Worry about preemption or accident then heightens the likelihood that the initiator will exercise counterforce options while they remain available. These pressures can be expected to be particularly intense if the target’s detection is only partial or has not revealed the true extent of damage to its NC3 (i.e. the target does not realize it has already lost some or all of what it hopes to use). These types of scenarios are most usually invoked in analyses of inadvertent escalation [23–27]. The essential distinction between “use-lose” risks and “war” in this typology is the target’s knowledge of some degree of NC3 compromise. Use-lose and other cognitive pressures can certainly result in nuclear war, since the breakdown of deterrence leads to the release of nuclear weapons, but we distinguish these outcomes to highlight the different decision making processes or rational incentives at work. A “spiral” of mistrust may emerge if one side attempts a compromise but the defender detects and mitigates it. Both sides again have common mutual estimates of the relative balance of power, which superficially resembles the “deterrence” case because the NC3 compromise is negated. Unfortunately, the detection of the compromise will provide the target with information about the hostile intentions of the cyber attacker. This in turn is likely to exacerbate other political or psychological factors in the crisis itself or in the crisis-proneness of the broader relationship. The strange logical case where there is no compromise but one is detected and mitigated could result from a false positive misperception (including a third-party false flag operation) that could conflict spiraling [96, 97]. The bluff and coercion outcomes are also likely to encourage spiraling behavior once the fleeting bargaining advantage dissipates or is dispelled (provided anyone survives the interaction). The risk of crisis instability is not the same for all dyads. It is harder to compromise the NC3 of strong states because of the redundancy and active defenses in their arsenal. Likewise, strong states are better able to compromise the NC3 of any states but especially of weaker states, because of strong states’ greater organizational capacity and expertise in cyber operations. Stable deterrence or MAD is most likely to hold in mutually strong dyads (e.g. the United States and the Soviet Union in the Cold War or Russia today to a lesser extent). Deterrence is slightly less likely in other equally matched dyads (India–Pakistan) where defensive vulnerabilities create temptations but offensive capabilities may not be sufficient to exploit them. Most states can be expected to refrain from targeting American NC3 given a US reputation for cyber power (a general deterrence benefit enhanced by Stuxnet and Snowden). The situation is less stable if the United States is the attacker. The most dangerous dyad is a stronger and a weaker state (United States and North Korea or Israel and Iran). Dyads involving strong and middle powers are also dangerous (United States and China**).** The stronger side is tempted to disrupt NC3 as a warfighting hedge in case deterrence breaks down, while the weaker but still formidable side has a reasonable chance at detection. The marginally weaker may also be tempted to subvert NC3, particularly for reconnaissance; the stronger side is more likely to detect and correct the intrusion but will be alarmed by the ambiguity in distinguishing intelligence collection from attack planning [98]. In a brinksmanship crisis between them, windows for coercion may be available yet fleeting, with real risks of spiral and war**.**

#### IoT innovation will be gutted by patent holdup – antitrust solves

Morton 16 [Fiona Scott Morton, Theodore Nierenberg Professor at Yale School of Management. Carl Shapiro, Former Director of the Institute of Business and Economic Research at UC Berkeley, Professor of the Graduate School at the Haas School of Business and the Department of Economics at the University of California at Berkeley. “Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?”. 2016. https://www.journals.uchicago.edu/doi/full/10.1086/684987#\_i22]

However, our overall conclusions regarding SEPs are more mixed. Policy and legal changes that have reduced the ability of SEP owners to engage in patent holdup appear to have stalled out, especially as regards reform of the IPR rules at SSOs other than the IEEE. If so, this could have important effects on innovation and efficiency. For example, the “Internet of Things” is a new and growing area where royalty stacking and patent holdup appear to be very real dangers. Devices of all sorts, from thermostats to railroad cars to refrigerators, are being given connectivity using standards developed by SSOs. The price of those chips, and whether the IP contained in them costs $5 or $0.50 or $0.005, will determine the nature of new applications and the rate of adoption.

Failure to prevent patent holdup relating to tomorrow’s information technology and communications standards is likely to cause significant social welfare loss in the years ahead. If new and more effective private solutions relating to standard setting do not emerge to promote innovation and protect consumers, antitrust enforcement is one of the only remaining remedies that seems feasible.

V. Conclusions

Over the past five years, the rewards provided to patent owners in the United States have become more closely matched with the value of the technology they contribute. When rewards and contributions are aligned, economic efficiency is promoted because investments into developing new technologies are commensurate with benefits. These changes have come from legislation, the federal courts, and policy statements and enforcement actions by regulators of various types. However, at this juncture, we see a substantial gap persisting between the ability of some patent owners to monetize their patents and the contributions provided by the technology underlying those patents. With the “Internet of Things” poised to create economic growth, this is a problem worthy of further research and policy attention.

#### Solves extinction through resource efficiency

Maheswaran 20 [Mohan, Forbes Council Member on Forbes Technology Council. “Why The IoT Will Save Our Natural Resources”. https://www.forbes.com/sites/forbestechcouncil/2020/02/21/why-the-iot-will-save-our-natural-resources/?sh=49a24ad51be5]

Since the 18th century, industrialization and overconsumption have contributed to the rapid depletion of nature's raw materials. Smart connectivity carves a path for us to be more efficient in our use of these materials, effectively reducing the rate at which we are consuming and wasting natural resources.

According to the United Nations' Global Resources Outlook 2019 report, the worldwide use of natural resources has more than tripled in almost 50 years, with nonmetallic minerals witnessing a fivefold increase and fossil fuel use increasing over 45% over the same time frame.

To ensure that future generations have access to these resources and for the long-term survival of our planet, we must focus our efforts on managing the use of resources like water, gas and coal.

The emerging role of the IoT.

There are many IoT options for preserving natural resources, from tracking the bee population to reducing global carbon remissions, but implementing solutions into existing infrastructure can require a high investment in terms of resources like time and money.

IoT solutions with key capabilities such as long range and low power are more reliable and effective in enabling smart cities, smart enterprises and smart homes to manage resources more efficiently. Their emergence is enabling villages, cities and countries to rapidly and cost-effectively plan and transform themselves into smart communities that prepare a long-term vision for their people and their associated resources.

Long-range, low-power devices also remove the obstacle of capturing incorrect data and/or inaccurate analytics, as these devices provide data in real time that can assist with decision-making processes that help to conserve both exhaustible and inexhaustible resources. Such decisions might include the shutting down of pipelines due to leaks, the monitoring of excess resource use or simply the alert of a potential loss of valuable resources due to imperfect environmental conditions.

For example, according to a survey conducted by the Energy Information Administration, a large commercial building in the U.S. uses an average of at least 20,000 gallons of water per day, while statistics published by the Environmental Protection Agency show that each American uses approximately 88 gallons of water per day. The concern of water shortage is rising so much that in 2014, the Government Accountability Office noted that 40 out of 50 U.S. states expected water shortages over the next 10 years.

Smart water management systems can provide commercial buildings with status updates on how much water is used by the minute and can help predict where water issues could occur while providing valuable, timely information. For corporations with multiple locations, this approach to managing water can help save millions of gallons of water annually, as well as millions of dollars in overhead operation costs.

Embedding the IoT into the land, sea and sky.

Companies like Costco as well as cities across the world are deploying LoRa-enabled sensors to help preserve raw materials and natural resources. High water usage is a common concern among farmers. To maximize the growth of crop yields and to reduce water usage, some farmers are installing LoRa-based sensors to monitor water in real time.

Sensoterra, a technology company offering low-cost wireless solutions for real-time soil moisture measurement for commercial farms, partnered with my company to integrate LoRa-based sensors in its agriculture systems to reduce up to 30% of water usage in commercial farms, including potato and almond orchards. Reducing water usage on commercial farms helps conserve limited water supplies while allowing the farmers to focus more on their businesses.

Additionally, city and park authorities use movement sensors on bridges, roads and buildings to get real-time alerts in case of an impending natural disaster such as an earthquake. Another of our customers, handheld device company Beartooth, uses IoT sensors and enables users to talk, text and locate friends in a cellular network outage without the need for Wi-Fi, and the LoRa-based device has low power consumption.

Air pollution also poses a major risk to our environment and health. According to the World Health Organization, exposure to outdoor air pollution causes 4.2 million deaths per year. IoT sensors are able to collect air quality data to determine the areas causing dangerous air pollution in cities and facilitate the analytical management of suitable air quality control programs. Consumers and businesses have already realized the significance of collecting data and synthesizing it into meaningful patterns of information.

I believe the transition to intelligent information systems will be crucial as global environmental challenges accelerate. Deploying IoT solutions with LoRa-based sensors, together with edge network analytics, makes it possible to install intelligent sensor systems without requiring labor-intensive sensor battery replacements.

In general, deploying an IoT solution is usually complex. Currently, there are limited end-to-end solutions that are available as "out-of-the-box" solutions. Systems integrators are the proper companies to turn to for providing such end-to-end solutions and making sure the relevant back-end IT systems are integrated such that existing processes will benefit from the new IoT data captured from sensors.

One challenge for companies who would like to implement LoRaWAN is that not all countries have public LoRaWAN network providers with nationwide coverage. Some companies prefer to deploy applications that can connect to a broad public, nationwide coverage. However, users are also able to use a private LoRaWAN network, and some customers actually prefer to use a private network. Customers are able to manage the private network by themselves or have third parties like systems integrators manage the network. Such private networks even have benefits compared to public networks when it comes to flexibly deploying LoRa gateways wherever coverage is needed, whether it's indoors or outdoors.

The proliferation of long-range, ultra-low-power IoT sensors and networks is potentially the most important technology innovation in generations that will play a huge role in the buildout of smart cities that will help preserve our future natural resources.

#### Resource wars are the most likely cause of global conflict – scarcity is a conflict multiplier

Lehane 17 [Sinéad Lehane is research manager for Future Directions International’s Global Food and Water Crises Research program. Her current research projects include Australia’s food system and water security in the Tibetan Plateau region. Shaping Conflict in the 21st Century—The Future of Food and Water Security. February 2, 2017. www.hidropolitikakademi.org/shaping-conflict-in-the-21st-century-the-future-of-food-and-water-security.html]

In his book, The Coming Famine, Julian Cribb writes that the wars of the 21st century will involve failed states, rebellions, civil conflict, insurgencies and terrorism. All of these elements will be triggered by competition over dwindling resources, rather than global conflicts with clearly defined sides. More than 40 countries experienced civil unrest following the food price crisis in 2008. The rapid increase in grain prices and prevailing food insecurity in many states is linked to the outbreak of protests, food riots and the breakdown of governance. Widespread food insecurity is a driving factor in creating a disaffected population ripe for rebellion. Given the interconnectivity of food security and political stability, it is likely food will continue to act as a political stressor on regimes in the Middle East and elsewhere. Addressing Insecurity Improving food and water security and encouraging resource sharing is critical to creating a stable and secure global environment. While food and water shortages contribute to a rising cycle of violence, improving food and water security outcomes can trigger the opposite and reduce the potential for conflict. With the global population expected to reach 9 billion by 2040, the likelihood of conflict exacerbated by scarcity over the next century is growing. Conflict is likely to be driven by a number of factors and difficult to address through diplomacy or military force. Population pressures, changing weather, urbanization, migration, a loss of arable land and freshwater resources are just some of the multi-layered stressors present in many states. Future inter-state conflict will move further away from the traditional, clear lines of military conflict and more towards economic control and influence.

#### The United States federal government should substantially increase antitrust prohibitions on standard essential patent holders that engage in anticompetitive licensing practices.

#### Applying antitrust to FRAND violations including refusals to deal solves collapsed innovation and market competition

Greene 19 [Kyle, J.D. Candidate Columbia Law. Columbia Business Law Review Writer and Honors intern @SEC. “Standard Essential Patents and Antitrust Law”. November 2019. https://journals.library.columbia.edu/index.php/CBLR/article/view/5120/2370]

III.ANTITRUST LIABILITY: WHEN SEP HOLDERS REFUSE TO DEAL

A.Reasons for a Presumption of Antitrust Liability

The affirmative case for a presumption of antitrust liability when a SEP holder refuses to deal with a prospective standard implementer in violation of its FRAND commitments proceeds, from the above discussion, as follows: (1) the standard setting process is of vital importance for many industries and technologies, but confers incredible and abusable power to SEP holders,141(2) despite Trinko, the Supreme Court has not ruled out either the essential facilities doctrine or an intent-based inquiry for a Sherman Act Section 2 refusal to deal case,142and (3) the leading circuit court decisions that consider refusals to deal by patent holders in general do not offer policy or legal objections which support an argument against presuming antitrust liability when the patent holder owns a standard essential patent.143As a result, a refusal to deal by an SEP holder is dangerously anticompetitive conduct that is—on its face—exactly the sort of conduct which has been, and should be, condemned by the antitrust laws.

Standards are crucial to the modern economy. But the factors that make standards valuable, even necessary, in so many industries are the same factors that lead to SEP holders occupying a dangerous position from the perspective of the antitrust laws: standards help coordinate disparate technologies and products from many firms into a consolidated, cohesive set. This enables interoperability, access, and the accumulation of massive network effects.144Given those valuable network effects, SEP holders who engage with the process of standards development and make FRAND commitments become ex post gatekeepers—regardless of their ex ante position in the market—to the implementation of standards and thereby control access to the entire market. If an SEP holder then violates its FRAND commitments by refusing to deal, the SEP holder has exhibited all of the markers of a Section 2 case that results in liability.

First, the SEP holder has acquired control over access to an essential facility (the relevant standard) and then denied competitors access to that facility (by refusing to license a patent necessary to fulfill the standard).145Although the same refusal to license its patent might have been acceptable if the SEP holder was not part of the SSO and the patent was not part of the standard, the market power and bargaining position of the patent holder is fundamentally altered when a patent becomes standard essential. This is reminiscent of Associated Press, except here the coordinating organization attempted to prevent the abuse of the SEP holder’s position by securing FRAND commitments from them.146It is therefore the deviant behavior of the SEP holder, not the SSO itself, that is to blame for the anticompetitive harm.

Second, the salient facts of a refusal to deal by an SEP holder are closely analogous to those of Aspen Skiing. The defendant monopolist was found liable in Aspen Skiing for two primary reasons: it had terminated a prior course of voluntary dealing and it had sacrificed short-run profits in order to harm a competitor.148Although an SEP holder may not have previously dealt with any given prospective standard implementer, the SEP holder’s participation in the SSO and its FRAND commitments constitute a prior course of dealing with allfellow participants and implementers of the standard. The subsequent violation of contractual FRAND commitments is a clear termination of that course of dealing. Additionally, licensing an SEP at a reasonable rate is, in isolation,obviously profitable for an SEP holder in the short-run (compared to an alternative world where the SEP holder earns no licensing revenue). The failure to profitably license at a reasonable rate raises, as it did in Aspen Skiing, a strong inference that the goal of the refusal to deal is anticompetitive.149Even if the conduct in Aspen Skiingis at the outer edge of Section 2 liability, it still falls within the boundaries of Section 2 liability. A FRAND-violating refusal to deal by an SEP holder, resembling the important features of Aspen Skiingas closely as it does, must also fall within that boundary.150

Finally, the burden of an inquiry into the intent of the SEP holder should be exactly reversed from what it was when the circuit courts considered refusals to license intellectual property more broadly. In those circuit court cases, the business justifications of the rights holders were treated as presumptively valid and defensible in light of the point of the intellectual property laws. Rather than appearing to be anticompetitive on its face, a refusal to deal seemed well within the ambit of reasonable, legislatively-permitted behavior by a firm holding valuable patents or copyrights. But the inclusion of a patent in a standard is transformative for a firm, and the firm becomes something much more than just another intellectual property rights holder. At that point, the subsequent violation of FRAND commitments is actually anticompetitive on its face: it loudly proclaims that the SEP holder has recognized its power in the market and decided to turn that power toward damaging the competitive process that it had previously contracted to protect and promote. PATENTS1119The presumption of antitrust liability for a SEP holder suggests that it should be presumed to not have a valid business justification when refusing to deal. The SEP holder would have the burden of rebutting this presumption before the court and substantiating a legitimate, procompetitive business justification for the refusal to deal.

B.Contrary Considerations

The strongest counterargument against presumptive antitrust liability for SEP holders who violate their FRAND commitments with a refusal to deal—and against any version of the essential facilities doctrine—is based in the fear that this approach to competition policy would lead to reduced investment and innovation.152The general form of the argument is that forcing firms to deal with competitors might increase competition in the short-run, but in the long-run it will reduce the incentive to innovate153because innovative firms will know that they will not be able to fully capitalize on a successful investment.154This concern is particularly strong in the realm of intellectual property. After all, these rights were specifically developed to give innovators and creators the ability to exclude others from copying and devaluing their work.155This increases the value of intellectual property to the owner and, in turn, encourages the creation of more intellectual property. Without the power to exclude competitors, a patent holder would have very little reason to take the risks and make the investments needed in order to develop a new idea or technology.

However, arguments of this form are often true at the extreme but not necessarily correct at the margin.156The complete lack of protection for intellectual property rights would be devastating for creators and inventors and would drastically reduce the incentives to innovate. But this does not mean that reducing the protections for intellectual property will always reduce the incentives for innovation to a greater degree than it will have positive, structural effects on the market.157To the contrary, this Note argues that antitrust liability will have positive, structural effects on the market which benefit competition and innovation more than the reduced incentives will harm competition and innovation. Still, this debate is fertile ground for further discussion, inquiry, and empirical research. Another possible objection to antitrust liability—this time on statutory rather than policy grounds—is that the Patent Act158created immunity for unilateral refusals to license patents.159The Federal Circuit adopted a version of this approach in CSU v. Xerox. The court based its decision, in part, on an inference that, “[t]he patentee’s right to exclude is further supported by [S]ection 271(d) of the Patent Act.”160But this view is not widely held by academics,161other courts,162or the DOJ or FTC.163A full examination of the Patent Act is outside the scope of this Note, but the idea that § 271(d) created broad antitrust immunity for intellectual property owners is a relatively fringe view.

Finally, it could be argued that the Supreme Court has recently expressed a reluctance to endorse either the essential facilities doctrine or the logic of Aspen Skiing. So, a new presumption of antitrust liability grounded in their fruitful combination is extremely unlikely in the near term. This argument is probably correct. But the question of what the law affords and what should be done with that affordance is separate from the question of what a particular court is likely to do. Presumptive antitrust liability for SEP holders may be wise today, unlikely tomorrow, and a reality the day after.

IV.CONCLUSION

This Note does not argue that an SEP holder should be prevented from benefiting when its patents lend value to a standard; this Note argues that an SEP holder should be prevented from benefiting when it attempts to abuse its position as a gatekeeper to a vital, collaborative standard. A presumption of antitrust liability for an SEP holder who refuses to deal in violation of its FRAND commitments accomplishes this balance. In some dynamic markets, the returns to innovation and the cycle of creative destruction are enough to ensure competition and progress.164But in standards-driven markets that derive their value from the coordinated creation of networks, the antitrust laws are an important bulwark of continued competition and growth.165They should be used accordingly. 164See Katz & Shelanski, supra note 156,at 5 (“Creative destruction means that a firm’s acquisition of possession of market power may be fleeting and that firms must protect such power through ongoing innovation efforts. Under constant pressure from actual and potential innovators, the incumbent firm itself produces better products on better terms for consumers....”). 165See Lao, supra note 22,at 562 (“Combined with a closed network system, network effects can, therefore, effectively create or reinforce existing entry barriers, insulate the monopolist from competition, and lock consumers into the existing technology.”).

### 2

#### Advantage Two is China

#### Influence in standard setting organizations (SSOs) determines future competitiveness, national security, and global tech norms. China understands their importance and is establish themselves as a standards power.

Hormats 21 [Robert D. Hormats, Former undersecretary of State for economic growth, energy and the environment, 2009-13, managing director of Tiedemann Advisors, a New York-headquartered financial firm “Who will set standards for 21st century technologies — the US or China?” 6/3/21. https://thehill.com/opinion/technology/556047-who-will-set-standards-for-21st-century-technologies-the-us-or-china]

The standards that are set will, in some cases, have a major impact in determining which nation’s products will enjoy growing opportunities in international markets. In others, they will regulate how well various countries’ products and services work or interact with those of other countries. In a number they will determine whether certain American products or services have an advantage or disadvantage in the global markets. And they have the potential to set broadly accepted international ethical and normative codes and conventions for growing industries, rather than letting these standards evolve in a nationalistic and fragmented way.

Such standards can affect the ways in which new technologies affect our societies, our security, our economies and our lives for decades to come. They can determine whether these technologies are used in constructive or destructive ways by countries and non-state actors.

Many of the global standards currently in place were set over the years by international “standards-setting” bodies. Many currently existing fora likely will seek to take on the task of determining standards for future technologies, although for certain rapidly emerging and dramatically new technologies no agreed standard-setting institutions yet exist. Where there are groups constituted or charged to take on these tasks, countries that are most effective at negotiating within them or developing coalitions of other members that support their objectives will have an outsized impact on the final rules or norms.

The Chinese understand this very well. They have proven to be effective negotiators in such meetings over the years, and are adept at mobilizing support from many parts of the world; the Belt and Road Initiative and China’s close political and commercial ties in large numbers of countries in the developing world have helped support its objectives. Beijing also has put together a long-term standardization reform plan and a five-year plan for standardization. As the draft Endless Frontier Act points out, China wants to establish itself as a “standards power” and dramatically strengthen its participation in international standards-setting organizations. The U.S. needs to have bold, long-term objectives as well — and a portion of this act is aimed at that. We need also to be a “standards power” in order to serve our global economic and trade interests and ensure that new technologies are ethically and safely utilized.

The legislation emphasizes how critical it is for the U.S. and its allies to participate vigorously in the development of standards that underpin fair international competition and constructive use of advanced technologies. U.S. leadership in standards development is particularly crucial for emerging technologies where there currently are no, or few, agreed international rules and little consensus on what constitutes ethical or safe practices or norms. A strong U.S. role in standards-setting will improve prospects for American competitiveness, the constructive use of certain advanced technologies that could be mobilized for a multitude of purposes, and national security.

#### US ability to influence SSOs is rapidly declining because of FRAND collapse

Hovenkamp 20 [Herbert, James B. Dinan University Professor, University of Pennsylvania Law School and The Wharton School. ‘’FRAND and Antitrust’’. <https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=3095&context=faculty_scholarship>]

While the FRAND process has been highly productive, it is also fragile. Firms are tempted to make commitments at the beginning when the incentive to join is large, but renege on them later when they can profit by doing so. At least in this particular case, private FRAND enforcement had not worked very well. Qualcomm had been able to violate FRAND commitments in order to exclude rivals and obtain higher royalties than FRAND would permit, largely with impunity. Other firms will very likely follow Qualcomm’s lead. If that happens the FRAND system will fall apart, doing irreparable injury to the modern wireless telecommunications network or, at the very least, diminishing the leadership role of the United States in preserving effective network competition.

#### Only reversing royalty hikes maintains US SSO leadership

Sokol 16 [Daniel, full-time law professor at the USC Gould School of Law with a secondary appointment at the USC Marshall School of Business, who serves part-time as Senior Advisor at White & Case, top 10 most cited antitrust law professor in the world. Wentong Zheng, University of Florida Research Foundation Professor & University Term Professor. “FRAND (And Industrial Policy) in China”. 5/5/16. https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2776235]

FRAND related issues are challenging in practice because there have been few cases around the globe that interpret and apply FRAND. Though some cases in dicta may identify patent hold up, no fully litigated case on the merits in the United States or Europe has yet found such hold up to exist in the case of licensing between two operating companies. We further note that the overwhelming majority of license agreements are determined through bilateral contractual negotiations between the parties without the need for any dispute resolution process. Issues of institutional design also contribute to the challenge. Different institutional choices on issues such as injunctions, patent scope, and the determination of fair and reasonable royalties across multiple jurisdictions (sometimes with different outcomes) complicate the FRAND 3 analyses. On the academic side, there is much theorizing about FRAND (Layne-Farrar 2016; Lim 2016) but very little empirical work (Galetovic, Haber and Levine 2015). Much of the academic work to date has been sponsored research or research that is based on consulting from one or more companies in the FRAND debate.

FRAND is an issue that has received an extraordinary amount of attention worldwide, including from antitrust authorities. FRAND issues in both mergers and conduct cases have been explored in: the United States, European Union, China, Korea, Taiwan, and India among others (Blair and Sokol 2016). Different proposals for defining or implementing FRAND (some of them divorced from the facts and circumstances of a particular transaction) abound.

It is in this context of complexity in both the substantive law and the institutional design on FRAND that a relatively new antitrust regime, the Anti-Monopoly Law (AML) of China, 1 has now come on the scene (Sokol 2013; Zheng 2010). Because of the size of China’s economy, developments on FRAND in China potentially have global impact on FRAND rates and even the business models of innovative firms. The operation of market forces will result in globalization of the lowest rate set by a court or agency for a particular patent or patent portfolio in a major jurisdiction. China is such a jurisdiction. Consequently, if China is more influential, it will be because China will be inclined to set rates lower than other jurisdictions. In essence, what happens in China on FRAND now impacts decision-making in the boardrooms of Silicon Valley.

#### US standards leadership prevents extinction from automation, strategic stability, genetic engineering

Jain 19 [Ash Jain is a senior fellow with the Scowcroft Center for Strategy and Security, where he oversees the Atlantic Council’s Democratic Order Initiative and D-10 Strategy Forum, Matthew Kroenig, "Present at the Re-Creation: A Global Strategy for Revitalizing, Adapting, and Defending a Rules-Based International System", 2019, https://www.atlanticcouncil.org/wp-content/uploads/2019/10/Present-at-the-Recreation.pdf]

The system must also be adapted to deal with new issues that were not envisioned when the existing order was designed. Foremost among these issues is emerging and disruptive technology, including AI, additive manufacturing (or 3D printing), quantum computing, genetic engineering, robotics, directed energy, the Internet of things (IOT), 5G, space, cyber, and many others. Like other disruptive technologies before them, these innovations promise great benefits, but also carry serious downside risks. For example, AI is already resulting in massive efficiencies and cost savings in the private sector. Routine tasks and other more complicated jobs, such as radiology, are already being automated. In the future, autonomous weapons systems may go to war against each other as human soldiers remain out of harm’s way.

Yet, AI is also transforming economies and societies, and generating new security challenges. Automation will lead to widespread unemployment. The final realization of driverless cars, for example, will put out of work millions of taxi, Uber, and long-haul truck drivers. Populist movements in the West have been driven by those disaffected by globalization and technology, and mass unemployment caused by automation will further grow those ranks and provide new fuel to grievance politics. Moreover, some fear that autonomous weapons systems will become “killer robots” that select and engage targets without human input, and could eventually turn on their creators, resulting in human extinction. The other technologies on this lisgt similarly balance great potential upside with great downside risk. 3D printing, for example, can be used to “make anything anywhere,” reducing costs for a wide range of manufactured goods and encouraging a return of local manufacturing industries.61 At the same time, advanced 3D printers can also be used by revisionist and rogue states to print component parts for advanced weapons systems or even WMD programs, spurring arms races and weapons proliferation.62 Genetic engineering can wipe out entire classes of disease through improved medicine, or wipe out entire classes of people through genetically engineered superbugs. Directed-energy missile defenses may defend against incoming missile attacks, while also undermining global strategic stability.

Perhaps the greatest risk to global strategic stability from new technology, however, comes from the risk that revisionist autocracies may win the new tech arms race. Throughout history, states that have dominated the commanding heights of technological progress have also dominated international relations. The United States has been the world’s innovation leader from Edison’s light bulb to nuclear weapons and the Internet. Accordingly, stability has been maintained in Europe and Asia for decades because the United States and its democratic allies possessed a favorable economic and military balance of power in those key regions. Many believe, however, that China may now have the lead in the new technologies of the twenty-first century, including AI, quantum, 5G, hypersonic missiles, and others. If China succeeds in mastering the technologies of the future before the democratic core, then this could lead to a drastic and rapid shift in the balance of power, upsetting global strategic stability, and the call for a democratic- led, rules-based system outlined in these pages.63

#### Authoritarian tech lead is an S-Risk of irreversible, constant suffering. That outweighs extinction

Minardi 20 [Di Minardi, "The grim fate that could be ‘worse than extinction’", 10/15/20, https://www.bbc.com/future/article/20201014-totalitarian-world-in-chains-artificial-intelligence]

What would totalitarian governments of the past have looked like if they were never defeated? The Nazis operated with 20th Century technology and it still took a world war to stop them. How much more powerful – and permanent – could the Nazis have been if they had beat the US to the atomic bomb? Controlling the most advanced technology of the time could have solidified Nazi power and changed the course of history.

When we think of existential risks, events like nuclear war or asteroid impacts often come to mind. Yet there’s one future threat that is less well known – and while it doesn’t involve the extinction of our species, it could be just as bad.

It’s called the “world in chains” scenario, where, like the preceding thought experiment, a global totalitarian government uses a novel technology to lock a majority of the world into perpetual suffering. If it sounds grim, you’d be right. But is it likely? Researchers and philosophers are beginning to ponder how it might come about – and, more importantly, what we can do to avoid it.

Existential risks (x-risks) are disastrous because they lock humanity into a single fate, like the permanent collapse of civilisation or the extinction of our species. These catastrophes can have natural causes, like an asteroid impact or a supervolcano, or be human-made from sources like nuclear war or climate change. Allowing one to happen would be “an abject end to the human story" and would let down the hundreds of generations that came before us, says Haydn Belfield, academic project manager at the Centre for the Study of Existential Risk at the University of Cambridge.

Toby Ord, a senior research fellow at the Future of Humanity Institute (FHI) at Oxford University, believes that the odds of an existential catastrophe happening this century from natural causes are less than one in 2,000, because humans have survived for 2,000 centuries without one. However, when he adds the probability of human-made disasters, Ord believes the chances increase to a startling one in six. He refers to this century as “the precipice” because the risk of losing our future has never been so high.

Researchers at the Center on Long-Term Risk, a non-profit research institute in London, have expanded upon x-risks with the even-more-chilling prospect of suffering risks. These “s-risks” are defined as “suffering on an astronomical scale, vastly exceeding all suffering that has existed on Earth so far.” In these scenarios, life continues for billions of people, but the quality is so low and the outlook so bleak that dying out would be preferable. In short: a future with negative value is worse than one with no value at all.

This is where the “world in chains” scenario comes in. If a malevolent group or government suddenly gained world-dominating power through technology, and there was nothing to stand in its way, it could lead to an extended period of abject suffering and subjugation. A 2017 report on existential risks from the Global Priorities Project, in conjunction with FHI and the Ministry for Foreign Affairs of Finland, warned that “a long future under a particularly brutal global totalitarian state could arguably be worse than complete extinction”.

Singleton hypothesis

Though global totalitarianism is still a niche topic of study, researchers in the field of existential risk are increasingly turning their attention to its most likely cause: artificial intelligence.

In his “singleton hypothesis”, Nick Bostrom, director at Oxford’s FHI, has explained how a global government could form with AI or other powerful technologies – and why it might be impossible to overthrow. He writes that a world with “a single decision-making agency at the highest level” could occur if that agency “obtains a decisive lead through a technological breakthrough in artificial intelligence or molecular nanotechnology”. Once in charge, it would control advances in technology that prevent internal challenges, like surveillance or autonomous weapons, and, with this monopoly, remain perpetually stable.

If the singleton is totalitarian, life would be bleak. Even in the countries with the strictest regimes, news leaks in and out from other countries and people can escape. A global totalitarian rule would eliminate even these small seeds of hope. To be worse than extinction, “that would mean we feel absolutely no freedom, no privacy, no hope of escaping, no agency to control our lives at all", says Tucker Davey, a writer at the Future of Life Institute in Massachusetts, which focuses on existential risk research.

“In totalitarian regimes of the past, [there was] so much paranoia and psychological suffering because you just have no idea if you're going to get killed for saying the wrong thing,” he continues. “And now imagine that there's not even a question, every single thing you say is being reported and being analysed.”

“We may not yet have the technologies to do this,” Ord said in a recent interview, “but it looks like the kinds of technologies we’re developing make that easier and easier. And it seems plausible that this may become possible at some time in the next 100 years.”

AI and authoritarianism

Though life under a global totalitarian government is still an unlikely and far-future scenario, AI is already enabling authoritarianism in some countries and strengthening infrastructure that could be seized by an opportunistic despot in others.

“We've seen sort of a reckoning with the shift from very utopian visions of what technology might bring to much more sobering realities that are, in some respects, already quite dystopian,” says Elsa Kania, an adjunct senior fellow at the Center for New American Security, a bipartisan non-profit that develops national security and defence policies.

In the past, surveillance required hundreds of thousands of people – one in every 100 citizens in East Germany was an informant – but now it can be done by technology. In the United States, the National Security Agency (NSA) collected hundreds of millions of American call and text records before they stopped domestic surveillance in 2019, and there are an estimated four to six million CCTV cameras across the United Kingdom. Eighteen of the 20 most surveilled cities in the world are in China, but London is the third. The difference between them lies less in the tech that the countries employ and more in how they use it.

What if the definition of what is illegal in the US and the UK expanded to include criticising the government or practising certain religions? The infrastructure is already in place to enforce it, and AI – which the NSA has already begun experimenting with – would enable agencies to search through our data faster than ever before.

In addition to enhancing surveillance, AI also underpins the growth of online misinformation, which is another tool of the authoritarian. AI-powered deep fakes, which can spread fabricated political messages, and algorithmic micro-targeting on social media are making propaganda more persuasive. This undermines our epistemic security – the ability to determine what is true and act on it – that democracies depend on.

“Over the last few years, we've seen the rise of filter bubbles and people getting shunted by various algorithms into believing various conspiracy theories, or even if they’re not conspiracy theories, into believing only parts of the truth,” says Belfield. “You can imagine things getting much worse, especially with deep fakes and things like that, until it's increasingly harder for us to, as a society, decide these are the facts of the matter, this is what we have to do about it, and then take collective action.”

Preemptive measures

The Malicious Use of Artificial Intelligence report, written by Belfield and 25 authors from 14 institutions, forecasts that trends like these will expand existing threats to our political security and introduce new ones in the coming years. Still, Belfield says his work makes him hopeful and that positive trends, like more democratic discussions around AI and actions by policy-makers (for example, the EU considering pausing facial recognition in public places), keep him optimistic that we can avoid catastrophic fates.

We need to decide now what are acceptable and unacceptable uses of AI

Davey agrees. “We need to decide now what are acceptable and unacceptable uses of AI,” he says. “And we need to be careful about letting it control so much of our infrastructure. If we're arming police with facial recognition and the federal government is collecting all of our data, that's a bad start.”

If you remain sceptical that AI could offer such power, consider the world before nuclear weapons. Three years before the first nuclear chain reaction, even scientists trying to achieve it believed it was unlikely. Humanity, too, was unprepared for the nuclear breakthrough and teetered on the brink of “mutually assured destruction” before treaties and agreements guided the global proliferation of the deadly weapons without an existential catastrophe.

We can do the same with AI, but only if we combine the lessons of history with the foresight to prepare for this powerful technology. The world may not be able to stop totalitarian regimes like the Nazis rising again in the future – but we can avoid handing them the tools to extend their power indefinitely.

#### Private action fails.

Melamed & Shapiro 18, \*A. Douglas Melamed is Professor of the Practice of Law at Stanford Law School; \*Carl Shapiro is the Transamerica Professor of Business Strategy at the Haas School of Business at the University of California at Berkeley; (May 2018, “How Antitrust Law Can Make FRAND Commitments More Effective”, <https://www-cdn.law.stanford.edu/wp-content/uploads/2018/05/How-Antitrust-Law-Can-Make-FRAND-Commitments-More-Effective.pdf>)

2. Why Antitrust Enforcement Is Necessary

Some SSO members have an interest in ensuring that the SSO takes steps to minimize the potential harms from the SEP holders’ monopoly power, and this undoubtedly explains in part why most SSOs have adopted FRAND policies or similar requirements. But, as shown in the economic model in the Appendix,73 SSOs cannot in general be counted on to adopt effective FRAND policies. The bases for this conclusion, which is central to our argument for the applicability of Section 1 to SSO FRAND rules, can be summarized as follows.74

First, the SSO members collectively have an interest in permitting SEP holders to charge supracompetitive royalties that elevate the downstream price of compliant devices to the monopoly level. Doing so will enable the members in aggregate to collect increased revenues from consumers, and thus to generate increased profits that in theory could be shared by all the members. In other words, supracompetitive royalties can enrich industry participants as a group at the expense of final consumers. This fact alone should serve as a clear and strong signal regarding the dangers of counting on SSOs to implement effective FRAND policies: if the SSO members negotiate efficiently, the outcome will be just as bad for consumers as if the members agreed to fix downstream prices.75 The fundamental problem is that final consumers are not at the table when the SSO rules are negotiated.

Second, SSO members that own SEPs but earn little or no profits as implementers have a powerful self-interest in being able to exercise the ex post monopoly power associated with their SEPs. Because SSO policies are usually determined by a consensus process, these members will likely be able to block the adoption of fully effective FRAND policies. Moreover, these SSO members often have the greatest interest in SSO patent policies. Since much of their income may be attributable to patent licensing, they can be expected to devote substantial resources to block the adoption of FRAND policies that effectively prevent patent holdup.

Third, even SSO members that earn significant profits as implementers may have mixed incentives if they also own SEPs, which can also lead to weak or in-effective FRAND rules. In the Appendix, we show that, if the requisite share of votes in the SSO are cast by firms whose share of SEP royalties is at least as large as their share of downstream profits, and if these firms can coordinate their voting over the FRAND rules, then an SSO unconstrained by antitrust laws will establish FRAND rules leading to an outcome no better for consumers than would result from an integrated monopolist controlling all SEPs and all downstream sales.76

Fourth, even SSO members that are downstream implementers and own few, if any, SEPs may have only a modest interest in promoting effective policies to restrict ex post opportunism. Because all implementers will be subject to the opportunism, all of them will face increased licensing costs, and therefore will likely be able to pass on most or all of the increased costs to their customers.77 Furthermore, these implementers might not be especially active or effective in the standard-setting process for free-riding or public-good reasons, especially if SEP royalties constitute only a relatively small portion of the costs of their standard-implementing products. Public choice theory predicts that the highly motivated SEP holders are likely to have the greatest influence over patent policies.

Empirical evidence bears out these concerns. As a starting point, we find it striking that SSO FRAND rules are almost always quite vague.78 Notably, SSOs in which SEP holders are more prevalent tend to have weaker FRAND rules.79 Further, to our knowledge, SSOs have made almost no effort to enforce their FRAND rules and have, instead, left enforcement efforts to others.80 This evidence raises serious doubts about the effectiveness of the existing FRAND rules in preventing ex post opportunism.

# 2AC

## A1

#### Much of holdup evidence is hidden from the public eye – thousands of deals are made behind closed doors

Wood 13 [Chris Wood and Joseph Kattan, partners in the Antitrust and Trade Regulation practice of Gibson, Dunn & Crutcher LLP. “Standard-Essential Patents and the Problem of Hold-Up”. 12/13/13. http://awa2014.concurrences.com/IMG/pdf/standard\_essential\_patent\_kattan-wood.pdf]

It is notable that the standard implementers in the cases discussed above were large multinational corporations, with the resources to engage in protracted litigation. Less known are the financial settlements extracted by holders of FRAND-encumbered SEPs, which are subject to confidentiality agreements that shield them from the public eye. For example, before having to defend its royalty demands in a declaratory judgment action, Innovatio had sent 8,000 demand letters to businesses such as coffee shops and hotels that used Wi-Fi equipment.46 The terms of its settlements with these businesses are not known. Nor are the terms of the confidential settlements of infringement cases brought by SEP holders known. The size of the demands made by the SEP holders in the cases discussed above certainly supports the view that implementers of industry standards face a genuine risk of post-adoption patent hold-up. Particularly in the case of Wi-Fi patents, which were at issue in each of these cases, the demands are extraordinary not only because of the royalty stack that they imply but because each involved a small sliver of the universe of SEPs for a standard for which the “central elements” were based on publicly available technologies.

#### It’s real.

Pierre Régibeau et al 16. Raphaël De Coninck and Hans Zenger. Charles River Associates. “Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing” June 2016. European Commission.

We do not think that this would be a correct conclusion to draw from the literature. First, the **formal empirical literature** - supported by a large number of case studies – shows quite unambiguously that, in the absence of contractual or organisational solutions, **hold-up would be a significant issue.** Second, it is generally hard to write complete contracts about innovations, since it is hard to write down an ex-ante contract about a solution that still has to be found. If we would ever expect un-remedied hold-up to occur, this would concern investment and exploitation of intellectual property rights. Third, the usual solutions to the hold-up problem are **further made difficult** by the current SSO process. There is essentially **no attempt** to force participants to sign reasonably complete contractual agreements at the beginning of the process. Very few SSOs require participants to make **explicit commitments on the prices and conditions** at which their IPRs would be made available to implementers. Traditional contractual solutions to potential hold-up are therefore not used. Common “organisational” solutions such as the formation of joint ventures or vertical integration between IP- owners and implementers are also not used in the SSO-based standardisation process. As we discuss later, when we talk about transactions costs of standardization processes, these features of the standardization process may have good economic reasons that make some contractual incompleteness unavoidable. Fourth, in some sectors like ICT, recent technological evolution has destabilised some of the mechanisms that might have greatly reduced the hold-up problem in the past. In particular, the emergence of new actors such as computer-oriented companies and non-practicing entities has decreased the degree of vertical integration between SEP- owners and implementers and has disrupted a culture of repeated collaboration between more traditional SSO participants. Our own assessment on the basis of these observations is that, if left unchecked, hold- up, in the sense defined, is an **issue in the context of SEPs.** Moreover, as recent changes have weakened some of the mechanisms that have likely limited opportunistic behaviour by SEP-holders in the past, renewed attention to hold-up minimising regulatory mechanisms seems warranted. It is therefore important to contemplate policy measures aimed at reducing hold-up and its negative impact on prices and, possibly, investments. However, we should also expect the relevance of hold-up to vary considerably across industries. Intense competition between users to be first to market, complex, uncertain and **fast-moving technologies** and the emergence of new, non-integrated players are all factors that would **magnify concerns about hold-up related costs.**

#### Applying antitrust to FRAND doesn’t deter innovation since investments happen before rate changes

Cary 11 [George Cary, Mark Nelson, Steven Kaiser, Alex Sistla. Cary and Sistla are members of the California and District of Columbia Bars. Mr. Nelson is a member of the New York and District of Columbia Bars. Mr. Kaiser is a member of the New Jersey and District of Columbia Bars. “THE CASE FOR ANTITRUST LAW TO POLICE THE PATENT HOLDUP PROBLEM IN STANDARD SETTING”. Antitrust Law Journal No 3. (2011). https://www.clearygottlieb.com/~/media/organize-archive/cgsh/files/publication-pdfs/the-case-for-antitrust-law-to-police-the-patent-holdup-problem-in-the-standard-setting.pdf]

Finally, measuring FRAND based on the ex ante value of a technology is unlikely to have any negative impact on incentives to innovate. Geradin’s hypothesized discovery of incremental ex post value was unanticipated, by definition, and would generally come to light only after investments in innovation were made. Under these circumstances, we doubt that the inability to capture such windfall gains later would deter a company from investing in innovation. Indeed, the existing practice of many essential patent holders to negotiate royalty rates early on, and in many cases before a standard is adopted, belies the concern about inadequate incentives to innovate. If firms believed it was important to be able to capture unanticipated future benefits of a technology, they would not so readily enter into long-term licensing agreements that locked them into established royalty rates. Indeed, in our experience firms typically consider the trade-off between the FRAND rate at which they license their technology (even assuming this rate is lower than some hypothetical ex post rate) and the additional sales volume they are likely to achieve by having their technology incorporated into a standard. Moreover, our experience with industry practice suggests that royalty rates for a particular technology do not increase, and often decrease, over time, suggesting that the concern that ex ante royalties will be too low is more theoretical than real.

#### Monopoly pricing and selective licensing undermines 5G innovation---FRAND enforcement is key.

Actonline 20, the App Association represents more than 5,000 app companies and information technology firms across the mobile economy; (August 26th, 2020, “Save Our Standards: The Ninth Circuit Court of Appeals Reverses Decision in FTC v. Qualcomm”, <https://actonline.org/2020/08/26/save-our-standards-the-ninth-circuit-court-of-appeals-reverses-decision-in-ftc-v-qualcomm/>), ability edited

Moreover, the FRAND agreement is a critical tool used by standard setting organizations to ensure the process enhances competition and does not run afoul of antitrust laws. Generally, a collaboration between competitors to choose market winners or set prices raises significant questions for competition regulators. Royalty free and FRAND licensing requirements were created by standards bodies to avoid potential antitrust scrutiny by limiting the market power and the potential for abuse by those involved in developing a standard. This is why the American National Standards Institute (ANSI) will not accredit any standards developing organization (SDO) that does not require standard-essential patent holders to provide licensing terms at least as favorable as FRAND.

The most important beneficiary of open interoperability standards and FRAND licensing requirements are the entrepreneurs and small businesses that have long fueled America’s innovation engine. They don’t have giant patent portfolios, market power, or the resources to hire legions of lawyers and spend years battling SEP abusers in civil court. Without some level of certainty about their ability to obtain licenses—let alone what they may cost—entrepreneurs will have trouble justifying the pursuit of any innovation that uses a standard and will certainly struggle to raise money from investors for such innovation. And Qualcomm’s vague and toothless promise simply “not to sue” smaller companies and component makers is no substitute for a license.

The adoption of 5G technology is expected to open unprecedented opportunities for innovation and economic growth as we move toward a world where everything from cars to tractors to buildings will connect to wireless networks. At every stage of the information technology revolution, America has been the undisputed leader because of the unparalleled entrepreneurial innovation ecosystem that we have built. If 5G SEP holders are able to arbitrarily refuse licenses to smaller firms, it would ~~cripple~~ undermine America’s innovation ecosystem at the start of the next big wave of innovation. As economic tensions continue to rise with China, Chinese-based companies could use their 5G SEPs as international economic weapons to thwart U.S. competitors.

The 5G standard is supposed to be a platform for competition, innovation, and entrepreneurship, but if the Ninth Circuit decision is allowed to stand, it will become a chokepoint for snuffing out competitors and demanding monopoly rents. Open standards and FRAND licensing commitments are fundamental to competition in the modern economy, and the idea that they aren’t a subject for antitrust enforcement is patently absurd.

## A2

#### Antitrust law is well developed, predictable, and has a better enforcement regime than alternatives for patent holdup

Cary 11 [George Cary, Mark Nelson, Steven Kaiser, Alex Sistla. Cary and Sistla are members of the California and District of Columbia Bars. Mr. Nelson is a member of the New York and District of Columbia Bars. Mr. Kaiser is a member of the New Jersey and District of Columbia Bars. “THE CASE FOR ANTITRUST LAW TO POLICE THE PATENT HOLDUP PROBLEM IN STANDARD SETTING”. Antitrust Law Journal No 3. (2011). https://www.clearygottlieb.com/~/media/organize-archive/cgsh/files/publication-pdfs/the-case-for-antitrust-law-to-police-the-patent-holdup-problem-in-the-standard-setting.pdf]

Antitrust law directly addresses anticompetitive conduct. It is a well-developed body of law, with relatively clear doctrines and standards. Almost from the time of its inception in the late 19th century, it has received significant attention from the Supreme Court, and this attention has, if anything, increased in recent years. It is recognized to be a common law doctrine, which provides all of the flexibility and adaptability that the common law affords.28

Moreover, in major economies, governments employ significant resources to enforce their antitrust laws. In the United States, this includes substantial enforcement regimes at two agencies, the Department of Justice and the Federal Trade Commission. No comparable enforcement regime exists in any other area that might police standard-setting abuse. Even where the government is not involved, the antitrust law provides relatively broad standing to parties that are directly harmed by the anticompetitive conduct at issue, including consumers.

Therefore, it is unsurprising that antitrust has long been applied to the conduct of standard-setting organizations. As one of us recently described in depth, there is little debate that the activity of SSOs (and their members) can raise serious anticompetitive issues, which may—in certain cases—violate Sections 1 and/or 2 of the Sherman Act.29 Indeed, because the opportunistic conduct resulting in patent holdup specifically “concerns the inefficient acquisition of market power,”30 many commentators have “generally assumed that [such] opportunism in the standard-setting process is an antitrust problem.”31

## Reg CP

### 2AC – Patent CP – Kentucky

#### Only antitrust enforcement creates a consumer-action feature that counterbalances SSO’s conspiratorial incentives---private action fails.

Melamed & Shapiro 18, \*A. Douglas Melamed is Professor of the Practice of Law at Stanford Law School; \*Carl Shapiro is the Transamerica Professor of Business Strategy at the Haas School of Business at the University of California at Berkeley; (May 2018, “How Antitrust Law Can Make FRAND Commitments More Effective”, <https://www-cdn.law.stanford.edu/wp-content/uploads/2018/05/How-Antitrust-Law-Can-Make-FRAND-Commitments-More-Effective.pdf>)

2. Why Antitrust Enforcement Is Necessary

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## States

### 2AC – States CP

#### Standard setting is global and SSOs are outside of US jurisdiction

Kasdan 19 [Abraham and Michael. Partners in IP Law @ Wiggins and Dana LLP. “Recent Developments In The Licensing Of Standards Essential Patents”. 8/30/19. https://www.natlawreview.com/article/recent-developments-licensing-standards-essential-patents-0]

Technologies that operate across many different devices and geographical regions are all around us. As one example, today's mobile telephones can connect to 3G/4G/LTE and WiFi networks and communicate with other devices virtually anywhere in the world. This is made possible because all of these devices comply with highly specific technical standards that are promulgated by national and/or international standards setting organizations (SSOs), made up of companies involved in developing and building these global technologies.

When aspects of technical standards are protected by patents, the patent owners are generally obligated by the pertinent SSO to offer licenses to their patented technology under "fair, reasonable and non-discriminatory" (FRAND) terms, as the quid pro quo for having their patented technology included in the standard. The purpose behind the FRAND requirement is to prevent patent owners from gaining an unfair advantage over companies who must make devices that practice the standard in order to participate in the market; and are therefore necessarily “locked in” to standard-compliant designs.

Over the past several years, the licensing and litigation landscape involving standard essential patents (SEPs) and FRAND has become a matter of intense focus. Numerous technology industries, as well as courts around the world have begun to grapple with key issues such as “How do you determine what a FRAND licensing rate should be?” and whether a licensor’s offer is FRAND or not. This article summarizes several recent developments in the transnational licensing of SEP portfolios.

The Overall Landscape

Not surprisingly, most of the recent licensing disputes over SEPs involve the worldwide telecommunications industry. A host of multinational companies have been involved in developing the 2G, 3G, 4G and soon-to-be-commercialized 5G standards (aspects of which are also described by a bewildering array of acronyms, such as "LTE" and "LTE Advanced" ) These standards specify the technical features included in mobile phones and their networks.

The European Telecommunications Standards Institute (ETSI) is an SSO charged with developing worldwide standards for these technologies. Early on, SSOs recognized that the incorporation of patented technology into a standard could give the patent holder significant leverage when negotiating licenses. SSOs therefore required the patent holder to agree to make its SEPs available on FRAND licensing terms. However, ETSI, like other SSOs, does not provide guidance on how to structure licensing terms that meet the FRAND requirement. Indeed, doing so or setting price or royalty rates among entities in a given industry may raise antitrust issues. This leaves it to others to work out the specifics of how SEP owners can comply with the FRAND requirement.

#### State international regulation gets preempted, kills foreign investment and triggers massive economic uncertainty

O’Rourke 10 [Ken, Senior Partner @ O'Melveny & Myers LLP. “United States: The FTAIA In State Court: A Defense Perspective”. 3/3/10. https://www.mondaq.com/unitedstates/trade-regulation-practices/95030/the-ftaia-in-state-court-a-defense-perspective]

A threshold question is whether these limitations similarly restrict the extraterritorial application of state antitrust laws. Defendants will argue that the state antitrust laws cannot permissibly extend to reach conduct or give rise to damages that Congress has placed beyond the reach of federal antitrust law under the FTAIA.

The defendants' argument goes like this. First, under the Supremacy Clause of the U.S. Constitution,4 federal law preempts state law even in the absence of an express preemption provision when, "under the circumstances of [a] particular case, [the challenged state law] stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."5

Second, the FTAIA's legislative history establishes that Congress had multiple objectives when enacting the statute. One objective was to ensure that the risk of Sherman Act liability did not prevent American exporters and other firms doing business abroad from entering into advantageous "business arrangements (such as joint selling arrangements), however anticompetitive, as long as those arrangements adversely affect only foreign markets."6

Another objective was to eliminate "ambiguity in the precise legal standard to be employed in determining whether American antitrust law is to be applied to a particular transaction."7

Congress sought to adopt a "clear benchmark ... for businessmen, attorneys and judges as well as [U.S.] trading partners"8 with the "ultimate purpose" of "promot[ing] certainty in assessing the applicability of American antitrust law to international business transactions and proposed transactions."9

A third objective was to promote international comity by acknowledging and respecting the prerogatives of other nations to establish and apply their own standards for regulating and remediating alleged restraints of trade in their own markets.10

Congress believed that respecting such foreign sovereign regulatory prerogatives would ultimately best serve U.S. interests by "encourage[ing] our trading partners to take more effective steps to protect competition in their markets."11

Applying state antitrust laws to regulate foreign trade or commerce excluded from federal antitrust jurisdiction by the FTAIA arguably would frustrate every one of these objectives.

American exporters and other businesses engaged in foreign trade or commerce could have no confidence that restraints exempted from federal antitrust attack would not be subject to alternative antitrust attack under the laws of one or more U.S. states. Businesses, therefore, would be deterred from entering into arrangements that Congress intended to enable.

Likewise, ambiguity in the "standard to be employed" for assessing the extraterritorial application of "American antitrust law" would not only persist, but would be multiplied fifty times.

And the imposition of as many as 50 states' antitrust laws on foreign trade or commerce clearly would negate the federal objectives of international comity and respect for foreign regulation of foreign markets.

At every level then, the application of state antitrust laws to foreign trade or commerce exempted by the FTAIA from federal antitrust regulation would "stand[] as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress" in enacting the FTAIA.12

Plaintiffs likely will counter these preemption arguments by pointing out that there is a presumption against preemption and that Congress did not expressly overrule any state antitrust law when enacting the FTAIA.

True, Congress did not address the reach of state antitrust laws, one way or the other, when it enacted the FTAIA. However, the Sherman Act has always extended to "commerce with foreign nations,"13 and was subject to a large body of pre-FTAIA case law addressing the limitations on its extraterritorial reach.14

By contrast, state antitrust laws such as California's Cartwright Act do not expressly reference foreign commerce and have no comparable history of being applied to it.

Congress, therefore, had no cause to be concerned that states would attempt to apply state antitrust laws to foreign trade or commerce exempted from federal regulation by the FTAIA.

Even if there had been such a concern, Congress would have been amply justified in anticipating that the doctrine of implied obstacle preemption — well established when the FTAIA was enacted in 198215 — would resolve any conflict.16

Take California as a specific example. There is a "strong presumption" against preemption, particularly in fields that have been the subject of California's "historic police powers."17 Antitrust plaintiffs would argue that California's "historic police powers" include the authority to regulate competition in California.

On the other hand, the U.S. Supreme Court has consistently held that the power of states to regulate commercial activity outside their borders is necessarily circumscribed.18 That principle applies a fortiori when states attempt to regulate foreign trade or commerce.19

Even in cases involving traditional regulation of conduct within state borders, the California Supreme Court has declined to apply a presumption against preemption where the regulation in question also implicates foreign affairs.20

When the area of regulation encompasses not only foreign trade and commerce but also international relations — that is to say, areas in which federal rather than state interests traditionally predominate — the case for preemption is even stronger.21

Extending the foreign extraterritorial reach of state antitrust laws beyond the limits of the Sherman Act would infringe not only the Supremacy Clause but several additional constitutional provisions establishing federal primacy in the areas of foreign trade, foreign commerce and international relations.22

This allocation of power is intended to ensure that only one entity — the federal government — represents American interests in foreign trade and commerce and foreign affairs.23

In recognition of these principles, courts have repeatedly invalidated state laws that undermine, or threaten to undermine, federal policies and prerogatives in the areas of foreign trade and commerce or foreign affairs.24

These decisions support a conclusion that states cannot constitutionally apply state antitrust laws such as the Cartwright Act to remediate alleged harm from restraints of trade in foreign markets having no direct, substantial and foreseeable anti-competitive effects on trade or commerce in the United States (as would be required for federal antitrust jurisdiction under the FTAIA).

There are policy reasons for this result as well. Claims arising from international cartel conduct or overseas monopolistic behavior arguably seek to apply state antitrust law to decide the legality of foreign conduct (e.g., communications between English and Japanese manufacturers about industry standards, or discussions between Chinese and Korean buyers, or joint ventures in Singapore investing in South America) regardless of whether such conduct was legal when and where it occurred.

Such claims threaten much more than an "incidental or indirect effect" on foreign trade and the internal affairs of foreign countries exercising their sovereign rights to regulate their own markets.25

To assert a state's antitrust law as an all-encompassing international antitrust statute available to police alleged restraints of trade in every country would contravene the federal policy, reflected in the FTAIA, of promoting international comity in this area.26

And allowing one state to apply its antitrust laws to foreign transactions paves the way for every other state to apply its antitrust statutes beyond the limits of the FTAIA.27

Exposure to a thicket of state antitrust regimes would drive foreign companies to avoid doing business that even tangentially affects U.S. commerce.

Finally, such an outcome would conflict with the reported decisions considering this specific issue. One federal court, in In re Intel Corp. Microprocessor Antitrust Litig. ("Intel II"),28 held that California Cartwright Act claims are "limited by the reach of their applicable federal counterparts."29

Intel II analyzed the question as follows:

"Plaintiffs have ... not demonstrated that their state law claims should be applied beyond the boundaries set by the FTAIA ... As the Supreme Court has recognized, '[f]oreign commerce is pre-eminently a matter of national concern,' and therefore, it is important for the Federal Government to speak with a single, unified voice.

"Here, Congress has spoken under the FTAIA with the 'direct, substantial and reasonably foreseeable effects' test, and the Court is persuaded that Congress' intent would be subverted if state antitrust laws were interpreted to reach conduct which the federal law could not."30

The only published California appellate decision on the issue, Amarel v. Connell, similarly holds that the Cartwright Act should not be construed to allow prosecution of extraterritorial antitrust claims that the FTAIA would not.31

The Amarel court observed that "[t]he legislative history of [the FTAIA] discloses it was intended to establish a uniform standard, in the face of conflicting judicial formulations, of the domestic effects necessary to trigger the jurisdiction of American antitrust laws,"32 and that "the proper approach to a preemption analysis is to reconcile 'the operation of both statutory schemes with one another rather than holding one completely ousted.'"33

The court concluded that the plaintiffs' state law antitrust claims were "not preempted" because, as pleaded, the claims did not seek to apply state antitrust laws in a manner inconsistent with the FTAIA.

Rather, they sought damages for anti-competitive practices "alleged to have had an adverse effect on the relevant markets in this state ..."34

According to the court:

"So long as the anticompetitive conduct in question has a direct, substantial and reasonably foreseeable effect within the state, prosecution of the conduct under state law is not precluded."35

In sum, there are strong reasons for a state court evaluating a state law antitrust claim involving foreign trade or commerce to limit the reach of that state law co-extensively with the reach of the Sherman Act as defined by the FTAIA.

#### Big tech antitrust and tax policy now solves – we’re inserting blue

Stofferahn 21—(MA in public policy from the **University of Minnesota**). Stofferahn, Justin. 2021. “Anti-Monopoly Movement: States Can Lead.” Minn Post. July 23, 2021. https://www.minnpost.com/community-voices/2021/07/anti-monopoly-movement-states-can-lead/.

Several weeks ago President Joe Biden signed a sweeping executive order that included 72 initiatives across the federal government aimed at combating America’s monopoly problem. Biden’s executive action is the first concerted effort to fight concentrated corporate p ower in decades. While anti-monopoly, particularly antitrust, is often seen as a job for the federal government, Biden’s order acknowledges the key role state government could and should play in reducing monopolists’ stranglehold.

Today, in an era of rampant economic concentration that is squeezing workers, destroying small businesses and distorting our political system, states like Minnesota can lead the way in standing up to corporate power. Minnesota has done this before. In 1871, as the Minnesota Grange movement was beginning to build momentum, the Legislature confronted that era’s most prominent monopolist by establishing maximum fares and rates for railroads and creating the office of railroad commissioner. The Grange went on to establish the Minnesota Anti-Monopoly Party in 1873 and with the help of Democrats, won legislative seats in 1874. These electoral victories lead to creation of a railroad commission as state legislators continued the work of curbing monopoly power.

Action in New York, Wyoming …

Looking to the present, states are again poised to lead the way. Last month the New York State Senate passed a groundbreaking overhaul of its antitrust laws. The 21st Century Antitrust Act would establish a broader standard for antitrust enforcement based on a firm’s ability to dominant markets, instead of the much narrower consumer welfare standard. Prior to that, Wyoming increased the fines companies will face for violating antitrust law, while state attorneys general have filed major suits against Google, Facebook and Amazon.

Beyond changes to antitrust law, state legislators across the country have been advancing anti-monopoly policies that take aim at today’s leading monopolist, Big Tech. This spring several states, including Minnesota, introduced legislation that would break up Google and Apple’s duopoly over the development of smartphone apps by allowing customers to use alternative app stores for app distribution and cap the predatory fees (as high as 30 percent) developers are charged.

Evaluating tax subsidies and exclusions

States are also taking a second look at tax policies that have aided large corporations’ economic takeover. Big Tech has grown fat off billions in state and local tax subsidies and exclusions, such as Minnesota’s sales tax exemption for data centers, which costs nearly $100 million annually! Research suggests these incentive programs are little more than a black hole of corporate largesse. Some policymakers are finally waking up to this corporate abuse and trying to end these programs, while others have joined the effort to establish an interstate tax compact that would limit the use of corporate giveaways. Minnesota would be well served to join these other states and examine the way in which taxpayer funds are used to pad the bottom lines of Fortune 500 companies.

Workers are also in the crosshairs of monopolists. Highly concentrated labor markets drag down wages, with Amazon warehouses serving as one particularly stark example of monopoly power putting the screws to working families. One tool used to accomplish this wage suppression are noncompete agreements, which are restrictive covenants prohibiting a worker from taking a job at a competing firm. The Economic Policy Institute has estimated 27.8% to 46.5% of workers are subject to noncompetes! States such as Illinois, Nevada and Oregon, have recently passed legislation limiting these coercive contracts.

Consumers are not spared the ills of monopoly power. For example, manufacturers such as Apple and John Deere make it impossible for consumers or independent repair technicians to fix items like smartphones and tractors. This forces consumers to either purchase a new product or send the device to the manufacturer itself, raising prices and destroying entrepreneurial opportunities for independent technicians. For the past several years legislators in Minnesota and across the country have introduced legislation that would break up this monopoly power and grant consumers the “Right to Repair” the things they own.

Apple, Google add lobbyists

While legislators, including some in Minnesota, are starting to understand the toolbox available to curb corporate power, the fate of many of these bills underscores the challenges ahead. Just days after Minnesota legislators introduced the app store legislation, Apple and Google each added three new lobbyists. The bills subsequently went nowhere. In North Dakota, Big Tech lobbyists persuaded the Senate to vote down similar legislation, and in Arizona, while app store legislation passed the House, it has gone nowhere in the Senate after Apple and Google “hired almost every lobbyist in town.”

The proposals outlined here are just some of the ways Minnesota can rebalance its economy. What is needed more than policy ideas are policymakers willing to challenge corporate power and think creatively about the role state government can play. That will require an electorate that presses candidates, at all levels, on their plans to confront corporate power and restore competition. Minnesota made anti-monopoly cool over a century ago; it can do so once more.

#### Not extinction – just to national security – Cal inserts blue

Silk 20—(PhD in philosophy from the University of Waterloo). Matthew S.W. Silk. April 6, 2020. The Pandemic and the Threat of Income Inequality”. The Prindle Post. https://www.prindlepost.org/2020/04/the-pandemic-and-the-threat-of-income-inequality/. Accessed 8/2/21.

The United States has one of the highest levels of wealth inequality in the developed world. It is not new information to most people that the top 1% of income earners make 30 times the income of those in the middle. The top 10% of families held 76% of the wealth in the United States in 2013. Over the past ten years many have tied this information to national security. An article from 2013 notes that this disparity, along with a lack of employment, could lead to an increase in youth gangs, property crime, and higher prison populations. Another from 2018 similarly points to the potential for higher crime. Despite these concerns, others have argued that we should not see income inequality as a problem. In 2013, the Cato Institute argued that the threat of civil unrest owing to income inequality is negligible and has no relationship to the concept of national security, noting “it is difficult to credit the view that inequality poses a security threat unless ‘security’ is completely redefined.” In 2017, the Heritage Foundation published a report arguing that there is little evidence that the very rich and the very poor have significantly divergent interests or influence over policy.

Yet, one event that the articles I have cited did not seem to see coming was an existential threat like a viral pandemic. It is well known from past cases that viral outbreaks can be particularly harsh on the poor. During the 1918 Spanish flu epidemic, the poor were significantly affected by the first wave. During the current COVID-19 epidemic we see this pattern repeating. Given that many people are now staying and home and not working, income is falling. Half of the nation would not have $400 if needed for an emergency which means that they are going to have a difficult time paying their rent and other living expenses. The result is going to be that millions will not be able to pay and could face evictions. While some politicians and governments are working to prevent this, that hasn’t stopped the calls for rent strikes during the pandemic. This means that during a time when social distancing is necessary, evictions and increases in the number of homeless will make the spread of the virus more difficult to contain.

In addition, wealth inequality is having a direct effect on healthcare. Roughly 10% of Americans did not have health insurance before the pandemic and most of these are likely to live in poverty. Without insurance, people are more likely to want to treat themselves at home or to avoid seeing a doctor. Now, millions of Americans who rely on employment benefits for coverage may now lose it. As many as 14 million may lose their jobs by summer. Those most vulnerable for losing their jobs are likely to work in the service and retail industries and are more likely to be low-wage workers. The cost of treatment for COVID-19 can be up to $35,000. This means that millions of Americans who could already not afford to pay rent can definitely not afford the potential cost of treatment. Indeed, there are already reports of potential deaths owing to lack of insurance.

What this means is that you now have large numbers of people who, despite the risk of increasing the spread of COVID-19, now still need to work in order to prevent losing their homes and their coverage. You have people who have now lost their jobs and their healthcare coverage less likely to seek medical care if they need it or to follow health protocols prescribed by governments to prevent the spread of the virus. This means that less will come forward for testing and less treatment of those who may have contracted COVID-19. As Joseph Eisenberg, chair of epidemiology at the University of Michigan notes, “People will go a lot longer since they don’t have access to healthcare…that both means they’ve been in the community more and been transmitting more, and when they get to the hospital their prognosis is going to be a lot worse.” So, in addition to a health crisis, there will also likely be an insurance crisis and a housing crisis owing to the economic situation of those worse off.

In addition, many of the jobs now deemed essential to keep supply chains going are those filled by the working poor. These include those who work in the food industry, custodial staff, many others including grocery stores staff. These people, in addition to staff employed in Amazon warehouses, are worried about a lack of protection against the virus. Amazon workers are calling for a strike to demand protection. Grocery store staff are worried about a lack of protective equipment as well. Despite efforts to protect these employees, several of them have now contracted the virus. At first many of these employers were not even offering paid sick leave and now that they are, there is still confusion. While many of these employers are now offering pay raises in response to the crisis, this still means that we are in a situation where most of us are now depending on low income workers to keep deliveries coming and to ensure that there is still food on the store shelves. These individuals are the very same who are now at a higher risk of contracting the virus and simultaneously less likely to seek treatment for it.

How does all of this relate to national security? Income inequality has exacerbated the healthcare crisis, will contribute to the eventual economic and financial crises, and has resulted in a situation where society is now counting on many of the poorest people to continue to risk their health in order to ensure supply lines continue to function, all while being more likely to be hurt by the pandemic. Now only does this increase the risk of social unrest, it makes handling the pandemic more difficult. Income inequality is now an existential threat to national security. While it may be easy to think that once the pandemic ends this threat will pass, a warming climate means the range of disease-carrying animals is increasing; this may not be the last major pandemic we will face. While it is cynical to think that we should only deal with a problem like income inequality because of this, the fact that the disparity between the rich and poor is a national security threat reminds us that there is a moral significance for everyone to do something about it.

#### Inequality inevitable

Gobry, 5-20 — Pascal-Emmanuel Gobry, 5-20-2016, Accessed: 10-1-2017, "Is inequality inevitable?" No Publication, http://theweek.com/articles/625010/inequality-inevitable

This might be the most depressing finding in social science. A new study tried to assess intergenerational mobility by looking at last names and found the highest earners in Florence in 2011 were the descendants of the highest earners in the year 1427, nearly 600 years earlier. Social mobility, or the lack thereof, persisted "despite the huge political, demographic, and economic upheavals that occurred between the two dates." Lest you think this problem is quarantined to Italy, let me assure you: It is not. There have been similar findings across various countries that possess vastly different cultures, histories, and political and economic systems, including Sweden, England, the U.S., and even China, in spite of the Maoist revolution. Those of us in the modern democratic West tend to think intergenerational mobility is desirable and achievable. Sure, social stratification exists, but, we think, with just the right policy tweaks, we can ensure every child at the bottom rung has a shot at joining, if not the 1 percent, then at least the 10 percent. But what if social mobility on a large scale simply isn't possible? If Chairman Mao, who sent his country's entire elite to death camps and labor camps, couldn't shuffle the deck, do you really think Bernie Sanders will? Regardless of circumstances, people with the money will always have the power to pass on their privilege, whether that power takes the form of actual political power, or money, or status, or social capital and social networks, or human capital.

## Fund CP

### 2AC – AT: Fund

#### Government R&D can’t solve growth or innovation

Terence Kealey 21. Professor of clinical biochemistry at the University of Buckingham. "Federal Science Funding Won't Accomplish Anything the Private Sector Can't Do Better". Cato Institute. 6-16-2021. https://www.cato.org/commentary/federal-science-funding-wont-accomplish-anything-private-sector-cant-do-better

A bipartisan group led by Senate Majority Leader Chuck Schumer (D-N.Y.) wants to counter China with legislation to dramatically increase government funding of pure science (science that is mainly concerned with theory rather than practical applications). They call their bill the U.S. Innovation and Competition Act. But if they really want to spur innovation and competition, they should be trying to slash science subsidies, not increase them.

The most potent criticisms of the government funding of science have come from government agencies themselves. The first came in 1969 when the Office of the Director of Defense Research and Engineering analyzed 700 research “events” that had led to the development of 20 weapons systems—finding that only two of those events were in pure science.

Then the Congressional Budget Office (in both 1991 and 1998) and the Bureau of Labor Statistics (2007) reviewed the entire academic literature, finding that study after study showed that the research projects that governments funded had failed, on average, to generate profits: in contrast, the research projects that the private sector funded were, overall, highly profitable.

Finally, in 2003 the Organisation of Economic Cooperation and Development, on studying the growth rates of the 21 leading world economies between 1971 and 1998, found that whereas levels of privately funded R&D correlated strongly with national rates of economic growth, there was no positive impact on GDP per capita from publicly‐​funded research and development.

Government funding of science isn’t just ineffective; it crowds out private sector success. When the government subsidizes a company’s science, or when the government pays for a research program, that company or that program will benefit. But the economy at large will suffer, because scientists have been pulled out of the projects the market was trying to fund.

Many view government funding of science as a foregone conclusion. But while the federal government has long funded so‐​called “mission research,” such as the Coast Survey (1807), it didn’t start to fund pure science until 1950, when it established the National Science Foundation (NSF).

The blueprint for the NSF was provided by American engineer Vannevar Bush. In his “linear” or “pipeline” model, he proposed there were both military and market failures in pure science: Only if the government funded pure science would U.S. technology flourish. In the ensuing years, much federally funded research has proven him wrong.

This is a tough story to propagate because the vested interests are aligned. The universities and the scientists lobby for governments to give them money on their own terms; industry lobbies for subsidies; and governments enjoy distributing research money, as the Medicis once did to Galileo. But the data show that these schemes will not benefit the economy.

Advocates for government funding of science will point to the many good things it has helped produce, including the internet. Vast funds for research will indeed yield good things, but the government studies cited above show that the costs of that research merely equal the benefits. In stark contrast, the costs of private research are dwarfed by their benefits. The plural of anecdote is not data; and if we are to get policy right, we should look to systematic cost‐​benefit studies, not anecdotes.

After the Soviets launched Sputnik in 1957, the federal government hugely increased its funding of research. Yet rates of growth in U.S. GDP per capita did not rise, and rates of productivity growth actually fell. That implies that government funding of research crowded out more useful work

## Security K

### 2ac

#### Studying existential risk is key to disaster management – you’re biased to deflate the risk with cherry picked examples BUT the negative effects of fear and insecurity are massively exaggerated – Masco is the worst account of security politics

Zimmerman 15 [Vera. MA in Political Science from George Mason University, BA in Global Affairs from George Mason University; BA in Translation between English, Russian, Ukrainian from Mariupol State University, Research Analyst at the Hudson Institute, “Book Review: The Theater of Operations: National Security Affect from the Cold War to the War on Terror. By Joseph Masco (Durham and London: Duke University Press, 2014)”, 5-23, https://verair.wordpress.com/2015/05/23/the-theater-of-operations-national-security-affect-from-the-cold-war-to-the-war-on-terror-by-joseph-masco-durham-and-london-duke-university-press-2014/]

In the aftermath of the 9/11 attacks, the United States prompted a global debate about nuclear terrorism to justify the invasion of Iraq, provoking much disapproval around the world, yet criticism at home about the country’s unilateral actions—unsuitable for a Western liberal democracy—did not seem to be as vociferous. In his latest book The Theatre of Operations, Professor of Anthropology, Joseph P. Masco, explains this acquiescence by the American society as a result of the well-designed population reprogramming based on fear of a nuclear catastrophe at home. This allowed for the rearrangement of the social contract, society’s docile obedience, and the expansion of national security apparatus to a planetary scale. The book portrays the state and a society as two organisms of one nervous system, both overreacting to fear of the imagined nuclear existential threat. What strikes the reader is the revelation that the United States has already practiced emotional management of its society during the Cold War. The strategic surprise attack on 9/11 triggered the return to a Schmittian state with friend-enemy distinctions, obsessed with anticipation, prevention, and proliferation of “present, contingent, projected, imagined terror” (194). The book contains five chapters written in protest against the amplification of national security threats, emotional manipulation of citizens, enlargement of security apparatus, and too much secrecy—the elements that enabled the counterterror state and created a global theater of operations. Masco shows that fear of an existential threat is a powerful emotion able to make officials overreact in their policies and convince people to sacrifice their civil liberties in the name of defense. The author does not believe that the 9/11 attacks and the receipt of a few anthrax letters were necessarily an existential threat to the U.S. national security but only served as a pretext to justify expanded defense, population management, and projection of power globally. As he puts it: “The amplification of threat has been one of the key attributes of this new system, which relies on an affective atmosphere of imminent danger to unlock new forms of governmental agency.” He makes a strong case that the American liberal democracy turned into a counterterror state which “thrives on a proliferating insecurity, using vulnerability and imaginative creativity, scenarios, fears, nightmares as its raison d’etre” (197). It “promises a world without terror via the constant production and response” of terror (156). Throughout the book, Masco maintains that the created counterterror state based on the secrecy/threat matrix is incompatible with democratic governance. Statements such as these are found all through the book with a notable lack of competing explanations to his argument. While only briefly recognizing the existence of the real threats, Masco’s critical interpretations of the government’s actions seem over confident and biased. In chapter one, “Survival Is Your Business: Engineering Ruins and Affect in Nuclear America,” Masco argues that the fear of existential nuclear devastation is embedded in every day American culture. The lively depiction of existential disasters (equated to the effects from nuclear explosions) found in recent Hollywood blockbusters of the 1990s like Armageddon and Deep Impact is reminiscent of a 1950s civil defense documentary spectacle Cue for Survival on the effects of a post-nuclear explosion in American city. The films demonstrate how the fear of the anticipated, imaginary nuclear devastation not only built a nuclear state as a response but produced a culture of nuclear fear that enabled the present counterterror state. To mobilize the American society after 9/11, the government only had to attach the image of WMD to a terrorist. More recent evidence that highlighted the strong impact of nuclear imagery in American culture was the perception and presentation of hurricane Katrina. In chapter two “Bad Weather: On Planetary Crisis,” Masco shows a strong link between nuclear war and ecological crisis in American culture. Instead of viewing Katrina as a result of climate change, the destruction was understood by America’s leadership, media, and citizens only in terms of nuclear catastrophe and was linguistically equated to an atomic explosion in Hiroshima. In “Sensitive but Unclassified: Secrecy and the Counterterror State”, Masco argues that excessive secrecy, which enabled the counterterror regime, has become nothing more than “a means to power” and is incompatible with democracy. Resorting to claims based on secrecy, the executive power asserts superior knowledge which not only helps manipulate threats but avoids legal persecution. Masco interprets the reclassification of the declassified documents that occurred after 9/11 as “the government’s refusal to admit its responsibility for the creation of boundless, endless nuclear and counterterror state.” In chapter four, “Biosecurity Noir: WMDs in a World without Borders,” Masco singles out concrete evidence of the amplification of the invisible biothreat triggered by the receipt of a few anthrax letters in 2001 to support his argument about the made-up ambiguous link to WMD. The author highlights that by proliferating ~~visions~~ [depictions] of catastrophic danger, biosecurity created a militarized response of global preemption in the name of domestic defense. Masco argues his case well and sharply, providing compelling evidence, but his interpretations of evidence at times seems exaggerated and biased. Though Masco does not deny the existence of the real threats, his recognition of them is too brief, while consideration of an alternative view is rather weak. He acknowledges that terrorist violence is not fictitious but insists that for the most part the United States inflated threats and politically exploited potential danger to declare and maintain the state of emergency. Such focus on the amplification of threats seems to suggest that for the most part the threats are not that real. Masco suggests that the link between terrorists and WMD is mainly inflated. Yet there is a real global concern about 2,000 tons of highly-radioactive nuclear materials being stored in poorly secured civilian locations around the world. The book never mentions the threat of a dirty bomb, which today is viewed as a more likely occurrence than an atomic bomb explosion. The IAEA cites a hundred reported thefts of nuclear materials on average each year. There is a good chance terrorists can get their hands on enough nuclear materials to produce a dirty bomb. The United States meets these challenges with increased international cooperation. Masco’s main argument that “the US is no longer constrained by territorial limits” is exaggerated. The only two cases cited when the United States appeared unconstrained were the invasion of Iraq. Though the invasion of Iraq was opposed by some U.S. allies (France, Germany, and New Zealand), it was still a combined force coalition from the U.S., the UK, Australia, and Poland. The United States does not have an unrestricted reach as Masco wants to depict. It is constrained by sovereignty and territorial integrity of other stable states. The unstable nuclear regimes in North Korea and Iran present that existential nuclear threat to the U.S. described by Masco, but the United States is in no rush to invade these countries. According to the anticipatory and preemptive logic Masco prescribes to the United States, it could have already invaded those states to prevent the disaster. Another limitation of his argument is that he paints the nuclear and counterterror states as consistent through all the presidencies, thus, drawing all administrations under a common denominator. Under Obama, the counterterror state became a liberal democracy again. The ‘unrestrained’ theater of operation has shrunk by ending the presence in Iraq and withdrawing from Afghanistan, even though our presence there could have been extended based on the preemption logic. Obama recognized the faults of the Bush administration in acting unilaterally, scaled back stability operations, and emphasized sharing the costs and responsibilities of global leadership. The emergence of the real ISIL threat undermines the book’s core argument of threat amplification, the U.S. preemption logic of response, and unconstrained global reach. The U.S.-led global effort against ISIL amounts to more than 50 nations, which shows the unified nature of the fight. Masco asserts that U.S. superpower depends on the ability of the state to monopolize a discourse of danger, but he doesn’t discuss how the United States succeeded in doing that. Masco could have developed his argument by tracing how the United States was able to use its soft power to mobilize like-minded states to agree with U.S. hegemony on WOT. It will be interesting to trace the U.S. internalization of fear and terror. He could have examined how allies responded to U.S. domestic mobilization of its population and whether other states imitated U.S. emotional management projects to mobilize their own populations. This would boost his argument that the U.S. was able to project its power on the global scale. In *Theatre of Operations*, Masco makes a compelling argument about the creation of the unrestrained theater of operations via domestication of fear and terror carried over from the Cold War days. His anthropological study reveals the extent to which a democracy is willing to use fear to assure the core principle of the social contract, defined by Hobbes as the exchange of public obedience for collective security. A democracy that chooses to be preoccupied with security risks to forgo core democratic values resulting in the lack of transparency, restriction of free flow of information, and negligence of non-military threats—no less threatening than nuclear terrorism. Making criticism of U.S. actions the main focus of the book, however, Masco’s interpretations are not properly balanced and sometimes appear biased. Still, reading Masco’s insight of the purpose of U.S. actions in the post-9/11 context offers opportunities to think critically about the effects of 9/11 emotional reprogramming of society and state of emergencies in U.S. history.

## Infrastructure

### 2AC—Infrastructure

#### Senate’s focused on nominations

Raymond 10/27 [Nate Raymond, "U.S. Senate confirms 2 more Biden judicial picks in biggest week yet", 10/27/21, https://www.reuters.com/legal/litigation/us-senate-confirms-2-more-biden-judicial-picks-biggest-week-yet-2021-10-27/]

The U.S. Senate on Wednesday confirmed two more of President Joe Biden's judicial picks in the biggest week yet for his nominees winning approval, as Democrats race to put their stamp on the bench while they maintain their narrow control of the chamber.

The Senate voted 52-46 to make Sarala Vidya Nagala the first federal judge of South Asian descent in Connecticut and 52-46 to elevate Michael Nachmanoff, a magistrate judge and former public defender, to become a judge in the Eastern District of Virginia.

Nachmanoff declined comment. Nagala did not immediately respond to a request for comment.

The votes came after the Senate earlier this week voted to confirm four other judicial nominees, including voting rights advocate Myrna Pérez to serve on the 2nd U.S. Circuit Court of Appeals, the most in a single week during Biden's term.

The Senate on Tuesday confirmed Jia Cobb, Karen McGlashan Williams and Patricia Tolliver Giles to district court judgeships in Washington, D.C., New Jersey and the Eastern District of Virginia, respectively.

A seventh nominee, Connecticut federal district court pick Omar Williams, is expected to receive a vote on Thursday, after the Senate on Wednesday voted 52-46 to cut off debate on his nomination.

The Senate has now voted to confirm 25 of Biden's 51 district and circuit court picks, a rate not seen since the Nixon administration.

Republican President Donald Trump by this point in his tenure had only won confirmation for seven judges, according to data collected by Russell Wheeler, a visiting fellow at the Brookings Institution.

The Democrats' goal is to counter the influence of Trump's near-record 234 confirmed judicial nominees. With their 50-50 control of the Senate an election away from being lost, Democrats have every incentive to keep up the quick pace.

Brian Fallon, the executive director of the progressive advocacy group Demand Justice, credited Senator Majority Leader Chuck Schumer, who in addition to scheduling rapid votes has recommended several nominees in his home state of New York.

"Leader Schumer is doing everything you could want in terms of using floor time to quickly confirm President Biden's nominees, as well as in recommending professionally diverse nominees for New York-based judgeships," Fallon said.

The latest confirmations were in keeping with Biden's goal of putting more women and minorities on the bench and promoting lawyers with civil rights and public defender backgrounds, rather than just former prosecutors and law firm alums.

#### Won’t pass—impossible to get unity among progressives and Sinemanchin

Glasser 10/28 [Susan B. Glasser is a staff writer at The New Yorker, "Biden Can’t Quite Close the Deal—with His Own Party", 10/28/21, https://www.newyorker.com/news/letter-from-bidens-washington/biden-cant-quite-close-the-deal-with-his-own-party]

Biden needed Democratic unity in both chambers not only to support the social-spending bill but to finally allow the House to vote on a nearly trillion-dollar bipartisan infrastructure bill that passed the Senate earlier this year with the support of nineteen Republicans. The House vote has been held up since then because his party’s progressives refused to proceed with it until they got an agreement on the bigger social-spending package. At the House Democrats’ meeting Thursday morning, Speaker Nancy Pelosi told the caucus that they should take the infrastructure vote that very afternoon rather than “embarrass” Biden by forcing him to show up in Europe empty-handed.

The problem, as it has been for months, is that absolute party unanimity is almost impossible to achieve, and yet that unanimity is necessary for a Democratic President without congressional majorities large enough to enact transformational legislation. Kyrsten Sinema, one of the two Democratic holdouts in the Senate, released a statement soon after Biden’s, praising the “significant progress,” which was not the robust endorsement that the White House had been hoping for. “I look forward to getting this done,” she added. Whatever that means. The statement from Joe Manchin, the West Virginia Democrat and the other Senate holdout, was also less than unequivocal. “This is all in the hands of the House right now,” he said. “I’ve worked in good faith, and I look forward to continuing to work in good faith. And that is all I have to say today.” This, needless to say, did not go over well among House Democrats. Representative Dan Kildee, of Michigan, complained that it was just more “hieroglyphics” from Manchinema—or was that Sinemanchin? Either way, the statements weren’t enough to get progressives to relinquish their hold on the infrastructure bill. One leading progressive, Rashida Tlaib, asked whether she would vote to pass the infrastructure bill, said that she wasn’t just a no, she was a “hell no.” So was much of the rest of the hundred-member-strong Progressive Caucus. By midday Thursday, the framework agreement was looking less and less like an agreement and more and more like a squeeze play to finally get the deal done.

**Lawmakers will compartmentalize conflict on separate issues – specific to infrastructure**

**Pergram 18** (Chad Pergram, Congressional reporter. “Amid Kavanaugh cacophony, Congress forges bipartisan agreements on key issues”. October 13, 2018. <https://www.foxnews.com/politics/amid-kavanaugh-cacophony-congress-forges-bipartisan-agreements-on-key-issues>)

Step back from the Kavanaugh cacophony. Examine what lawmakers from both parties in both chambers accomplished in September and early October, with virtually zero fanfare. **Amid** the **turmoil**, Congress approved the first revamp of national aviation policy in years. The Senate approved the final version of the legislation 93-6. This came after a staggering six extensions due to bickering and disagreement. Then, Congress approved a sweeping, bipartisan measure to combat opioid abuse. The House okayed the package 393-8. The Senate adopted the measure 98-1. And, there was no government shutdown. The House and Senate came to terms on two bipartisan bills which funded five of the 12 annual spending bills which operate the government. The sides agreed to latch an additional measure to one of the spending plans to fund the remaining seven areas of federal spending through December 7. President Trump briefly threatened to force a government shutdown if lawmakers didn’t include money for his border wall in the plan. But the President ultimately punted that battle until December. Democrats praised Republicans for keeping conservative “poison pill” riders out of the appropriations bills. That decision drew Democratic support for the measures. The Senate approved a bipartisan **water and infrastructure** package. McConnell hailed the **bipartisanship** which descended upon the Senate – **even as the senators fought over Kavanaugh**. Nearly **in the same breath**, McConnell derided boisterous, anti-Kavanaugh protesters outside the Capitol as a “mob.” McConnell insisted this week he needed the Senate to clear a slate of 15 conservative judges to lower courts before he could cut senators loose for the midterm elections. McConnell and Schumer appeared at loggerheads. McConnell’s goal was clear: extract the confirmation of these nominees – or tether to Washington vulnerable Democratic senators from battleground states to keep them off the campaign trail. Schumer knew McConnell would ultimately prevail on the nominees after the midterms. So the New York Democrat accepted McConnell’s ransom, permitting the Senate vote on a slate of nominees on Thursday night. Schumer also extracted a concession from McConnell: send senators home until November 13th. One may wonder how lawmakers can find themselves in an **imbroglio** over a major issue like Kavanaugh – **yet forge major bipartisan accords on other**. Frankly, that’s just politics. Politics always elicits strange bedfellows. Successful lawmakers know they should **compartmentalize their disputes**. The enemy today may be your best ally tomorrow.

#### Aff is bipartisan and popular

Muris 17 [Timothy, Foundation Professor of Law at George Mason University’s Antonin Scalia Law School and Senior Counsel at Sidley Austin LLP. “Bipartisan Patent Reform and Competition Policy”. May 2017. https://www.aei.org/wp-content/uploads/2017/05/Bipartisan-Patent-Reform-and-Competition-Policy.pdf]

Finally, I have outlined how antitrust law can assist contract and patent law in limiting holdup. Under Republicans and Democrats, the antitrust agencies have pursued anticompetitive conduct. Despite disagreement on particular cases and on the underlying theory under which cases should proceed, there is widespread agreement on the importance of the issue and its suitability as an appropriate subject for antitrust enforcement. Further attention to patent holdup in the Trump administration is warranted and would continue the bipartisan focus on this vital issue.

#### Even $500 million of new investment’s insufficient

Abramsky 10/29 [Sasha Abramsky is a freelance journalist and a part-time lecturer at the University of California at Davis, "The Centerpiece of the Build Back Better Climate Plan Has Been Stripped Out", 10/29/21, https://truthout.org/articles/the-centerpiece-of-the-build-back-better-climate-plan-has-been-stripped-out/]

Even the stripped-down version of the bill, which looks likely to come in at about $1.75 trillion in new spending, as opposed to the $3.5 trillion originally envisaged, currently promises to contain upward of $500 billion to fund climate change-related investments, most of it devoted to tax incentives to encourage companies to move toward cleaner energy products. That’s a lot of money, and if used effectively, it has the potential to alter the country’s relationship to fossil fuels and to carbon emissions over the next decade.

But what could have been a moment in which the full force of the federal government was laser-focused on transforming the economy to rapidly and permanently move away from fossil fuels, and on mitigating the effects of global warming, has instead degenerated into a food fight. Yes, there may still be a lot of money unleashed to tackle climate change, but it will be done with ill will, begrudgingly and denuded of vital provisions designed to turbo-charge the restructuring of the economy.

#### Warming doesn’t trigger extinction

* peer-reviewed journal shows IPCC exaggeration
* history proves resilience
* no extinction- warming under Paris goals
* rock breaking strategy could offset warming

IBD 18 [Investors Business Daily, Citing Study from Peer reviewed journal by Lewis and Curry, “Here's One Global Warming Study Nobody Wants You To See”, 4/25/18, https://www.investors.com/politics/editorials/global-warming-computer-models-co2-emissions/]

Settled Science: A new study published in a peer-reviewed journal finds that climate models exaggerate the global warming from CO2 emissions by as much as 45%. If these findings hold true, it's huge news. No wonder the mainstream press is ignoring it.

In the study, authors Nic Lewis and Judith Curry looked at actual temperature records and compared them with climate change computer models. What they found is that the planet has shown itself to be far less sensitive to increases in CO2 than the climate models say. As a result, they say, the planet will warm less than the models predict, even if we continue pumping CO2 into the atmosphere.

As Lewis explains: "Our results imply that, for any future emissions scenario, future warming is likely to be substantially lower

than the central computer model-simulated level projected by the (United Nations Intergovernmental Panel on Climate Change), and highly unlikely to exceed that level.

How much lower? Lewis and Curry say that their findings show temperature increases will be 30%-45% lower than the climate models say. If they are right, then there's little to worry about, even if we don't drastically reduce CO2 emissions.

The planet will warm from human activity, but not nearly enough to cause the sort of end-of-the-world calamities we keep hearing about. In fact, the resulting warming would be below the target set at the Paris agreement.

This would be tremendously good news.

The fact that the Lewis and Curry study appears in the peer-reviewed American Meteorological Society's Journal of Climate lends credibility to their findings. This is the same journal, after all, that recently published widely covered studies saying the Sahara has been growing and the climate boundary in central U.S. has shifted 140 miles to the east because of global warming.

The Lewis and Curry findings come after another study, published in the prestigious journal Nature, that found the long-held view that a doubling of CO2 would boost global temperatures as much as 4.5 degrees Celsius was wrong**.** The most temperatures would likely climb is 3.4 degrees.

It also follows a study published in Science, which found that rocks contain vast amounts of nitrogen that plants could use to grow and absorb more CO2, potentially offsetting at least some of the effects of CO2 emissions and reducing future temperature increases.

## 1AR

### CP

#### No inequality impact

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Inequality is unjust, not bad for growth Disparity of income is both a virtue and a vice. The virtue of providing rewards for effort and generating economic growth must be balanced against the vice of inequality’s manifest injustice. Riches derived through good fortune, good parents or being born at a good time are far from easy to defend. The problem for society and governments is to determine an acceptable degree of redistribution, balancing the remaining inequality with the blunted incentives from higher taxes and benefits. Or so we thought. The past two years have witnessed huge growth in the industry of academic research rejecting this trade-off. Lower inequality boosts growth, its advocates claim, so countries really can have more redistribution, a narrower gap between rich and poor, alongside more sustained economic expansion. Leading the charge towards the new consensus are two somewhat surprising institutions — the International Monetary Fund and the Organisation for Economic Cooperation and Development. Are these traditional bastions of orthodoxy infusing their policy prescriptions with the most up-to-date empirical evidence or merely following fashion? There is no doubt that the new ideas are strongly held. Angel Gurría, head of the OECD, is convinced of the new reality. “Addressing high and growing inequality is critical to promote strong and sustained growth,” he says only to be outbid in rhetorical certainty by Christine Lagarde, the fund’s managing director. She reckons the rich should thank the poor. “Contrary to conventional wisdom, the benefits of higher income are trickling up, not down,” she says. For all the excitement among this rarefied global elite, the research results are mundane. Economic performance varies wildly over time and across countries, yet the evidence suggests inequality explains only a tiny fraction of these differences. Whatever effect the gap between rich and poor might have on growth, other forces dominate, so we should not look to redistribution as the new engine of growth. With the results almost entirely based on cross-country correlations, they also have troubling inconsistencies. Ms Lagarde and the IMF research think that a higher income share for the rich harms economic performance while the OECD says only inequality between the poorest and the middle matters. The Paris-based international organisation concludes that a lack of access to skills among the poor is the mechanism by which higher inequality hits growth at the same time as finding no role for skills in its equations on growth. If the global results are weak, they also have close to zero policy prescriptions for rich countries where the results have caused most excitement — the US and the UK in particular. Far from being examples of the worst excesses of capitalism, these Anglo-Saxon nations emerge from the IMF data set as countries with relatively strong growth, low inequality and high redistribution.

#### Nearly all major SSOs are global – we’ll insert a table

Maskus 13 [Keith and Stephen A. Merrill, editors, contributors include: National Research Council; Policy and Global Affairs; Board on Science, Technology, and Economic Policy; Committee on Intellectual Property Management in Standard-Setting Processes. “Patent Challenges for Standard-Setting in the Global Economy”. https://www.nap.edu/catalog/18510/patent-challenges-for-standard-setting-in-the-global-economy-lessons]

The committee’s selection of SSOs to examine represents a diversity of organization types (both formal standards organizations and consortia) and geographical foci (U.S., European, and global) and encompasses standards activity across the range of ICT technologies—consumer electronics, microelectronic products and their associated software and components, and communications networks including the Internet. These organizations and their salient characteristics are listed in Table S-1.

TABLE S-1 Organizations and their Salient Characteristics

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#### Federal courts grant implied antitrust immunity wherever they can

Kahn 8 [Jacob Kahn, J.D. Candidate, Chicago-Kent College of Law, 2008; B.A., Economics, Amherst College, 2004. “From Borden to Billing: Identifying a Uniform Approach to Implied Antitrust Immunity fr Antitrust Immunity from the Supr om the Supreme Cour eme Court's Precedents ecedents “. June 2008. https://scholarship.kentlaw.iit.edu/cgi/viewcontent.cgi?article=3697&context=cklawreview]

Despite the Supreme Court's reluctance to grant claims for implied antitrust immunity, the lower federal courts have granted six such claims in the last five years. 31 Moreover, although such a small group of cases is not normally cause for concern, it is significant here because federal courts had granted just four implied immunity claims in the previous nineteen years, and none since 1991.32 At the very least, the increased frequency of successful claims suggests that courts today are more willing to find implied antitrust immunity. Has the doctrine of implied antitrust immunity been diluted?

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#### Reps aren’t deterministic – they have to prove the plan is bad under their framework because the political context is the determining feature of how representations are deployed

Shim 14 [David Shim is Assistant Professor at the Department of International Relations and International Organization of the University of Groningen. “Visual Politics and North Korea: Seeing is believing.”]

Imagery can enact powerful effects, since political actors are almost always pressed to take action when confronted with images of atrocity and human suffering resultant from wars, famines and natural disasters. Usually, humanitarian emergencies are conveyed through media representations, which indicate the important role of images in producing emergency situations as (global) events (Benthall 1993; Campbell 2003b; Lisle 2009; Moeller 1999; Postman 1987). Debbie Lisle (2009: 148) maintains that, 'we see that the objects, issues and events we usually study [. . .] do not even exist without the media [.. .] to express them’. As a consequence, visual images have political and ethical consequences as a result of their role in shaping private and public ways of seeing (Bleiker. Kay 2007). This is because how people come to know, think about and respond to developments in the world is deeply entangled with how these developments are made visible to them.

Visual representations participate in the processes of how people situate themselves in space and time, because seeing involves accumulating and ordering information in order to be able to construct knowledge of people, places and events. For example, the remembrance of such events as the Vietnam War, the terrorist attacks of 11 September 2001 or the torture in Abu Ghraib prison cannot be separated from the ways in which these events have been represented in films, TV and photography (Bleiker 2009; Campbell/Shapiro 2007; Moller2007). The visibility of these events can help to set the conditions for specific forms of political action. The current war in Afghanistan serves as an example of this. Another is the nexus of hunger images and relief operations. Vision and visuality thus become part and parcel of political dynamics, also revealing the ethical dimension of imagery, as it affects the ways in which people interact with each other.

However, particular representations do not automatically lead to particular responses as, for instance, proponents of the so-called 'CNN effect’ would argue (for an overview of the debates among academic, media and policy-making circles on the 'CNN effect', see Gilboa 2005; see also. Dauber 2001; Eisensee/ Stromberg 2007; Livingston/Eachus 1995; O'Loughlin 2010; Perlmutter 1998, 2005; Robinson 1999, 20011. There is no causal relationship between a specific image and a political intervention, in which a dependent variable (the image) would explain the outcome of an independent one (the act). David Perlmutter (1998: I), for instance, explicitly challenges, as he calls it, the 'visual determinism' of images, which dominates political and public opinion. Referring to findings based on public surveys, he argues that the formation of opinions by individuals depends not on images but on their idiosyncratic predispositions and values (see also, Domke et al. 2002; Perlmutter 2005).

Yet, it should also be noted that visuals function as unquestioned referents in international politics when underlining the necessity of such specific policy practices as sanctions, deterrents and/or military cooperation. A good example of this is satellite imagery, which plays a pivotal role in the surveillance and assessment of missile or nuclear proliferation activities by so-called ‘rogue states’ like Iran and North Korea. Regarded as providing compelling evidence about the stage of development of nuclear facilities or about the collaboration between suspect states, satellite images point to a nexus between visuality, knowledge and international politics wherein this way of seeing consequently enables governments to make legitimate statements, draw conclusions and take informed political action. In sum, the visual provides the foundation for knowledge generation and, in doing so, bestows political responses with legitimacy (cf. Möller 2007). A now famous case-in-point is Colin Powell’s PowerPoint presentation at the United Nations Security Council in February 2003. In the briefing, the then US Secretary of State showed satellite images that allegedly proved the existence of Iraqi ‘Weapons of Mass Destruction’. What was remarkable about Powell’s presentation was that the visual emerged as the primary referent for the US government’s casus belli, which, in the words of MacDonald et al. (2010: 7–8), disclosed the fact that the ‘logic of geopolitical reason is now inseparable from its visual representation’ (see also, Campbell 2007c; Der Derian 2001).

The causal theory of the ‘CNN effect’, or what Perlmutter (1998: 1) has called above ‘visual determinism’, misconceives of how the visual recasts the political realm itself (Hansen 2011). Rather than asking whether an image caused an intervention, it should be asked instead how the visual has been involved in structuring the understandings of legitimate action, and how visual representations of different policy options affect particular security practices (Williams 2003: 527). For instance, many scholars have shown that images can provoke particularly emotive responses (Bleiker/Hutchison 2008; Crawford 2000; Hariman/Lucaites 2007; Mercer 2006; Ross 2006). Just one example of the (deliberate) evocation of an emotional reaction is the numerous fundraising campaigns that have been run by different humanitarian aid organizations over the years, in which imagery plays an essential role (Bell/Carens 2004; Dogra 2007; Manzo 2008).